

**The Patent Uncertainty Problem: Can the Judiciary Effectively Curb the Cost
of Indefinite Claims?**

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1. Introduction

In 1853, Justice Campbell wrote “fullness, clearness, exactness, preciseness, and particularity, in the description of the invention, its principle, and of the matter claimed to be invented, will alone fulfill the demands of Congress or the wants of the country.”¹ Justice Campbell’s words were particularly prescient and still ring true over 150 years later in a time of renewed focus on patent definiteness and uncertainty.² The demand for clear patent boundaries is set forth in the Patent Act, which requires the patent “conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor...regards as the invention.”³ The patent system, while capable of producing great societal benefits, can also hamper technological progress and free competition when competitors, inventors, the public-at-large, and the judicial system cannot reasonably ascertain patent claim boundaries.⁴ When patent claims are unpredictable or unclear they provide poor notice to the public with

¹ *Winans v. Denmeand*, 56 U.S. 330, 347 (1853) (Campbell, J., dissenting).; *See also* Brief of Peter S. Menell as Amicus Curiae Supporting Neither Party at 27, *Nautilus, Inc. v. Biosig Instruments, Inc.*, (134 U.S. 2120) (2013) (No. 13-369) (quoting from Justice Campbell’s dissent).

² Council of Economic Advisers, Exec. Office of the President, *The Patent Litigation Landscape: Recent Research and Developments*, at 2 (Mar. 2016) (noting several important changes in the recent patent landscape due to executive and judicial actions, such as high-profile Supreme Court patent decisions and the implementation of new post-grant procedures established by the 2011 Leahy-Smith America Invents Act).

³ 35 U.S.C. §112(b) (2011).

⁴ Brief of Peter S. Menell as Amicus Curiae Supporting Neither Party at 27, *Nautilus, Inc. v. Biosig Instruments, Inc.*, (134 U.S. 2120) (2013) (No. 13-369); *See also* John R. Allison & Lisa L. Ouellette, *How Courts Adjudicate Patent Definiteness and Disclosure*, 65 *Duke L.J.* 609, 616-17 (2016) (describing the patent bargain as requiring patent holders, in return for exclusive patent rights, to teach others how to create the invention and clearly notify the public of the exact contours of the property interest by writing claims that specify the invention with particularity and distinctness).

respect to the boundaries of the patented invention. The problem of poor notice is often amplified by the unforeseeable nature of claim interpretation in the courts.

In an economically efficient marketplace, firms should compete vigorously by approaching the intangible property lines carved out by patents.⁵ In reality, the innovation sector is awash with patents of uncertain scope, substantially raising the costs of competing, hampering cumulative innovation, and clogging the courts with needlessly complex litigation.⁶ The optimal condition for intellectual property rights requires a balance between the static monopolization cost of exclusion and the dynamic benefit from encouraging innovation.⁷ The Supreme Court acknowledged this tension in the 2014 *Nautilus v. Biosig* decision stating the §112 definiteness requirement “entails a delicate balance between the inherent limitation of language to describe an invention; and the need to provide those skilled in the art with clear notice of the invention’s scope.”⁸ On the one hand, patent owners have incentives to write claims with ambiguous scope.⁹ The economic significance of a patent depends in part on its scope, the broader the scope the larger the number of competing products and processes that will infringe the patent.¹⁰ On the

⁵ Peter S. Menell & Michael J. Meurer, *Notice Failure and Notice Externalities*, 5 J. Legal Analysis, 1, 12 (2013) (analogizing innovation rights to those of a land owner’s right to plant crops up to a neighbor’s property line).

⁶ Brief of Peter S. Menell as Amicus Curiae Supporting Neither Party at 3, *Nautilus, Inc. v. Biosig Instruments, Inc.*, (134 U.S. 2120) (2013) (No. 13-369); *see also* Menell & Meurer, *supra* note 5, at 4 (identifying patent neighbors and ascertaining patent boundaries add substantially to the costs and risks of technological resource development); Allison & Ouellette, *supra* note 4, at 611 (Jan. 2016) (stating patents cannot serve as efficient property rights with uncertain boundaries).

⁷ Keith N. Hylton, *Patent Uncertainty: Toward a Framework with Applications*, 96 B.U. L. Rev. 1117, 1120 (2016) (emphasizing intellectual property rights are justified only where the costs of exclusion and related costs are outweighed by the benefits of additional creation or discovery and benefits of better management, promotion, and allocation of the property).

⁸ *Nautilus v. Biosig Instruments, Inc.*, 134 S.Ct. 2120, 2128 (2014).

⁹ Deepa Varadarajan, *Of Fences and Definite Patent Boundaries*, 18 Vand. J. Ent. & Tech. L. 563, 581 (Spring 2016) (finding compelling evidence that patentees purposely inject avoidable ambiguity into the claims in hopes of gaining broader coverage for their invention which may be exploited through litigation in the future).

¹⁰ Robert P. Merges & Richard R. Nelson, *On The Complex Economics of Patent Scope*, 90 Colum. L. Rev. 839 (1990).

other hand, indefinite claim language subjects investors and inventors to unavoidable risk of disputes and litigation.

Claim language is interpreted using two different standards, depending on the institution partaking in the claim construction. The Patent Office, both during prosecution and post-grant review proceedings, interprets claim language with the “broadest reasonable interpretation.”¹¹ This broad standard is justified because there is open communication between the patent applicant/holder and the Patent Office with the opportunity for amendment to the claim language. In the courts, claim language is given its “plain and ordinary meaning...to one skilled in the art.”¹² While this standard is stricter and the patent holder is afforded no opportunity to amend, patents in court proceedings are given a presumption of validity.

Patent litigation has increased dramatically within the past decade, much of it driven by uncertain patent scope.¹³ Patent litigation and patent uncertainty both carry heavy economic burdens, thus bringing the issue of patent scope to the forefront in recent years.¹⁴ In several recent decisions, the Supreme Court and the Federal Circuit have directly addressed the claim construction process during patent litigation.¹⁵ In this paper I examine what, if any, influence these court decisions had on the cost of claim indefiniteness. I use time to completion of claim construction at trial as a proxy for cost of patent scope uncertainty, since the claim construction

¹¹ See *Cuozzo Speed Technologies v. Lee*, 136 S.Ct 2131, 2142 (2014) (holding the Patent Office has legal authority to issue its broadest reasonable construction regulation with respect to inter partes review); 37 C.F.R. §1.75(d)(1) (2009) (stating the Patent Office determines the scope of patent application claims by giving claims their broadest reasonable construction in light of the specification as it would be interpreted by one of ordinary skill in the art); 37 C.F.R. §42.100 (2016) (establishing that an unexpired claim in an inter partes review trial shall be given its broadest reasonable construction in light of the specification).

