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THE WAITING IS THE HARDEST PART: DOES LONGER PATENT PENDENCY MEAN MORE VALUABLE PATENTS?

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**THE WAITING IS THE HARDEST PART: DOES
LONGER PATENT PENDENCY MEAN MORE
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Michael P. Ellenberger



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Notes

The Waiting Is the Hardest Part: DOES LONGER PATENT PENDENCY MEAN MORE VALUABLE PATENTS?

*Michael P. Ellenberger**

ABSTRACT—The United States Patent and Trademark Office (USPTO) is one of the busiest—and slowest—patent offices in the world. The average utility patent is pending for 25.3 months before issuance. For parties that require legal protections in fast-moving technological fields, such as mobile technology startup, the waiting could be detrimental. Moreover, the patent backlog problems worldwide cost the global economy over \$10 billion per year. Even under such a delay, an increasing number of issued patents are threatened or invalidated in the U.S. court system.

Undoubtedly, then, if patents are considered to have “quality” only if they are both (a) valid and (b) litigation-proof, the USPTO is failing. If, however, instead the consideration is broadened as to what it means for a patent to be “high quality”—using the four “patent worth considerations” of market, signal, impact, and reputational value—then the situation looks far from disastrous. This note proposes to examine the time-value dynamic of a patent and evaluate whether, in consideration of a variety of metrics, long-pending patents are more valuable. In short, are patents worth the wait? This note concludes with proposals for a more efficient Patent Office through examination of existing functional policies both internal to the USPTO and abroad.

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INTRODUCTION

The United States Patent and Trademark Office (USPTO) is one of the busiest patent offices in the world, fielding approximately 500,000 newly-filed utility applications annually, and receiving more certified mail per day than any other single entity.¹ At such a volume, the time from application filing to issuance is long. Owing to a myriad of factors, the average pendency period in the United States is 25.3 months and can be as long as twenty-eight months for “Networks, Multiplexing, Cable, and Security,” a burgeoning and crowded art space.²

Patent pendency is frustrating for the impatient but potentially lethal for the startup.³ A recent report from the UK Intellectual Property Office estimated that the “combined losses from each year of backlog in the U.S. Patent and Trademark Office, Japan Patent Office, and the European Patent

¹ Iain M. Cockburn et al., *Are All Patent Examiners Equal? Examiners, Patent Characteristics, and Litigation Outcomes*, in PATENTS IN THE KNOWLEDGE-BASED ECONOMY 19, 23 (Wesley M. Cohen and Stephen A. Merrill eds., 2003) (“The USPTO is one of the earliest and among the most visible agencies of the federal government, receiving more certified mail per day than any other single organization in the world.”); Michael D. Frakes & Melissa F. Wasserman, *Is the Time Allocated to Review Patent Applications Inducing Examiners to Grant Invalid Patents?: Evidence from Micro-Level Application Data*, 99 REV. ECON. STAT. 550, 552 (2016) (“Each year between 300,000 and 500,000 patent applications are filed at the Patent Office.”).

² U.S. PATENT AND TRADEMARK OFFICE, PERFORMANCE AND ACCOUNTABILITY REPORT, FISCAL YEAR 2016, at 180 (2016), <https://www.uspto.gov/sites/default/files/documents/USPTOFY16PAR.pdf> [<https://perma.cc/M6RA-3HA2>] [hereinafter PERFORMANCE & ACCOUNTABILITY REPORT].

³ MARK SCHULTZ & KEVIN MADIGAN, THE LONG WAIT FOR INNOVATION: THE GLOBAL PATENT PENDENCY PROBLEM 3 (2016).

Office [combined] costs the global economy over \$10 billion a year.”⁴ While the pendency brings the costs of lost revenue, it does not necessarily impact the quality of the applications across four classifications: market value, signal, impact, and reputational considerations.

Compared with the bifurcated search and examination stages before the European Patent Office (EPO), the USPTO consolidates the two steps into one, increasing complexity and stress on examiners in their limited allotted time and incorporating additional sources of error.⁵ Research suggests that the time allotted to each examiner per patent, absent the already inherent intellectual rigor of the position, induces examiners to grant invalid patents already “on the margin.”⁶ Coupled with a backlog of a half million patents still awaiting examination, the incentives for an examiner to rush through an application and render a quick, rather than quality, decision is all too high.⁷

Moreover, the view that disclosure-for-monopoly rights is the driving force for patent law in the United States is a faulty “simple view” of intellectual property rights, and one wherein “inventors should be loath to disclose any more information than necessary to obtain patent protection.”⁸ Mere patent protection provides insufficient incentive for a complete disclosure: such an arrangement is too weak to drive the engine of patent law. There *must* be more.

Undoubtedly, if patents are considered to have “quality” only if they are both (a) valid and (b) litigation-proof, then the USPTO is failing. Patents are continually challenged, overruled, or invalidated before district courts, the Patent Trials and Appeal Board (PTAB), the Federal Circuit, and the Supreme Court. If instead the consideration is broadened as to what it means for a patent to be “high quality”—if the introduction of patent signaling, reputation, or minor, readily implementable tweaks to the Patent Office are allowed to hold worth—then the situation looks far from disastrous.

Part I of this note will look at the Patent Office’s function and the factors that feed into pendency: application backlog, examiner incentives, and rate of application. Part II will investigate the value-quality-worth dynamics of patents, and how pendency, while depriving applicants of raw financial gain, may not inhibit a patent’s value. In doing so, Part II will further develop a new multifaceted model for patent value. Finally, Part III will consider

⁴ *Id.*

⁵ Colleen V. Chien & Jay P. Kesan, *Comparing Patent Quality at the USPTO and EPO*, LAW360 (Nov. 29, 2016), <https://www.law360.com/articles/863111/comparing-patent-quality-at-the-uspto-and-epo> [https://perma.cc/5BGL-YL55] (reflecting a joint presentation on the subject available within the article).

