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TOWARD A PLURALISTIC THEORY ON AN EFFICACIOUS PATENT INSTITUTION

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INTRODUCTION

It is axiomatic that one cannot discuss intellectual property law without concomitantly touching upon the field of economics. This is not because the patent institution is understood as a purely economic institution;[1] rather, it is because the patent institution connects the market to *some* knowledge by creating exclusion of some goods derived from that knowledge, giving economic value where otherwise none would exist.[2] Essentially, the patent institution provides incentives for people to create new, useful, and inventive knowledge, which, in turn, develops into a commodity that may be traded in the market. Therefore, the definition of institutional patent efficacy follows the definition of efficiency in economical terms. However, even as an economic institution, the patent institution fundamentally involves selecting a set of values—a normative task. In this function, patent law serves as an instrument forged out of policy, to select knowledge, the value of which may or may not be traded in the market. Thus, patent law consists of a set of criteria to grant rights and duties, while simultaneously generating social meaning.[3] Ultimately, patent law marks the boundary between that which is public and that which is private. The selection of values concerns norms, and therefore, typically is the subject of legal analysis.

Over time, scholars have attempted to assess the efficacy of the intellectual property institution and in so doing, have created a vast amount of material on the subject. While the sheer volume of works is impressive, it is not nearly as remarkable as the fact that there exists an absence of a generally applicable theory on intellectual property either claiming or disclaiming its efficacy. One may wonder if there is any point in engaging in this exercise and one may also question the

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[1] *See* F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697, 697–98 (2001) (claiming the basis for the American patent system lies in both rights based theories and classical utilitarian economic theory); *see also* John W. Schlicher, *If Economic Welfare is the Goal, Will Economic Analysis Redefine Patent Law?*, 4 J. PROPRIETARY RTS. 12, 12–19 (1992).

[2] *See* ERICH KAUFER, THE ECONOMICS OF THE PATENT SYSTEM (Harwood Academic Publishers 1989); WILLIAM D. NORDHAUS, INVENTION, GROWTH AND WELFARE: A THEORETICAL TREATMENT OF TECHNOLOGICAL CHANGE PINCITE (MIT Press 1969); *see also* Wendy J. Gordon, *Assertive Modesty: An Economics of Intangibles*, 94 COLUM. L. REV. 2579, 2579 n.1 (1994) (stating intellectual property law is fundamentally "a mode of converting mental labour into a 'vendible commodity.'").

[3] *See generally* Lawrence Lessig, *The Regulation of Social Meaning*, 62 U. CHI. L. REV. 943, pt. II, at 962–91 (1995) (discussing the construction of social meaning through the use of various models altered over time).

efficacy of this enquiry itself. This article answers this question by challenging the existence of a uniform definition of efficiency applicable to the assessment of intellectual property and argues that efficiency, as a unifying normative criterion, may not be useful. Of course, within micro theories of patent law, containing individualized and specific policy goals, the efficiency of a rule can be specifically defined and may be useful in identifying an inefficient policy. However, the indeterminacy of efficiency is such that a normative explanation of an institutional arrangement based solely on one version of economic efficiency would be misleading. Based on this observation, this article argues that the patent institution is best understood as a policy institution consisting of pluralistic definitions of efficiency that constantly require balancing.[4]

I. EFFICACY OF THE PATENT INSTITUTION AND EFFICIENCY

Assessing the efficacy of the patent institution is premised on the assertion that a patent systems is an institution with definable efficiency and, as a corollary, one can define and assess an efficacious patent institution. In assessing the efficacy of a patent institution, three concepts require discussion: institution, efficiency, and an efficient patent institution. Defining exactly what the definition of an institution is and why institutions are created goes to the heart of the debates on the emergence of a society. Although this discussion has generated copious volumes of literature, recounting it all would require stepping beyond the scope of this article. However, a brief discussion is needed to put the patent system in context.

Definitions of an institution vary, but as a general matter, institutions are socially constructed and are a means to achieve predetermined ends. Douglass C. North[5] defines an institution as the humanly devised constraints that structure political, economic, and social interaction.[6] Institutions consist of both formal rules, as in the case of legal institutions, or informal rules, as in social norms, customs, sanctions, and the like. When reduced to its mechanical simplicity, an institution is a man-made creation embedded with values, objectives, and goals, which drive and direct the behavior of the institution's members,[7] as opposed to nature.[8]

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[4] *See* Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575, 1638–39, 1641 (2003) (discussing how U.S. patent law uses pluralistic policy levers for balancing policies specific to each industry).

[5] Douglass C. North, *Institutions*, 5 J. ECON. PERSPECTIVE 97, 97 (1991). Constraints of economic terms means a set of rules according to which a right(s) (or bundle of titles) on the resources (movables, immovable, tangibles, intangibles, material and immaterial) is granted, registered, transferred, infringed, expired and enforced.

[6] *See generally* Lessig, *supra* note 3, at 964–65 (citing helmet use for Russian drivers as an example of a time when a government directed the behavior of institutional members by utilizing social meanings, namely by issuing government sanctioned helmets to stigmatize those who failed to wear a helmet).

[7] Literatures of old and new exist in abundance on what nature is, whether it is a historical reference or a prior ethical argument and so on. Here, nature is as opposed to the status of being a constraint. For a more recent discussion of this topic, *see* LAWRENCE LESSIG, CODE AND OTHER LAWS OF CYBERSPACE 24–25, 30, 82 (Basic Books 1999), where the author calls nature an "architecture."

General legal discussions on the nature of institutions typically take the form of "how the systems of rights (a grant of right in one, and imposition of duties on the others) can be socially justified." For example, according to North, the need to constrain behavior, comes from the need to create "order and reduce uncertainty in exchange" because, as explained by game theory, rational "wealth maximizing individuals will usually find it worth while to cooperate with other players when the play is repeated."[9] Similarly, other institutional economists[10] define institutions as "sets of ordered relationships among people which defines their rights, exposures to the rights of others, privileges and responsibilities,"[11] or as "regularities in behavior which are agreed by all members of a society and which specify behavior in specific recurrent situations."[12] Focusing on how rational beings interact with each other, game theory uses the "prisoner's dilemma" to explain that "an effective institution raises the benefits of cooperative solutions or the cost of defections." [13]

Jurisprudentially speaking, the discussion could be viewed as similar to theories of natural or positive law on the source of the authorities or respects.[14] In other disciplines, such as institutional economics, the discussion concerns constraints on behavior, and why such constraints are accepted or even needed. In the context of patent law and the patent system, questions abound such as, "why is there a need to create constraints on the exchange of knowledge with the patent institution, and why do the current set of rules form the basis for those constraints?" This fundamentally questions the philosophical underpinning of the patent institution and how the current rules of the patent institution can be characterized. This is because the outcome of the analysis may differ depending on whether patent law is an institution of property or an institution of policy.

As a socially constructed institution, the rules of the patent institution guide the behavior of societal members down certain paths depending on whether they are part

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[8] North, *Institutions*, *supra* note 5, at 97.

[9] *See* Allan Schmid, *Analytical Institutional Economics*, 54 AM. J. AGRIC. ECON. 893, 893-901 (1971). New institutional economists, however, recognize two different aspects of institution: institutional environment and institutional arrangement. *See* LANCE E. DAVIS & DOUGLASS C. NORTH, INSTITUTIONAL CHANGE AND AMERICAN ECONOMIC GROWTH 6–7 (Cambridge at the University Press 1971).

[10] ANDREW SCHOTTER, THE ECONOMIC THEORY OF SOCIAL INSTITUTIONS 72 (Cambridge University Press 1981).

[11] *Id.* at 9.

[12] North, *Institutions*, *supra* note 5, at 98. Prisoner's dilemma explains the dilemma of the non-zero-sum game. Peter Huber, *Competition, Conglomerates, and Evolution of Cooperation*, 93 YALE L.J. 1147, 1148 (1984). Based on the scenario of two prisoners with limited amount of resources, it explains the situation of cooperation versus cheating, and explains why cooperation is the most favorable. *Id.* Prisoner's dilemma however is believed to be not applicable to non rival goods.

[13] *See generally* BUCKLE STEPHEN, NATURAL LAW AND THE THEORY OF PROPERTY ch.1, § 4, ch.2, § 2, ch.3, § 1 (Oxford Claredon Press 1991) (providing a discussion of the foundations of natural law); HANS KELSEN, INTRODUCTION TO THE PROBLEMS OF LEGAL THEORY ch.3, § 10 (Bonnie L. Paulson & Stanley L. Paulson trans., trans. of the *Reine Rechtslehre* or PURE THEORY OF LAW, Oxford University Press 1992) (1934) (discussing the sources of authorities for natural law and legal positivism).

[14] Robert P. Merges, *Intellectual Property Rights and the New Institutional Economics*, 53 VAND. L. REV. 1857, 1859–60 (2000).

of the general public, present and future inventors, patent holders, patent infringers, or patent licensor/licensees. Patent law creates social meaning proclaiming the use of a patented method or manufacture of a patented product without the authorization of the patent holder is a wrong. These actions have to be sanctioned, even when one might have thought of them independently. Additionally, study of patent law as an institution also means approaching patent law as a system of rights that are ultimately part of a larger institution. This larger institution consists of interaction of the various branches of laws, including Constitutional law. At the same time, an economic institution such as the patent institution has interaction with other essential institutions of capitalism, such as markets and firms.[15]

In this context, the patent system can be understood to be an institution that embodies an artificially devised construct that is embedded with values and objectives that may be subject to change by society. Assessing the institution's efficacy would require a tenable definition of institutional efficiency. One often adopted method is to assume a set of "golden rules" that are hidden within the wordings of the current patent law, to try to make these rules explicit. Another common method is to find applicable norms from non-legal documents and instruments from areas such as culture, history, tradition, and economics.[16] Whichever method one follows, a set of golden norms would allow comparison of the current institution to the ideally efficient institution and based on such comparisons, a recommendation may be made to bring the current set of rules closer to the ideal. However, neither a golden set of norms nor a definable efficiency of the institution readily exists. At the same time, this disregards the dynamic nature of the institution of law.[17] Scholars have argued that the institution-centric study of law deserves serious skepticism.[18] Formalism assumes that there are essential meanings to words in the positive text of law. Roberto Unger has called this method of studying society by legal scholars an "institutional fetishism,"[19]and condemned this

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[15] *See generally* K Kalan, *Property Rights, Individual Rights, and the Viability of Patent Law Systems*, 71 U. COLO. L. REV. 1439, 1457–65 (2000) (discussing the culture and history leading to the creation and evolution of patent law in Slovenia); *id.* at 1460–61 (explaining how the shift from a socialist economy to a market economy altered Slovenia's patent system); *id.* at 1465–74 (describing the history and cultural of Indonesia responsible for the various shift in the nation's legal code and explaining how this shift led to the current system of patent law); *id.* at 1472 (stating global economic pressures caused Indonesia to alter its patent law); Aoki Keith, *(Intellectual) Property and Sovereignty: Notes Toward a Cultural Geography of Authorship*, 48 STAN. L. REV. 1293, 1328, 1330 (1996) (explaining the impact new technology has on promulgating and understanding property rights).

[16] *See* Adam Mossoff, *Who Cares What Thomas Jefferson Thought about Patents? Reevaluating the Patent 'Privilege' in Historical Context*, 92 CORNELL L. REV. (forthcoming 2007), *available at* http://ssrn.com/abstract=892062 (discussing a time based criticism of the Constitutional grant of intellectual property rights). U.S. CONST. art. I, § 8, cl. 8 ("Congress shall have Power . . . To promote the Progress of Science and useful Arts, by securing for limited Times to Authors . . . the exclusive Right to their . . . Writings . . . .").

[17] *See* JAMES BOYLE, CRITICAL LEGAL STUDIES xiv–xv (James Boyle ed., New York University Press) (1992) (characterizing the law as an institution and discussing the vulnerability of such an argument).

[18] *See* ROBERTO M. UNGER, WHAT SHOULD LEGAL ANALYSIS BECOME? 7 (Verso 1996).

[19] S*ee id.* (defining "institutional fetishism").

"rationalizing" method of research.[20] This is because there are aspects of studying law as an institution that ultimately lead to the discussion of politics or policy choices, which involve choosing one set of values over others. By objectifying value choices made to elect the institution of law, one can make the mistake of overlooking this subjective and dynamic aspect of the institution.

If one embraces these criticisms to the study of the law as an institution, one should accept that there are parts of this institution that are contradictory, incoherent, and not neutral.[21] When one understands the patent institution to also be such an institution, it should be expected that there is a possibility that the patent institution may lack a single coherent set of objectives or principles and, instead, contain "a set of principles and counter principles, rules and exceptions, policies and counter policies."[22] This makes the neutrally balanced picture of the patent institution an academic fiction based on indeterminable assumptions.