¹² *Phillips v. AWH Corp.*, 415 F. 3d 1303, 1314 (Fed. Cir. 2005) (en banc) (establishing that claims must be given their “ordinary meaning...as understood by a person of skill in the art” during claim construction).

¹³ Hylton, *supra* note 7, at 7 (noting the uncertainty of ascertaining patent scope as a basis for patent litigation).

¹⁴ Varadarajan, *supra* note 9, at 590 (noting the Supreme Court’s decision to “wade into the claim uncertainty conversation” in *Nautilus* underscores the perceived magnitude of the patent boundary problem).

¹⁵ See section 5.B of this paper, below, for a detailed discussion of the relevant case law.

process directly addresses questions of indefinite claims and, in turn, patent claim indefiniteness and claim construction drive much of patent litigation. I hypothesize that court decisions that clearly establish the rules and protocols for claim construction should be associated with a decrease in the time for claim construction and a concomitant decrease in the cost of patent uncertainty.

I tested the hypothesis by using three major court decisions to establish four unique test periods and compared the median time to complete claim construction across each period.¹⁶ I found there was essentially no change in time to claim construction completion across the four time periods. Potential reasons for this finding may include the patent selection problem, i.e., very few patents are litigated and the ones that are litigated are the most unclear or uncertain, and a lack of change in practice due to the Federal Circuit's interpretation of key Supreme Court decisions.

Given the apparent lack of meaningful change as a result of new indefiniteness jurisprudence, I turned my focus to the impact of a new post-patent grant procedure for challenging validity at the Patent Office. In 2012, the Patent Office instituted the Inter Partes Review (IPR). IPRs offer a third party the opportunity to challenge a granted patent's validity in front of the Patent Trial and Appeal Board (PTAB). If an IPR is instituted, the PTAB construes the language of the challenged claims and holds a trial to determine the claim's validity. A final written decision is required within 12 months of the IPR's institution and discovery during the trial is limited. Congress's goal in establishing IPRs was to provide a quick and inexpensive alternative to district court litigation.

¹⁶ The three cases I use are *Phillips v. AWH Corp.*, *Nautilus v. Biosig*, and *Teva Pharmaceuticals v. Sandoz Inc.*, These cases and the study methodology are discussed in detail, below.

I hypothesize that the availability of the IPR as an alternative, seemingly favorable, way to challenge a patent's validity would siphon off cases from the district court. This should lower the time to completion of claim construction for cases remaining in court. I tested this hypothesis by using two time periods, the four years before IPRs were available and the four years after the implementation of IPRs, and again compared the median length of time to claim construction completion at the district court. I found a decrease of four and a half months to claim construction completion in the four years following implementation of IPRs. This suggests that the Patent Office, rather than the judiciary, may be the more appropriate institutional actor to address issues of patent indefiniteness and that such a change would decrease the cost of indefiniteness to the innovation process and to society as a whole.

2. The Economics of Indefiniteness

In a requirement known as claim definiteness, §112(b) of the Patent Act requires patentees to “particularly point out and distinctly claim[[ing]]” the subject matter of the invention.¹⁷ Claim definiteness is crucial because patent claims serve as the boundaries of patent rights.¹⁸ The claim language, rather than what the inventor has actually built, delineates the scope of the patentee's right to prevent others from making, using, selling or importing a patented technology.¹⁹ Patent claims thus shape the reach of a patent owner with respect to bringing infringement actions.²⁰ A patent's claims serve to put the public, and most importantly future innovators, on notice of what a patent owner claims right to as their invention.

¹⁷ See 35 U.S.C. §112(b) (2012) (requiring that a patent “conclude with one or more claims particularly pointing out and distinctly claiming...the invention”).

¹⁸ Varadarajan, *supra* note 9, at 568-9 (describing modern patent law's focus on ‘peripheral claiming’, whereby patentees mark the outer bounds of their inventions by ‘listing necessary and sufficient characteristics’).

¹⁹ *Id.* at 568.

²⁰ *Id.*

Claim definiteness, and other patent disclosure requirements, reflect the uneasy nature of the patent bargain by attempting to balance the interests of the originators with those of future innovators.²¹ However, as Menell and Meurer bluntly state in their 2013 paper, patent law’s “nearly schizophrenic commitment” to broad access and diffusion of information as well as strong rights to exclude has created issues and complications in patent law.²² As discussed below, these complications have serious ramifications on the innovation landscape and economy.

There is an inherent difficulty in determining patent boundaries and providing sufficient boundary notice.²³ Much of this stems from the fact that patents are intangible property rights.²⁴ Issues common to intangible resources with respect to notice include identifying potentially conflicting rights, ascertaining the boundaries of these rights, locating the owners of potentially conflicting rights, and assessing the scope of the potentially conflicting rights.²⁵ Tangible resources, such as land, avoid this problem by having reliable and inexpensive means for determining boundaries, governing rules which are relatively clear, and institutions which enable developers to resolve disputes prior to making large expenditures.²⁶ One of the biggest challenges regarding notice of patent boundaries is that neither the Patent Office, the courts, nor interested parties can conclusively and definitively settle the scope of claims prior to a dispute.²⁷

Menell and Meurer set forth three major categories of factors that contribute to notice externalities for intellectual property rights – inherent resource characteristics; institutions; and

²¹ *Id.* at 567 (noting the juxtaposition between giving an invention patent protection and the disclosure requirements meant to apprise the relevant public about the boundaries of the invention and how to replicate it).

²² Menell & Meurer, *supra* note 5, at 27.

²³ *Id.* at 2 (noting the far greater notice challenges when the resources in question are intangible due to amorphous nature of intangible boundaries and non-rivalrous nature of intangible goods).

²⁴ *Id.* at 15 (setting forth the difficulty developers of intangible resources face when trying to assess potentially conflicting rights).

