

# UNDERSTANDING PATENT QUALITY MECHANISMS

R. POLK WAGNER<sup>†</sup>

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## INTRODUCTION

The need to “improve patent quality” is a cry heard anywhere patent lawyers gather, and is a centerpiece of the political and academic establishments’ reform agendas.<sup>1</sup> Indeed, although the

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<sup>†</sup> Professor of Law, University of Pennsylvania Law School. Thanks to Satoshi Hattori, Hiroyuki Hinda, Masanori Katsura, Takeyuki Iwai, Shinjiro Ono and Shigeo Takakura and participants at a workshop at the Institute of Intellectual Property for helpful comments on an earlier draft. I gratefully acknowledge research support from the Institute for Intellectual Property in Tokyo, Japan and the Center for Technology, Innovation, and Competition at the University of Pennsylvania Law School.

<sup>1</sup> See, e.g., Coalition for Patent Fairness, Coalition for Patent Fairness Supports Introduction of Bipartisan, Bicameral Patent Reform Bills, PR Newswire, April 18, 2008 (highlighting the need to improve patent quality); The Coalition for 21<sup>st</sup> Century Patent Reform, Statement on Introduction of Senate and House Patent Legislation, at [http://www.patentmatter.com/press/release\\_041807.php](http://www.patentmatter.com/press/release_041807.php) (visited, December 15, 2008) (same); Intellectual Property Organization, Patent Reform, at [http://www.ipo.org/AM/Template.cfm?Section=Action\\_Center&Template=/CM/ContentDisplay.cfm&ContentID=3361](http://www.ipo.org/AM/Template.cfm?Section=Action_Center&Template=/CM/ContentDisplay.cfm&ContentID=3361) (visited December 15, 2008) (same); Robert Pear, Patent Bill Is Bonanza To Lobbyists, NY Times, April 30, 2008, at C1 (reporting views on patent reform, and quoting USPTO Director as stating that “We are getting more and more unpatentable ideas, worse and worse quality applications.”); National Research Council of the National Academies, A Patent System for the 21<sup>st</sup> Century (Stephen

modern patent system is characterized by policy disputes across a huge range of issues, the need to improve patent quality is essentially undisputed.<sup>2</sup> This is in a significant sense unsurprising. For one thing, basic structural facts flag the issue quite clearly: As the amount of patenting activity has grown rapidly worldwide, the administrative apparatus of patent systems have been strained to their limits (or perhaps beyond), raising urgent concerns about the viability of their basic mission of evaluating patentability.<sup>3</sup> At the same time, the substantial costs of granting large numbers of patents inappropriately are reasonably well-understood—uncertainty, additional litigation, and a perversion of the incentives generated by patents themselves.<sup>4</sup> One of the consequences, however, of the near-universal agreement surrounding the question of patent quality is that relatively less attention is paid to the mechanisms that support (and undermine) patent quality. That is, improving patent quality is generally viewed as an administrative concern—a question of funding levels, regulatory process, bureaucratic reform, and so on.<sup>5</sup> And while there have been many interesting and innovative proposals for enhancing patent quality by reforming (even radically) the patent prosecution process, less work has been done in identifying the underlying mechanisms of patent quality.<sup>6</sup>

What has largely been lost in this drumbeat for improved patent quality is that the modern patent system affirmatively encourages low patent quality.<sup>7</sup> Put directly, it is hardly a surprise that almost everyone agrees that patent quality needs to

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A. Merrill, Richard C. Levin, & Mark B. Myers, eds., *The National Academies Press* 2004); Federal Trade Commission, *To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy* 4 (2003).

<sup>2</sup> One prominent critic of efforts to improve patent examination is Scott Kieff, who argues that a better approach is to move to a “soft look” examination process. I explore this approach in more detail in Section III below. *See generally*, F. Scott Kieff, *The Case for Registering Patents and the Law and Economics of Present Patent-Obtaining Rules*, 45 B.C. L. Rev. 55 (2003).

<sup>3</sup> See *infra* Section II.

<sup>4</sup> See *id.*

<sup>5</sup> See *infra* Section IVB.

<sup>6</sup> See *id.*

<sup>7</sup> See *infra* Section III.

improve: the incentives at work are such that we cannot reasonably expect anything other than a system that generates (very) large numbers of low quality patents. And is for this reason that virtually all of the proposed reforms directed to patent quality are doomed to fail; until we change the incentives (and change them quite significantly), we will continue to have a growing patent quality problem.<sup>8</sup>

In this paper, I suggest that only by understanding the mechanisms of patent quality—the incentive structure that not only discourages ‘good’ patenting behavior, but even encourages ‘bad’ patent behavior—will any real progress be made in improving our situation. Low patent quality is not, I argue, the problem of the USPTO and its counterparts worldwide, and no patent office will “fix” patent quality. Indeed, at the scale of the annual filings, it is hard to imagine any scenario in which enough resources could be directed to this effort in the amount required to have a meaningful impact. Instead, a serious effort to improve patent quality will need to address the reasons *why* patentees increasingly adopt a high-volume, low-quality patenting strategy, *why* litigation has become virtually the only reliable tool for determining a patent’s scope and validity, and why memes such as “patent trolls” and “patent thickets” have become embedded in current legal-policy discourse.

Creating a patent system that yields high quality patents is not an unattainable goal. But administrative reforms will not get us there, although they might well help—or at least not hurt. Until patentees have strong, unequivocal incentives to seek patents that clearly meet the standards for patentability, that are explained in context of the prior art, and that draw clear and unambiguous lines around their subject matter, we will not succeed. The tools are there, however. We just need to understand which ones we need to use.

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<sup>8</sup> See *infra* Section IVD.

## II

## PATENT QUALITY: A READER'S GUIDE

A. *What Is Patent Quality?*

At the outset, it is important to be quite precise about what I mean by “patent quality” in this context. Patent quality is the capacity of a granted patent to meet (or exceed) the statutory standards of patentability—most importantly, to be novel (§102), non-obvious (§103), and be clearly and sufficiently claimed and described (§112).<sup>9</sup> Thus a “low quality” patent would be one granted on an invention that does not meet these standards. And, although it should be clear, I want to make plain that there is a clear distinction between the quality of a patent (as I use it here), and its value. Although there may at times be a relationship between value and quality in patenting—in many ways, in an ideal world, the correlation would be rather strong—in other cases these characteristics will be independent. A patent’s value depends on factors well beyond those of concern to the patent law—such as the size of the relevant market, the relationship between the patent’s scope and a marketable good or service, and many more. Some of these factors will suggest the quality of the patent, such as the nature of the advance over the prior art, but others have little to nothing to do with patent quality, as defined above.

B. *Should We Care About Patent Quality?*

Another threshold question to be addressed is whether there is a problem with patent quality worthy of further consideration. That is, the argument might be put forth that although higher patent quality is better than lower patent quality, there is no particular reason to believe that the current state of affairs is dramatically suboptimal. A stronger form of this argument would posit a trade-off between patent quality and costs, and suggest that perhaps a ‘high’ patent quality is an inefficient goal in any event: better, perhaps, to allow market forces (in the form of

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<sup>9</sup> See 35 U.S.C. §102 (requirement for novelty), §103 (requirement for nonobviousness), §112 (requirement for description). There are other statutory provisions that might be described as standards of validity, including the subject matter and utility requirements of 35 U.S.C. §101, and the inventorship requirement of 35 U.S.C. §116, but the novelty, non-obviousness, and description requirements are overwhelmingly the most important.

litigation and licensing) to sort the wheat from the chaff in terms of quality in the same way that patent value is cleared.<sup>10</sup>

I have significant sympathy for this line of argument. Reaching a state of affairs where every granted patent meets or exceeds the standards of patentability seems both implausible and likely a misallocation of resources. The patent prosecution process is fraught with serious informational problems of the sort that a robust marketplace might well be able to resolve at least as well as an over-taxed administrative agency.<sup>11</sup> And yet, the case for better patent quality still carries the day, for the several reasons that follow.

### 1. Uncertainty

Particularly compelling for me is the recognition that a patent system characterized by low patent quality sows substantial uncertainty at all levels of the patent system:

uncertainty about the validity of granted patents;

uncertainty about the scope of granted patents;

uncertainty about whether a particular invention is patentable; and

uncertainty about whether a valid patent will be fully enforced.

This uncertainty, obviously, makes business decisions based on patents (whether by patentees, prospective licensees,

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<sup>10</sup> Scott Kieff and Mark Lemley have made versions of this argument. Kieff suggests that much patent quality assessment is best left to the marketplace, while Lemley makes the less vigorous argument that it is likely rational to be relatively uncertain about patent quality (“rationally ignorant”) at the patent office, as so few patents have any substantial value in the marketplace. See Kieff, *supra* note xx; Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 *NWU L. Rev.* 1495 (2001).