In this context, one can now review various versions of efficiency theories that have been applied to the study of the patent institution. As criticized above, some of these theories assume a uniform set of golden norms that underlie an institution, which justifies a particular definition of an efficient patent institution. This article argues through a combination of different principles and policies that such a uniform view of the patent institution is misleading because it downplays the quality of the patent institution as an institution of law. Therefore, instead of working toward a neutral definition of efficiency that can be applied generally, or searching for a unitary definition of efficiency, it would be more fruitful to highlight and clarify to what end, and what interests specific institutional arrangements serve. In other words, research questions should clarify *which efficiency* the institution is balanced toward and in *which circumstances* the current rules of institutions are efficient. In this way, efficiency may only be defined on the basis of a specific goal that is to be achieved by a specific part of an institution.

A. Definitions of Efficiency

Economic theories offer useful analytical tools in understanding the role of the patent institution by connecting the scarce tangible resources that are necessary in the creation of complementary intangible knowledge goods. With the maximization of the net social welfare on one hand, and efficient resource allocation on the other, economic theories provide positively useful analytical tools for identifying specific patent law rules and doctrines that are inefficient. Normatively, this exercise can also generate a policy recommendation to counter such inefficiencies. In either case, scholars begin their analyses with widely varying definitions of efficiency. Two large branches of definitions are used: technical efficiency and normative efficiency.[23]

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[20] *See generally* ROBERTO M. UNGER, PASSION; AN ESSAY ON PERSONALITY (The Free Press 1984); *see also* James Boyle, *Modernist Social Theory: Roberto Unger's Passion* 98 HARV. L. REV. 1066, 1078 (1985) (reviewing ROBERTO M. UNGER, PASSION; AN ESSAY ON PERSONALITY (1984)).

[21] *See* BOYLE, *supra* note 17, at xv.

[22] *Id.*

[23] A. Samuel Oddi, *Un-unified Economic Theories of Patents – the Not-Quite-Holy-Grail*, 71 NOTRE DAME L. REV. 267, 270–71 (1996); *see also* Rebecca S. Einsberg, *Analyze This: A Law and*

These two types of efficiency form the axes of different paradigms of the intellectual property institution. Often, technical efficiency forms the framework of the institution, providing for the overall direction of the institution as well as the basis of the analysis of how a specific rule of patent law may or may not produce the desired effect. Normative efficiency is often used to analyze whether systematic legal reform or institutional interference is necessary.

1. Positive Efficiency - Static and Dynamic Efficiency

In the most basic production system, efficiency is understood as the ratio of output (growth) to input and is therefore defined in terms of productivity and growth.[24] This is termed, "technical efficiency" and, in other words, is a simple cost to benefit ratio. Relating technical efficiency to knowledge and resource allocation, economists[25] often develop this into two further categories: static and dynamic efficiency. Static efficiency is measured at a given time, while dynamic efficiency is measured over time.

Using these concepts, economists often explain the patent system as follows: knowledge is a non-rival good, i.e., the usage of one unit is not synonymous with the consumption of one unit. At the same time, however, once knowledge is produced and disclosed, it generates externalities and it is difficult to exclude, making the marginal cost of the end product near zero. Because initial production of knowledge has its costs, the producer of knowledge will not disclose it unless the initial cost of production of that knowledge can be recouped. However, the users of the knowledge will not pay for it when they can get it for free, resulting in market failure.[26]

Economics Agenda for the Patent System, 53 VAND. L. REV. 2081, 2087 (2000) (addressing technical efficiency); Merges, *supra* note 14, at 1868; *see generally* Rochelle Cooper Dreyfus, *Games Economists Play*, 53 VAND. L. REV. 1821 (2000).

[24] FRED FOLDVARY, PUBLIC GOODS AND PRIVATE COMMUNITIES 19 (Edward Elgar Publishing 1994).

[25] *See* Janusz A. Ordover, *A Patent System for Both Diffusion and Exclusion*, 5 J. ECON. PERSPECTIVES 43, 43 (1991) (recognizing the "public policy analysis of optimal patent regimes is often framed as a tradeoff between static and dynamic efficiency"); ERICH KAUFER, THE ECONOMICS OF THE PATENT SYSTEM (Harwood Academic Publishers 1989); Edwin Mansfield, *Patents and Innovation: An Empirical Study*, 32 MGMT. SCI. 173, 174–75 (1986) (analyzing how various sizes of manufacturing firms allocate their resources to optimize their commercial gain); Sanford J. Grossman & Joseph E. Stiglitz, *On the Impossibility of Informationally Efficient Markets*, 70 AM. ECON. REV. 393, 394 (1980) (explaining how the optimum market needs an equilibrium utility between persons whom are knowledgeable and those whom are uninformed); WILLIAM D. NORDHAUS, INVENTION, GROWTH AND WELFARE: A THEORETICAL TREATMENT OF TECHNOLOGICAL CHANGE 89 (MIT Press 1969); *see also* SUZANNE SCOTCHMER, INNOVATION AND INCENTIVES 31–59 (MIT Press 2004); Dominique Foray, *Knowledge Distribution and the Institutional Infrastructure: The Role of Intellectual Property Rights*, IN INTELLECTUAL PROPERTY RIGHTS AND GLOBAL COMPETITION, at 77–118 (Horst Albach and Stephanie Rosencrantz eds., 1995).

[26] *See* FRITZ MACHLUP, KNOWLEDGE - ITS CREATION, DISTRIBUTION, AND ECONOMIC SIGNIFICANCE, 3 THE ECONOMICS OF INFORMATION AND HUMAN CAPITAL 122 (Princeton Univ. Press 1984); *see also* Wendy J. Gordon, *Asymmetric Market Failure and Prisoner's Dilemma in Intellectual Property*, 17 U. DAYTON L. REV. 853, 861–67 (1992) (applying the prisoner's dilemma to intellectual property law).

When the output is defined as the utility of knowledge, optimal efficiency is achieved when it is shared by the most, as its marginal cost is zero. Therefore, it is *statically efficient* when it is used by the most persons, businesses, or entities.[27] However, unless the initial cost of production is recouped, a drop in production over time occurs, thereby causing *dynamic inefficiency*. Assuming that market exchange is more efficient at allocating resources to knowledge production and diffusion than other alternative institutional arrangements,[28] the patent system grants exclusive rights that enable a market-based recoupment of the cost of invention.[29] While this sacrifices the static efficiency in the long run, the gains in dynamic efficiency compensate for the losses because more investments in knowledge will be made and more knowledge will be produced and diffused.

Although these concepts do not generate norms by themselves, they are useful at a normative level because they lead to the conclusion that the market created could never be perfectly efficient and would require a constant balancing of two important policies: exclusion and diffusion. Normatively, the institution may consist of rules that favor efficient exclusion or, conversely, the institution may consist of rules that favor efficient diffusion.[30] The merit in balancing the exclusion and diffusion policies is that they show how static efficiency, often equated to the competition, may suffer when dynamic efficiency (i.e. exclusive rights) is promoted. Weak protection of intellectual property (statically efficient) discourages firms from contracting to eschew the risk of loss of valuable knowledge and firms will rely more extensively on internal safeguards instead, such as keeping the technology as a trade secret.[31] A stronger regime of protection for intellectual property (dynamically efficient), however, will raise the cost of doing business. Moreover, emphasis on this trade-off may answer both the question of stand-alone knowledge creation and cumulative knowledge creation.[32] This is because using the cumulative knowledge, a knowledge

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[27] *See* Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention, in* THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS 616–17 (Richard R. Nelson ed., Princeton Univ. Press) (observing that "any information obtained, say a new method of production, should, from the welfare point of view, be available free of charge (apart from the costs of transmitting information). This insures optimal utilization of the information but of course provides no incentive for investment in research. . . . In a free enterprise economy, inventive activity is supported by using the invention to create property rights; precisely to the extent that it is successful, there is an underutilization of information.").

[28] This assumption eclipses with the Pareto efficiency problem discussed under 2.1.2

[29] *See* Grossman & Stiglitz, *supra* note 25, at 394 (explaining in a market where the quality of information increases, such as a patent system, the price system becomes more informative and the uninformed are able to give back).

[30] *See* Ordover, *supra* note 25, at 49 (highlighting the Japanese patent institution includes properties of both efficient exclusion and diffusion).

[31] *Id.* at 49–50 ("when the patent regime is weak, innovators must rely on other means to achieve appropriability and excludability [and] rely on non-patent mechanisms, like secrecy and first-mover advantages, to protect their intellectual property.").

[32] Suzanne Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and the Patent Law*, 5 J. ECON. PERSPECTIVES 29, 29 (1991) (recognizing in the society of advanced technologies most innovators use the foundation of existing inventions to create their own); *see also* Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 880–82 (1990) (discussing the origin of invention may be "discrete" or may come from a "cumulative" group of technologies depending on the invention and industry).

base accumulated over time, is necessary for the future production of stand alone knowledge.

On the other hand, the general criticism for applying an efficiency-oriented study to the law can also be directed to the above analysis. Because an efficiency-oriented study cannot account for the full range of externalities, values as benefits, and costs that a nuanced study should take into consideration, it is often criticized as two-dimensional and crude.[33] An efficiency-based analysis is useful for explanation rather than in generating norms and therefore, it can be criticized as rationalizing and justifying the status quo. When used normatively, this may confuse the explanation with the justification.[34]

As seen above, this definition of efficiency alone may not generate the answer to why a specific policy choice should be made. However, its *positive explanatory power* lies in its focus on the conditionality of exclusion to the objective of diffusion. Therefore, it acknowledges the need to create an institution to balance the trade-off between static and dynamic efficiency, and recognizes the contingent nature of the institutional arrangement. Fundamentally, it highlights an instrumentalist view of the patent institution as an institution that balances different incentives for specified goals. The norm of exclusion that the dynamic efficiency promotes does not necessarily hold priority over the norm of diffusion that the static efficiency promotes.

2. Normative Efficiency

To bridge the gap between the technicalities of efficiency and the need to generate norms, the Pareto and/or Kaldor-Hicks efficiency analysis is often used in law and economics literature to argue for or against a legal change.[35] A situation is viewed as "Pareto efficient" when no reallocation of resources can be made without decreasing the utility of at least one other person. The outcome of a change is "Pareto superior" to the status quo if the outcome would make at least one individual better off without making anyone worse off. A system of rules can be said to be "Pareto efficient" if it is impossible to make one person better off without making at

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[33] Merges & Nelson, *supra* note 32, at 842 (stating newer economic approach to patent goes far "beyond the two-dimensional analysis of incentives and deadweight loss"); *see also* James Boyle, *Cruel, Mean, or Lavish? Economic Analysis, Price Discrimination and Digital Intellectual Property*, 53 VAND. L. REV. 2007, 2013 (2000) (discussing the lack of incentives is only one layer into a complex economical analysis); Merges, *supra* note 14, at 1871–72; *see generally* Jules L. Coleman, *Efficiency, Utility and Wealth Maximization*, 8 HOFSTRA L. REV. 509 (1980).

[34] *See generally* Mark Lemley, *Ex Ante Versus Ex Post Justifications for Intellectual Property,* 71 U. CHI. L. REV. 129 (2004).

[35] *See, e.g.*, FOLDVARY, *supra* note 24, at 19; RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 12–13 (4th ed. 1992); *see also* R. H. Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1 (1960), *reprinted in* 1 RICHARD A. POSNER & FRANCESCO PARISI, LAW AND ECONOMICS 433–76 (Edward Elgar Publishing 1997); *compare* WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW 294 (Harvard University Press 2003) (developing similar ideas on the minimization of transaction costs slightly modified), *with* Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972).

least one person worse off. On the other hand, a system of rules is "Pareto inferior" when it is possible, under the current status quo, to make at least one person better off without making anyone worse off. Therefore, an institution is *"Pareto optimum"* if it creates a situation where any possible change involves the objection of at least one person who will be worse off.

A "Pareto optimum" is practically impossible to achieve, and a revised version of this efficiency theory[36] is Kaldor-Hicks efficiency. The Kaldor-Hicks efficiency theory is sometimes referred to as a hypothetical compensation, or potential Pareto superiority. This definition of normative efficiency is believed to be more convincing because it assumes a general balancing of costs and benefits, not unanimity. An institution is *Kaldor-Hicks efficient* if it generates a higher-valued total output of goods, services, and leisure for the members of society taken together, than would be possible by any alternative. When applied to private actors, this means an outcome is efficient if the gainers value its occurrence more than the losers devalue it. In other words, if the preference satisfaction is maximized by an exchange, the gains of exchange or trade are most efficient.