²⁵ *Id.*

²⁶ *Id.*

²⁷ *Id.* at 18 (highlighting the challenge innovators face in gaining predevelopment clearance of any identified potentially conflicting rights apart from negotiating a license).

the complexity and dynamism of property rights.²⁸ In applying these characteristics to patents, some of the driving factors of indefiniteness stem from the difficulties of using language to define the boundaries of technological inventions; the nature of patent claim boundaries as multi-dimensional and complex, making cataloging them in advance difficult; the statutorily granted right that patentees may serve as their own lexicographers, thus increasing the difficulty of codifying boundaries uniformly across technologies; and the changing uses of inventions over time, making it hard to foresee the boundaries of a patent at the time the invention was made or application filed.²⁹ The Patent Office itself contributes to some uncertainty concerns due to the slow speed and questionable quality of patent examination, and the practice of delaying publication of patent applications 18 months after the filing date.³⁰

Acting as a disincentive to drafting definite patent claims, private parties do not internalize the positive externalities they bestow on others by providing clearly defined boundaries of their intellectual property rights.³¹ Information establishing patent boundaries, such as claim scope and ownership, is a public good that is jointly produced by private and public action. Quality and quantity of notice information will be suboptimal in many circumstances due to the fact that private actors cannot fully appropriate the value of providing notice information.³²

More significantly, patent applicants have little incentive to clearly define their patent rights because patent holders can benefit from strategically hiding, obfuscating, and distorting

²⁸ *Id.* at 18-9 (establishing three principal dimensions for comparing tangible and intangible property rights - inherent resource characteristics; effectiveness of institutions for recording, verifying, clearing, and insuring against property claims; and the complexity and dynamism of rights associated with the resource).

²⁹ *Id.* at 20-1.

³⁰ *Id.* at 22 (describing the PTO's contribution to patent uncertainty including a high rate of invalid patent grants and little effort to ensuring clarity and scope of claims).

³¹ *Id.* at 6 (noting private parties tend to underprovide public goods because they do not appropriate the full value of their investments).

³² *Id.* at 5.

claim boundary information.³³ A good deal of evidence suggests that patentees deliberately inject ambiguity into claims in the hopes of broadly enforcing their claims later against future competitors.³⁴ By seeking broad and vague functional claims, the patentee maximizes the likelihood that the patent can be stretched to reach unforeseen competing technologies during the patent life.³⁵ This hampers follow on innovation by inappropriately expanding patent coverage beyond the true scope of an invention.³⁶ The patentee, who is responsible for disclosing the scope of the claim, has incentives that differ from those of the public.³⁷

It is difficult to predict how courts will interpret patent claims in advance of litigation.³⁸ Vague claims allow patent holders to mold their property rights to fit a future product of a currently unknown potential infringer or to avoid invalidation if previously undiscovered prior art comes to light.³⁹ By artfully crafting claims in an unclear manner, the patent holder can increase their chance of going unnoticed as potential infringers survey the landscape prior to undertaking a new R&D project.⁴⁰ This benefits patent holders because they have much greater

³³ *Id.*

³⁴ Varadarajan, *supra* note 9, at 587 (finding many avoidable ambiguities in claim language, such as terms of degree and subjective terms, are the result of deliberate choice by the patentee in hopes of broad enforcement following patent issuance).

³⁵ Menell & Meurer, *supra* note 5, at 33; *See also* Brief of Peter S. Menell as Amicus Curiae Supporting Neither Party at 3, *Nautilus, Inc. v. Biosig Instruments, Inc.*, (134 S.Ct. 2120) (2013) (No. 13-369) (noting patentees can gain greater flexibility in targeting new ventures as well as an element of surprise in later asserting their rights by obfuscating the scope of patent claims).

³⁶ Menell & Meurer, *supra* note 5, at 11 (presenting case studies where the resource developer knew of a conflicting property owner, but due to ambiguous scope of the claims failed to properly innovate around the other's right).

³⁷ *Id.* at 6.

³⁸ Varadarajan, *supra* note 9, at 568 (noting subsequent innovators face a challenge when attempting to invent around existing patents due to notoriously uncertain patent scope and lack of an ability to predict how claims will be interpreted in a court).

³⁹ Brief of Peter S. Menell as Amicus Curiae Supporting Neither Party at 11, *Nautilus, Inc. v. Biosig Instruments, Inc.*, (134 S.Ct. 2120) (2013) (No. 13-369); *see also* Menell & Meurer, *supra* note 5, at 14 (noting a patent applicant gains from the flexibility of vague claims improving the likelihood that a competitor falls within the scope of the claimed invention).

⁴⁰ Menell & Meurer, *supra* note 5, at 14.

bargaining power if the potential infringer has already sunk substantial resources into a project or product before the patent holder attempts to assert rights.⁴¹

3. The Effect of Patent Uncertainty

Claim scope uncertainty deters efficient investment in innovation in a number of problematic ways.⁴² Uncertain patent scope substantially raises the costs of competing in a given industry.⁴³ In some industries, such as software, notice costs are so high that innovators often choose to ignore competitors' patents at the outset in favor of dealing with licensing and litigation issues that may arise down the road.⁴⁴ Even patents that are not licensed or litigated can impose significant social costs as innovators and businesses seek to determine their "freedom to operate."⁴⁵ As a new project is developed, the notice costs tend to rise because the return on enforcement of property rights tend to grow with value of the potentially infringing technology.⁴⁶

Additionally, inefficient notice regimes risk hampering cumulative innovation and generating wasteful litigation.⁴⁷ Notice failure impedes early bargaining because potential counterparties often cannot find each other until after a dispute arises.⁴⁸ Inventors might be

⁴¹ *Id.* at 9 (finding patent holders are often in a stronger position by obscuring patent boundaries until after a potential infringer has dedicated resources to the infringing technology).

⁴² See Varadarajan, *supra* note 9, at 573 (noting the unpredictability of claim scope means that the interested public cannot predict whether their action invade another's patent rights, therefore deterring investment); See also Menell & Meurer, *supra* note 5 at 9-10 (describing four types of costs imposed on resource developers by inadequate resource notice – determining owners of potentially conflicting property; costs of ascertaining boundaries of those properties; costs of assessing the scope of those property rights; and dispute resolution costs).

⁴³ Brief of Peter S. Menell as Amicus Curiae Supporting Neither Party at 3, *Nautilus, Inc. v. Biosig Instruments, Inc.*, (134 S.Ct. 2120) (2013) (No. 13-369) (including increased cost of competing as a cost of patents of uncertain scope).

⁴⁴ See Menell & Meurer, *supra* note 5, at 33.