⁶ Frakes & Wasserman, *supra* note 1, at 552.

⁷ *Id.*

⁸ Clarisa Long, *Patent Signals*, 69 U. CHI. L. REV. 625, 626 (2002).

potential improvements to the patent system in the United States, improvements that will decrease patent pendency without harming patent value when considering the new paradigm proposed in Part II.

I. PATENT OFFICE FUNCTION

A. Pendency

The lack of expedited service at the USPTO is largely due to the substantial number of patents previously filed but not yet examined, a backlog further exacerbated by the uptick in filings in the 21st century.⁹ The USPTO handled 629,647 applications in 2015—including utility (589,410), design (39,097), and plant (1,140) patent applications.¹⁰ 325,979 patents were granted.¹¹ According to the Patent Office’s 2016 Performance and Accountability Report (PAR), patent applications on average received a first action within 16.2 months of filing and remained in the Patent Office 25.3 months.¹² While the total pendency measure is within the USPTO fiscal year 2016 target, the time to first action—the period it takes an examiner to determine faults or deficiencies in the filed application—is slower than the USPTO’s published target of 14.8 months.¹³

That’s not to say change hasn’t come. At the start of the Obama Administration in 2009, the USPTO backlog of unexamined patent applications was about 750,000.¹⁴ Driven by USPTO protocol and an increased awareness of such slog, backlog was cut by over 200,000 in the 2016 fiscal year, a 28% decrease in spite of an annual increase in filings of almost 4%.¹⁵ Along with shortening the backlog, the USPTO has continually chipped away at pendency, cutting the figure from 25.9 months in January 2009 to 16.2 months in September 2016.¹⁶ All of this, says the USPTO, “means that deserving patented technology can reach consumers at home and around the world sooner than they would have in the past, further driving innovation and economic growth.”¹⁷

⁹ *U.S. Patent Statistics Chart: Calendar Years 1963 - 2015*, U.S. PATENT AND TRADEMARK OFFICE (June 15, 2016), http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.htm [<https://perma.cc/B38E-R367>] [hereinafter *U.S. Patent Statistics Chart*].

¹⁰ *Id.*

¹¹ *Id.*

¹² PERFORMANCE & ACCOUNTABILITY REPORT, *supra* note 2, at 37.

¹³ *Id.* at 23–24.

¹⁴ *Id.* at 3.

¹⁵ *Id.*; *U.S. Patent Statistics Chart*, *supra* note 9.

¹⁶ PERFORMANCE & ACCOUNTABILITY REPORT, *supra* note 2, at 3.

¹⁷ *Id.*

B. International Patent Office Comparisons

The pendency period before the USPTO is on par with its four peer offices in other countries, collectively comprising the five largest patent offices (IP5): USPTO, Japanese Patent Office, Korea Patent Office, Chinese Patent Office, and European Patent Office (EPO).¹⁸ In its 2016 Annual Report, the EPO disclosed that:

For examination, the objective is to progressively reduce the total time for an examination procedure, from receipt of a request for examination to the announcement of the intention to grant a patent under Rule 71(3) EPC, to 12 months on average by 2020. As a first step, median examination pendency has been reduced to 23.3 months.¹⁹

Pendency is coming down across the globe. The other countries in the IP5 have similar or longer waits (2.8 years in Korea, 2.9 in China, 5.3 in Japan), but none of the IP5 countries are within striking distance of the one year goal of the EPO.²⁰ By global standards, however, the offices of the IP5 comprise five of the seven fastest global offices to decision—a far cry from the ten and 10.1 years of pendency in Thailand and Brazil, respectively.²¹

And, while the EPO is quicker to issuance than the USPTO, much of the disparity is covered in the EPO's production of a search report, which advises potential applicants on the patentability and the technological landscape of their application. The search report takes time to produce, certainly, but heads off many potential fruitless prosecutions.²² Thus, when the EPO patent prosecution timeline is adjusted to account for the lapse between publication of the search report and subsequent examination, "EPO pendency is actually very similar, at least with respect to recent patents, to the USPTO pendency."²³

The published search report may be an effective tool for the United States to counter long pendency. Before the EPO, the publication discourages investors who have potentially invalid or insignificant inventions from filing applications frivolously and demanding an examiner's

¹⁸ IP5, U.S. PATENT AND TRADEMARK OFFICE, <https://www.uspto.gov/patents-getting-started/international-protection/office-policy-and-international-affairs-ip5> [https://perma.cc/SDF6-HJ6A].

¹⁹ EUR. PATENT OFFICE, EPO QUALITY REPORT 2016, at 24 (2016), available at [http://documents.epo.org/projects/babylon/eponet.nsf/0/D4D30CF45FD00F51C125814C003C4B0D/\\$FILE/epo_quality_report_2016_en.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/D4D30CF45FD00F51C125814C003C4B0D/$FILE/epo_quality_report_2016_en.pdf) [https://perma.cc/K6BX-CTSD].

²⁰ SCHULTZ & MADIGAN, *supra* note 3, at 1.

²¹ *Id.*

²² L. Petrucci & J. Beatty, *Fast and Sure: Options to Quicker Processing Before the EPO*, EPI INFORMATION, <http://information.patentepi.com/4-16/fast-and-sure-options-to-quicker-processing-before-the-epo/> [https://perma.cc/XDR5-S7FE]; see *infra* Part III.C.