<sup>11</sup> I, as well as many others, have observed the informational problems inherent in patent prosecution. See, e.g., Lee Petherbridge, *Positive Examination*, 46 *IDEA* 173 (2006); Michael Risch, *The Failure of Public Notice in Patent Prosecution*, 21 *Harv. J. L. & Tech.* 179 (2007); John R. Thomas, *Collusion and Collective Action in the Patent System: A Proposal for Patent Bounties*, 2001 *U. Ill. L. Rev.* 305 (2001); R. Polk Wagner, *Reconsidering Estoppel: Patent Administration & the Failure of Festo*, 151 *U. Penn L. Rev.* 159 (2002).

investors, etc.) much more difficult and costly. To be sure, I recognize that uncertainty exists in virtually every human activity, and that robust markets can function well even with uncertainty. But it's important to remember that patent laws are an intervention into the free operation of the market—a well-justified intervention, in my view, but an intervention nonetheless.<sup>12</sup> Accordingly, the basis of the patent system is that the proprietization of certain ideas ('patentable' ones, of course), will stimulate behaviors that will enable the market to better support innovation.<sup>13</sup> The strongest case for the patent system, then, is where it best performs the function of enabling the market for innovation. And it cannot do so particularly well when the basic components of the implementation mechanism—property rights in (patentable) ideas—are so imbued with uncertainty.<sup>14</sup> Again, uncertainty is both unavoidable and unlikely to be crushing (at least at moderate levels) in this context. But I am convinced that the current patent system has

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<sup>12</sup> Although it is well beyond the scope of this paper to explore the underlying policy basis for the patent system, the highlight is that innovation has characteristics of a public good—where the cost of providing the good does not increase with consumption, and where it is generally infeasible to exclude others from consuming the good—and is likely to be underproduced in the absence of market intervention. The classic articulation of this idea is found in Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in *The Rate and Direction of Inventive Activity: Economic and Social Factors* 609, 614-16 (Nat'l. Bureau of Econ. Res. Ed., 1962). For an overview of public good economics, see e.g., Hal R. Varian, *Microeconomic Analysis* (1992). For my views, see generally, R. Polk Wagner, *Information Wants to Be Free: Intellectual Property and the Mythologies of Control*, 103 *Colum. L. Rev.* 995 (2003). For further information, see, e.g., Peter Menell & Suzanne Scotchmer, *Intellectual Property*, in *Handbook of Law and Economics* (A. Mitchell Polinsky & Steven Shavell, eds., 2006); William Landes & Richard Posner, *The Economic Structure of Intellectual Property Law* (2003), F.M. Scherer, *Industrial Market Structure and Economic Performance*, 443-45 (2<sup>nd</sup> ed. 1980).

<sup>13</sup> It is of course important to remember that the incentives created by the patent system are not merely to create inventions, but to commercialize inventions, invest in inventive activity—that is, more broadly create a market for innovative activity. See, e.g., F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 *Minn. L. Rev.* 697 (2001); R. Polk Wagner, *Reconsidering Estoppel: Patent Administration and the Failure of Festo*, 151 *U. Penn L. Rev.* 161, 192 n. 105 (collecting sources).

<sup>14</sup> See, e.g., Henry E. Smith, *Property and Property Rules*, 79 *N.Y.U. L. Rev.* 1719, 1729, 1755-64 (2004).

too much uncertainty, and that low patent quality plays a substantial role. It is the patent reformer's version of the Hippocratic Oath: first, consider uncertainty.<sup>15</sup>

## 2. Type I and Type II Errors<sup>16</sup>

By definition, a low quality patent system is characterized by large numbers of errors in the patent-granting process. Paradigmatically, we think of these errors as being inappropriate grants: patents granted that do not meet the standards for patentability. But errors in the patent granting process also involve inappropriate denials, those where patentable inventions are turned away. These errors may well be as costly to society as inappropriate grants, as they may undermine the incentives for important innovations to be fully commercialized, and/or have demoralizing effects on future research efforts. (These errors are also, of course, far less visible, by their very nature.)

## 3. The Cure Is Worse than The Disease

Another reason to be concerned about patent quality is that many of the responses to low quality patents may have unintended pernicious effects across the patent system. For example, in *eBay v. MercExchange*, the Supreme Court's widely-reported rejection of the Federal Circuit's longstanding presumption in favor of injunctive relief for patent infringement was largely based on four Justices' sense that patent quality was too low to support permanent injunctive relief in many cases.<sup>17</sup>

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<sup>15</sup> See, e.g., Hippocratic Oath, National Library of Medicine, trans. 2002, available at [http://www.nlm.nih.gov/hmd/greek/greek\\_oath.html](http://www.nlm.nih.gov/hmd/greek/greek_oath.html) (last visited December 20, 2008).

<sup>16</sup> In statistics, "type I" errors are false positives, while "type II" errors are false negatives. In this context, type I errors would be the inappropriate grant of a patent that did not fully achieve the standards for patentability; type II would refer to the inappropriate denial of a patentable application. See Graham Upton & Ian Cook, Oxford Dictionary of Statistics 165-66 (2004) (discussion included in entry for "hypothesis testing").

<sup>17</sup> See *eBay, Inc., v. MercExchange, LLC*, 547 U.S. 388 (2006). See also See Jeremy Mulder, Note, The Aftermath of eBay: Predicting When District Courts Will Grant Permanent Injunctions in Patent Cases, 22 Berk. Tech. L. J. 67, 72 (2007); Andrew Beckerman-Rodau, The Aftermath of *eBay v. MercExchange*, 126 S. Ct. 1837 (2006): A Review of Subsequent Judicial Decisions, 89 J. PAT. & TRADEMARK OFF. SOC'Y 631, 633 (2007) (positing greater uncertainty, but finding relatively little change in behavior).

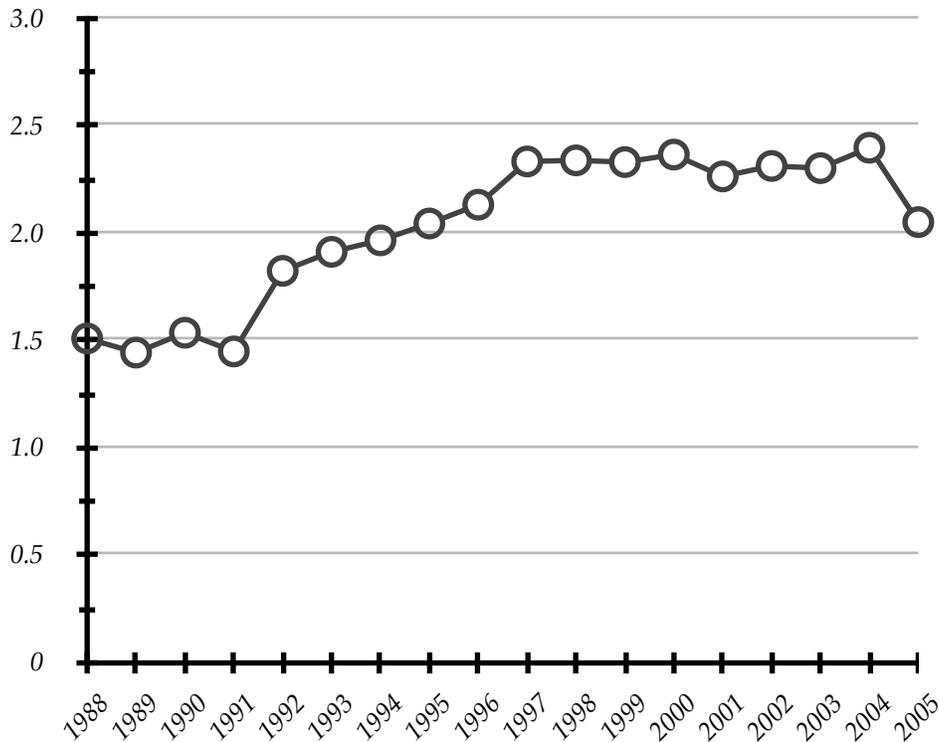
The rule change, of course, at least marginally reduces the power of patents, and increases uncertainty surrounding enforcement—for both high quality and low quality patents. In a similar vein are the various reform efforts to curtail the activities of so-called “patent trolls”; many of these measures, such as limiting the damages available to infringed patentees, would again diminish patent power while increasing uncertainty about enforcement, again irrespective of patent quality.<sup>18</sup>

#### 4. Litigation and Strategic Behavior

Perhaps the most obvious consequence of low patent quality is the increase in litigation (in terms of raw filings, as well as “litigation intensity”—suits filed per in-force patent) we’ve observed over the past decade or so. Figure 1 below shows this trend.

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<sup>18</sup> John Markoff, *Two Views of Innovation, Colliding in Washington*, *The New York Times*, January 13, 2008 at C3.



**Figure 1: Patent Litigation Intensity, 1988-2005**

[ patent infringement suits filed per 1000 in-force patents ]<sup>19</sup>

A low quality patent system means there are more patents with greater uncertainty, leading to increasing disputes over patents, and increasing resort to the decision-maker of last resort, the courts. And more uncertain patents means that litigation becomes more complex and expensive, adding again to both the private and social costs of the system as a whole.

What might be somewhat less apparent is that a low quality patent system enables greater opportunities for socially-harmful strategic behavior: with more patents and more uncertainty (both

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<sup>19</sup> Lawsuit information is provided by the Annual Reports of the Administrative Office of the US Courts. Patent filing data is provided by the USPTO Annual Reports. Calculation of in-force patents is conducted by reducing the total potential number of in-force patents (using expiration date data) by the proportion of patents which expire early due to failure to pay maintenance fees.

in terms of the patents themselves, as well as the possible scope of enforcement), the system can be exploited, whither by filing low-probability, high-cost litigations or by seeking large numbers of low quality patents to use as leverage for settlement.