⁴⁵ Brief of Peter S. Menell as Amicus Curiae Supporting Neither Party at 7, *Nautilus, Inc. v. Biosig Instruments, Inc.*, (134 S.Ct. 2120) (2013) (No. 13-369).

⁴⁶ Menell & Meurer, *supra* note 5 at 10.

⁴⁷ *Id.*; see also Brief of Peter S. Menell as Amicus Curiae Supporting Neither Party at 3, *Nautilus, Inc. v. Biosig Instruments, Inc.*, (134 S.Ct. 2120) (2013) (No. 13-369) (including hampering cumulative innovation and clogging courts with needless litigation as a costs of patents of uncertain scope).

⁴⁸ Menell & Meurer, *supra* note 5, at 13 (pointing out that notice failure prevents negotiation between two parties in advance of new technological development).

discouraged by having to deal with unknown and unknowable claimants after great effort and resources have been expended into a new project.⁴⁹ Economic waste is generated, to the extent that ex ante negotiations might have resolved encumbrance risks at the front-end rather than through greater litigation costs after the fact.⁵⁰ Unclear patent boundaries and the advantages they provide to litigious patent holders have created a vicious cycle whereby enterprises hoard patents for both defensive and offensive purposes, sowing the seeds for future opportunism.⁵¹ There is little question that overall social welfare can be improved by reducing the uncertainty of patent right boundaries.⁵²

4. The Economics of Patent Litigation

Unclear patent scope drives much of patent litigation by expanding patent holders' rights through fuzzy property boundaries and adding complexity to litigation through patent validity challenges and complicated claim construction hearings. The overall number of patent litigation cases has approximately quadrupled over the past three decades.⁵³ Patent litigation as a whole is costly to society.⁵⁴ While the direct cost of patent litigation to the litigating parties is substantial⁵⁵, indirect business costs of patent litigation likely far exceed direct costs.⁵⁶ Indirect

⁴⁹ *Id.* at 39 (noting reluctance of financiers and developers to invest in new innovations due to notice externalities).

⁵⁰ *Id.*

⁵¹ *Id.* at 52.

⁵² *Id.* at 39.

⁵³ Council of Economic Advisers, Exec. Office of the President, *The Patent Litigation Landscape: Recent Research and Developments*, at 2 (Mar. 2016).

⁵⁴ James E. Bessen & Michael J. Meurer, *The Private Costs of Patent Litigation 2* (B.U. Sch. L., Working Paper No. 07-08), http://ssrn.com/abstract_id=983736 (finding a large expected joint loss incurred by parties to patent litigation using event study methodology to analyze patent lawsuit filing).

⁵⁵ AIPLA, *Report of the Economic Survey 2015*, 37 (2015) (finding 2015 median total litigation cost for patent infringement suit, based on a single IP asset to be \$600,000 when less than \$1 million is at risk; \$2 million when \$1 million to \$10 million is at risk; \$3.1 million when between \$10 million and \$25 million is at risk; and \$5 million when there is more than \$25 million at risk).

⁵⁶ Bessen & Meurer, *supra* note 54, at 2 (noting the many forms of indirect business costs of patent litigation such as disruption to businesses as managers and researchers spend their time producing documents, testifying in depositions, strategizing with lawyers, and appearing in court).

business costs include disruption to business activities, strained relationships between the two parties jeopardizing cooperative development of the patented technology, and increased credit costs to financially weaker firms due to risk of bankruptcy created by the pending litigation.⁵⁷

Alleged infringers face additional associated costs with patent litigation suits as customers may stop buying a product with or without preliminary injunctions.⁵⁸ Bessen and Meurer found in their 2012 study that alleged infringers lose about half a percentage point of their stock market value upon being sued for patent infringement, the value of which greatly outweighs average legal fees.⁵⁹ Importantly, they found the losses to alleged infringers do not correspond to a transfer of wealth to patent holders, but rather there is a substantial joint loss of wealth.⁶⁰ Thus, society has an incentive to reduce patent litigation, both in terms of the number of cases filed and the cost of each litigated case, in order to minimize the net loss of wealth.

The expected costs of patent litigation drive inappropriate settlements and may weaken overall incentives for research and development. The risk of inadvertent infringement acts like a “tax” on innovation, with the cost of defending against inadvertent infringement creating a disincentive to invest in innovation.⁶¹ Patent holders may use litigation opportunistically – if the cost of litigation is higher than the cost of settling, alleged infringers may choose to settle regardless of the merits of the case.⁶² The possibility of obtaining a settlement, without challenge to the merits of a case, in turn increases the expected value of frivolous litigation and

⁵⁷ *Id.*

⁵⁸ *Id.*

⁵⁹ *Id.* at 4 (finding alleged infringers lose about half a percentage point of stock market value, corresponding to a mean cost of \$28.7 million in 1992, much larger than mean legal fees of approximately half a million dollars).

⁶⁰ *Id.* at 26.

⁶¹ Bessen & Meurer, *supra* note 54, at 3 (fearing that the “tax” of unavoidable infringement on innovation investment has increased due to a dramatic increase in the hazard of patent litigation for publicly traded firms during the 1990s).

⁶² Council of Economic Advisers, Exec. Office of the President, *The Patent Litigation Landscape: Recent Research and Developments*, at 2 (Mar. 2016).

increases incentives for frivolous litigation to occur.⁶³ Research suggests that non-practicing entities (NPEs) account for a substantial amount of patent litigation in the United States, often with little substantive merit.⁶⁴ On the flip side of baseless litigation, patent holders with meritorious claims but limited means may decide to settle rather than bearing the costs of fully enforcing their rights.⁶⁵

5. Analyzing the Effect of External Events on the Cost of Patent Indefiniteness

A) Introduction to the Study

In 1996, the Supreme Court in *Markman v. Westview Instruments, Inc.* held that claim construction is a matter for the judge, rather than the jury.⁶⁶ In practice, this resulted in Markman hearings, in which the district court conducts a pre-trial hearing to preform claim construction and determine the boundaries of a patent holder's rights. Three post-*Markman* decisions provide key elements in patent indefiniteness jurisprudence: the 2005 Federal Circuit decision in *Phillips v. AWH*;⁶⁷ the 2014 Supreme Court decision in *Nautilus v. Biosig*;⁶⁸ and the 2015 Supreme Court decision in *Teva Pharmaceuticals v. Sandoz*.⁶⁹ I used each of these three cases to delineate four distinct time periods for comparing data on the time to completion of claim construction in patent litigation cases, using time to claim construction as a proxy for the

⁶³ *Id.* at 1.