²³ Chien & Kesan, *supra* note 5.

time that could go towards examining a more valid patent.²⁴ And despite the pendency time coming down compared to a decade ago, studies by the National Bureau of Economic Research found that “the pressure to make decisions too quickly may be one reason the patent office grants ‘bad’ patents—approving weak applications that never should’ve been granted in the first place—that allow patent trolls to thrive.”²⁵

The differences don’t end there. Indeed, the rate of opposition at the EPO is “more than thirty times higher” than the rate of reexamination domestically.²⁶ Before the EPO, judicial challenges lead to revocations of the patent or restriction of the patent right in roughly 35% and 33% of the cases, respectively.²⁷ In the U.S., “re-examination results in a cancellation of the patent right in only 10 percent of all cases.”²⁸ Since the passage of the America Invents Act, patent pendency and patent rules have changed considerably in both jurisdictions, and the U.S. reexamination procedure has been significantly amended. Still, the idea that stronger patents result from more rigorous (and lengthier) prosecution assignments is still not well-defined.

C. *The Cost of Delay*

Patents are hardly the only way innovators can protect their investments, but they are one of the most prevalent. As will be explored, patent pendency hurts innovators but may have further ramifications to non-inventive society. As patent backlogs continue to linger at major worldwide patent offices, the stress of pending applications may force an examiner’s hand into issuing suboptimal patents, which further reverberates throughout the patent world. As such, pendency can reciprocally harm patent offices in reputation and revenue.

The USPTO is aware that delays create significant costs to innovators seeking protection. The result? A limiting of the number of hours an examiner spends per patent in order to expedite the process.²⁹ As such, the average patent gets about nineteen hours before an examiner in total, between researching prior art, drafting rejections and responses, and

²⁴ *Id.*

²⁵ Brian Fung, *Inside the Stressed-Out, Time-Crunched Patent Examiner Workforce*, WASH. POST (July 31, 2014), <https://www.washingtonpost.com/news/the-switch/wp/2014/07/31/inside-the-stressed-out-time-crunched-patent-examiner-workforce/> [<https://perma.cc/Z5SH-7N45>].

²⁶ Stuart J. H. Graham et al., *Patent Quality Control: A Comparison of U.S. Patent Re-examinations and European Patent Oppositions*, in *PATENTS IN THE KNOWLEDGE-BASED ECONOMY* 74, 75 (Wesley M. Cohen & Stephen A. Merrill eds., 2003).

²⁷ *Id.*

²⁸ *Id.* at 75-76.

²⁹ Fung, *supra* note 25.

interfacing with prosecuting attorneys.³⁰ Plainly, this allotment is insufficient. Frakes and Wasserman, in their investigation into whether time pressures placed on examiners force the issuance of bad patents, determined that “as an examiner is given less time to review an application, the less active she becomes in searching for prior art, the less likely she becomes to make obviousness rejections (which are especially time-intensive exercises), and the more likely she becomes to grant the patent.”³¹ Regardless of the quality of the material before them, examiners under time crunches will both increase obviousness rejections for the sake of time, or simply move for issuance, even if there are claimed elements that may not fit validity requirements.

Delays hurt innovators in a number of ways. A study by Joan Farre-Mensa et al. found that for each year a startup’s application is delayed before the patent body, the startup’s employment and sales growth are reduced by 21% and 28% respectively over the five years following the eventual approval.³² Resultantly, long delays at the patent office can disincentivize a company from innovating or patenting its technologies, stunting not only its individual progress but also the nation’s technological progress. As Mark Schultz and Kevin Madigan postulate, the patent office functions somewhat as a promise to the inventors it serves, a signpost by which a prospective inventor can buoy itself.³³ But “if the patent system is to support local innovation, then the patent system needs to serve entrepreneurs with speed and efficiency.”³⁴

Substantial academic effort has been put into understanding the examiner-patent relationship and the timescale-based promotion mechanism that plagues examiners. For example, examiners with a certain level of experience necessarily move to higher General Schedule (GS) pay scales.³⁵ This promotion allows fewer hours per patent, which in turn *increases* the likelihood of patent granting.³⁶ More provocatively, if all examiners were allowed as many hours per patent as an entry level (GS-7) examiner, the

³⁰ Frakes & Wasserman, *supra* note 1, at 553.

³¹ *Id.*

³² Joan Farre-Mensa et al., *The Bright Side of Patents* 3 (USPTO Econ. Working Paper No. 2015-5 Dec. 15, 2015), <http://ssrn.com/abstract=2729060> [<https://perma.cc/CV3A-RJ8N>].

³³ SCHULTZ & MADIGAN, *supra* note 3, at 19 (“Patent pendency statistics are a strong indicator of how serious a country is about supporting its own entrepreneurs.”).

³⁴ *Id.*

³⁵ Gene Quinn, *Perspective of an Anonymous Patent Examiner*, IP WATCHDOG (Mar. 16, 2009), <http://www.ipwatchdog.com/2009/03/16/perspective-of-an-anonymous-patent-examiner/id=2190/> [<https://perma.cc/43BS-HJ58>].

³⁶ *Id.*; Frakes & Wasserman, *supra* note 1, at 555.

USPTO's overall grant rate would fall 20%.³⁷ Examiner tenure at the Patent Office and examiner grant rates are directly related, despite more experienced examiners receiving the same or more technically proficient applications, suggesting an independent variable unrelated to application quality may have staggering effects on patentability.³⁸

Financially, however, the backlog has far greater impact on the financial viability of the patent-seeking entity. In avoidance of entities losing significant portions of their terms to prosecution pendency, the Patent Term Adjustment (PTA) statute, 35 U.S.C. § 154(b)(2)(C), allows for Type A and Type B delay awards when, for example, the USPTO takes more than four months after the Request for Continued Examination (RCE) is filed to act on the application.³⁹ However, § 154(b)(2)(C) further provides for a deduction from any PTA award "equal to the period of time during which the applicant failed to engage in reasonable efforts to conclude prosecution of the application."⁴⁰ Thus, the tension between applicant failure and USPTO delay must be weighed such that applicants are not disgorge of patent exclusivity due to backlog.