This definition is adopted to explain the nature and function of legal institutions, such as property and contract, in relation to private actors and their behavior, also referred to as "private ordering."[37] The Coase theorem applies this theory to the system of private rights.[38] The Coase theorem asserts that if the transaction cost is zero, Pareto efficiency will be obtained, regardless of the initial allocation of property rights, because opportunistic individuals would trade their rights to maximize their own interests. In this scenario, an initial entitlement or right allocation does no more than set the conditions of the trade. The trade that ensues will then redistribute the resources to those who place the most value on them. Therefore, an efficient institution should minimize the transaction costs to allow parties to maintain the gains of the trade and at the same time should provide maximum allowance for private ordering by *interfering minimally*. Similarly, Douglas C. North argues that "institutions and the effectiveness of enforcement determine the cost of transacting" and that an efficient institution "reduces the transaction costs and production costs so that the gain from trade is realizable."[39]

Creation of an exclusive right, viewed in this light, is one way of reducing the transaction costs. It has been argued that the objective of the property institution is the "maximization of exclusivity and transferability with minimal transaction cost" and that "efficiency requires a mechanism to transfer such rights."[40] Furthermore, the problem of externalities and hold-outs, which are typical in private trade-offs and result in positive transaction costs, can be regulated by the institution of law. In this sense, "the choice of the proper legal rule can be defined as that which minimizes the

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[36] *See* Calabresi & Melamed, *supra* note 35, at 1102 (equating Pareto optimality to economic efficiency).

[37] OLIVER E. WILLIAMSON THE ECONOMIC INSTITUTIONS OF CAPITALISM (Collier-Macmillan Publishing 1987) at 164-166; *see generally* Posner, *supra* note 35, at 12–17.

[38] *See* Coase, *supra* note 35, at 22–23

[39] North, *supra* note 5, at 98.

[40] Posner, *supra* note 35, at 12–13; *see also* ROBERT C. ELLICKSON, PERSPECTIVES ON PROPERTY LAW 47 (Robert C. Ellickson, Carol Marguerite Rose & Bruce A. Ackerman eds., 1995).

sum of these externality and holdout costs in any particular institutional setting."[41] The object of the legal institution in addressing this problem should be a solution designed to "minimise the sum of costs that are associated" with it.[42]

The parable of the zero transaction cost provides a convenient objective for a legal institution. The zero transaction cost parable provides a behavioral pattern that, if true, could be used as an assumption in constructing the objectives of a legal institution that regulates behavior. Therefore, the object of law becomes the development of "a set of rules that promotes the closest approximation to the world of zero transaction costs." [43] However, a variety of moral and normative objections still exist. The strongest objection would be the criteria of better-off or worse-off requires commensurability of preferences, even when the preferences can be culturally and socially conditioned.[44] Additionally, because the crux of the zero transaction cost analysis is transactional, it has been often argued that efficiency opposes the argument of equality, and that the zero transaction cost theory may fail to address the issue of distributive justice.[45] Many scholars have warned of the dangers associated with this kind of economic analysis of legal institutions, noting that while this analysis focuses on efficiency and utility, it ignores other values such as fairness, equality, and freedom.[46]

Of particular significance to institutions that condition exclusive rights on competition, is the observation that a Pareto optimal institution operates with *perfect competition* or as a *monopoly with perfect price discrimination*.[47] In this regard, either perfect competition with no exclusion, or a monopoly with perfect price discrimination that perfectly tailors preferences would be Pareto efficient. A Pareto optimal institution operates with either perfect competition or as a monopoly with perfect price discrimination. For which of these two optimal models should institutions strive? Furthermore, where there are pre-existing exclusive rights, there may be a tendency to recommend the creation of more rights, or at least to reduce transaction costs, for those who already hold the exclusive rights to facilitate a maximum efficiency exchange. This built-in-bias is fundamentally proprietary and it supports the proprietarial arrangement within an efficient market as the most efficient method of allocating resources.[48] This is because a proprietary arrangement "views a system of universally applied and clearly defined property rights as a cornerstone of market efficiency."[49] Such an institutional arrangement will reduce

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[41] Richard A. Epstein, *Holdouts, Externalities and Single Owner: One More Salute to Ronald Coase,* 36 J.L. & ECON. 553, 557 (1993).

[42] *Id.*

[43] *Id.* at 556.

[44] *See generally* MARGARET J. RADIN, CONTESTED COMMODITIES (Harvard Univ. Press 1996).

[45] *See, e.g.*, Coleman, *supra* note 33, at 520–26; *see also* T.M. WILKINSON, FREEDOM, EFFICIENCY, AND EQUALITY (Palgrave MacMillan Press 2006).

[46] *See generally, e.g.*, Coleman, *supra* note 33; *see also* Ronald M. Dworkin, *Is Wealth a Value?*, 9 J. LEGAL STUD. 191 (1980); RADIN, *supra* note 44, at 79–94 (arguing the rhetoric of law and economics tends to marginalize the values required for human flourishing).

[47] *See* Boyle, *supra* note 33, at 2026.

[48] *See* Neil Weinstock Netanel, *Copyright and a Democratic Civil Society*, 106 YALE L.J. 283, 311–14 (1996) (providing a brief critique of the neo-classical and new institutional approach to IP institution as applied to copyright institutions).

[49] *Id.* at 312.

the cost of transactions, thus creating an institutional propensity to propertize and emphasize universal, concentrated, exclusive, and exchangeable rights of property.

B. An efficient Patent Institution

As discussed above, there are many different definitions of efficiency. As analytical tools, these different definitions of efficiency are *not mutually exclusive* and have often been applied to analyze the same aspect of an institution simply from different angles.[50] When used normatively, normative efficiency may help to prioritize the importance of exchanges in the market and accordingly, it may also end up supporting a strong proprietary arrangement and minimal regulation of exchanges. While providing a positive explanation, however, application of technical efficiency may not provide any normative changes and may defer this to other societal decision making processes. This indeterminacy is commonly observed in any efficiency-oriented study of social institutions because ultimately, any definition of efficiency depends on the underlying normative choices.

Even when there is agreement on the abstract and general goals of a patent institution, the means of implementing those goals may be radically different.[51] One way to characterize the patent institution is to analyze it as a continuation of the property institution.[52] Another contrasting way to characterize the patent institution is as a policy institution.[53] Both perspectives deal with the question of efficiency in regulating relationships between private persons and the government that grants and enforces rights. Viewing the patent institution as an extension of the property institution tends to highlight the private nature of the right, and reiterates the need to grant an equivalent right of ownership to the patent holder as is bestowed on the owner of traditional tangible property. On the other hand, viewing the patent institution as a policy institution stresses the public nature of the right and the public goods problems associated with the creation of knowledge. Scholars taking this position tend to endorse rigorous institutional actions to regulate the transactions or the flow of knowledge in society as a whole. Unlike the private property theory, the public goods theory forms the basis of the policy institution and thus, the patent institution is viewed as *an instrument of a set of policies or goals*. The patent institution's efficacy may be assessed based on its efficacy in achieving the ex ante policy goals and in redressing the potential harm ex post.

The several economic theories of patent institutions, both normative and positive, reflect these differences. These economic theories on patents do not alone satisfactorily explain what an efficient patent institution is. However, there are

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[50] *See* NICHOLAS MERCURO & STEVEN G. MEDEMA, ECONOMICS AND THE LAW: FROM POSNER TO POST-MODERNISM 68–93 (2006) (providing an comprehensive overview of several concepts: efficiency in exchange, efficiency in production, and Kaldor-Hicks efficiency).

[51] *See generally* Schlicher, *supra* note 1.

[52] *See, e.g.*, WILLIAM M. LANDES & RICHARD A. POSNER, *The Economic Structure of Intellectual Property* 11–36 (2003) (extending a case for propertization, by stressing the continuity of the property interests).

[53] *See generally, e.g.*, Burk & Lemley, *supra* note 4 (proposing the initial steps courts might take to craft patent law in a way that meets the needs of particular industries).

theories, approached from both economic and legal researchers, on what should be an optimum patent term,[54] the scope of the patent,[55] the cost of imitation,[56] the cost of the patent institution,[57] and the relationship between patent and inventive activity in different fields of technology.[58] Most often, these theories have a philosophical or economic basis

A universal theory, however, that can explain the entire patent institution does not seem to exist. When commenting on the lack of a unified theory for patents, Samuel Oddi explained that one may classify the existing theory for patents in macro and micro theories. [59] Macro theories aim to explain why society needs the patent institution. Micro theories, on the other hand, attempt to explain why society needs a specific patent to be enforced or not enforced and therefore, theorize on the prediction of validity analysis. For example, micro theories explain why society would benefit from a race-to-invent system with narrow patent scopes and rapid development. In this section, some of the theories are reviewed from these angles to show that a portion of these theories assume both positions. This section argues that there are incoherent theories that create omnibus view points, such as theories that view patents as property, while recognizing other objectives such as diffusion of knowledge. This article also argues that this collage of view points is reflected in current patent laws and there are multiple objectives, which makes a single definition of efficiency infeasible. In addition, the existence of multiple incoherent objectives in one institution makes prioritization of the objectives inevitable. Prioritizing the competing objectives inevitably leads to an inefficient, at least in certain aspects, institution and ultimately, a single, optimally designed structure may not be possible.

II. PROPRIETARIAN THEORIES AND ALLOCATIVE EFFICIENCY

As argued above, the efficiency of an institution may be defined in such a way as to rationalize the existence of the institution. An institution can be efficient according to a set of rules, and therefore, the set of values that the rules of the institution are based on defines the normative context of its efficiency. In an intellectual property institution, it is the justification for the legal monopoly over intangible and non-rival goods for the first mover that indicates the underlying normative choices.

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[54] *See generally* Merges & Nelson, *supra* note 32 (suggesting ways that patent scope doctrine can be applied to favor a competitive environment for patent pioneers).

[55] *See generally, e.g.*, Merges & Nelson, *supra* note 32.

[56] Edwin Mansfield, *Technological Change and the Rate of Imitation*, 29 ECONOMERTRICA 741 (1961); Edwin Mansfield, Mark Schwarts and Samuel Wagner, *Imitation Costs and Patent: An Empirical Study*, 91 ECON. J. 908 (1981).

[57] Fritz Machlup & Edith Penrose, *The Patent Controversy in the Nineteenth Century*, X J. ECON. HIST. 1, 23–24 (1950).

[58] RICHARD R. NELSON & S. WINTER, AN EVOLUTIONARY THEORY OF ECONOMIC CHANGE (Belknap Press 1982).

[59] Oddi, *supra* note 23, at 268–71.

If the patent institution is viewed as a property institution, then the objective of the patent institution is equivalent to that of the institution of property. "Intellectual property," as opposed to industrial or intangible rights, has become a dominant and unifying term that appears in many legal instruments. For example, the United States Federal Trade Commission ("FTC") recognizes the existence of pro-competitive uses and anti-competitive uses of intellectual property. The 1995 Antitrust Guidelines for the Licensing of Intellectual Property state how the United States Department of Justice ("DOJ") and FTC treat intellectual property as "essentially comparable to any other form of property" and that the existence of intellectual property does not create "market power in an antitrust context."[60] Similarly, the Agreement on Trade Related Aspects of Intellectual Property Rights ("TRIPS") has also adopted this understanding of the patent institution. Indeed, in its preamble, the TRIPS treaty has actively accepted the use of the terminology "intellectual property" as a way to express an understanding of the patent institution as an institution for providing governmental assistance to private rights. The fourth paragraph of the Preamble was added toward the end of the negotiations, and it states that the contracting parties will recognize intellectual property rights as private rights. The history of the negotiations suggests that this paragraph was added to clarify the fact that TRIPs does not obligate a government to take *ex officio* actions against infringement or violations, such as imposing criminal sanctions.[61] The paragraph is an assertion of the private nature of intellectual property rights.

The property theory of the patent institution explains patents on the basis of three related assertions: (1) a property right should be granted (2) because it is the natural right of the laborer and (3) it is fair and just to reward the laborer. Supporting these assertions is a belief that property rights are the most efficient means of allocating resources and this highly efficient allocation method is the best way to address the "tragedy of the commons," the conflict between individual interests and the common good.[62] In the next section, each of the three assertions is critically assessed. As argued above, there are many moral objections to this use of normative efficiency. Most notable among the objections is that an efficient allocation of resources proffered by this approach is not necessarily the most fair and just method of distribution.[63]

A. Natural Right Theory and Proprietarian Efficiency

The natural right theory on knowledge serves as the justification for granting the producer of knowledge, whether it is work or invention, a property right. Under this theory, inventors have natural rights in their mental labor. Modern acceptance of the natural right theory in the intellectual property discourse stems from the

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[60] U.S. DEP'T. OF JUSTICE & FED. TRADE COMM'N, ANTITRUST GUIDELINES FOR THE LICENSING OF INTELLECTUAL PROPERTY (1995).