⁶⁴ *Id.* at 3 (finding the share of patent litigation cases brought by NPEs has grown from less than 30% of all cases in 2009 to over 60% of all cases in 2014).

⁶⁵ *Id.* at 7 (discussing opportunistic patent litigation when the cost of litigating is higher than settlement cost which may drive accused infringers to settle rather than bear litigation costs or patent holders with legitimate claims deciding to settle rather than endure a litigation battle).

⁶⁶ *Markman v. Westview Instruments, Inc.*, 517 U.S. 370,376 (1996) (affirming the interpretation of claim terms as the "exclusive province of the court").

⁶⁷ *Phillips v. AWH Corp.*, 415 F. 3d 1303 (Fed. Cir. 2005) (en banc).

⁶⁸ *Nautilus v. Biosig Instruments, Inc.*, 134 S.Ct. 2120 (2014).

⁶⁹ *Teva Pharm. v. Sandoz, Inc.*, 135 S. Ct. 831, 836 (2015).

cost of patent scope uncertainty.⁷⁰ DocketNavigator, a research database curated from patent litigation data from U.S. district courts, the ITC, and the PTAB, provides time to milestones in patent litigation cases.⁷¹ My dataset consisted of cases that involved either an initial claim of infringement or a counter claim of infringement, since these cases involve Markman hearings to construe patent claim boundaries and thus must directly face the problem of claim indefiniteness.⁷² I then restricted the DocketNavigator data for each time period to orders filed within the given time period's range.

My initial thesis is that the clarifying guidance from these three cases on indefiniteness practice and claim construction, should be associated with a reduction in claim construction time, representing a decrease in the cost of patent uncertainty. I first provide background on each of the cases, and then present my findings with analyses and conclusions.

B) Key Decisions in Patent Indefiniteness Jurisprudence

In *Markman v. Westview Instruments*⁷³, the Supreme Court affirmed the Federal Circuit, mandating that claim construction is the sole province of the court and must not be performed by the jury⁷⁴. It is important to note that the Supreme Court never declared claim construction to be

⁷⁰ DocketNavigator only has data dating back to January 1, 2000, so I could not capture the effect of this case on the time to claim construction. I include discussion about *Markman v. Westview Instruments* as important background to recent judicial developments.

⁷¹ DocketNavigator provides a search option for times to milestone which generates a with data on the time between filling the complaint and the named milestone. For this paper I restricted data to U.S. district court cases with either a claim or counter claim of infringement, and looked at the median time between filling the complaint and claim construction. <http://home.docketnavigator.com>

⁷² See Laura C. Whitworth, *What's in A Claim? The Importance of Uniformity in Patent Claim Construction Standards Between District Court Litigation and Inter Partes Review*, 98 J. Pat. & Trademark Off. Soc'y 21, 26 (2016) (explaining that patent claims must be clearly defined through proper claim construction before other legal questions are presented).

⁷³ DocketNavigator only has data dating back to January 1, 2000, so I could not capture the effect of this case on the time to claim construction. I include discussion about *Markman v. Westview Instruments* as important background to recent judicial developments.

⁷⁴ *Markman*, 517 U.S. at 384 (setting forth the elements of a patent case as construing the patent, a question of law for the judge, and determining whether infringement occurred, a question of fact to be submitted to the jury).

purely a question of law.⁷⁵ The Federal Circuit, however, upon applying the Supreme Court's *Markman* ruling determined there were no subsidiary fact questions involved in interpreting claims, thus making claim construction a question of law given de novo review upon appeal.⁷⁶ This interpretation shows the Federal Circuit's desire to exert control over the claim construction process, and appears to have had a direct impact on definiteness rulings.⁷⁷ Following the *Markman* decision, trial court judges began holding pre-trial hearings (Markman hearings) to determine claim constructions for trial.⁷⁸ Evidencing the importance of claim construction, Markman hearings can be highly dispositive in the outcome of a case, and often drive settlement as well.⁷⁹

On July 12, 2005 the Federal Circuit decided *Phillips v. AWH Corp.* and set forth the current methodology for claim construction. A claim term must be given its ordinary and customary meaning as understood by one skilled in the art at the time of the invention, and read in light of the patent disclosure.⁸⁰ In determining meaning of indefinite claim language, intrinsic evidence – the claim language itself, the patent disclosure, and the prosecution history – must be

⁷⁵ Katherine E. White, *Post-Teva: When Will the Federal Circuit Embrace the Deferential Standard of Review for Patent Claim Construction*, 25 Fed. Circuit B.J. 191, 203-4 (2016) (pointing out that the Federal Circuit converted the Supreme Court's *Markman* holding into an affirmation that claim interpretation was a question of law).

⁷⁶ *Id.* at 198-9 (describing the Federal Circuit's decision in *Cybor Corp. v. FAS Technologies, Inc.* in which the court applied the Supreme Court's *Markman v. Westview* decision and held that claim construction is a purely legal question to be reviewed de novo on appeal).

⁷⁷ Allison & Ouellette, *supra* note 4, at 614 (finding that court decisions rendered after *Markman v. Westview* were statistically significantly more likely than to find a patent definite than decisions prior to *Markman v. Westview*).

⁷⁸ *Id.* at 658 (describing the *Markman* hearing as taking place "after some pretrial discovery in practically every patent-infringement case, the sole goal of which is construction of the claim terms").

⁷⁹ Joshua D. Furman, *Patent Claim Construction Under Teva v. Sandoz: Deference at Last, or More of the Same?*, 97 J. Pat. & Trademark Off. Soc'y 579, 583 (2015) (describing the near universality of Markman hearings to determine claim construction for trial).