The costs of patents are substantial. Inventors pay for filing, cede their disclosure to the public, and wait years for issuance. What, exactly, do they get in return?

II. MEASURING PATENT QUALITY

The USPTO invests significant resources (nearly \$2.8 *billion* in 2016) to further its published "Goal I" of "optimizing patent quality and timeliness."⁴¹ While the constitutionally codified goal of the patent system is to "promote the Progress of Science and useful Arts,"⁴² the USPTO has distilled that broad heading into three aspects to further that objective: "(1) examining all of the patent applications prior to issuing patents, (2) issuing only high quality, valid patents, and (3) treating all inventors and technologies equally."⁴³ Specifically, the USPTO instituted the Patent Examiner Technical Training Program "aimed at encouraging innovation and strengthening the quality and accessibility of the patent system."⁴⁴ Patent

³⁷ Frakes & Wasserman, *supra* note 1, at 560.

³⁸ Mark A. Lemley & Bhaven Sampat, *Examiner Characteristics and Patent Office Outcomes*, 94 REV. ECON. STAT. 817, 826 (2012).

³⁹ 35 U.S.C. § 154(b)(1)(A) (2015).

⁴⁰ *See id.* § 154(b)(2)(C); Reduction of Period of Adjustment of Patent Term, 37 C.F.R. § 1.704(c).

⁴¹ PERFORMANCE & ACCOUNTABILITY REPORT, *supra* note 2, at 121.

⁴² U.S. CONST. art. I, § 8, cl. 8.

⁴³ Lily J. Ackerman, *Prioritization: Addressing the Patent Application Backlog at the United States Patent and Trademark Office*, 26 BERKELEY TECH. L.J. 67, 68 (2011).

⁴⁴ PERFORMANCE & ACCOUNTABILITY REPORT, *supra* note 2, at 174.

quality indisputably means something different to the agency than to an applicant, and perhaps to an individual inventor than to a larger entity.

The valuation of a patent is necessarily multifaceted, such that if the private value of a patent allows incorporation of variables beyond those considered in the simple view of disclosure and exclusivity, “then we need to reconsider the simple view’s implication that legal rules tend to under-reward invention because appropriability is imperfect.”⁴⁵ The enumeration of patent quality must necessarily be considered through the market value, signal, reputational, and impact considerations to be complete.

A. The Market Value Consideration

Patent worth may well be modeled by the economic value connoted by those patent-sanctioned exclusivities. In considering the landscape of patented products, economists consider the raw worth of patented products comprising the “brokered patent market” to be a fluctuating landscape in which “the only constant appears to be change.”⁴⁶ In 2016, the value of the brokered patent market was \$165 million and the entire market \$11 billion, both of which change considerably year-over-year.⁴⁷ That \$11 billion of intellectual property is spread across more than 3,500 packages, comprising over 86,000 assets.⁴⁸ Through assignment data, experts estimate that \$2.3 billion of that market has sold, a number that likely underestimates the total sales as not all assignments are recorded.⁴⁹ Intellectual property, brokered or otherwise, changes hands constantly in the United States and to significant financial effect.

More specifically, the average asking price per asset by technology group includes \$235,000 for software and \$193,000 for communications, with a market average of \$197,320 per asset.⁵⁰ For U.S.-issued assets, that market average was \$271,440.⁵¹ These sales figures also lend some validity, outside market value, to protecting patents through litigation. Of the collections of IP assets sold on the market (comprising a package), 10.2% have at least one U.S. patent litigated after the listing date.⁵² “[O]n a per-U.S. patent basis, about 1.2% of U.S. patents presented are litigated.”⁵³ Thus,

⁴⁵ Long, *supra* note 8, at 635.

⁴⁶ Kent Richardson et. al., *Inside the 2016 Brokered Patent Market*, IAM, Jan./Feb. 2017, at 34.

⁴⁷ *Id.*

⁴⁸ *Id.* at 34–35.

⁴⁹ *Id.*

⁵⁰ *Id.* at 36.

⁵¹ *Id.*

⁵² *Id.* at 44.

⁵³ *Id.*

patents have considerable monetary worth, here termed the “value consideration,” which can be degraded by insufficient examination and by pendency at the examining office.

Implicit are two points: the quality of patents issued by the USPTO necessarily is imperfect (that is, the fact that claims are litigated, even if many are found to be valid, means the USPTO is frequently issuing invalid patents), and the cost of those litigations must be considered in the value, and thus quality, of the patent grant.

To the first point, litigation before the PTAB suggests that patents issued are far from perfect, with some patentability challenges showing greater than 50% reversal rates, including Section 102 and 112 rejections.⁵⁴ If there exists a certain amount of necessary time for prosecuting a patent and any means undercutting that time will compromise patent quality regarding its judicial validity, then judicial workload will necessarily increase with any decrease in pendency below the quality-pendency threshold marker.