I want to be clear that litigation is a necessary, important, and unavoidable part of the private enforcement scheme that is fundamental to the patent system, and that strategic behavior exists in every form of human economic activity. Even a patent system with only the highest, most valid, most clear patents will have litigation (and, likely, strategic behavior). But low quality patents will create more of these costs.

##### 5. The Public Believes there is a Patent Problem

Although most academics likely believe that patent quality could and should be higher, it seems very clear that those less familiar with the patent system are convinced that there is a serious problem. In part, this is reflection of the mass media's treatment of the patent system in recent decades; articles and editorials headlined "Patently Absurd" (and similar) are all-too-common features of the popular press' coverage.<sup>20</sup> Several Supreme Court justices seem to see a serious problem with patent quality; apparently they read the New York Times, too.<sup>21</sup> Certain industries, notably the high-tech industry, have been engaged in a concerted public relations effort that, among other things, highlights patent quality problems.<sup>22</sup> And as the patent system grows in importance—both by growing in size as well as importance to the modern knowledge economy—this public perception matters, greatly. It determines the future direction of the system, and the role it will play in innovation policy.

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<sup>20</sup> See, e.g., James Gleick, *Patently Absurd*, NY Times, March 12, 2000; *Patently Ridiculous* (Editorial), NY Times, March 22, 2006, at A24; *Patently Obvious* (Editorial), Wall St. J., May 3, 2007, at A16; *Patently Absurd* (Editorial), Wall St. J., March 1, 2006, at A14; *Patently Flawed* (Editorial), Boston Globe, July 23, 2007, at A10; *Patently Obvious*, The Economist, May 5, 2007.

<sup>21</sup> See *eBay, Inc., v. MercExchange, LLC*, 547 U.S. 388, 396 (2006) (Kennedy, J., concurring).

<sup>22</sup> Robert Pear, *Patent Bill Is Bonanza To Lobbyists*, NY Times, April 30, 2008, at C1.

## 6. Feedback Effects

Finally, and most importantly, a low quality patent system is likely to be self-reinforcing. If low quality patents create uncertainty, spur increased litigation, and provide opportunities for strategic behavior, then one important response will be for firms to file more low quality patents. I consider this question in more detail in Section XX below: the basic outline is that a rational firm response to a patent system with large numbers of low quality patents is to seek more patents, irrespective of individualized quality.<sup>23</sup> As Gideon Parchomovsky and I have argued, this phenomenon nicely explains some important recent trends in patenting behavior, especially the increase in filings and patent intensity.<sup>24</sup> It may well be that the feedback effects from low quality patents have created a spiral-down effect, meaning that without intervention, we should expect patent quality to worsen over time.

But it might well be that the converse is also true; and that if so, we should be very interested in improving patent quality. That is, a patent system with higher quality patents seems likely to be more certain, less prone to strategic manipulation—and thus encourage patentees to seek fewer, better, and clearer patents than under a low quality system.

To return to the question noted above, is there a serious patent quality problem? The short answer, of course, as with so many issues in patent law, is that we don't know for sure. But as I've outlined above, even skeptics about the seriousness of the problem should nonetheless care about patent quality.

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<sup>23</sup> See *infra* Section IIIC.

<sup>24</sup> See generally Gideon Parchomovsky & R. Polk Wagner, *Patent Portfolios*, 154 U.Penn L. Rev. 1 (2005).

## III

PATENT QUALITY MECHANISMS:  
WHAT CAUSES LOW PATENT QUALITY?

Why are too many patents low quality? That is, why are substantial numbers of patents granted by the USPTO every year that do not meet the required standards for patentability? This is not merely a rhetorical question: the core mission of patent offices worldwide is to evaluate applications against the standards of patentability, and it is not at all self-evident that an invalid patent is in the interest of the holder (even setting aside the substantial resources involved in obtaining patents, note that invalid patents will bar their holders from later patents on the same or closely similar inventions). Furthermore, as has been noted above, low quality patents are costly to society at large, and vilified in the popular press and academic circles alike. Why then, are there so many of them?

The easy answer, of course, is that evaluating inventions in light of the statutory standards of patentability is a difficult and uncertain business, fraught with serious informational problems, shifting legal tests and frameworks, all against a backdrop of limited resources.<sup>25</sup> This is all certainly true; even under the best of circumstances, one would have to expect a non-trivial number of invalid patents to slip through the system (as well, of course, a number of patentable inventions to be inappropriately rejected). Yet this answer, I think is incomplete. It does not account for the pervasive sense on the part of most observers of the patent system that patent quality is poor and worsening, as well as the various metrics that appear to signal growing concern.<sup>26</sup> If patentees, the USPTO, and the public are all put in a worse position by low quality patents, *why doesn't patent quality improve?*

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<sup>25</sup> See, e.g., R. Polk Wagner, *Reconsidering Estoppel: Patent Administration & the Failure of Festo*, 151 U. Penn. L. Rev. 159, (2002). See also See, e.g., Lee Petherbridge, *Positive Examination*, 46 IDEA 173 (2006); Michael Risch, *The Failure of Public Notice in Patent Prosecution*, 21 Harv. J. L. & Tech. 179 (2007); John R. Thomas, *Collusion and Collective Action in the Patent System: A Proposal for Patent Bounties*, 2001 U. Ill. L. Rev. 305 (2001).

<sup>26</sup> See *supra* Section II (discussing reasons for concern).

Understanding this puzzle—why patent quality is low despite the near-universal agreement that low quality is suboptimal, and despite the focus on quality by the administrative agencies—is the first step to any serious effort to address the issue. A careful analysis reveals that low patent quality is supported by a series of powerful incentives: incentives that encourage patentees to draft patent applications that effectively obscure the true scope of the invention and its relationship to the prior art, incentives that lead the administrative agencies (the USPTO and other patent offices) to conduct relatively ineffective examination of many patents, and, most importantly, incentives that compel modern innovative firms to adopt a high-volume, low-quality patenting strategy. I discuss these three sets of incentives (as well as others) in more detail below. Considering these incentives suggests that patent quality is a question not of bureaucratic incompetence or administrative process, but instead a problem of interlocking incentive structures that impose themselves on the entire patent system.

#### A. *Deferring Clarity*

I start with the unremarkable premise that a patentee has a strong incentive to draft, file, and prosecute a valid patent, with claims that cover appropriate subject matter. Applications rejected by the patent office, and those found invalid by courts during litigation, are ultimately worthless (or even worse, given sunk costs, opportunity costs and preclusive effects).<sup>27</sup> Yet this tenet is too simple, for a couple of reasons. First, it overlooks the dual-stage nature of patent validity analysis, wherein a first evaluation is conducted by the patent office, and a second during any enforcement action that may occur.<sup>28</sup> There are critical

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<sup>27</sup> According to surveys, it costs upwards of \$10,000 to prosecute a patent application of even moderate complexity, and can cost much more if extensive amendments are required. See, AIPLA, Report of the Economic Survey 21(2007). The opportunity costs of an invalid patent are those resources which could have been dedicated to a valid patent, and/or the missed opportunity to adequately protect a patentable invention. The preclusive effects result from the various bars in 35 U.S.C. §102(b), which generally preclude the patentee from seeking a patent on ideas, even their own, disclosed more than a year prior to application.

<sup>28</sup> That those accused of patent infringement may seek to have the patent invalidated is an important (and unique) aspect of the patent law. See 35 U.S.C. §282 (listing defenses to patent infringement, including “invalidity of the patent”).

differences between these stages. By necessity, the first stage of this analysis is a softer look: resources are limited, patent examiners are likely under-informed, and so forth.<sup>29</sup> Further, without a particular “targeted” good or service in hand, a careful analysis of the scope of the patent (what subject matter is encompassed within the claims) is understandably unlikely.<sup>30</sup> During the litigation stage of the analysis, patents are given a much closer look by virtue of the oppositional litigation process and the need to analyze the scope of the patent against a particularized target (the accused infringing good). Of course this harder look comes at a substantial cost—to the patentee and the challenger/accused-infringer. Accordingly, the grant (the completion of the first stage of analysis) will attach to the patent a value in the marketplace—irrespective of its validity—related to the costs of obtaining a decision on validity from the courts. So even clearly invalid patents have some recognized value to patentees, once granted.<sup>31</sup>

A second important point is to recognize the critical component of timing in any analysis of patent incentives. Patent prosecution can take years, and most enforced patents are subject to suit several years after they are issued.<sup>32</sup> This means that a

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<sup>29</sup> See supra note \_\_ and accompanying text.

<sup>30</sup> Indeed, one problem with the current patent examination process is that the USPTO does not explicitly (or perhaps at all) determine the meaning of claim language—and if it does so, it uses what it describes as “the broadest reasonable construction” analysis rather than the legal rules established in the courts. See Manual of Patent Examining Procedure (MPEP) §2111 (8<sup>th</sup> Ed, Rev. 7, 2008). The Federal Circuit has acknowledged (and apparently blessed) this approach:

The Patent and Trademark Office (“PTO”) determines the scope of claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction “in light of the specification as it would be interpreted by one of ordinary skill in the art.” Indeed, the rules of the PTO require that application claims must “conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description.”

See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005) (en banc) (internal citations omitted).

<sup>31</sup> Though, as I noted above, that value may be (and I think is likely to be) less than the sum of the sunk costs, opportunity costs, and any costs of precluding future patents by the patentee. See supra note \_\_.