[61] *See* DANIEL GERVAIS, THE TRIPS AGREEMENT: DRAFTING HISTORY AND ANALYSIS 37 (Sweet and Maxwell 1998).

[62] *See generally* Garret Hardin, *The Tragedy of the Commons*, 162 SCI. 1243–48 (1968).

[63] *See generally* Jules L. Coleman, *Efficiency, Utility and Wealth Maximization*, 8 HOFSTRA L. REV. 509 (1980).

combination of Lockean property theory and the Cartesian theory of knowledge to the human existence.[64] The natural right theory is founded on the "plausibility on the existence of natural right (law of nature) and the existence of reason in humans to enable its identification."[65] Linking Locke's theory of property, based on the natural right theory, with Descartes's assertion of human rationality lay the foundation for the natural right theory.

The adoption of property rhetoric into the patent discourse allows the association of Locke's natural law theory of property with patent theory. Locke argued that the original owner of property is the one who mixes his or her labor with a previously un-owned thing and that the act of mixing establishes ownership in the thing.[66] Therefore, the useful laborer is rewarded with a property right in the thing, based on the idea of just deserts. Locke's theory is premised on the assertion that one owns one's body because one occupies and possesses it. If the mind is the extension of one's body, then one owns the mind. As a corollary, thinking persons have a natural property right in their ideas. People, therefore, have a natural property right in their own ideas, just as they have a natural property right in their own bodies. Society should build a patent institution that recognizes this property right and should punish those who infringe that right just as society punishes thieves. Following this logic, this right is not created by society, but the property right is given to the thinking man by nature itself.

Stanislas de Boufflers went as far as to claim that intellectual property is a "primary property," while all other property is merely conventional.[67] In adopting Boufflers' argument, the French National Assembly in 1791 proclaimed an inventor's property right to be one of the rights of man.[68] Similarly, during the patent reform period of the 1820s in the United Kingdom, J.R. McCulloch advocated this position by stating, "[I]f anything can be called a man's exclusive property, it is surely that which owes its birth entirely to combinations formed in his own mind, and which but for his ingenuity would not have existed."[69] Natural property theory is based on the premise

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[64] *See generally* Tom Bethell, THE NOBLEST TRIUMPH: PROPERTY AND PROSPERITY THROUGH THE AGES 259–71 (1998), PETER DRAHOS, A PHILOSOPHY OF INTELLECTUAL PROPERTY 41–72 (1996), CHRISTOPHER MAY, A GLOBAL POLITICAL ECONOMY OF INTELLECTUAL PROPERTY RIGHTS – A NEW ENCLOSURE? (2000); *see also* JAMES BOYLE, SHAMANS, SOFTWARE, AND SPLEENS- LAW AND THE CONSTRUCTION OF THE INFORMATION SOCIETY 56–58 (1996), Samuel A. Oddi, *TRIPs – Natural Rights and a "Polite Form of Economic Imperialism?* 29 VAND. J. TRANSNAT'L L. 413, 425 (1996). *But see* Wendy J. Gordon, *A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property*, 102 YALE L.J. 1533 (1993); Alfred C. Yen, *Restoring the Natural Law: Copyright as Labor and Possession*, 51 OHIO ST. L.J. 517 (1990), Steven Cherensky, Comment, *A Penny for Their Thoughts: Employee—Inventors, Preinvention Assignment Agreements, Property, and Personhood*, 81 CAL. L. REV. 595 (1993) (discussing arguments on natural rights theory).

[65] *See* DRAHOS, *supra* note 64, at 25.

[66] *See generally* JOHN LOCKE, THE SECOND TREATISE OF GOVERNMENT, ch. 5, (1690), *available at* http://www.gutenberg.org/dirs/etext05/trgov10.txt.

[67] *See* opinion of Stanislas de Bouffler adopted for French Patent Statute, in Dictionaire de L'economique Politique (Dictionary of Political Economics) Tome Premier, Bruxelles etc.:Meline, Cans et Compagnie, Libraires-Editeurs, (1853) at 233.

[68] *Id.* at 252.

[69] H. I. DUTTON, THE PATENT SYSTEM AND INVENTIVE ACTIVITY DURING THE INDUSTRIAL REVOLUTION 1750–1852, 17–18 (Manchester University Press, 1984).

that inventors have inherent property rights in their invention. Patent rights are, therefore, the natural right of the inventor. Marcel Plaisant, in 1949, adopted this idea and wrote:

> [T]he right of the inventor, like the right of the author, is a personal right above all. . . . [W]e believe that the principal theoretical justification of the right of the inventor or in general the creator in the industrial spheres lies in the principle that the mission of the law is to provide most generously for the expansion human beings, in a way that would best promote the justice.[70]

Despite the criticism that Locke's writing was initially meant to discuss tangible property, not intellectual property,[71] the Lockean concept of property was cited in terms of intellectual property as early as 1769. In a copyright case in the UK, *Millar v. Taylor*,[72] the judges cited natural right theorists such as Grotius, Pufendorf, and Locke.[73] Further, in the context of discussing copyright, William Blackstone, who argued on behalf of the London booksellers in both *Millar* and in *Donaldson v. Becket*,[74] argued for a perpetual common-law copyright in COMMENTARIES ON THE LAWS OF ENGLAND.[75] Blackstone's rationale was that such rights were a matter of "original and natural right."[76]

The natural property theory of patent rights collapses, however, if it fails to explain why society needs to have a property institution or why society needs to acknowledge the natural rights of man. Under the natural right theory, this explanation is given as a divine command and natural law.[77] Assuming the existence of natural law, or God-given laws, Locke's natural right theory explains that divine-will gave the commons to the industrious and as a result, the labor based reward

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[70] *See* MARCEL PLAISANT, TRAITE DE DROIT CONVENTIONNNEL INTERNATIONAL CONCERNANT LA PROPRIETE INDUSTRIELLE 4 (Sirey Paris 1949). Translation by the author.

[71] *See* RONALD V. BETTIG, COPYRIGHTING CULTURE: THE POLITICAL ECONOMY OF INTELLECTUAL PROPERTY 19–22 (Westview Press 1996) (expressing doubt that Locke had intellectual creativity in mind when articulating his labor theory of property, because he did not earn a living from the publication of his books; thus not seeing the need to make a case for authors' rights); s*ee also* DRAHOS, *supra* note 64, at 47 ("When he wrote on property, Locke probably did not have intellectual property in mind. It was the ownership of physical rather than abstract objects that occupied his attention.").

[72] *See* DRAHOS, *supra* note 64, at 24 (stating that *Millar v. Taylor*, 98 Eng. Rep. 201 (K.B.) (1769), established the existence of a common law copyright).

[73] *See generally* BUCKLE, *supra* note 13 (seeking to trace the important continuities in early modern political thought development by analyzing some major themes in the natural law and property theories of Hugo Brotius, Samuel Pufendorf, John Locke, Francis Hutcheson, and David Hume).

[74] *See* DRAHOS, *supra* note 64, at 24 (stating *Donaldson v. Beckett*, 98 Eng. Rep. 257 (H.L.) (1774), which came after *Millar v. Taylor*, ultimately decided that the common law copyright was abolished).

[75] 2 SIR WILLAM BLACKSON, COMMENTARIES ON LAWS OF ENGLAND 2–11 (1766) (stating the rudiment and grounds for property law as a matter of practice should be examined).

[76] *Id.*

[77] *See* LOCKE, *supra* note 66, §§ 25–26 (arguing since the right to possession was divinely given to mankind in common, that right should extended to the spoils of his labor).

theory was born.[78] Therefore, the property institution was created so that men would obey the divine command. This is also referred to as "just property,"[79] and therefore, meaning is given to the perception of property as proprietary. This creates a social meaning whereby a property right in one's creation is just. This argument, seen in the case of Locke's flight into divine command, sounds morally superior to the idea that a certain privilege is granted for a purpose. The natural right justification, therefore, calls for the justification for the entitlement of such rights. Even this reliance on "just property," however, calls for further qualifications.

In the context of the TRIPS treaty, Oddi argues that the morality ridden argument for natural rights forms the basis for some of the main principles that these multilateral agreements envision.[80] International conventions predating TRIPS obligated members to treat other nations fairly, but those conventions were not based on the universal natural rights of an inventor in his invention, nor did they call for a global concentration of those rights into one holder.[81] If inventors have a natural right in their inventions, differentiated treatment of the same subject matter of the creation of this right would be unfair. TRIPs addressed this problem simply by requiring all member states to meet the same minimum standard of protection for intellectual property rights. The justification for this requirement, according to Oddi, is nothing more than TRIPS' recognition of natural rights.

Natural right justification is sometimes argued to be the fundamental basis of the proprietarian view of the intellectual property institution and as a *proprietarian philosophical justification* for a specific expansion of the subject matter of intellectual property. For example, as recently as 1984, the United States Supreme Court actually cited Locke's Treatise as support for its holding that intangible "products of an individual's 'labour and invention'" can be "property" subject to protection of the Fifth Amendment of the United States Constitution.[82]

However, natural right theory cannot be applied to patent law as the theory stands today.[83] History shows that the natural right argument concentrates on the rights of an author rather than on the rights of a patent holder.[84] From the

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[78] *Id.* § 6.

[79] *Id.* § 46.

[80] Oddi, *supra* note 64, at 432.

[81] International Convention for the Protection of Industrial Property, Mar. 20, 1883, last revised at Stockholm, July 14, 1967, 21 U.S.T. 1583 [hereinafter Paris Convention].

[82] Ruckelshaus v. Monsanto Co., 467 U.S. 986, 1002–03 (1984). *See also* Pamela Samuelson, *Information As Property: Do Ruckelshaus And Carpenter Signal A Changing Direction In Intellectual Property Law?*, 38 CATH. U.L. REV. 365, 365 (1998) (stating *Ruckelshaus'* decision, which classified information as private property, was contrary to the general resistance of characterizing trade secret as property in American intellectual property law). *See also* Wendy J. Gordon, *A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property*, 102 YALE L.J. 1533, 1539 (1998) (stating *Ruckelshaus* cited Locke's Second Treatise, among other sources, in holding that trade-secret rights can be "property" under the Fifth Amendment Taking Clause).

[83] *See* DRAHOS, *supra* note 64, at 32–33 (stating patents belong to inventors by virtue of a privilege and not a natural right).

[84] *See generally* MACLEOD CHRISTINE, INVENTING THE INDUSTRIAL REVOLUTION: THE ENGLISH PATENT SYSTEM, 1660–1800 (Cambridge University Press 1988). *See* Edward. C. Walterschied, *To Promote The Progress Of Useful Arts: American Patent Law And administration 1787-1836 (Part 1)*, 79 J. PAT. & TRADEMARK OFF. SOC'Y 61 (1997). *See* Edward C. Walterschied, *To Promote The*

beginning, patent rights were viewed as artificial constructs with a limited term in the form of a privilege that was designed for specific economic and policy concerns. One of the reasons for this distinction stemmed from the belief that invention was believed to be uncovered; while literary work was believed to be created. This explanation, however, is incorrect because no author creates something out of nothing. In much the same way that an inventor invents using pre-existing knowledge, authors "create" work using pre-existing knowledge by using languages, the most commonly held knowledge, as their tools.[85] However, historical debates indicate that the patent institution, in its early history, was viewed as an artificial construct aimed toward specific purposes, with patent rights amounting to privileges that could be "readily shaped, limited and finally extinguished by law."[86] Therefore, the patent institution's nature has been fundamentally *instrumentalist*. Only recently has the natural right theory been used to redefine the nature of the institution as it applies to a property institution.

B. Intellectual Property as Reward for Labor or Benefit

Natural right and property based reward theory can be distinguished from the incentive based reward theory in that the former asserts the nature of reward to be a property right as opposed to a form of privilege or a special right conditioned by duties that are attached to its exercise. A slight variation of this reward argument asks whether the reward should be for the labor or, instead, for the benefit society enjoys from the invention. The reward theory explanation of the property theory of patents presupposes a natural right in property as its justification. In sum, the *nature* of the right is characterized as a property right, while its *function* is a reward to the inventor.

According to Locke's theory of property, inventors own their labor, and the fruits of their labor should be rewarded with a property right. Specifically applied to knowledge, it is argued that without the reward, no one would put any effort toward labor. As briefly mentioned above, Locke, in his second Treatise of Government, asserted the labor based reward theory of property.[87] Similarly, Jeremy Bentham claimed that protection against imitators is necessary because "he who has no hope that he shall reap, will not take trouble to sow," and a patent is the best protection because it is "the most natural and least burdensome" and it costs "nothing."[88]

Progress Of Useful Arts: American Patent Law and Administration 1787-1836 (Part 2), 80 J. PAT. & TRADEMARK OFF. SOC'Y 11 (1998). *See* EDITH T. PENROSE, THE ECONOMICS OF THE INTERNATIONAL PATENT SYSTEM (The Johns Hopkins Press 1951). *See also* DRAHOS, *supra* note 64, at 29.