Specifically, challenges for § 112(a) issues (deficient written description, enablement) have an overall 52% chance of reversal considering both PTAB and appellate decisions; § 112(b) (indefiniteness) has a 48% chance; § 102 (novelty), 57% for at least one claim and 49% across all claims; and § 103 (obviousness), 43% on one claim and 34% across all claims.⁵⁵ PTAB and Federal Circuit reversals are, in theory, direct notations of USPTO quality failures—decisions in which a judicial entity overrules the Patent Office in determining the validity of a previously issued patent.⁵⁶

Here the patent-value-matrix widens as additional considerations exist in litigation-validity outcomes: while pharmaceutical and medical patents are more likely than not to be upheld, the majority of computer and communication-based technology patents are overturned.⁵⁷ Additionally, “the age of a patent seems to be an important predictor of validity—pre-1990 approvals are much more likely to be upheld by the U.S. Court of Appeals for the Federal Circuit (‘CAFC’) than post-1990 approvals.”⁵⁸ Patents are frequently and expensively litigated; improper examination and issuance of invalid claims can significantly diminish their value consideration.

⁵⁴ *Update on ex parte PTAB Appeals Reversal Rates: High Reversal Rates Maintained Except for 101 – Nonstatutory Rejections*, ANTICIPAT BLOG (Aug. 23, 2017), <https://blog.anticipat.com/2017/08/23/update-on-ex-parte-ptab-appeals-reversal-rates-high-reversal-rates-maintained-except-for-101-nonstatutory-rejections/> [https://perma.cc/3S8L-ZNTW].

⁵⁵ *Id.*

⁵⁶ Roberto Mazzoleni & Richard R. Nelson, *Economic Theories About the Benefits and Costs of Patents*, 32 J. ECON. ISSUES 1031, 1042–43 (1998).

⁵⁷ Cockburn et al., *supra* note 1, at 45–46.

⁵⁸ *Id.* at 46.

B. *The Signal Consideration*

To more fully understand the worth of patents in the United States, the scope must be further broadened. Scholars argue that patents retain value from their ability to act as signals: Clarisa Long of Columbia Law School rejects the “simple view” of intellectual property rights, and instead looks at patents as signals.⁵⁹ Specifically, she writes:

[Patent portfolios] can indicate what lines of research the firm is undertaking and what the firm does and doesn't consider valuable, outline a research trajectory that adumbrates fields the firm may be branching into next, disclose how fast the firm is proceeding within a particular area of research, and reveal other valuable dynamic information.⁶⁰

This view incorporates a bird's-eye view of the patentscape, wherein the value of intellectual property is determined not only by what it can fetch on the open market but by what the IP means for the process of innovation and creation in the same space.

Signals further serve to supplement the value lost from any financial delays. Because patents are published at eighteen months from filing, regardless of validity, an entire facet of the patent's worth is necessarily staged such that the Patent Office delay is irrelevant: the signal will occur at publication, regardless of when the patent issues. Thus, if patents are valued not only for their economic worth but also for their signaling ability, the two-year slog to issuance is, at least partially, mitigated.

Beyond the signaling value of the application itself, patents can act as signals for the firm at large. To that end, “[if] patents are correlated with less readily observable firm characteristics,” they can serve as a signal of firm quality.⁶¹ Put alternately, the quality of the patent is independent of the pendency before the USPTO when taken broadly to incorporate the patent's function as an indicium of what the firm is doing and where its research and development processes lie. Specifically, a patent may “reduce the cost of communicating private information to the market regarding the financial prospects of the firm,” potentially increasing the patent's signatory value.⁶² Under signal theory, then, the USPTO may increase patent worth simply by decreasing the requisite time to publication or allowing further signal capacities outside of the examination.

To only value a patent's disclosure is to fail to see the entire picture. That is, if the “value of a patent is composed of additional variables that the

⁵⁹ Long, *supra* note 8, at 635, 646-48.

⁶⁰ *Id.* at 648.

⁶¹ *Id.* at 637.

⁶² *Id.*

simple view does not consider, then it may be rational to seek patent rights even when the expected cost of the rights is greater than the expected but-for rents.”⁶³ It is thus likely that there exists a variable that is *unaffected* by the pendency before the PTO, and dictated solely by the patent’s ability to signal the publication requirement. For some applications, this signaling value to the patentee may manifest as “extra capital [the applicant] is able to raise in capital markets because of the information conveyed by the patent.”⁶⁴

Still, additional patent-economic theories support the approach that disclosure, and not the issued patent grant, is the marker of quality—and thus, the time lag before the Patent Office hardly detracts from value.⁶⁵ Under disclosure theory, patents are not presumed necessary to spur innovation.⁶⁶ Rather, inventors will solve the problems that arise from the non-rivalrous, non-excludable nature of ideas by maintaining secrecy over their inventions.⁶⁷ That is, applicants are not incentivized by patents to invest their resources into new innovations, but once these innovations occur they are incentivized to disclose.

If signal theory is allowed to stand beside the monetary value of a patent, the quality and worth of the application becomes far more complex and inclusive. In some ways, the pendency before the Patent Office is negated by the mandatory publication date at eighteen months.⁶⁸ That is, “[i]f inventors might gain from publicizing information in a patent, then they may choose to seek patent protection, even if the anticipated value of the exclusive rights received in return were zero.”⁶⁹ Undoubtedly, if pendency dissuades inventors from filing patent applications, then the value and quality decreases.⁷⁰ But the Patent Office has a long history of accepting more filings than the year before.⁷¹ While the backlog remains, and time to issuance stays over the two-year hurdle, the mandatory publication date may salvage significant worth from the application.

C. *The Impact Value*

Beyond the monetary and signaling values of a patent, there are inherent qualities in an application that factor into the patent’s overall worth. An

⁶³ *Id.* at 641.

⁶⁴ *Id.* at 642.

⁶⁵ Mazzoleni & Nelson, *supra* note 56, at 1033.

⁶⁶ *Id.* at 1038.

⁶⁷ *Id.*

⁶⁸ Long, *supra* note 8, at 635.

⁶⁹ *Id.*

⁷⁰ See Mazzoleni & Nelson, *supra* note 56, at 1035.