<sup>32</sup> Atkinson, Marco, and Turner find that the average age of a litigated patent is around seven to eight years after 2000. See Scott Atkinson, Alan

patent applicant must necessarily be a futurist: looking down the road of technological advancement, perhaps for a decade or more, to predict the market for the technology, the behavior of competitors, etc. A patent application written in year 0 might be enforceable only in year 3 (due to the pendency of prosecution), and the market may not be significant until year 5. By then, competitors will have the benefits of intervening technological advancements, as well as the teachings of the patent itself. In order for the patent to retain power in the marketplace (and thus value for the patentee), it will have to be written in anticipation of these changes, as well as be a substantial advance over the prior art alternatives.

I want to be clear that the set of circumstances above is precisely as designed, and almost certainly socially beneficial: that very few patents have real marketplace value is, in my view, a tremendous benefit of the system to society.<sup>33</sup> But that the deck is in some ways stacked against the patentee does create powerful incentives, and patentees will (and do) respond. Most obviously, of course, patent lawyers are trained with precisely this scenario in mind: I have always regarded teaching claim drafting as a short course in prognostication.<sup>34</sup> But the timing-based incentives also create strong interests in deferring a careful analysis of the patent (especially the claim scope) as long as possible, or at least retaining as broad a range of possibilities as long as one can. And given that the patentee is solely in control

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Marco, & John Turner, *The Economics of a Centralized Judiciary: Uniformity, Forum Shopping and the Federal Circuit* (May 1, 2008), available at SSRN: <http://ssrn.com/abstract=1129846>.

<sup>33</sup> On how many patents are valuable, see, e.g., Gideon Parchomovsky & R. Polk Wagner, *Patent Portfolios*, 154 *U. Penn. L. Rev.* 1, 16-19 (2005); Mark A Lemley & Carl Shapiro, *Probabilistic Patents*, 19 *Journal of Economic Perspectives* 75 (2005). Patents are privately enforced (a “hunting license”, not a reward), and therefore society only “pays” a patentee when his or her patent has marketplace value. The remainder of patented inventions (perhaps upwards of 95 percent) are disclosed to the public for free (and eventually, of course, enter the public domain). See *id.* For a more general theory of how incomplete capture is a key tenet of intellectual property laws, see R. Polk Wagner, *Information Wants to Be Free: Intellectual Property and the Mythologies of Control*, 103 *Colum. L. Rev.* 995 (2003).

<sup>34</sup> The classic treatment (one which nearly all patent lawyers experience at some time) is Robert C. Faber, John L. Landis, *Landis on Mechanics of Claim Drafting* (2005).

of the words used to describe and claim the invention, a rational patentee will tailor the language accordingly. This manifests itself in two ways. First, almost certainly the dominant strategy for a patentee here is to seek substantial vagueness, allowing the flexibility to effectively alter the scope and description of the patent according to changing circumstances. Second, the less description the patentee can provide the better, because of legal rules which penalize detailed descriptions. Both of these—vagueness and a lack of description—have important costs to the patent system. At best, they make it much harder to evaluate the scope and validity of the patent, making it much more likely that mistakes will be made. In many cases, they allow patentees to exploit the dual-stage analysis process noted above to obtain a patent under one understanding of the language (e.g., a narrow understanding) and later assert that same patent in a way that broadens the scope of coverage. And in all cases, they yield patents that are substantially less likely to comport with the statutory standards of validity—low quality patents.

It is important to note that although there are patent rules that discourage the deferral of clarity, there are also several rules that support it. For example, although 35 USC § 112 requires clear and adequate disclosure, as well as clear and distinct claim language,<sup>35</sup> the USPTO rejects patent applications for §112 less than for prior art problems (§102 and §103), and virtually never provides a detailed analysis of claim language, meaning that serious §112 analysis is left for litigation.<sup>36</sup> Second, the statutory presumption of validity (wherein “clear and convincing”

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<sup>35</sup> See 35 U.S.C. § 112 (2008):

*The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.*

*The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention....*

<sup>36</sup> Indeed, the USPTO itself notes in the MPEP that “[b]y far the most frequent ground of rejection is on the ground of unpatentability in view of the prior art, that is, that the claimed subject matter is either not novel under 35 U.S.C. 102, or else it is obvious under 35 U.S.C. 103.” See MPEP § 706.02 (2008).

evidence is necessary to find a granted patent invalid)<sup>37</sup> encourages patentees to pursue a flexible view their patent: narrow during prosecution, when the risk of rejection due to prior art is higher, and broader during litigation, where patent scope is of paramount importance. Third, the Federal Circuit’s rules regarding claim construction—that claims are to be understood in context, in a holistic manner, without any established process or framework—encourage patentees to limit the disclosure of their invention (such disclosure will create ‘context’ used for fixing claim scope), and ensures that the final analysis of claim scope (and thus virtually all other validity and enforcement matters) will only occur after appeal to the Federal Circuit.<sup>38</sup>

Deferring clarity, then offers a number of critical advantages to the patentee. It allows the patentee to capture some value for an invention at a very early stage, simply by receiving a grant. And it hedges against the patent being undermined by the passage of time and technology, allowing patents to change scope to fit later circumstances. Further, while some legal rules oppose this strategy (most importantly, perhaps, 35 USC § 112), several others support it. Therefore, it should be no surprise that many rational patentees would seek to defer clarity, and that it plays an important role in diminishing the quality of patents.

#### B. *Administrative Incentives*

In addition to patentees’ incentives to defer clarity, there are powerful incentives on the part of the USPTO that have the effect of reducing patent quality. Most of these are straightforward and understandable. The first set of administrative incentives encourages the Patent Office to issue many patents. Resources are limited, and filings continue to rise rapidly. Pendency—the

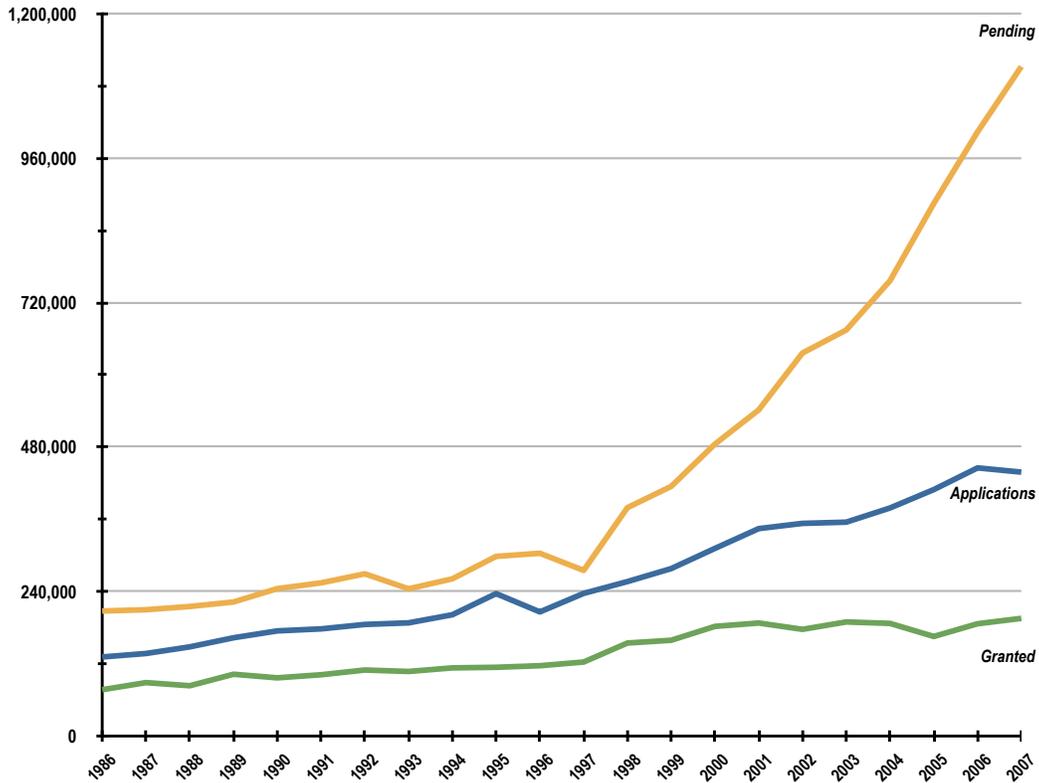
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<sup>37</sup> See 35 U.S.C. § 282 (2008):

*A patent shall be presumed valid. Each claim of a patent (whether in independent, dependent, or multiple dependent form) shall be presumed valid independently of the validity of other claims; dependent or multiple dependent claims shall be presumed valid even though dependent upon an invalid claim.... The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity.*