[85] *See* BOYLE, *supra* note 64, at 57 (stating works of literature, although remarkable and original, are not crafted out of thin air). *See also* Keith Aoki, *Neocolonialism, Anticommons Property, And Biopiracy In The (Not-So-Brave) New World Order Of International Intellectual Property Protection*, 6 IND. J. GLOBAL LEG. STUD. 11, 35 (Fall 1998) (articulating Boyle's point that the romantic idea of purely creativity intellectual property tends to ignore that new intellectual creations are formed from pre-existing thoughts and common-sense knowledge).

[86] DRAHOS, *supra* note 64, at 32.

[87] *See* LOCKE, *supra* note 66, at 16–30.

[88] Steven Cheung, *Property Rights and Invention*, 8 RES. LAW & ECON. 5, 5–6 (1986).

The modern version of reward theory is philosophically based on the idea of a natural right to one's own labor. The patent institution, as explained by the modern version of reward theory, remains a necessity because it is just to reward labor and a just reward benefits society as a whole.[89] Essentially, a patent is a reward society bestows on the inventor for the benefits society received from the invention. Inventions are not created without cost. Reward theory explains that because society benefits from the fruits of the inventor's labor, society should reward the inventor for that benefit by giving him a patent.

However, the concept of using labor as the justification for conferring a property right to an inventor has been the object of much criticism. Labor, alone, cannot be the sole justification of a property institution because the ideas of possession, occupation, intention, or consent remain.[90] Some authors disregard the conditions for a property institution as insignificant, while others argue that the vision of a community contained in the conditional proviso is the real strength of Locke's theory. Wendy Gordon suggests that it is still a useful theory and understands the "just deserts" element of the Lockean *proviso,* based on the natural rights theory, to emphasize the rights of the user/public rather than the rights of the creator.[91] On the other hand, at least one author finds the contemporary acceptance of Locke in intellectual property theories to be misleading.[92] Peter Drahos has suggested, quite correctly, that the importance of the Lockean theory does not lie in its justification of property based solely on labor.[93] Rather, he explains that Locke's theory fails when taken to its limits and used as the basis for intellectual property theories because of the indeterminacy of labor.[94] In the context of the patent institution, the application of Locke's sufficiency proviso, which requires that the laborer not take too much from the commons so that others can draw from it, is not without interesting issues. The nature of knowledge is that it exists in abundance and can be used by many people at the same time without the various uses negatively affecting each other. However, to facilitate the creation of new knowledge, the knowledge in the commons must be sufficient. The patent institution, while addressing the question of incentive, should also consider the fact that without access to all existing common knowledge, the creation of new knowledge grinds to a halt. The second proviso is the spoilage proviso, which requires that things appropriated not go to waste in order to maximize utility. This principle is often used to explain the tragedy of the commons, where individuals acting separately may together over-utilize a scarce resource.[95] However, the patent institution suffers from the opposite situation, where too many individuals have the right of exclusion in a scarce resource, referred to as the tragedy of the anti-commons.[96] Furthermore, under the property as reward theory, a property right

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[89] PENROSE, *supra* note 83, at 26.

[90] *See generally* ELLICKSON, *supra* note 40, at 172–99.

[91] Gordon, *supra* note 64, at 1606.

[92] BETTIG, *supra* note 71, at 19.

[93] *See* DRAHOS, *supra* note 64, at 41–72.

[94] *Id.* at 68.

[95] *See* Hardin, *supra* note 62, at 1244.

[96] *See generally* Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698, 698–701 (1998); Michael A. Heller, *The*

should be granted that allows the inventor to recapture the cost of his labor via the market; it should explain the efficiency of property over other means. However, the natural right explanation simply argues there is a natural right that needs to be recognized as a positive property right in the invention. If this is to be efficient, other means such as pecuniary subsidies or other forms of reward should be shown to be not as efficient. Thus, economic critics of the reward theories have primarily questioned whether the reward is actually efficient regardless of whether it is good or bad. Yoram Bazel noted rewards often have inefficient consequences that might affect the patent system, and that rent dissipation is one of the worst inefficiencies.[97]

C. Efficient Patent Property Institution

These variations of reward theory are proprietarian because, under these variations, the nature of such rewards is a property right, and not just a privilege, based on certain conditions. Arguably, a property institution is necessary for the efficient use of resources, and the objective of a property institution is to protect and provide certainty in a given transaction. For an institution to be efficient and provide protection, it must contain clear and easy to follow procedures to grant, transfer, and enforce property, while also respecting other person's property. When the patent institution is viewed as a property institution with these objectives, the exclusivity of each right should be maximized by broad subject matter, a wide scope, long term, and a broad range of sanctionable acts of infringement. In addition, maximizing the transferability of a patent can be performed by minimizing restrictions on transactions consequently permitting rights to be flexibly transferred (e.g., a partial transfer and an assignment of rights). For example, according to Ulen and Cooter, transaction costs are minimized when patent rights are clear and simple.[98] Standardized or harmonized rules and restrictions help to lower institutional costs incurred in monitoring and punishing infringement while also reducing transaction costs. In sum, an efficient patent institution can be achieved if it is (1) viewed as a property institution whose objective is the efficient use of resources; (2) available for any technological field; (3) provides a longer term of protection; (4) contains a broad scope and effective enforcement tools; and (5) is harmonized with international patent law.

As a private rights granting institution, the patent institution remains an institution of property-like rights. For example, the patent institution adopted property rules and conventions, such as registration and specification, which are used in property law for both tangible and immovable objects. Borrowing ideas grounded in property law, patent law was created to provide specific procedures to

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Tragedy Of The Anticommons: Property In The Transition From Marx To Markets, 111 HARV. L. REV. 621, 641–88 (1998).

[97] Yoram Barzel, *Optimal Timing of Innovations*, 50 REV. ECON. & STAT. 348, 352–54 (1968). *See also* Edmund W. Kitch, *The Nature and Function of The Patent System*, 20 J. L. & ECON 265, 265–67 (1977).

[98] *See generally* ROBERT COOTER & THOMAS ULEN, LAW AND ECONOMICS, 84–87, 119–25 (Edison-Wesley, 2d ed. 1997), *see also* Robert Cooter, *The Cost of Coase*, 11 J. LEGAL STUD. 14–20 (1982).

follow. Patent law stipulates the procedures necessary for the "object" to be granted public protection against the public en masse, while at the same time allowing the party to draft licensing agreements. Accordingly, patent law adopted the ideas engrained in property law. As such, the objective of the patent institution became the *maximization of exclusivity,* transferability with minimal transaction cost so that the resources can be used most efficiently.[99]

This objective is the basis for a model called the patent prospect theory, which considers the patent institution in conjunction with the above goals. The patent prospect theory was first suggested by Barzel,[100] and later elaborated by Kitch in 1977. The patent prospect theory is "a particular opportunity to develop a known technological possibility."[101] Kitch elaborated this and argued that the element of a prospect of a patent increases the output from resources used for technological innovation, against the claims that "patent inevitably reduces the output of the technology it subjects to exclusive control." [102] Kitch argues the property problem of the commons, with regards to rival goods, is based upon knowledge of the goods; this idea can be directly applied to the costs related to the duplicative research activity within the realm of patent law.[103] Therefore, Kitch argues patent laws promote the central coordination of research and development in new and promising areas and prevent, or reduce, duplicative improvement efforts. One method to get private parties to invest efficiently in innovation is to give them property rights in what they produce. Additionally, an efficient institutional arrangement confers property rights to the intellectual property creators, thereby encouraging the inventor to invest further in the identification, development, and commercialization of new inventions. Conversely, Barzel suggested the exploitation of technological information has a problem similar to one in property law, where the deletion of resources is akin to removing fisheries and public roads; however, the exclusive right to cultivate the technological opportunity solves this problem.

Furthermore, the patent prospect theory states a property right is the most efficient form of allocating knowledge, and therefore, a patent should be treated identically to any other property right. This theory receives much criticism, including that the model of a patent system is contestable;[104] and that it fails to discourage the rent dissipation. [105]

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[99] *See* POSNER, *supra* note 35, at 37–45.

[100] Barzel, *supra* note 9735, at 349–51.

[101] Kitch, *supra* note 97, at 265.

[102] *Id.* at 266.

[103] *Id.* at 276.

[104] *See* F.M. Scherer, *Comments on Edmund Kitch*, 8 RES. LAW & ECON. 51, 54–55 (1986).

[105] Rent dissipation means that the benefit to society by the invention is dissipated when there are redundant duplicative efforts. If the invention yields high rents, firms that seek rents will engage in a race to develop the invention (i.e. rent-seeking). This rent seeking will result in dissipation of the rents as it creates wasteful development activities. Kitch's patent prospect is criticised that it simply shifts the time when the rent dissipation would occur – as the firms would race for the patent prospects, rather than the innovation. *See* Mark F. Grady & Jay I. Alexander, *Patent Law and Rent Dissipation*, 78 VA. L. REV. 305, 315–17 (1992). Grady and Alexander stated that this rent dissipation may, for some inventions, be called "signalling" inventions; inventions that have modest value, but signal a large potential for improvement. *Id.* As they signal many follow-on improvements, they should be granted a broad patent. *Id.* This would discourage the dissipation of

Alternatively, the proprietarian view of the patent institution is the result of combining classical or neo-classical economics with the law and economics theories of property. By incorporating these different theories, the proprietarian view uses the explanatory tools of property law to explain the patent institution; however, the view also incorporates many assumptions engrained within property law. The proprietarian view of the patent institution is fundamentally based upon the idea that property is the most efficient institution to allocate resources. Rose, for example, explains the property institution as one of persuasion that can be explained through the use of descriptive aids such as metaphors and narratives.[106] The theory points out that the institution of property is based on many false assumptions.[107] Two of these common assumptions are the assumption of limited resources and the assumption of rational preference maximizing behavior. These assumptions make it problematic for the proprietarian view to be applied in describing intellectual works and inventions.

The assumption of limited resources may not apply to patents or any other intellectual property. As noted by Thomas Jefferson, the "action of thinking power called idea" is "less susceptible than others of exclusive property," because "no one possesses less" than whole and one's possession of it does not lessens the others.'"[108] This zero sum game theory, however, does not apply to patents. The knowledge that a patent right is granted is a distinctive characteristic, which differentiates itself from other property. This knowledge is what economists call a "public good" and has three elements: non-rival possession; low marginal cost of reproduction and distribution; and substantial fixed cost of original production. Goods that are derived from knowledge inherently have all three of these elements. Thus, the use of an idea by person who is not the inventor does not reduce the value of the idea; this camaraderie is indicative of the friendly nature of knowledge. The goal of intellectual property is to ensure that the consumption of one resource of knowledge does not exhaust the source of the material.

This dilemma spurred the debate about the adoption of a patent institution in the nineteenth century.[109] Authors were troubled with the perception that IP is property as they debated over the idea of "possession" as an indicium for property.[110] Assuming there are no rights in the commons, a physical possession or a first act of taking the res out of the commons serves two important functions, specifically, notice and reward. While it may be true that the tangible resources used in the course of inventing are limited, this still does not explain why possession of those limited resources has to be connected to the "possession" of the resulting invention. Once the

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rents by excessive improvement activities or by duplicative primary inventive activities. *Id.* They argued that an elegant invention that has high social value, but can not be improved should get no patent protection. *Id.*

[106] *See generally* CAROL M. ROSE, PROPERTY AND PERSUASION: ESSAYS ON THE HISTORY, THEORY AND RHETORIC OF OWNERSHIP, 65–66 (Robert W. Gordon & Margaret Jane Radin, eds., Westview Press 1994).

[107] *Id.* at 26–27.

[108] THOMAS JEFFERSON, THE WRITINGS OF THOMAS JEFFERSON, 333–34 (Andrew A. Lipscomb ed., Thomas Jefferson Memorial Association of the United States 1904).

[109] *See* Machlup & Penrose, *supra* note 57, at 9–11.

[110] I NAKAYAMA NOBUHIRO , PATENT LAW ANNOTATED 15 (2000).

holder of knowledge parts with his information, the knowledge moves to the public domain. But consider an idea that is simultaneously invented by different people – the knowledge could not be held to be the property of only one specific person.[111] To solve a problem of this nature, the patent institution replaced first physical possession with the first to conceive the inventive idea. However, this switch to allocating property rights to the first to conceive the idea, and the subsequent public notification, does not solve the problem when an identical idea is simultaneously conceived. While the first possession idea specifically addresses the tragedy of the commons in rival goods, a metaphysical possession, the exclusion of which is created artificially by law, may not reduce the inefficient use of resources by investing on the same inventive ideas.