⁷¹ See *U.S. Patent Statistics Chart*, *supra* note 9.

Intellectual Asset Management and Santa Clara study led by Chien and Kesan investigated the differences in perceived quality metrics between the USPTO and the EPO.⁷² The EPO ranked above its U.S. counterpart in consistency, predictability, search, evaluation of obviousness, consideration of Non-Patent Literature, evaluation of specification, and adequate time.⁷³ Meanwhile, the USPTO ranked ahead of the EPO in customer service, cost, and timeliness.⁷⁴

A major outcome of this—and a detriment to the quality of patents—is the variability in the scope of claims allowed. A common metric in patent quality—and one most readily quantifiable—is the number of citations it receives in other patent applications.⁷⁵ Here too, human error resides. Functionally, “examiners who tend to allow broader claims will impinge on a greater number of follow-on inventions and therefore receive more citations over time.”⁷⁶ Thus frequent markers of quality are dependent on the skill and prosecution style of the particular examiner (that is, “prior research has emphasized the degree to which the number of citations received by a patent is an indicator of its underlying inventive significance”).⁷⁷ Inventions bringing paradigm shifts and often those with scarce prior art are most heavily cited. But, as Iain Cockburn admits, “[c]itations may also reflect the quality or scope of the disclosure accompanying the claims.”⁷⁸

Like the reputational value, the impact value of a patent is directly related to the pendency period and thus hampered by an inefficient Patent Office. Most notably, patents are driven by citation metrics, such that a well-cited patent is considered to be a stronger (and more valuable) one. Such strength is reduced proportionally when a patent has less time to garner citations. The effects are undoubtedly alleviated by the publication at eighteen months (as with signaling), but in the absence of an issued patent, the impact value is tempered by pendency.

D. The Reputational Value

Of course, any patent office has a vested interest in insuring issuance of high-quality patents; both its reputation, and the stability of the patent market

⁷² Chien & Kesan, *supra* note 5.

⁷³ Joff Wild, *New Survey Explores Perceived Quality Gaps Between the USPTO and EPO, and Identifies User Priorities*, IAM (Sept. 6, 2016), <https://www.iam-media.com/patents/new-survey-explores-perceived-quality-gaps-between-uspto-and-epo-and-identifies-user> [https://perma.cc/5LVW-BEPK].

⁷⁴ *Id.*

⁷⁵ *See, e.g.*, Cockburn et al., *supra* note 1, at 22.

⁷⁶ *Id.*

⁷⁷ *Id.*

⁷⁸ *Id.* at 45.

are theoretically at stake.⁷⁹ Specifically, when firms file and receive patent rights there exists some expectation that the grant confers exclusivity to the patentee. As described by Long, “issuance of a patent stands for the proposition that the PTO has reviewed the information contained in a patent and declared that it describes something new, useful, and nonobvious.”⁸⁰ The USPTO has strong reputational pressure to continue to issue sound, valid, and reasonably litigation-proof patents to propagate the patent system in the United States.

Reputational value is outfitted in the interplay between USPTO examiners and the patents they issue. The possibility exists that “USPTO patent examination procedures *do* allow for significant differences across examiners in the nature and scope of patent rights that are granted,” a finding that “points to an important role for litigation and judicial review in checking the impact of discretion and specialization in the patent examination process.”⁸¹ Given the variability of issuance before the USPTO, there are “as many patent offices as there are patent examiners,” further prompting the question of whether the significant pendency period is due to more thorough investigation or simply slow examiner action.⁸² Thus, a significant determinant of issuance—and thus a determinant of the quality of patents outputted by the USPTO—is dependent on the individual examiner. If patent worth is significantly variable depending on the examiner in the current state, the USPTO must move for conformity to ease judicial burden, but also to preserve their reputation as distributors of constitutionally-protected material.

Finally, reputational value comes to investors simply in the form of a “patent pending” moniker applicable to their invention. Functioning as something separate from the patent as a signal, the patent pending denomination is cosmetic and may serve notice to competitors that the investor’s product is, at least potentially, novel and patentable.⁸³

The reputational considerations—the most relevant metrics for the Patent Office considered in this study, and the most directly tied to USPTO performance—are directly tied to pendency. That is, the reputational value of a patent is stronger when the Patent Office is more efficient and more correct—inclusive of both pendency and validity (i.e. strength) of patents

⁷⁹ See Long, *supra* note 8, at 667.

⁸⁰ *Id.*

⁸¹ Cockburn et al., *supra* note 1, at 22 (emphasis added).

⁸² *Id.* at 21.

⁸³ *How Do Valuers Look at “Patent Pending?”*, INTELLECTUAL PROP. NEWS (Mar. 23, 2011), <https://www.bvresources.com/blogs/intellectual-property-news/2011/03/23/how-do-valuators-look-at-patent-pending> [<https://perma.cc/86MW-24TC>].

issued. That said, reputational values are the least substantial in the overall worth of a patent. The monetary, signaling, and impact considerations add more to a patent's net value, and the pendency effects here—while existent—are not substantial.

These four considerations—market, signal, impact, and reputational value—are all derived from the quality of a patent. But not all four are harmed by the pendency before the USPTO and, in the case of signaling, may actually benefit from it.