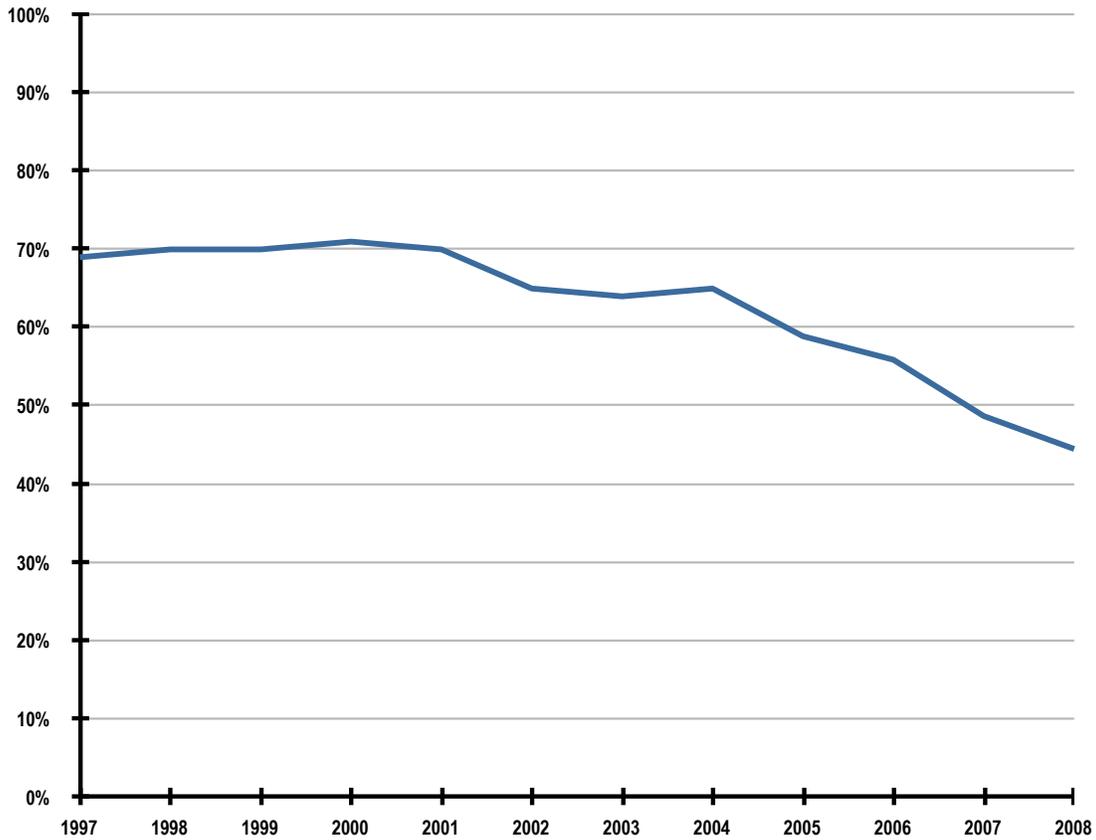
<sup>38</sup> See *Phillips v. AWH*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). See also R. Polk Wagner & Lee Petherbridge, *Did Phillips Change Anything? Empirical Analysis of the Federal Circuit’s Claim Construction Jurisprudence* 27-33 (draft manuscript, April 2008).

number of patent applications in the prosecution process—has risen strikingly in the last few years.



*Figure 2: Patent Activity in the US – 1986-2007*

This leads to a strong push for higher throughput: more processed patents. There are two ways, of course, to raise throughput: deny more patent applications more quickly, and grant more patents more quickly. And while it appears that the USPTO has markedly lowered the allowance rate in the past couple of years (see Figure 3), it is clear that the number of patents issued has risen as well.



*Figure 3: Allowance Rate for US Patent Applications - 1997-2008*

Second, there are inherent institutional biases that may serve to favor weaker, lower-value patents. Patent law is a specialized field, with many repeat players; in this context, there are always concerns that the views of the insiders (here, large patentees) will have more weight than the public-at-large. And although this does not necessarily mean that the institutional biases will favor lower quality patents, if the insiders' interests tend towards lower quality patents, then the institutions may well reflect those views. Even beyond the inherent institutional biases, it is widely known that there are internal bureaucratic incentives at the USPTO in favor of granting patents, as a component of an examiner's performance evaluation depends on "production counts," which are most easily and quickly obtained by allowing patent applications.

C. *Feedback Effects, or the Prisoners' Dilemma of Patent Quality*

Perhaps one of the thorniest incentive mechanisms to unravel in this context is this: it seems reasonably clear that one important mechanism favoring lower quality patents is the fact that so many low quality patents already exist. That is, a patentee has incentives to seek low quality patents at least in part because of what might be best described as the feedback effect of low patent quality. This phenomenon is related to what Gideon Parchomovsky describe as the “patent paradox”: if virtually all patents have negative cash value (their acquisition cost is large than their expected value), then why do so many otherwise quite rational firms not only file for so many patents, but in fact increase their patent intensity over time?<sup>39</sup> Although there are several possible reasons for this, we think the simplest explanation is that rational patentees adopt a high-volume, low-quality patenting strategy because it maximizes the possibility of advantage gained from the patent system – or perhaps minimizes the loss.<sup>40</sup> In our earlier work, we sketch a range of important reasons that a high-volume, low-quality strategy—we call a portfolio strategy—is advantageous in the modern innovation economy.<sup>41</sup> Having many patents, even if their quality is low, can provide much-needed marketplace power in a world where individual patents become less and less certain in scope and validity.<sup>42</sup> Having many patents, even if low quality, can hedge against the difficulties in predicting the future noted above; by casting a broader net with many patents in a particular field, less emphasis is placed on any individual patent to endure into the future.<sup>43</sup> And of course, having many patents, even if low quality, can hedge against changes in the law itself.<sup>44</sup> This is not to suggest that a patent portfolio approach inevitably leads to low quality – indeed, high-volume, high quality would be obviously better. But, given resource constraints, the is point is that the players in the modern patent system appear to have evolved into a strategy that privileges the volume of patents over their quality.

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<sup>39</sup> See generally Gideon Parchomovsky & R. Polk Wagner, *Patent Portfolios*, 154 U.Penn L. Rev. 1 (2005).

<sup>40</sup> See *id.*, at 27-43.

<sup>41</sup> See *id.*

<sup>42</sup> See *id.*, at 32-37.

<sup>43</sup> See *id.*, at 37-41.

<sup>44</sup> See *id.*

Further, as we suggest in *Patent Portfolios*, that others in the patent system are adopting a portfolio strategy is likely to further encourage the high-volume, low-quality approach. If the ‘coin of the realm’ in the innovation economy is an ever-increasing patent portfolio, then firms will increase their patent portfolios (again, given resource constraints, trading volume for quality).<sup>45</sup> Therefore, a feedback effect, wherein more low-quality patents (organized into ever-large portfolios) beget even more low-quality patents. In this way, low patent quality might resemble a form of a Prisoners’ Dilemma: even if most firms would be better off with high quality patents (and fewer of them), adopting such a strategy in the face of others’ more numerous (lower quality) patents is disadvantageous. Thus firms maintain the suboptimal strategy, unable to increase patent quality without widespread agreement among peers.

#### D. *Cognitive Biases and Patent Quality*

One additional mechanism that may support lower patent quality comes in the form of cognitive biases on the part of patentees, biases that encourage patentees to seek more patents than necessary, but to spend fewer resources on each patent. Consider that the distribution of patent value is very highly skewed, with a very small number of patents being very valuable, and virtually all others with little or even negative value. A patentee deciding whether to seek patents, will, like any decision maker, be subject to cognitive biases of various sorts. Most importantly for our purposes, is the prospect theory, which holds that decision-makers will tend to over-weight low-probability events, investing resources even where rational assessment of the probability would suggest otherwise (this theory is used to explain, among other things, the success of lotteries).<sup>46</sup> In the patent context, the prospect theory would suggest that too many patents are filed: patentees overweight the likelihood that a patent will in fact have significant value. At first blush, this might also suggest that patentees would over-invest in patent quality, because an invalid patent is virtually certain to have no value.<sup>47</sup> But research into cognitive biases suggests that

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<sup>45</sup> See *id.*, at 60-66.

<sup>46</sup> See, e.g., Dennis Crouch, *The Patent Lottery: Exploiting Behavioral Economics for the Common Good*, 16 *Geo. Mason. L. Rev* 1 (2008).

<sup>47</sup> Subject to the exceptions noted above—that there is some value in any granted patent, due to the cost that others’ will incur to have it

decision makers alter their assessments of probabilities based on the framing of the decision, and that people tend to make decisions that avoid even smaller chances of losses. If patenting decisions are made in stages—first an essentially binary decision to seek a patent or not, and later (or even ongoing) decisions about resources to invest into the patent prosecution process—then it is probable that decision makers would simultaneously decide to patent too much, while under investing in each patent. That is, once a decision is made to seek a patent on a particular invention, assume a decision maker has to decide whether to spend \$10,000 on acquisition costs, or \$50,000. Because the decision to patent has already been made, the acquisition cost is likely framed as a loss, and loss aversion would suggest that the cheaper, lower-quality route would be taken. Note that given the initial bias leading to over-patenting, the choice to under-invest in the patent might well be fully rational—there is an exceedingly small chance of positive value, after all. But even if this second decision is rational for the patentee, the two-stage decision process—patent, but under invest in quality—will obviously lead to lower quality patenting behavior.

Understanding the patenting decision as a series of two decisions (patent, then invest) suggests that other forms of cognitive bias might support low quality patents. For example, prospective patentees might be overconfident about the expected value of their invention, leading to a positive patenting decision, followed later by the analysis about resource expenditures noted above. In this way, cognitive biases can support low quality patenting behavior.