Furthermore, inventions in some industries are highly cumulative.[112] This means that the assumption that no rights exist within the commons may not actually be true. A genuinely new idea, thus, may not exist because it is based not on one person's idea, but rather on a pool of ideas generated by others. Therefore, unless the inventor surrenders all of what he owes to others, a claim for the exclusive rights to one inventive idea is not possible.[113] The taking of an idea is hence more analogous to the borrowing of a tool (the invention) to cultivate land (the tangible implementation of inventive idea), rather than simply taking an apple from a tree.

The second problematic assumption is that of rational preference maximizing behavior. This includes the presumption that property based perspectives do not anticipate anti-competitive behavior of the patentee, such as defensive or strategic patenting. The proprietarian theory explains that dynamic transactions in a patent will almost automatically commercialize the patented invention. It is assumed the patent is applied for because the patentee/inventor/assignee desires to trade the knowledge of the patented invention for a patent in the invention (the "transaction"). Property rights enable this transaction based on the exclusive rights afforded to the inventor, specifically that no one else can exploit the invention. Bartow explains this in the following manner.

> The invention owner can charge a premium and use the monopoly profits that accrue to pay off the costs associated with developing the invention. The owner might also invest in additional research and development, which can lead to refinements of the original invention and other valuable innovations. Society has the benefit of the product or process embodying the invention, the invention owner makes a tidy profit, and everyone is happy. [114]

This is based on the behavioral assumption that a transaction will occur and that a monopoly will not be allocated to the inventor. However, as discussed above, Pareto efficiency, which these explanations are based upon, does not value perfect

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[111] *See* PENROSE, *supra* note 84, at 23.

[112] Scotchmer, *supra* note 32, at 35–37.

[113] BOYLE, *supra* note 64, at 57 (discounting the copyright concept of "originality").

[114] Ann Bartow, *Separating Marketing Innovation From Actual Invention: A Proposal for a New Improved, Lighter, and Better-Tasting Form of Patent Protection*, 4 J. SMALL & EMERGING BUS. L. 1, 2 (2000).

competition over a perfect monopoly, both of which are efficient. An institution with no transaction cost could either be perfectly competitive or perfectly monopolized. Even when the transaction cost is zero, any bargaining of the transaction could be non-cooperative and, therefore, detrimental to the institution. For example, opportunistic individuals would not only try to maximize their position, but they could also maximize their preferences by refusing to trade. In a situation that resulted from what Cooter calls a Hobbes theorem, as opposed to a Coase theorem, the institution of law needs to minimize its inefficiencies by regulating threats to a patentee and other non cooperative solutions.[115] However, proprietarian behavioral assumptions do not expect this behavior.

When applied to the patent institution, even though Coasian bargaining does not occur, one may argue that the disclosure required by patent law may be sufficient to accrue benefits to society. This is not convincing because implementation of the invention may also be prevented if the disclosure itself is not sufficient. At the same time, if use is prohibited, knowledge of an invention without a license to produce it commercially may not significantly benefit society. In addition, where an invention is questionable, an inefficient issuance of any initial rights cannot be corrected if the transaction does not occur. The self correcting path to efficiency will not occur without licensing.

Furthermore, while it is true both intellectual property and real property delineate and convey legally sanctioned conditions for excluding others from trespass to the holder, the institution of property does not establish any positive rights to not be excluded.[116] Therefore, as a property institution, the patent institution does not create rights to not be excluded. However, for the production of knowledge, these positive rights to not be excluded are crucial for further creation. As discussed above in the efficiency section, there are two types of efficiencies involved in the production and exchange of knowledge based goods. When an institutional penchant is to prioritize dynamic efficiency, the institution would be inefficient statically. As the result, "a tragedy of the anti-commons" may occur.[117]

When one understands the patent institution as a property institution, an efficient patent institution derives its efficiency from the *exclusion that dominates its assessment.* An efficient institution then has the following features: an internationally harmonized patent law; availability for any technological field; a long term of exclusivity; broad scope of protection; and effective enforcement tools. In other words, its efficacy can be defined in terms of its efficiency as a public institution to *protect and enforce the property rights.* The efficiency in property protection can be defined in terms of whether the procedure is efficient in application, filing, and registration of the property rights. The enforcement efficiency can be defined in

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[115] Cooter, *supra* note, 98 at 18–20.

[116] PAUL A. DAVID, A TRAGEDY OF THE PUBLIC KNOWLEDGE 'COMMONS'?, GLOBAL SCIENCE INTELLECTUAL PROPERTY AND THE DIGITAL TECHNOLOGY BOOMERANG 16 (Maasctricht Econ. Res. Inst. on Innov. & Tech. ed. 2000), *available at* http://www.merit.unu.edu/publications/rmpdf/2001/rm2001-003.pdf.

[117] *See generally* Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698, 698–701 (1998); Michael A. Heller, *The Tragedy Of The Anticommons: Property In The Transition From Marx To Markets*, 111 HARV. L. REV. 621, 671–79 (1998).

terms of whether the procedure is efficient within definition of infringement (*i.e.*, clear rules on infringement) and in enforcement of governmental actions (*i.e.*, clear rules on enforcement of rights and on enforcement of the related decisions).

Proprietary theories often adopt the Pareto or Kaldor Hicks definition of allocative efficiency. This definition of efficiency rationalizes the patent institution as a property institution in terms of its resource allocation. Specifically, it justifies a strong patent protection with the propensity to expand. However, there are theoretical and normative challenges to this definition of efficiency and the resulting institutional model, which has the goal of minimizing transaction costs and an assumption concerning the individual's bargaining behavior, i.e. that rational wealth maximizers will bargain if the cost of transaction is zero. Beyond the justification of a natural right to a patent institution, proprietarian theories assign a fundamental status to the institution itself and reward the first act of appropriating the commons into private ownership.

This explanation forms the basis of the international trade rules regarding inventions. While the Agreement on Trade Related Aspects of Intellectual Property Rights ("TRIPs") does include dissemination of knowledge as a technology transfer within Article 7, the theoretical foundation for its rules is based on the belief that efficiency of a patent institution is a private right. According to this understanding, as a property institution, an efficient patent institution minimizes the transaction cost so private actors can trade their property rights to achieve a Kaldor-Hicks Optimal level. To achieve this, resources are redistributed to those who value the material most, and thus, TRIPs was created to reduce international transaction costs. Fundamentally, TRIPs endorses the natural right theory and a proprietarian understanding of patent law.

The soundness of viewing patents as private property is repeatedly questioned. However, no critic has produced a satisfactory theory or hypothesis as to why the patent institution should give a first mover exclusive dominion over intangible and non-rival goods, when both goods are readily available. Yet, if the goods are scarce, there is a need to efficiently manage the resources; conversely, if the intellectual knowledge is not scarce, the resources do not need to be efficiently managed. Regardless, accepting the proprietarian theory of the patent institution is dangerous because of the potential of accepting property through rationalization, explanation, and rhetoric.

A natural rights based explanation of the patent institution can be justified by placing a central significance on the property institution and by emphasizing the centrality of transactions. Alternatively, the proprietarian theory assigns a fundamental status to the institution itself. The proprietarian theory assumes there is an absence of rights within the public knowledge commons, therefore rewarding the first private appropriation by the public. This creates an institutional propensity to increase the breadth, scope, and the amount of privately appropriated subject matter. Proprietarian theories validate the patent institution through labor, possession, consent, or reward, and assume a property right is the most efficient form for allocating the knowledge found within the commons.

III. THEORIES ON THE PATENT INSTITUTION AS A POLICY INSTRUMENT

An alternative view on the patent institution characterizes it as a policy institution and views it from an instrumentalist perspective. As an institution of policy, there are many ways of explaining the patent institution.[118] Policy perspectives explain the patent institution as one that is created to grant a temporary privilege of exclusive rights for socioeconomic concerns and for the public good.[119] There are policy reasons behind granting such rights, and when the balance of the exclusive rights and their benefits are not met, the rules may change. At the same time, the policies may be revised, or even withdrawn, if they are not supported by public consent. To borrow Brimelow's words, "the reasons for the privilege should be respectably founded and that the legal system that upholds them may well be transparent and democratic, but if you lose public consent, tacit or explicit and the system is at risk."[120]

The current patent laws, despite their overall generality and ambiguity, are still committed to specific policy goals.[121] For example, Article 7 of the TRIPs agreement states the policy reason for affording protection is that the patentee "should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations."[122] This is a reflection of policy perspective. As explained by economists, the absence or weak administration of appropriability may discourage inventors from disclosing their inventions rather than risk the loss of valued know-how. Thus, the grant of an exclusive right is necessary and justified only when accompanied by sufficient disclosure and diffusion. Commonly, patent policy theories stress the importance of recognizing the trade-offs, and accordingly, suggest an efficacious patent institution as the one that efficiently balances these conflicting policies. In the following section, some of the theories are

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[118] *See generally* DRAHOS, *supra* note 64, at 199–224 (arguing for the instrumentalist view of intellectual property rather than the proprietarian view); *see also* MAY, *supra* note 64, at 18–21; MACLEOD, *supra* note 84, at 20–39 (describing patent as policy instrument in late Stuart period of UK in 17 century); NOBUHIRO, *supra* note 110, at 22 (where he claims that for those countries that were industrialized later, like Japan or Germany, the patent institution is to be used as an instrument or a tool of industrialization and economic development).

[119] Alison Brimelow, *Does Intellectual Property Need a New set of Wheels?*, 23 E.I.P.R. 44, 445 (2001). Brimelow argues we need to remind ourselves that intellectual property rights are a form of privilege and that could be abused, as proven by the history. *Id.*

[120] *Id.*

[121] The U.S. Constitution provides the exclusive right is to "Promote the Progress of Science and useful Arts." U.S. Const. art. I, § 8, cl. 8. In Japanese Patent Law, article I provides the purpose of the law shall be "to encourage inventions by promoting their protection and utilization so as to contribute to the development of industry." Japanese Patent Act No. 121 (1959), a*vailable at* http://www.cas.go.jp/jp/seisaku/hourei/data/PA.pdf. The English translation does not include the 2006 patent law revision by Law Revising Parts of the Design Law and Others, Japanese Law No. 55 (June 7, 2006), which enters into force in April 1, 2007.

[122] Agreement on Trade-Related Aspects of Intellectual-Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299, 33 I.L.M. 81, art. 7 (1994).

evaluated, and these theories are based on viewing the patent institution as a policy institution.

A. Monopoly Theory

One of the most persistent challenges to the idea that a patent involves the institution of property is the monopoly argument: a patent is a form of a state-backed economic monopoly. As a private right, a patent may not be positive if a private monopoly is believed to be discouraged. The term "monopoly" is generally understood as the situation where a single seller dominates the market of a non-substitutable good and where there is a substantial barrier to the entry of new competitors. The idea of a monopoly is premised on the concept of perfect competition. Identified elements of perfect competition are numerous players, small market shares, product homogeneity, perfect information, and easy entry and exit.[123] A monopoly theorist views a patent right as an economic monopoly to the patented subject-matter-market, which grants the right-holder an exclusive right to prohibit the exploitation of the invention.

However, if a patent right is simply a continuation of a private property right, then the patent "monopoly" argument becomes less convincing.[124] This is often explained in the following manner: as property, a patent *per se* cannot be a monopoly, unless the use of the patent is monopolistic. Arguably, the right to exclude in patents is analogous to the right of possession in ownership and, thus, the right holder has a legal monopoly over the invention or idea in the same manner that an owner of a pencil has dominion over his pencil. Therefore, the test for monopolistic use of patents should similarly be treated as an economic monopoly.[125]

Economists often explain this with a simplified model that shows the monopoly allows the patented product to be priced higher than the competitive price, but lower than the cost prior to the invention.[126] As compared to non-patented products, more quantity is produced at lower cost. Because as patents allow the patent holder to set pricing at a higher point, one can argue there is a social loss due to the monopoly pricing. Whether this loss by monopoly pricing is recoverable by the increased quantity of production is the focus of the policy oriented view *i.e.* the instrumentalist view of the patent institution.

Earlier, Machlup made a similar argument. He argued "the idea that 'property' and 'monopoly' are one and the same from the economic point of view, and that the

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[123] ERNEST GELLHORN & WILLIAM E. KOVACIC, ANTITRUST LAW AND ECONOMICS IN A NUTSHELL 71 (West Publishing 4th ed. 1994).

[124] *See* Simone A. Rose, *Patent "Monopolyphobia": A Means of Extinguishing the Fountainhead?*, 49 CASE W. RES. L. REV. 509 (1999); *see also* Edmund W. Kitch, *Elementary and Persistent Errors in the Economic Analysis of Intellectual Property*, 53 VAND. L. REV. 1727, 1729–38 (2000) (claiming arguments expressing patent rights in terms of an economic monopoly are fallacious).

[125] *See* Kitch, *supra* note 124, at 1734–35.