⁸⁰ *Phillips v. AWH Corp.*, 415 F. 3d 1303, 1314 (Fed. Cir. 2005) (en banc) (establishing that claims must be given their "ordinary meaning...as understood by a person of skill in the art" during claim construction); *see also* Whitworth, *supra* note 55, at 26 (2016) (distinguishing the plain and ordinary meaning claim construction standard, as set forth by *Phillips* and used by the judiciary, from the Patent Office's broadest reasonable interpretation standard).

examined before turning to extrinsic evidence.⁸¹ The Federal Circuit solidified their control over the claim construction process by diminishing the importance of extrinsic evidence, and bolstering the position that claim interpretation is a question of law.⁸²

The Supreme Court directly addressed the indefiniteness standard in *Nautilus v. Biosig*. In *Nautilus*, the Court rejected the Federal Circuit’s “insolubly ambiguous” standard of indefiniteness, which found claims sufficiently definite as long as the claim is “amenable to construction” even if “reasonable persons will disagree” as to the scope of the claim.⁸³ The Supreme Court set forth a new, stricter standard that requires a claim to be found indefinite “if the claim fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention.”⁸⁴ Commentators believe this decision will have a significant impact on both patent prosecution and litigation decisions.⁸⁵ Under the “insolubly ambiguous” standard, patent applicants had little incentive to provide the public with adequate notice of claim boundaries since there appeared to be no appreciable risk that patent claims would be held invalid.⁸⁶

In *Teva Pharmaceuticals v. Sandoz, Inc.* the Supreme Court addressed the appellate standard of review for claim construction. Prior to *Teva*, the Federal Circuit treated claim

⁸¹ *Phillips*, 415 F. 3d, at 1317 (finding extrinsic evidence, evidence external to the patent and prosecution history, as less significant than the intrinsic record in determining “the legally operative meaning of claim language”).

⁸² White, *supra* note 75, at 199-200 (postulating the Federal Circuit sought to exert control over the entire claim construction process through giving no deference to trial judge findings of fact).

⁸³ *Nautilus v. Biosig Instruments, Inc.*, 134 S.Ct. 2120, 2130 (2014) (deciding the Federal Circuit’s “insolubly ambiguous” standard is not probative of the essential inquiry for claim definiteness and therefore does not satisfy the Patent Act’s definiteness requirement).

⁸⁴ *Id.* at 2124.

⁸⁵ Fiona S. Morton & Carl Shapiro, *Patent Assertions: Are We Any Closer to Aligning Reward to Contribution?*, 16 Nat’l Bureau of Econ. Research 89, 108 (2016) (stating *Nautilus* is likely to have a major impact on how patent claims are drafted, improving patent quality and reducing the amount of patent litigation); Varadarajan, *supra* note 9, at 589 (criticizing the insolubly ambiguous standard for its sweeping conception of definiteness and creating a “vicious cycle” of presumably valid patents with overly broad scope); *Id.* at 592 (noting that, on its face, requiring claims to delineate boundaries with “reasonable certainty” seems to ask more of patentees than requiring claims to not be “insolubly ambiguous”).

⁸⁶ Brief of Peter S. Menell as Amicus Curiae Supporting Neither Party at 15, *Nautilus, Inc. v. Biosig Instruments, Inc.*, (134 S.Ct. 2120) (2013) (No. 13-369).

construction as a question of law and reviewed it de novo.⁸⁷ De novo review added to the struggle of determining claim boundaries in the Markman hearing by discouraging trial court judges from engaging fully in the evidentiary processes that could help in determining the proper patent scope.⁸⁸ The Supreme Court made clear in *Teva* that factual findings of the trial court are subject to clear error review, while the ultimate claim construction is given de novo review.⁸⁹ Post-*Teva*, appellate courts are required to defer to trial court findings of fact.⁹⁰ If the trial court does not make findings of fact, the appellate court must remand the case for factual findings before proceeding with review of claim construction.⁹¹ *Teva* appears to settle the question of how claim construction should be reviewed on appeal – clear error review applies when considering underlying factual determinations and extrinsic evidence, and a de novo standard of review applies as far as the ultimate choice of construction.⁹²

C) *The Effect of Judicial Decisions on the Cost of Patent Uncertainty: Data and Analysis*

Given that the *Phillips* majority clearly established the claim construction process and provided uniformity across the federal courts, I expected the time to claim construction to decrease. Trial judges are now compelled to turn first to intrinsic evidence already on the record,

⁸⁷ See *Teva Pharm. v. Sandoz, Inc.*, 135 S. Ct. 831, 836 (2015) (explaining the grant of certiorari to clarify the appellate standard of review for claim construction in light of the Federal Circuit’s practice of de novo review of all aspects of the District Court’s claim construction, including the determination of subsidiary facts).

⁸⁸ Brief of Peter S. Menell as Amicus Curiae Supporting Neither Party at 9, *Nautilus, Inc. v. Biosig Instruments, Inc.*, (134 S.Ct. 2120) (2013) (No. 13-369) (noting district court judges struggled to determine patent claim boundaries for several reasons including the de novo review standard); See also White, *supra* note 75, at 193 (explaining that before *Teva*, because claim construction received no deference on appeal, trial courts accordingly did not always document their findings).

⁸⁹ *Teva Pharm.*, 135 S.Ct. at 835 (holding the appellate court must apply a “clear error”, not de novo, standard of review to a trial judge’s resolution of an underlying factual dispute during claim construction).

⁹⁰ White, *supra* note 75, at 214.

⁹¹ *Id.*

⁹² Furman, *supra* note 79, at 595 (describing *Teva*’s holding as allowing the Federal Circuit to reconsider the ultimate claim construction but, barring a finding of clear error in fact finding, they must rely on the facts accepted by the lower court).

and to stop the claim construction process once a definite meaning has been established.⁹³ This should, in theory, reduce reliance on extrinsic evidence, making Markman hearings briefer and reducing the pendency of the litigation overall. One could also expect this to drive costs of litigation down with the reduced focus on extrinsic evidence, lessening the need for expert testimony and shortening discovery.

On the other hand, Judge Mayer, in his *Phillips* dissent, forewarned that the majority's failure to acknowledge the factual component to claim interpretation and elevation of the court's own importance in claim construction, perpetuated "unworkable standards litigants cannot apply."⁹⁴ Judge Mayer's opined that rather than introducing predictability to patent law, the Federal Circuit instead created "the substitution of a black box, as it so pejoratively has been said of the jury, with the black hole of this court."⁹⁵

The indefiniteness standard was given new teeth under *Nautilus*. One would expect this to trickle down to patent drafting resulting in more defined claim boundaries.⁹⁶ Additionally, it should make Markman hearings move more quickly as there is now a stricter and clearer standard for trial judges to apply and for patent claims to meet. There has, however, been some skepticism with respect to *Nautilus*' actual effect.⁹⁷ *Nautilus*' actual impact will likely depend on the Federal Circuit's willingness to embrace a stricter definiteness standard.⁹⁸ The Federal

⁹³ *Phillips*, 415 F.3d at 1324 (restricting the use of extrinsic evidence which contradicts a claim meaning that is unambiguous in light of the intrinsic evidence).