#### *E. Nontraditional Uses for Patents*

It is by now common to note that patents are obtained for reasons other than what is often assumed by classical theory. That is, the traditional understanding is that patentees obtained patents to protect investments in knowledge, by utilizing the patents' right to exclude others from the scope of a good or service based on the patented idea. We now understand that patentees often patent for many reasons in addition (or, instead of) the classic explanation. And in each of these cases, if the long-term enforceability of the patent is relatively less important, then

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declared invalid. But in this context, this exception will have little impact, as it is certain that an invalid patent will not be among those with a very large return.

the importance of patent quality is reduced as well. For example, if a patentee is patenting primarily (or even partly) for defensive purposes—so as to have an arsenal of possible patents to use in counter-claims in any lawsuits, or a means to preclude competitors from obtaining relevant patents—then that patentee will care less about patent quality; what matters in that case is not the ability to withstand a validity challenge in litigation, but simply the fact of the patent.<sup>48</sup> The bare minimum required to squeak through the patent office is sufficient. Similarly, Professor Long's suggestion that patentees use patents as signals of innovative acumen or technological savvy would similarly lead to lower-quality patents: if patents are used as external signals independent of themselves, then their quality is relatively unimportant.<sup>49</sup> As more patentees adopt these nontraditional approaches, then we can expect patent quality to drop.

The core incentive mechanisms identified above—deferring clarity, administrative incentives, feedback effects, cognitive biases, and nontraditional uses for patents—are likely not the only incentive mechanisms supporting low quality patents in the modern patent system. And, as I noted above, there are certainly plenty of incentives (and rules) supporting high quality patents. The point here is that there exist several powerful (and, in many cases, growing) incentives in favor of low quality patenting behavior. We should therefore not be surprised that most observers believe that patent quality is a serious and growing problem: we are merely seeing the harvest of what has been sown (intentionally or unintentionally) by the incentive structures in the modern patent system.

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<sup>48</sup> See, e.g., Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1504 (2001); Bronwyn H. Hall & Rosemarie Ham Ziedonis, *The Patent Paradox Revisited: An Empirical Study of Patenting in the U.S. Semiconductor Industry, 1979-1995*, 32 RAND J. ECON. 101, 125 (2001); Wesley M. Cohen, *Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (or Not)* 3 (Nat'l Bureau of Econ. Research, Working Paper No. 7552, 2000), <http://www.nber.org/papers/w7552>.

<sup>49</sup> See, e.g., Clarisa Long, *Patent Signals*, 69 U. CHI. L. REV. 625 (2002) (focusing on patents as a means for credibly publicizing information).

## IV

THE DURABILITY OF LOW PATENT QUALITY:  
OR, WHY MOST REFORMS WILL FAIL

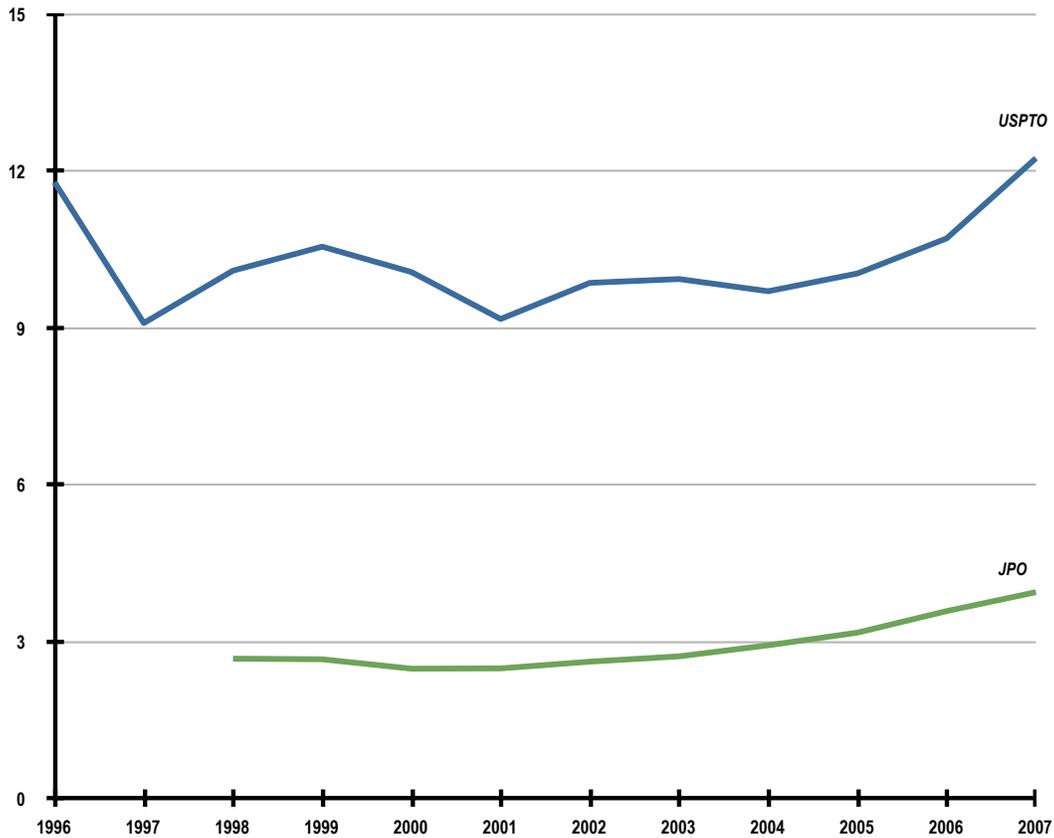
If the preceding section outlining the several and significant incentive structures that support low quality patenting behavior demonstrates anything, it is that low patent quality is not a simple matter of reforming the patent office—even quite radically. Instead, low patent quality is a problem that has its roots deep within the incentive structure of the patent system, and indeed, is aligned with major long-term trends, such as the rise in patenting activity and the changing use of patents in the marketplace. Yet most of the efforts (and proposals) to date treat patent quality as primarily an administrative issue, to be adjusted chiefly through the alteration of the patent prosecution process. In this section, I briefly sketch some of the major reform efforts—both undertaken and proposed—and note whether they are likely to overcome (or at least address) the incentives that create low quality patenting behavior.

A. *Administrative Changes*

Because patent quality has been at the top of many lists of problems with the patent system, patent offices (most especially the USPTO in the United States) have made a number of administrative adjustments to try to address the issue.

## 1. Increasing Examiner Headcount

Prompted in large part by the rise in filings, and apparent explosion in pendency, many additional examiners have been hired by the USPTO. This has of course been a substantial effort, requiring the hiring and training of thousands of new examiners, to say nothing of the additional resources dedicated to the project. And yet this effort has seen only modest results, even at the most basic level: the additional examiners, especially in the last two to three years, has effectively returned the PTO to the applications/examiner ratio of about the mid-1990s (itself not generally considered to be a golden era for patent quality). All the while, of course, pendency has continued to rise.



*Figure 4: Patent Examiners Per 1000 Applications Filed (US & Japan), 1996-2007<sup>50</sup>*

Importantly, a comparative look at the ratio of other national patent offices suggests that there may be only limited gains in quality from increasing examiner headcount. See Figure 4. For example, in Japan, the JPO has about one third or less the examiners per application as the PTO, yet the widespread perception is that patent quality in Japan is at least equal, if not better, than in the United States. Further, given the scale of the rises we've seen recently in filings and pendency, and assuming roughly continuing trends, even keeping the application/examiner ratio steady will consume enormous resources over the next several years; it seems implausible that

<sup>50</sup> Report of the Trilateral Commission, 200-2007; USPTO Performance & Accountability Reports 2000-2008.

we can make significant gains in patent quality via hiring more examiners.

## 2. Improving Search Tools

Evaluating a patent application against the standards of patentability presents enormous information problems, requiring examiners to find the most relevant concepts in the prior art, and then evaluate whether the pending application is novel and nonobvious. Further, as technology in many areas becomes more and more integrated, the problem of finding the best possible prior art has become more and more difficult. Accordingly, a major effort has been made to improve searching technologies and processes. Part of this, of course, is the deployment of electronic search tools. In Japan, they go beyond implementing search tools to outsourcing the majority of searches to outside organizations, including a dedicated non-profit agency.<sup>51</sup>

## 3. Institutionalizing Patent Quality

As patent quality has risen in observers' and policymakers' consciousness, patent offices have begun to institutionalize patent quality efforts, forming internal offices which are tasked with assessing and disseminating information about patent quality. In the US, such an office has been in operation for several years; in Japan, this office was created in July 2008. Unfortunately, relatively little of these offices' work reveals substantial progress on patent quality. In the U.S., the quality management office reports that the rate of high-quality examination is around 95 percent (a number that may observers find either dubious, or useless as an actual metric of quality).<sup>52</sup>

## 4. Broadening Public Access to Prosecution

Traditionally, the patent prosecution process has been a secretive affair, between the applicant and the assigned examiner. Increasingly, however, more access to the prosecution process is being offered to the public. Most patent applications, even if pending, are published eighteen months after filing. New inter-parts reexamination proceedings allow third parties to be

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<sup>51</sup> JPO Annual Report 44-45 (2008). In FY 2007, 79.3% of prior art searches were outsourced at the JPO. There are eight "registered search organizations" on Japan, though one (a non-profit foundation) conducts the bulk of the searches.

<sup>52</sup> USPTO Performance and Accountability Report (2008).

involved in reexamination.<sup>53</sup> There have been moves to increase the ability of third parties to submit information to examiners during prosecution. And the USPTO has been engaged in a pilot test of the Community Patent Project, which seeks to engage interested outsiders in assisting examiners (especially with searches for prior art).<sup>54</sup>

## 5. Post Grant Review

Finally, serious proposals have been made to incorporate a form of post-grant review into the US patent system (similar systems are in place in Japan and Europe).<sup>55</sup> Post-grant review allows third parties to effectively extend the prosecution phase of a recently-granted patent, and is premised on the idea that marketplace actors will be best positioned to both determine which patents warrant further review, as well as be good sources of relevant information. In the US, the details surrounding a post-grant review system have been controversial, but the odds seem good that eventually the US will follow Japan and Europe in this direction.