[126] *See* GELLHORN & , *supra* note 123, at 71. However, this way of modeling – using downward demand curve - has been criticized by Kitch for being imprecise and its inability to be applied to the practices. *See* Kitch, *supra* note 124, at 1734–36. As it assumes price and quantity of the product, not the patent itself, the economic monopoly that is derived from the graph is that of a product. *Id.*

'owner' of an invention has a monopoly of its use just as the owner of a house has a 'monopoly' of the use of the house."[127] The presence of an independent invention, however, may refute this point. This is because "anyone who develops a technology exactly like one developed earlier by someone else will be prohibited, by the patent rights granted to the "first inventor," from using it or selling it--even if his work was entirely independent."[128] This signals the monopoly theory of patents. Although Machlup did not say explicitly that all patents are a monopoly, he acknowledges the possibility of a monopoly granted to the first inventor in "exactly [the] same" technology of the second inventor.[129] Kitch argues that the error in Machlup's model lies in assuming the two product implementing technologies to be "exactly [a]like."[130] Kitch argues that 'exactly [a]like' causes confusion because of the concept of functional equivalents within patent claims.[131] Kitch suggests instead the demand curve is something similar to that of mining claims, thus, near horizontal or maybe without any curve;[132] therefore, the monopoly loss does not exist.

From a policy point of view, Kitch's argument fails to explain the overall patent institution. Confusion of two technologies literally within the claimed scope of each other, and that are functionally equivalent, affects not only theoreticians, but also law makers. Because patent laws sanction not only literally infringing technology, but also its equivalents, they expand the range of "exactly [a]like" technology. Kitch also recognizes this scenario, acknowledging there could be cases where a patent combined with other economic elements becomes an economic monopoly.[133] However, he believes that what is loosely termed a patent monopoly is different from this economic monopoly that may form the basis of an anti-monopoly action.[134]

Although, not all patents constitute economic monopolies with market power, the nature of patent rights as exclusive negative rights calls for an institutional arrangement to prevent the abuse of these rights. Monopoly theory emphasizes the special nature of a right that is granted based on policy concerns. A privilege that is granted for a specific goal requires its beneficiary to use the privilege to meet the policy goals. An institutional arrangement can be made to stipulate rights of the rest to require the beneficiary to fulfill a certain duty. For example, the requirements could be a duty to disclose the invention, a duty to practice the invention, and a duty not to harm the competition, so that the efficiency projected in the calculation may be achieved.

The conceptual division or confusion concerning the nature of the patent right is reflected in how this right is treated in most of the competition law legislation. As many countries' laws prohibit private monopolies in principle, the monopoly argument assumes this patent right is a temporary exception to the monopoly prohibition. The legal history of the patent institution is quite ambiguous in terms of

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[127] AN ECONOMIC REVIEW OF THE PATENT SYSTEM, S. Res. 236, at 53, 85th Cong. (1958) (statement of F. Machlup).

[128] *Id.* at 54.

[129] *Id.* at 54.

[130] *See* Kitch, *supra* note 124, at 1735–36.

[131] *See* Kitch, *supra* note 124, at 1735.

[132] *See* Kitch, *supra* note 124, at 1734.

[133] *See* Kitch, *supra* note 124, at 1731.

[134] *Compare* Kitch, *supra* note 98, at 274, *with* Kitch, *supra* note 124, at 1733–34.

distinguishing the monopoly-like rights of the past from those in the present day. Historically speaking, the patent institution started from the royal grant of a monopoly right. For example, in the United Kingdom, where the contemporary patent institution is believed to have started, the system of letters patent was a privilege to monopolize in a certain market.[135] The first statute that regulated the grants and exercise of the patent was called "the Statute of Monopolies," and its origin traced back to the medieval privileges granted by the Crown.[136] Also, it has been argued the United States' patent system was initially developed primarily to reward inventors, and not for the benefits accruing to the public.[137]

Older court cases in the United States seem to reflect this understanding. The Supreme Court, in a 1944 decision, ruled:

> [a patent] carries, of course, a right to be free from competition in the practice of the invention . . . . The necessities or convenience of the patentee do not justify any use of the monopoly of the patent to create another monopoly. . . . The patent is a privilege. But it is a privilege which is conditioned by a public purpose.[138]

Although the case itself has not been overruled explicitly, case law has consequently limited similar use of monopoly language. This coincides with the decline of the other patent monopoly based doctrines in the United States law such as the patent misuse doctrine.[139] The 1995 FTC guideline altogether adopted the approach that the patent monopoly theory may be misleading, presuming that a patent does not confer market power to its holder that enables the holder to maintain prices and output above and below the competitive level respectively.[140]

A similar perception echoes through European Union ("EU") competition policy and Japanese anti-monopoly law. Early EU jurisprudence was based on the dichotomy of existence and exercise, and it underscored the view that the right itself is not a monopoly, unless it is exercised in a manner that is anti-competitive.[141] Japanese anti-monopoly law regulates this contradiction in a similar, but different fashion, because Japanese Section 21 categorically exempts the *exercise* of intellectual property rights from the prohibition of monopolies.[142] Interpretations of Section 21 distinguish between exercises of intellectual property that are pro-

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[135] *See generally* MACLEOD, *supra* note 84.

[136] *Id.* at 10–19.

[137] *See* Walterschied, *supra* note 84, 75.

[138] Mercoid Corp. v. Mid-continent Inv. Co., 320 U.S. 661, 665–66 (1944).

[139] For example, the per se misuse doctrine of *Morton Salt Co. v. G.S. Suppiger Co.*, 314 U.S. 488 (1942) was superseded by Statute. 35 U.S.C. § 271(d)(5) (1988). *Morton Salt* was overruled in part by *Ill. Tool Works Inc. v. Indep. Ink, Inc.*, 547 U.S. 28, 1291 (2006).

[140] U.S. DEP'T. OF JUSTICE & FED. TRADE COMM'N, *supra* note 60, at 4.

[141] *See* Etablissements Consten S.a.R.L. and Grundig-Verkaufs-GmbH v. Comm'n of the European Economic Community, joined cases 56 & 58/64, [1966] E.C.R. 299.

[142] Act Concerning Prohibition of Private Monopolization and Maintenance of Fair Trade, Act No. 54 of 14, § 21 (1947). "The provisions of this Act shall not apply to such acts recognizable as the exercise of rights under the Copyright Act, the Patent Act, the Utility Model Act, the Design Act, or the Trademark Act." *Id.*

competitive in principle and exercises that would require clearance from the competition authority.[143]

Most of these interpretations, however, have been severely criticized as making the law and the market uncertain. This is due to the difficulties of separating existence from exercise in light of the view that existence of patents, per se, is almost never monopolistic. In addition, against the monopoly argument, Kitch identified four errors in the economic analysis of intellectual property and he deemed "the monopoly error to be the fundamental misperception of IP."[144] Similar views are also held by Easterbrook,[145] Merges,[146] and Rose.[147] They argue that labeling patents as monopolies attaches undue negativity and hostility toward patents, and creates confusion that patents per se are anticompetitive and, therefore, against the interests of the public.[148] Furthermore, it was argued that this has led towards a negative public perception of patent filings.[149]

Nevertheless, connecting the patent right of exclusivity to a monopoly is rather inevitable. Patent exclusivity is fundamentally a negative right, to exclude or prohibit others from engaging in a certain action. Ultimately, the right is not directed toward a thing, but toward an action – to use, make, exploit, market a claimed invention.[150] Several developments of late seem to revive this monopoly perspective. For example, the United States FTC report of 2003 calls for more balance between competition and the right of exclusion. The grant of questionable patents can harm innovation in multiple industries, because it increases problematic patenting behavior.[151] A similar tendency to identify the cases where the presence of intellectual property could be construed as a near monopoly may run afoul with the EU competition rules.[152] Scholars, for example, still argue that a "patent right is a monopoly right for the use of the patented and registered invention."[153] Drahos goes even further and calls for a shift of paradigm from a property oriented understanding

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[143] *See, e.g.*, YOSHIYUKI TAMURA, SHIJOU, JIYUU, CHITEKIZAISAN [MARKET, FREEDOM, INTELLECTUAL PROPERTY] 142–43 (2003).

[144] Kitch, *supra* note 124, at 1729. According to Kitch, the researchers have erred in labeling IP rights as economic monopolies, improperly analyzing single units of IP in isolation, disregarding the possibility of post-grant transfer of IP rights, and weighing only a limited number of potential policy variables available in the design of IP institution. *Id.*

[145] Frank H. Easterbrook, *Intellectual Property Is Still Property*, 13 HARV. J. L. & PUB. POL'Y 108, 118 (1990) ("Rights to exclude are not monopolies just because the property involved is an intangible rather than something you can walk across or hold in your hand.").

[146] Merges, *supra* note 15, at 1859.

[147] Rose, *supra* note 124, at 526–27.

[148] *Id.*

[149] *Id.* at 527.

[150] *See* TAMURA , *supra* note 143, at 120–23.

[151] *See* U.S. FED. TRADE COMM'N, TO PROMOTE INNOVATION: THE PROPER BALANCE OF COMPETITION AND PATENT LAW AND POLICY 5–6 (Oct. 2003).

[152] *See* IMS Health GmbH & Co. OHG v. NDC Health GmbH & Co. KG, Case C – 418/01 (E.U. Apr. 29, 2004), *available at* http://curia.eu.int/en/content/juris/index.htm; Sun Microsystems, Inc. v. Microsoft Corp., Case COMP/C3-37.792, 143 (E.U. Comm. Mar. 24, 2004) (relating to a proceeding under Article 82 of the EC Treaty), *available at* http://ec.europa.eu/comm/competition/antitrust/cases/decisions/37792/en.pdf.

[153] Nakayama Nobuhiro, *Bizunesu Houhou Tokkyo – Jyoron* [*Business Method Patent – An Introduction]*, 1189 JURISUTO 24, 25 (2000).

of patents back to its original instrumentalist understanding of the patent institution.[154] Modern versions of monopoly perspectives are still viewed as convincing arguments, including the view that patents are state backed price discrimination.[155] This perception often highlights the importance of the patent institution in the maintenance of fair competition and stresses the interface of intellectual property law with competition law.[156]

Conceptualizing the patent system as an institution that grants the special privileges of a monopoly emphasizes the contingent nature of the right subject to a higher authority. As opposed to rationalizing property rhetoric, monopoly theory is useful in preventive law and policy making. A more important merit of the monopoly theory, however, lies in its inherent ability to accept the paradigm of balancing different definitions of efficiency.

B. Incentive Theories

The patent system is based on the premise that industrial progress is desirable to society. Other incentives for creation, such as market lead time, social recognition, or a simple labor of love may not be not sufficient, thus calling for an artificial incentive. Primarily, patent incentives are for creation and disclosure of the invention, but further variants of the theories posit different characterization of the underlying incentives.

Schumpeter was one of the first economists who recognized the necessary evil of a temporary patent monopoly in economic growth.[157] Penrose noted "the patent laws rest upon the assumption that it is desirable to encourage invention for its own sake and that a monopoly privilege is the best way of doing it."[158] In this vein, the instrumentalist explanation understands the reward, or the incentive, as a constructed privilege, while reward theory posits proprietary reward as the incentive. The reward recognizes the possibility that there can be a more efficient incentive structure other than the patent institution by governmental subsidies, patent buy-outs, and the like.[159]

Another version of an incentive theory is a patent induced theory. It is an economic theory that explains the patent institution and society by analyzing the net benefit from the invention that the patent institution induced. Assuming the creation of an invention is causally linked to the patent institution, the patent induced theory dictates that the institution should reward only the inventions that

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[154] *See generally* DRAHOS, *supra* note 64, at 199–223.

[155] *See, e.g.*, MARK A. LEMLEY, PETER S. MENELL, ROBERT P. MERGES & PAMELA SAMUELSON, SOFTWARE AND INTERNET LAW 30–37 (Aspen Publishers, 2d ed. 2000); Douglas Lichtman, *Property Rights in Emerging Platform Technologies*, 29 J. LEGAL STUD. 615, 617–20 (2000).

[156] Eleanor M. Fox, *The Interface With Competition Law: Trade, Competition, and Intellectual Property – TRIPS and its Antitrust Counterparts*, 29 VAND. J. TRANSNAT'L L. 481, 481–505 (1996).

[157] JOSEPH A. SCHUMPETER, CAPITALISM, SOCIALISM AND DEMOCRACY 88, 106 (Harper & Row, 3d ed. 1950) (1942).

[158] PENROSE, *supra* note 84, at 17.