⁹⁴ White, *supra* note 75, at 201 (discussing Judge Mayer's dissent in *Phillips*).

⁹⁵ *Id.*

⁹⁶ See *Nautilus v. Biosig Instruments, Inc.*, 134 S.Ct. 2120, 2129 (2014) (commenting that "absent a meaningful definiteness check...patent applications face powerful incentives to inject ambiguity into their claims" and "the patent drafter is in the best position to resolve" claim ambiguity).

⁹⁷ Varadarajan, *supra* note 9, at 592 (finding that many commentators surmised that patentees would have less leeway to claim ambiguously following the *Nautilus* decision, but in practice it is unclear whether the new *Nautilus* standard will reduce patent uncertainty); Allison & Ouellette, *supra* note 4, at 620 (noting that while the language in the *Nautilus* decision seems to call for imposition of a stricter definiteness requirement, its actual impact largely remains to be seen).

⁹⁸ Varadarajan, *supra* note 9, at 593.

Circuit's decision in *Nautilus*, on remand, seems to support a characterization of no meaningful change in the indefiniteness jurisprudence.⁹⁹

With *Teva*, commentators again believe that any meaningful shift in jurisprudence is in the hands of the Federal Circuit.¹⁰⁰ One would think that a definitive ruling from the Supreme Court on the appropriate standard of review would set forth clear guidance to both the judiciary and litigants as to how a case will be reviewed upon appeal. More deference to the trial court should, in theory, result in a smaller percentage of decisions being appealed. However, the new focus on fact finding at the appellate level might increase the length of trial court Markman hearings as trial courts may be motivated to engage in more fact-finding and dedicate more time to providing a clear record.

The figure below suggests that the time to claim construction completion remained essentially constant over time. In practice the Federal Circuit has continued to review claim construction almost completely de novo, indicating no change in review standard following *Teva*.¹⁰¹ There is some concern that the *Teva* decision may, in fact, complicate the jurisprudence and perhaps increase the length of litigation thus increasing the overall costs to both private parties and society of patent disputes. The *Teva* decision has the potential to create more battles over what precisely qualifies as an underlying factual determination in the district court.¹⁰²

There is also the question of whether a new legal construction reached on appeal properly

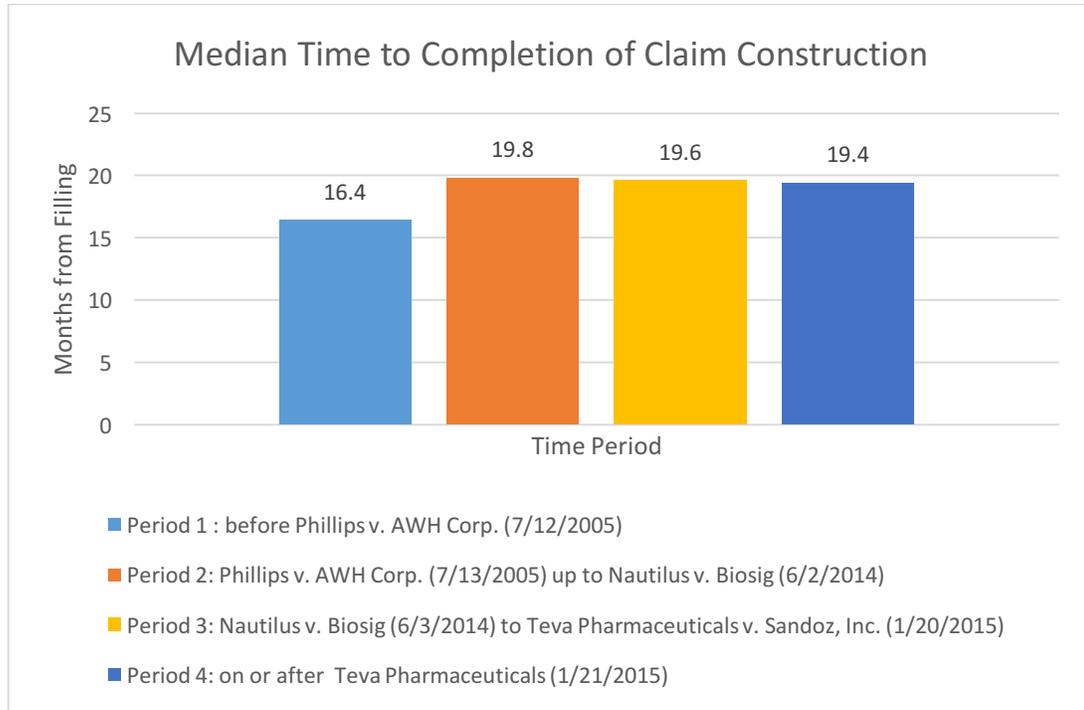
⁹⁹ *Id.*

¹⁰⁰ See White, *supra* note 75, at 193 (noting that few cases have come out differently under the new *Teva* standard, the Federal Circuit continues to decide cases as if *Teva* never happened); Furman, *supra* note 79, at 591 (discussing two cases CAFC decided following *Teva* in which the Federal Circuit disregarded district court determinations of fact, declared all of the evidence intrinsic, and reviewed claim construction de novo).

¹⁰¹ White, *supra* note 75, at 210 (finding few exceptions to the Federal Circuit continuing to treat claim interpretation as a question of law. In cases where extrinsic evidence on the record is in conflict with intrinsic evidence, the CAFC finds the extrinsic evidence is not credible); Furman, *supra* note 79, at 581 (finding the Federal Circuit has shown a distinct unwillingness to find certain evidence sufficiently factual so as to be required to grant it deference).

¹⁰² Furman, *supra* note 79, at 596.

comports with the existing underlying fact finding.¹⁰³ Justice Thomas' dissent in *Teva* acknowledges the possibility that the majority's holding will create new confusion and further draw out litigation. Justice Thomas writes "[t]he line between fact and law is an uncertain one" and the majority's opinion is likely to create "collateral litigation over the line between law and fact."¹⁰⁴



The litigation selection problem is a possible explanation for the lack of any significant change over the data test period.¹⁰⁵ Few US patents are litigated, and of the litigated cases about 95% settle.¹⁰⁶ Consequently, the cases that do go to trial and generate the data I analyzed are the

¹⁰³ *Id.*

¹⁰⁴ White, *supra* note 75, at 209 (discussing Justice Thomas's dissent in *Teva Pharmaceuticals*, in which Justice Thomas argued that, for purposes of attaining uniformity, the appellate courts are in a better position to control claim construction and thus the de novo standard of review should be upheld).