### *B. Reforming the Prosecution Process*

A second set of (proposed) reforms is more squarely directed at the prosecution process itself. Proposals to outsource some or all of the prosecution process have been around for some time; I noted above that Japan has outsourced most searching functions for the past several years. Professors Lemley and Lichtman and Sampat have proposed that a system be established whereby patentees can choose to “gold-plate” their patents: that is, seek a more exacting form of validity analysis than would be typical today. Patents granted with heightened scrutiny would receive the benefit of a stronger presumption in favor of validity than the others, as well as exhibit an important signal about their

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<sup>53</sup> See 35 U.S.C. §§ 311-318 (2008). See also Stephen G. Kunin & Anton W. Fetting, *The Metamorphosis of Inter Partes Reexamination*, 19 *Berk. Tech. L. J.* 971 (2004).

<sup>54</sup> See, e.g., [www.peertopatent.org/](http://www.peertopatent.org/)

<sup>55</sup> See Patent Reform Act of 2007 (S.1145), §5. See also Biotech Industry Organization, *Fact Sheet: Oppose New Post-Grant Review System*, available at <http://www.bio.org/ip/domestic/> (visited Dec 22, 2008).

validity.<sup>56</sup> In a similar vein, Professors Abramowicz and Duffy have proposed allowing patentees to choose alternative patent prosecution venues, ending the PTO's monopoly over granting patent rights in the US.<sup>57</sup> In both cases, these academic proposals are aimed at harnessing patentees' private information about their inventions, as well as their sense of their ultimate value, to improve the prosecution process (and thus, the idea goes, patent quality).

C. *Going the Other Direction: Patent Registration*

Finally, a third category of proposed reform would effectively abandon the administrative effort to grant only valid patents, and move to a form of a registration system—wherein patentees file an application which is granted by the PTO after a relatively minimal level scrutiny. The strong form of this argument proposes that the scrutiny involves only a review of the formalities of the application (i.e., that all required components exist, are formatted properly, and so forth). A weaker version would implement a “soft look” system, whereby a relatively quick and cursory review of the application for basic validity requirements (is the disclosure clear and specific, for example). In either version, a registration (or ‘registration-lite’) system would rely on a combination of private ordering and litigation to sort out the valid from the invalid patents.<sup>58</sup> It would of course allow many more low quality patents; on the other hand, it would save the enormous cost of the PTO's examination apparatus.<sup>59</sup> And because relatively few patents have economic impact in any event, there would be perhaps only modest increases in litigation—and, over time, service organizations would emerge that would be able to provide assessments of patent quality.<sup>60</sup>

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<sup>56</sup> See Mark A. Lemley, Douglas Gary Lichtman, Bhaven N. Sampat, *What to do About Bad Patents*, 28:4 Regulation 10-13 (Winter 2005-2006).

<sup>57</sup> See Abramowicz & Duffy (draft manuscript in this volume).

<sup>58</sup> See generally, F. Scott Kieff, *The Case for Registering Patents and the Law and Economics of Present Patent-Obtaining Rules*, 45 B.C. L. Rev. 55 (2003).

<sup>59</sup> See *id.*

<sup>60</sup> See *id.*

D. *The Weaknesses of These Approaches*

Each of these three distinct approaches—improve the administrative organization, alter the prosecution process, and abandon the prosecution process—have significant value. Many of the ideas are uncontroversial: improving the measurement and analysis of patent quality is clearly a good thing (though very difficult in practice); improving search tools is obviously helpful; using an outsourcing approach for aspects of patent prosecution is likely to improve efficiency; and likewise, harnessing the private information of patent applicants should allow resources to be better allocated.

Given the findings of Section III above, however, I am skeptical that any of these proposals will make a substantial improvement in patent quality. (I set aside the patent registration approach for now, since that approach does not directly seek to improve patent quality.) This is for several reasons. First, improving the administrative organization (i.e., improving the performance and efficiency of the PTO) suffers from real problems of scale. As noted briefly above, merely keeping pace with increased filings will exact an enormous, and possibly unsustainable, drag on resources—without clear evidence at all that such expenditures will improve even pendency, much less patent quality. Similarly, I am skeptical that broadening public access (i.e., allowing additional third party submissions, or the Community Patent Project) will scale to anything near the size required to make a substantial contribution to patent quality, although these are each likely to be modestly helpful.

A second major problem is that none of these proposals has much likelihood of altering the basic incentive structure that support low quality patenting behavior. Gold-plating patents is a good idea, but to a not insubstantial degree patentees have already “voted with their feet,” on the choice between high and low quality patents, and have chosen low quality. Certainly it is possible that the benefits of a gold plated patent could be substantial, but as noted in Section III above, the benefits of a low quality patent are powerful incentives. Given the odds that a patent will actually be enforced, I doubt that a more robust presumption of validity will shift behavior, any more than a much higher likelihood of validity does under the current system. And as for the idea of selectable prosecution, my analysis certainly suggests that most patentees will likely choose a prosecution venue that offers speed and low cost at the expense of thoroughness. That is, to a substantial degree, patentees

already choose between higher cost, lower volume, higher quality patents, and lower cost, higher volume, and lower quality patents—so it seems quite unlikely that this proposal will change the fundamental analysis much at all.

The basic problem with viewing patent quality as an administrative issue is that, given the incentives, there is relatively little that the PTO (or any patent office) can do to change them. First, as long as the balance of interests tips in favor of high volume, low quality patenting behavior, we should expect to get those sorts of patents, irrespective of the administrative process used. Second, in a great many cases, the die is cast with respect to a patents' quality by the time of filing of the application: either the application has been drafted carefully and with a scope commensurate with the disclosed idea, or it hasn't. Either a robust prior art search was conducted, and the patent drafted with this knowledge, or it wasn't. To be sure, the PTO will (and is required to) conduct its own search, and make its own evaluation of the application—but the PTO is inherently under-informed, severely resource-constrained, and typically ignores important features of the application (such as defining the claims). There are real limits to how much quality the PTO can "add" to a filed application; it can reject claims or request revisions, but the power of language remains in the patentee's hands. In patent prosecution, it will often be a case of "garbage-in, garbage-out"; if the filed application is low quality, the chances are that any granted patent will be low quality as well.

Accordingly, the focus on the administrative aspects of patent quality is misguided—although unlikely to be harmful (and perhaps modestly helpful), such efforts are exceedingly unlikely to make any significant improvement in overall patent quality.

## V

### AN INCENTIVES-BASED APPROACH TO ADDRESSING PATENT QUALITY

Perhaps the most important finding reported in this paper is that the mechanisms that underlie patent quality—that is, the

incentives that encourage patentee to file too many patent applications with too little attention to quality—are both remarkably durable and exist prior to (and largely independent of) the prosecution process. Any truly effective responses, then, will have to both directly address the incentive structure, as well as be rather forceful in order to overcome the range of strong incentives that now operate on patentees.

The problem, of course, is that devising a strategy that seems likely to be effective in actually improving patent quality—that is, one that directly alters the incentives structure and is robust enough to change behavior—raises other concerns. Such schemes are likely to have their own costs, raising the question of where patent quality ranks on the scale of problems to be addresses. For example, as I note below, a straightforward way to incentivize higher patent quality is to makes patents much harder and more costly to obtain. But of course this has other significant effects, including a disincentive for inventors to obtain patents altogether. The key question, then, is whether there are relatively modest reforms that can be made—ones that address the incentives structure, but have relatively small spillover effects. In this light, what follows should be understood as more of a series of thought experiments about ways to change patenting behavior. I’ve divided the discussion into three categories, roughly corresponding to the major incentives effects I noted above.

A. *Encouraging Early Clarity*

As I noted in Section IIIA above, one of the major supporting structures supporting low quality patenting behavior is the advantage for patentees in deferring clarity of their patents as long as possible. Again, deferring clarity offers a number of important advantages, allowing patentees to minimize up-front risks, while preserving critical flexibility in patent scope over time.

There are a number of ways to more strongly encourage clearly written patent disclosures and claims, and prevent the “nose of wax” problem that plagues patent litigation. The key component in these responses is to minimize the differences between the two phases of patent validity analysis (prosecution and litigation): that is, if a patent’s meaning and scope were truly fixed at an early stage, then the advantages of deferring clarity would be reduced or eliminated.

One potentially fruitful area of experimentation would be to require the USPTO to conduct much more thorough claim construction analyses, perhaps even drafting an administrative opinion on claim scope, defining key terms according to public reference works. Professor Petherbridge has made the case for such a system in earlier work.<sup>61</sup> Note that this additional inquiry into claim scope may not much improve the patent office's ability to evaluate validity. But that is not the intent—at least in this context. The goal would be to, as much as possible, fix the meaning of patents at as early a stage as possible. In tandem with the increased attention paid by the USPTO would be a diminishment of the role of the courts in claim construction; ideally, the courts could largely defer to the administrative opinion on claim scope. In terms of the incentive structures discussed above, what this change would do is to shift the locus of detailed scope analysis earlier in time, thus diminishing both the ability for patentees to defer clarity, as well as the benefits of doing so.