[159] *See* Foray, *supra* note 25, at 82–83.

are induced by the patent institution.[160] There is, however, a gap in the simple incentive to create theory, because the theory fails to explain why incentive is provided for innovations that are not rewarded with an exclusive right. Scherer is regarded as one of the major contributors to this theory.[161] Because the social cost of rewarding the non-patent induced invention would be too great, the patent induced incentive theory eliminates inventions that are induced by curiosity, market, and accident. This may provide an explanation for the contemporary patentability requirements to filter those inventions that are patent induced from those that are not.

Scherer classified inventions as revolutionary and divided them into three categories.[162] First, patents induce basic inventions with uncertain benefit-cost ratios, because these creations would not be made without the incentive to create.[163] The second type, inventions with high benefit-cost ratios, are generally market induced, accidentally induced, or curiosity induced, as their creation does not need incentive.[164] The third kind of invention is one with a low benefit-cost ratio.[165] These are typically improvement inventions with narrow application in the market where there is a high degree of competition.[166] Scherer classified this as patent induced; without a patent, there would be little incentive to create them because they would be copied immediately.[167] Patent induced theory is useful in the explanation of the patent institution at a macro level. Despite the criticism that the patent institution is unable to answer empirical cases and that the patent institution also discriminates against the low cost invention,[168] it provides a useful prediction; if patents are granted to only patent induced inventions (uncertain benefit/cost ratio and low benefit/cost ratio), a net social benefit results.

Functioning as an institution, the patent system provides several incentives to affect the behaviors of individuals. Not all of the incentive structure is positive. Notably, two negative aspects of incentives that are discussed are the rent dissipation theory and the race to invent theory. The rent dissipation theory takes the second criticism of the patent induced theory, i.e. that it discriminates against the low cost invention, and develops a theory that corrects one of the undesirable side-effects of the patent institution. The patent institution is based on the rent that society pays to the inventor for the benefit of the invention, which is the difference between the development cost and what society is willing to pay.[169] The rent dissipation theory states that the invention's benefits to society (rent) are dissipated when there are redundant development efforts, which are encouraged by the

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[160] *See* Oddi, *supra* note 23, at 292.

[161] F.M. SCHERER, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 398 (Rand McNally College Publ'g Co. 1970).

[162] *Id.*

[163] *Id.*

[164] *Id.*

[165] *Id.*

[166] *Id.*

[167] *Id.*

[168] *See* WARD S. BOWMAN, JR., PATENT AND ANTITRUST LAW: A LEGAL AND ECONOMIC APPRAISAL, 39–42 (The Univ. of Chicago Press 1971); Kitch, *supra* note 97, at 280–82; Grady & Alexander, *supra* note 105, at 312–14.

[169] *See* Grady & Alexander, *supra* note 105, at 308.

incentive structure in the institution. If patents were simply awarded to a qualified coordinator, one would expect a race to claim areas that seem promising based on the available information. Therefore, a competition for the right to develop prospects would completely dissipate the rents from innovations. According to Grady and Alexander, rent dissipation occurs at the time of invention (conception), innovation stages based on the signaling of the basic invention (improvement), and in cases where an excessive investment is made in secret rather than through reliance on the patent institution.[170] An efficient patent institution should minimize rent dissipation.

The rent dissipation theory has been criticized for its indeterminacy in terms of the definition of signaling invention. With imperfect information of the future development of an industry, it is unknown which inventions may signal improvements and which may not.[171] This theory is also criticized for suggesting an institutional arrangement that discourages pioneering signaling inventions.[172]

The race to invent theory states that society benefits from granting patents with a relatively narrow scope of protection to permit competition in improvement inventions (innovations) to enhance the rapidity of development. In 1990, based on empirical inquiries on patent scope, Merges and Nelson argued the incentive structure in the patent institution should create an incentive to race for the patent, "without extensively reducing the incentive to patent a pioneering patent."[173] This is because, "the law should attempt at the margin to favor a competitive environment for improvements, rather than an environment dominated by the pioneer firm. In many industries the efficiency gains from the pioneer's ability to coordinate are likely to be outweighed by the loss of competition for improvements to the basic invention."[174]

While the patent induced theory focuses on the importance of revolutionary or pioneer invention, Merges and Nelson's theory, under the same incentive structure, becomes the antithesis of patent induced theory.[175] However, this theory would provide additional incentives for the invention that would be induced anyway by the market and other factors. Oddi observes that this would result in massive rent dissipation and waste, either by discrimination against basic patents, or by secrecy.[176]

Utilitarian incentive theories are often found in the object clauses of patent law. For example, article I, section 8 of the United States Constitution states patent law should "promote the Progress of . . . useful Arts."[177] Therefore, an efficient patent

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[170] *Id.* at 316–18.

[171] *See* Robert P. Merges, *Rent Control in the Patent District: Observations on the Grady-Alexander Thesis*, 78 VA. L. REV. 359, 364 (1992).

[172] *See supra* note 105 and accompanying text.

[173] *See* Merges & Nelson, *supra* note 32, at 843 (analyzing the effects of patent scope in various industries).

[174] *Id.* at 843–44.

[175] *See* Oddi, *supra* note 23, at 283.

[176] *Id.*

[177] S. Rep. No. 82–1979, at 3 (1952), *as reprinted in* 1952 U.S.C.C.A.N. 2394, 2396.

> The purpose of the first provision is to promote the progress of science by securing for limited times to authors the exclusive right to their writings, the word "science" in this connection having the meaning of knowledge in general, which is one of its

institution should promote the progress of useful arts, and as a result, the instrumentalist character of the patent institution as a tool to promote the progress is enshrined. In Japan, the patent institution "*encourage[s] inventions* by promoting their protection and utilization so as to contribute to the development of industry."[178] The greater objective is to encourage inventions so as to contribute to the development of industry. Protection and utilization are given as methods for achieving this objective.[179] The objective of the Japanese patent system endorses the theory of incentive to develop (i.e. incentive theory), thereby indirectly taking the position of property as the incentive theory justifies the grant of property. Tamura views the intellectual property institution as an institution of "incentives."[180] Whether the institution creates, maintains, or supports the incentives, the objective of the intellectual property institution lies with the "incentive to create and to innovate."[181] Therefore, the natural rights property theory is not correct in view of this interpretation of Japanese patent law.[182]

Incentive based theories are fundamentally instrumental in nature. Whether they view a patent as a monopoly or a privilege, they share the common theoretical understanding that the patent institution is an instrument of policies. Even with incentives as the central unit of analysis, the theories explain the institution with such variety that one could be called an antithesis of the other.

This variety is present because policy perspectives allow different versions of efficiency that allow the balancing to be performed differently. Policies that proponents of each theory advance to balance trade-offs between conflicting efficiencies are radically different. Lack of a unified theory may not be necessarily negative. In a recent study, Burk and Lemley take up the point that one theory may not explain the entire patent institution or the entire industry.[183] One of the perennial criticisms for incentive theory is that incentive structures vary widely across the industry. As a generalized rule for an even more general concept of technology, patent law is unified in concepts on the surface. However, as the industry demands technology specific patent rule, empirical evidence only partially supports theories.[184] As Oddi observed, this leads to theoretical confusion,[185] which produces different theories that are all partially correct.[186] However, as a policy institution, Burk and Lemley argue, the patent law is equipped with policy levers

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> meanings today. The other provision is that Congress has the power to promote the progress of useful arts by securing for limited times to inventors the exclusive right to their discoveries. The first patent law and all patent laws up to a much later period were entitled "Acts to promote the progress of useful arts."

Id.

[178] Japanese Patent Act, Article 1, *supra* note 121.

[179] *Id.*

[180] *See* YOSHIYUKI TAMURA, CHITEKIZAISANHOU [INTELLECTUAL PROPERTY LAW] 7–15.

[181] *Id.* at 8–10.

[182] *Id.* at 170–72.

[183] *See* Burk & Lemley, *supra* note 4, at 1577.

[184] *Id.* at 1580–1615 (comparing the application of patent law in various technologies, such as semiconductors, biotechnology, pharmaceuticals, etc.).

[185] Oddi, *supra* note 23, at 326.

[186] Burk & Lemley, *supra* note 4, at 1615.

that may be used flexibly.[187] As a policy institution, patent law is equipped with different levers to efficiently balance conflicting interests. An efficacious patent institution may be determined on the basis of how efficiently these levers are used in achieving its policy and goals: exclusion and diffusion.

CONCLUDING REMARKS

Law and economic theories of patent law teach us that we need the patent institution so that we can allocate scarce resources in the most efficient manner. Efficiency used in this context is often a normative efficiency. A Pareto efficient patent institution would make at least one individual better off and no one worse off. Because a patent institution that creates no cost, but only benefit(s) is Pareto efficient, the patent institution in this sense is not Pareto efficient because one class of inventions create a whole new class of infringement and the activities that create costs along with it. On the other hand, efficiency as preference maximization is achievable by minimizing the transaction cost. In this vein, the patent institution is an institution of property, with the goal of efficient exclusion. As discussed above, legal theories adopting this view often characterize the nature of patent rights as a continuation of property rights, justifiable with natural rights, and the function of patents as a reward, either for costs on the inventor or for benefits for society. On the other hand, emphasis on the trade-off of two technical efficiencies highlights the contingency of the institutional arrangement. As positive efficiency, one rather explain than recommends or justifies that it allows such plural policy goals, making balancing of different policy goals as the institutional efficiency. Viewed as a policy institution, the efficacy of the patent institution may be measured in terms of its efficiency in balancing of the *diffusion and exclusion* of specific knowledge. When applied to legal theories, it allows characterization of the patent right as a privilege and it allows the function of a patent as providing various incentives, which leads to dynamic efficiency.

This article builds on to the perspective that denies the existence of a uniform set of norms that underlie the patent institution. Furthermore, this article suggests such assumptions of unified definition of a patent institution may not be correct or useful because they downplay the need to understand the patent institution as an institution of law with a combination of different principles and policies.

Furthermore, a patent right is a social construction. A study on the efficacy of patent law should approach it as an institution that artificially creates the right of exclusion. In other words, it is an instrumentalist institution for a specific end. If we define efficacy of the patent institution as the efficiency in achieving its goal, one should start by identifying the goals of the institution. However, the patent institution is an institution of law that encompasses a variety of rules, norms, exceptions, principles, and counter principles. As an institution of law, the patent institution cannot avoid the fundamental conflict of interests and prioritize these different interests according to some of the values that society deems desirable. At this point, the efficiency oriented analysis argues the frame of reference in

[187] *Id.* at 1578–80.

prioritizing should be efficiency. Promoting one interest is more efficient than promoting the other. However, efficiency as such is not a value.[188] It needs other modifiers such as efficiency in wealth maximization[189] or in diffusion of knowledge.

Given these observations, how may one analyze the patent institution? As there is no uniform theory of the patent institution, the study of the patent institution should be pluralistic and functional,[190] and application-specific and contextual. All theories and definitions of its efficiencies are therefore contingent and valid to a degree. The definition of an efficient patent institution is valid only to the degree of its definition of efficiency and only to the degree of its identified norms of patent. Therefore, a general assessment of the efficacy of the patent institution is not possible. However, a specific efficacy assessment can be made. The focus of research then should not be whether an institution is efficient, but "which efficient institution" and "why such efficiency."

Efficiency in and of itself cannot be a normative goal. As such, it is not the only goal of a social institution. Therefore, assessing an institution only from this point is subject to a broad level of generality. An institution can be seen efficient to a certain set of rules, depending on a "proper" definition of efficiency. The essential criticism is that an efficiency analysis can only explain uncertainties existing in the status quo.[191] As a corollary, it is possible to say that a legal institution of status quo can be always efficient to a degree, if the efficiency is defined to suit the existing rules. One can always ask then, why assess the efficiency of an institution if efficiency can be defined to fit any rules or any rule based institution? An institution is more or less efficient to a certain set of rules. However, as North pointed out "institutions are not necessarily or even usually created to be socially efficient; rather they . . . are created to serve the interest of those with the bargaining power to devise new rules."[192] Therefore, an efficiency assessment of a legal institution may not be necessarily the most useful assessment that one can make about an institution. Therefore, it is argued that it does not help in revising or constructing an institution. This dilemma notwithstanding, it is still worthwhile to discuss efficacy of patent institution in terms of economic efficiency. This is mainly true because the discussion would help us identify the underlying bias in the policy changes based on economic efficiency, and critically understand any suggestions of legislative changes based solely on the economic efficiency of one kind. The efficacy of the patent institution lies in the balancing of different efficiencies. Justification for such balancing should be found in social norms.

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[188] *See generally* Coleman, *supra* note 33, at 510–12 (providing analysis of efficiency in terms of utilitarianism or wealth maximization, and postulating the existence of other efficiency criteria).

[189] *See* Dworkin, *supra* note 46, at 194.

[190] *See, e.g.*, Tamura *supra* note 180, at 15–17.

[191] Boyle, *supra* note 33, at 2031.

[192] North, *supra* note 5, at 16.