Patent Worth Consideration	Direct Authority	Relative Harm by Pendency [Rank]
Market Value	Inventor-Applicant	1
Signal	Market-at-Large	4
Impact	Investor-Applicant; Market-at-Large	3
Reputational	Institution (USPTO)	2

III. MODULATING QUALITY BEYOND PENDENCY

An obvious, if imperfect, initiate to decrease the lengthy wait at the USPTO is to hire and train more examiners so that each examiner has a decreased workload, less top-down pressures, and the opportunity to give each application a more thorough investigation.⁸⁴ But even increasing the staff of examiners could prove to be a stopgap solution if the number of applications filed annually continues to rise.⁸⁵

Thus, if the pendency issue is considered an insurmountable one—if the backlog of patents and quality variance of examiners suggests that the pendency will never be significantly decreased to make up for the signal-disclosure paradox set forth above—perhaps patent quality can be modulated in other ways. Facilitation of an expedited patent prosecution process can be modulated in three ways: reduced cost, the (already implemented) Patent Prosecution Highway, and the publication of a search report. Each may slash at the pendency before the USPTO, but a published search report, similar to what is found in the EPO, would allow examiners to focus their time more specifically on the search component before delving into the validity (i.e. examination) component of the patent.⁸⁶ This would allow examiners more time to understand complicated art units and determine relevant prior art in

⁸⁴ See Fung, *supra* note 25.

⁸⁵ *U.S. Patent Statistics Chart*, *supra* note 9.

⁸⁶ Cockburn et al., *supra* note 1, at 6-7.

a detached setting from the validity at hand, enabling prosecution with higher fidelity.

A. Cost

One means to diminish pendency is cost. The financial barrier to entry before the EPO is higher than that before the USPTO, and EPO pendency is shorter. Specifically, the EPO requires a search fee of €1,300 (about \$1,500) with examination and designation fees added to sum to just under €3,000.⁸⁷ Additionally, the EPO requires renewal fees post-issuance of €470 beginning in the third year of the term.⁸⁸ At the USPTO, the application fee is a comparable \$1,600, but the combined application and issue fee is just \$2,560 with renewal fees due at 3.5 years post-issuance.⁸⁹ That's not to belittle the total expense; indeed, a conservative estimate is that applicants spent about \$7.5 billion pursuing patents in 2012—dwarfing the approximately \$1.4 billion the USPTO spent examining applications the same year.⁹⁰

“Pricing out” frivolous applications by increasing the filing and examining cost could have the unwanted effect of dissuading junior and smaller inventors from filing due to economic constraints.⁹¹ Fortunately, the USPTO already incentivizes smaller inventors through decreased pricing structures, including 50% and 75% fee reductions, depending on the size and income of the filing inventor or entity.⁹² A sliding-scale pricing model, in which application fees are adjusted based upon technology group, novelty (by number of citations) and inventor-size, may facilitate a protocol by which the USPTO can price-out frivolous applications without deterring serious applicants.

There are additional, extensive considerations in the cost-prosecution matrix that may indeed filter filed claims such that applicants are already motivated to file only claims at a certain threshold validity. Such an explanation, as put forth by Stephen Yelderman at Harvard Law School, may

⁸⁷ Chien & Kesan, *supra* note 5.

⁸⁸ *Id.*

⁸⁹ *Id.*

⁹⁰ Stephen Yelderman, *Improving Patent Quality with Applicant Incentives*, 28 HARV. J.L. & TECH., 78, 79 (2014) (citing U.S. PATENT AND TRADEMARK OFFICE, PERFORMANCE AND ACCOUNTABILITY REPORT, FISCAL YEAR 2013, at 80–81 (2013), available at <https://www.uspto.gov/sites/default/files/documents/USPTOFY2013PAR.pdf> [<https://perma.cc/YK38-PMPE>]).

⁹¹ See *How Much Does A Patent Cost?*, RICHARDS PATENT L., <https://www.richardspatentlaw.com/faq/how-much-does-a-patent-cost/> [<https://perma.cc/WEU7-T6F7>].

⁹² *New Fees and Micro Entity Status Take Effect March 19*, U.S. PATENT AND TRADEMARK OFFICE: INVENTORS'EYE (Feb. 2013), <https://www.uspto.gov/custom-page/inventors-eye-advice> [<https://perma.cc/ZC6C-SZF9>].

counter the idea that cost could have a determinative effect on pendency.⁹³ That is, if claims are already filtered *ex ante* based on their relative validity in terms of their cost, then upping the costs to file or prosecute at the USPTO would seemingly “knock out” only preselected, valid claims.⁹⁴ Yelderman writes that:

Although applicants have the option of filing a theoretically unlimited number of claims, not every conceivable claim is necessarily worth filing. . . . Given these incremental expenses, applicants will rationally seek to avoid filing claims that have an expected value that is less than the expected marginal cost to obtain them.⁹⁵

There is, then, a floor beneath which claim value is insufficient to justify filing.⁹⁶ While raising this floor could, in Yelderman’s considerations, decrease the number of filings—and resultantly the pendency period—it would likely decrease the quantity of *good* patents and run counter to USPTO prerogative.⁹⁷

B. Patent Prosecution Highway

A second measure taken by the USPTO to decrease pendency is the institution of the Patent Prosecution Highway (PPH), a joint program with other major patent offices worldwide that was founded on the theory that a valid patent in one jurisdiction should have an accelerated track to issuance in another.⁹⁸ The PPH provides a means to facilitate expedited prosecution in a partnering country given allowance in another.⁹⁹ Resultantly, PPH applications before the USPTO were issued in 84% of cases, compared to

⁹³ See generally Yelderman, *supra* note 90 (positing an alternative approach to low-quality patents by looking at patent quality from an applicant’s perspective and evaluating how certain patent rules might be encouraging inventors to file higher or lower quality claims).

⁹⁴ See *id.* (proposing that improving patent quality may be a function of increasing the costs to file an application while reducing the benefits of low-quality claims such that applicants are discouraged from filing frivolous claim sets).

⁹⁵ *Id.* at 92.