Admittedly, the primary advantage of such a change is also its biggest weakness: shifting patent scope analysis earlier in time has important costs, and won't resolve all ambiguity surrounding a patent by any means. For the same reasons that deferring clarity is advantageous for the patents, shifting scope analysis earlier places significantly more risk on the patentee, requiring earlier decisions, made with less information about future technology, markets, and competitor behavior. On the one hand, this is the point—deferring clarity allows patentees to externalize these risks—but the net effect will be to make patents a less advantageous mechanism for protecting innovation. Further, it is entirely possible that even the more detailed analysis of the patent's scope by the USPTO won't actually resolve ambiguities: a dispute during later litigation might just be concerned with the interpretation of the administrative scope determination instead of the actual words of the claim. Both of these concerns are well-founded, I think. My own sense is that this reform would make a positive difference, but by no means would it resolve all problems.

Another approach to combat the incentive to defer clarity is to create disincentives for patentees to make significant alterations in claim scope during the prosecution process. As I have argued before, jurisprudential doctrines such as prosecution history

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<sup>61</sup> See Lee Petherbridge, *Positive Examination*, 46 *IDEA* 173 (2006).

estoppel—which eliminates or substantially limits the application of the doctrine of equivalents (and thus patent scope) when patentees amend their claims during prosecution—provides important incentives for patentees to draft clear, coherent, and appropriate claims.<sup>62</sup> By imposing a penalty when patent scope is altered, the law can incentivize early clarity.

The costs of this approach are similar to the proposal described above. First, and most simply, it imposes significant costs on patentees, and might undermine the basic incentives to seek patents. Second, penalizing amendments during prosecution will discourage such amendments, and amendments are in many cases desirable behavior in this context, since it makes patents more likely to comport with standards of patentability. Third, by discouraging patent applications from accepting the requests for amendments from patent examiners, it is likely to extend the time and cost of the prosecution phase, increase workload at the patent office, and the like. All of these criticisms are, again, valid points. The question is whether the costs of the proposal outstrip the advantages. My view is that in the longer term, as patentees adjust to a penalty regime, they will work harder to file applications that are high quality, needing fewer and fewer amendments. If true, then many of the costs will diminish over time. See *id.*

One additional problem with this proposal is that, unfortunately, the Supreme Court has limited the utility of the doctrine of prosecution history estoppel in this way, although the Federal Circuit has increasingly used closely related doctrines such as “prosecution disclaimer” to similar effect.

Reducing the presumption of validity is another way to address the incentive to defer clarity. That is, one of the reasons that patentees are encouraged to defer clarity is that the standards by which patents are evaluated for validity change over time—during litigation, the presumption of validity places the burden on a challenger to prove (with “clear and convincing” evidence) the invalidity of the patent. As I noted in Section III above, this means that patents that are granted even when they don’t meet the standards for validity have a greater chance to be found “not invalid” in later litigation, thus encouraging weak patenting behavior. If the presumption of validity were reduced

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<sup>62</sup> R. Polk Wagner, *Reconsidering Estoppel: Patent Administration & the Failure of Festo*, 151 U. Penn L. Rev. 159 (2002).

or eliminated, this benefit of deferring clarity would disappear. The downside, of course, that this change would weaken patents, and in some sense diminish the value of the USPTO's administrative processes. Further, given the several other benefits of deferring clarity, I am skeptical that this change itself would have much effect.

*B. Addressing Feedback (Portfolio) Effects*

The next major set of incentives I outlined in Section III above were feedback effects—the encouragement to seek more low quality patents because so many low quality patents already exist. That is, in prior work, I identified important advantages to obtaining large collections of patents (portfolios), even at the expense of patent quality.<sup>63</sup> And that others in the patent system are adopting a high-volume, low quality strategy further encourages that behavior: if patent portfolios are the way to maximize returns from the patent system, then we can expect that strategy to become more popular over time.<sup>64</sup>

Reforms to address the incentives to adopt a high-volume, low quality patenting strategy are difficult to craft. As I briefly noted above, one straightforward approach is to simply make patents significantly more costly (thus increasing the costs of a portfolio strategy).<sup>65</sup> Another approach, which Professor Parchomovosky and I briefly touched upon in our *Patent Portfolios* paper, is to directly limit the number of patents granted (or applications filed), perhaps by adopting a series of yearly quotas, or tradable rights to apply for patents.<sup>66</sup> Much like increasing the direct cash costs of patenting, this would have the effect of making a portfolio-driven strategy much more difficult to implement (if not impossible). As we concluded in *Patent Portfolios*, the options for effectively diminishing the incentives to

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<sup>63</sup> See generally Gideon Parchomovosky & R. Polk Wagner, *Patent Portfolios*, 154 U.Penn L. Rev. 1 (2005).

<sup>64</sup> See supra note \_\_\_ and accompanying text.

<sup>65</sup> See supra note \_\_\_ and accompanying text.

<sup>66</sup> See Parchomovosky & Wagner, supra note \_\_\_, at 67-68. Professors Parchomovosky and Ayres have also proposed a system of tradable patent rights, which would also, in theory, reduce the number of patents. Ian Ayres & Gideon Parchomovosky, 60 Stan. L. Rev. 863 (2007).

create patent portfolios are limited—and in some cases, the possibilities seem likely to be as harmful as the problem itself.<sup>67</sup>

C. *Addressing Administrative Incentives*

In Section III, I sketched a series of administrative incentives that, put together, serve to encourage poor patent quality. These include the rising filings that pressure the USPTO to issue patents quickly (so as to diminish backlog), as well as the inherent biases of specialized regulators and courts, which might tend to place the interests of repeat-players in the patent system over those of the public at large.

Several scholars have proposed ways to address the inherent administrative incentives, including rethinking the Federal Circuit as a specialized court,<sup>68</sup> and offering additional administrative power to the USPTO.<sup>69</sup> Because I do not think that the administrative incentives are the most important causal factor in low patent quality, I am skeptical that any of these would have much effect of relevance to this paper (though they might well have important impacts in other areas).

As for the rising filings, I noted above that it seems very unlikely that we can simply hire more examiners to address this long-term trend. Many of the same proposals I noted with respect to the portfolio incentives (increasing costs of getting patents, directly limiting numbers) would address this problem, though, again, with substantial costs of their own.<sup>70</sup>

As I noted at the outset of this section, my analysis has demonstrated that the mechanisms that support low patent quality are widespread and powerful, in many ways, inherent in the modern patent system. It should come as little surprise, then, that I am doubtful that any one reform is likely to make much a change in patenting behavior. Certainly, there are more radical

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<sup>67</sup> See Parchomovosky & Wagner, *supra* note \_\_ at 66-74 (exploding policy options).

<sup>68</sup> See Craig Allen Nard & John F. Duffy, Rethinking Patent Law's Uniformity Principle, 101 *NWU L. Rev.* 1619 (2007).

<sup>69</sup> Stuart Benjamin & Arti K. Rai, Who's Afraid of the APA? What the Patent System Can Learn from Administrative Law, 95 *Geo. L.J.* 269 (2007).

<sup>70</sup> See *supra* note \_\_ and accompanying text.

approaches – we could limit patenting to 100,000 filings per year, for example, and raise direct costs ten-fold – that would plainly have some impact. But they would also have serious (and probably negative) effects on the basic incentive structure of the patent system, effect large enough to probably swamp any losses from low quality patents. Under these circumstances, the best option seems to be to try to muddle through, using relatively modest reforms to try to adjust some of the incentives that lead to poor patent quality, while recognizing the limits of what can be accomplished. In particular, I think the proposals to address the incentives to defer clarity (fixing patent scope early) are the directly targeted, and seem likely to have the best likelihood of success without serious side effects.<sup>71</sup>

#### CONCLUSION

There is perhaps no patent issue with a higher profile than the question of patent quality – or one with more widespread agreement that patent quality should be improved. Yet little attention is paid to carefully teasing out the mechanisms that have led us to the point where there is near-universal agreement about the problem of poor patent quality.

This analysis above has attempted to begin to fill this gap, explaining that the problem of low patent quality is not one of poor administrative performance on the part of the USPTO and its colleagues worldwide, but rather one of incentives. That is, the reason we have low patent quality is because the incentives to file low quality patents are too high, and the incentives to file high quality patents are too low. That is, patent quality is low primarily because of decisions made by patentees, choosing a to trade volume for quality in patenting, or seeking to maximize return from their patents, or simply seeking to save costs. By outlining the various incentive structures at work, a much more complete picture of the problem of low patent quality comes into focus.

Unfortunately, the picture that emerges suggests rather strongly that patent quality is far from an easy problem to fix – and that in many cases, the cures may be worse. In particular, we

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<sup>71</sup> See supra note \_\_ and accompanying text.

should not expect reforms that focus on enhancing the quality of the patent prosecution process to bear much fruit: patent quality is a matter in the hand of patentees, and as long as the incentives operate to encourage low quality, we should not expect anything different, no matter how much more effective the USPTO becomes. And, although I suggest that some rather modest reforms might serve to alter patenting behavior, ultimately, I conclude that there is no easy answer, no simple fix. But at least if we understand the problem fully—here, the mechanisms that underlie low quality patents—we can both begin to address it, and, more importantly, avoid making changes that will only make matters worse.