⁹⁶ *Id.* at 113–14 (“[T]he cost of filing a claim can serve as an important backstop that may screen against some of the lowest-value claims. . . . Without some cost constraint, there would be no reason to avoid filing extremely broad or extremely narrow claims, since there is always a chance that one of those claims might turn out to be valuable.”).

⁹⁷ *Id.* at 93.

⁹⁸ U.S. Patent and Trademark Office, *Patent Prosecution Highway (PPH) - Fast Track Examination of Applications* (Feb. 21, 2018, 8:54 PM), <https://www.uspto.gov/patents-getting-started/international-protection/patent-prosecution-highway-pph-fast-track> [<https://perma.cc/BX5E-U4R4>]

⁹⁹ *Id.*

53% for non-PPH applications.¹⁰⁰ While accelerated prosecution does not include a legal presumption of validity, it does allow an officer of the later examining office to reuse search and examination materials to more quickly and efficiently pursue the application.¹⁰¹

Here, the pendency versus quality dichotomy could not be more apparent; because PPH applications have already been examined by a foreign patent office, they may arrive before the USPTO with claims significantly narrower than an unexamined application sent directly. While this narrower scope increases the probability of patentability, it also means that unclaimed material may be “left on the table,” inaccessible to a PPH applicant. Additionally, and in spite of a PPH application being placed on a USPTO examiner’s “special” docket, examination times can vary markedly based on the number of other matters on the docket. Thus, though prosecution times under the PPH are generally faster, they are likely due to prosecution beginning earlier, not the simplified process provided by an already-examined application.¹⁰²

While the PPH allows for marginal increases in speed before the USPTO, the same is not true for PPH applications submitted to the EPO.¹⁰³ That is, “anecdotal evidence suggests that PPH applications at the EPO actually have lower rates of allowance and longer pendencies than the average.”¹⁰⁴ Of course, the nature of slower and less-patentable subject matter moving from the USPTO to the EPO is not directly due to examiner-examiner comparisons; rather, the EPO mandates its own substantive search and examination procedures be applied to incoming PPH applications “irrespective of the application’s prosecution and granting in another country.”¹⁰⁵

And while the EPO currently provides no data on PPH applications other than the number of applications filed, there is no available data available suggesting that PPH applications at the EPO show any substantive improvement in speed or outcome, hampering the feasibility of major improvements to the USPTO from PPH expansion.¹⁰⁶

¹⁰⁰ Gene Quinn, *PPH at the USPTO: Following the Patent Prosecution Highway for a Smooth Ride*, IP WATCHDOG (Dec. 26, 2016), <https://www.ipwatchdog.com/2016/12/26/pph-uspto-patent-prosecution-highway/id=76004/> [<https://perma.cc/JWZ2-G67B>].

¹⁰¹ U.S. Patent and Trademark Office, *supra* note 98.

¹⁰² Martin D. Hayden et. al, *IP5 PPH Pilot Program*, FINNEGAN: INTELLECTUAL PROPERTY TODAY, <https://www.finnegan.com/en/insights/ip5-pph-pilot-program.html?news=18e8dcb7-884f-4d63-ae30-12f3ecaecff8> [<https://perma.cc/HA5B-UWZP>].

¹⁰³ *Id.*

¹⁰⁴ *Id.*

¹⁰⁵ *Id.*

¹⁰⁶ *Id.*

C. Search Report

A potential implementation to deter low-quality patents (and thus reduce the backlog of patents awaiting prosecution) would be implementation of a search report similar to what is requisite in the European Patent Office. Publication of a search report would likely increase the withdrawal rate from the USPTO and place it more on par with the EPO where withdrawals rather than rejections make up the majority of all non-granted European patent applications.¹⁰⁷ Implementation of such a commitment step for inventors would create a sufficient barrier to entry to decrease frivolous (or simply nonviable) applications from being filed.

A search report would allow examiners to focus their time more specifically on the search component before delving into the validity component, again mirroring what happens at the EPO.¹⁰⁸ Studies have found that two-thirds of USPTO examiners believe they have somewhat less or much less time than needed to complete a thorough prior art search—something they were allowed under former Director David Kappos.¹⁰⁹

It is unclear that requisite search reports and bifurcating the search and examination proceedings would significantly decrease the PTO workload in the absence of other structural changes. Considering the newly-filed application-to-examiner ratio at the EPO is roughly half that of the USPTO (37.85 (160,000 applications:4227 examiners) compared to the USPTO's 73.62 (600,000:8150)), the USPTO would need more drastic measures than simple search report publication to cut pendency by a significant margin.¹¹⁰

A combination of the three options, if implemented today—a reduced cost, an option to ride the Patent Prosecution Highway, and the publication of a search report—may streamline the USPTO sufficiently to make significant progress on decreasing pendency. But in a climate where big changes are scarce—and budgetary concerns dictate policy—even the implementation of a published prior art search report before an examiner conducts the application's validity examination would constitute significant inroads towards a more efficient patent system in the United States.

IV. CONCLUSION

Part I of this paper looked at the patent office function and the factors that feed into pendency—from application backlog, improver examiner incentives, and an influx of applications. Part II considered the value-quality-

¹⁰⁷ Chien & Kesan, *supra* note 5.

¹⁰⁸ *Id.*

¹⁰⁹ *Id.*

¹¹⁰ *Id.*

worth dynamics of a patent and how pendency—while depriving applicants of raw financial gain—may not inhibit a patent from being valuable. Part III sought potential improvements to the patent system in the United States.

If patents are considered to have “quality” only if they are (a) valid and (b) litigation-proof, then the USPTO is not doing its job. But instead, if the quality-value-worth matrix is widened via the introduction of patent signaling, reputation, or minor, readily implementable tweaks to the Patent Office, patents have value beyond any monetary considerations and the pendency consideration is not a significant detriment to filing.