¹⁰⁵ Allison & Ouellette, *supra* note 4, at 616 (finding a continuous year variable to test for any doctrinal shifts over time had little effect on results in their study of litigated patents and resulting rulings on §112 issues).

¹⁰⁶ Andrew Eckert & Corinne Langinier, *A Survey of the Economics of Patent Systems and Procedures*, 28 *Journal of Economic Surveys* 996, 999 (2014) (stating courts are the primary enforcement mechanism of patents in the US, but only 1 to 2% of US patents are litigated or go to trial, and about 95% of litigated patents settle out of court).

most contentious and the most unclear.¹⁰⁷ My theory is that no matter how clear the definiteness standard is, the cases that make it to trial will always have an “X factor” of indefiniteness that leads to an almost unchanging average time to complete claim construction. This finding suggests that the judiciary may not be the best institution to address the complex indefiniteness problem, which plays a key role in patent litigation and, in turn, has negative effects on the economic incentives of innovation and business.

My initial findings lead me to consider began another recent development – the Inter Partes Review, a proceeding held in front of the Patent Trial and Appeal Board and created with the passing of the America Invents Act in 2011. I adjusted my data ranges to test the effect of this new avenue for challenging a patent’s validity through the IPR process on the time to claim construction in court. I hypothesize that the creation of the IPR would divert a number of potential cases from the courts to the PTAB, thus decreasing the length of claim construction in the courts and decreasing the cost of patent uncertainty. In the next section I introduce the IPR proceeding and present the data associated with the implementation of the IPR.

D) Inter Partes Review and the Effect on the Cost of Patent Uncertainty

In 2012, the United States Patent and Trademark Office (USPTO) issued rules and guidance that established a new trial procedure, the inter partes review (IPR), handled in-house by the Patent Trial and Appeal Board (PTAB).¹⁰⁸ A third party may petition the USPTO to institute an IPR, challenging the validity of an issued patent on novelty or non-obvious

¹⁰⁷ Allison & Ouellette, *supra* note 4, at 616 (noting the limitations of their empirical study on the §112 requirement includes that not all patents are litigated and not all litigated patents have their validity challenged under a §112 issue).

¹⁰⁸ See 35 U.S. C. §311 (a) –(b) (2013) (establishing that “a person who is not the owner of a patent may file with the Office a petition to institute an inter partes review...may request to cancel as unpatentable 1 or more claims of a patent”).

grounds.¹⁰⁹ The PTAB is statutorily mandated to reach a final decision within 12 months of instituting an IPR and discovery for the IPR trial is limited, as compared to a district court trial.¹¹⁰ These aspects of the IPR make it a quick and relatively inexpensive alternative to district court litigation.¹¹¹

The purpose of the IPR is to streamline the patent process and improve patent quality, thus reducing frivolous litigation.¹¹² Similar to the district courts, the PTAB must construe the challenged claims in order to review the patentability.¹¹³ The PTAB applies a “broadest reasonable interpretation” (BRI) standard to the claim language during its claim construction process.¹¹⁴ The BRI standard is much broader than the “plain and ordinary meaning” standard used by the judiciary. The BRI standard appears to play a significant role in IPR outcome. As of October 31, 2016, the PTAB has invalidated all challenged claims in 68% of the final written IPR decisions and has found some of the instituted claims unpatentable in an additional 16% of final written decisions.¹¹⁵ Thus, the broad claim construction standard in a validity challenge appears favorable for potential defendants seeking to invalidate patents on validity grounds.

¹⁰⁹ *Id.*

¹¹⁰ 37 C.F.R. §42.100(c) (2016) (stating “an inter partes review proceeding shall be administered such that pendency before the Board after institution is normally no more than one year.”); 37 C.F.R. §42.51(b) (2015) (setting forth the limited discovery permissible in an inter partes review trial).

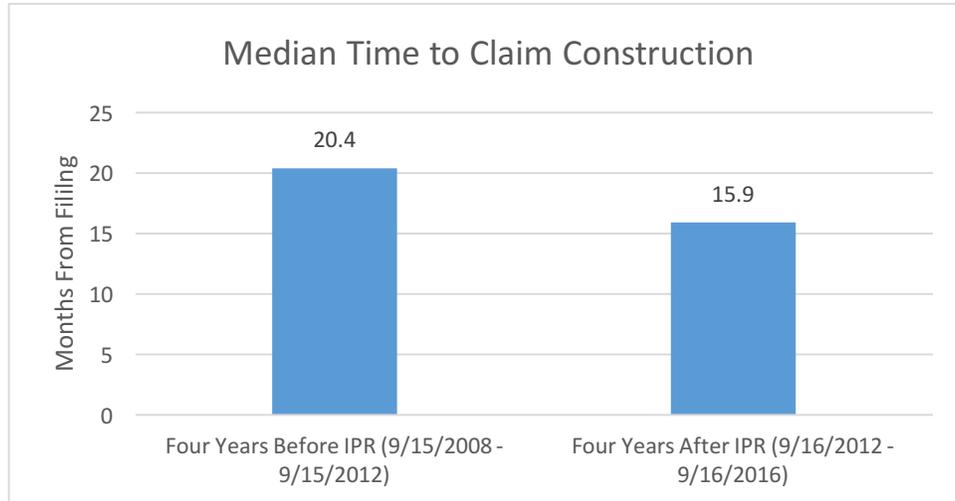
¹¹¹ Council of Economic Advisers, Exec. Office of the President, *The Patent Litigation Landscape: Recent Research and Developments*, at 6 (Mar. 2016) (describing the IPR as providing a quick, inexpensive alternative to district court litigation for challenging the validity of a patent).

¹¹² Whitworth, *supra* note 72, at 29 (articulating IPR’s purpose to improve and streamline the patent system by enabling early challenges to issued patents while preserving the rights and interest of inventors and patent owners).

¹¹³ James Stein et al., *Spotlight on Claim Construction Before PTAB*, 11 *Buff. Intell. Prop. L.J.* 73, 75 (2015).

¹¹⁴ *Cuozzo Speed Tech.*, 136 S.Ct. at (holding the Patent Office has legal authority to issue its broadest reasonable construction regulation with respect to inter partes review).

¹¹⁵ U.S. Patent and Trademark Office, *Patent Trial and Appeal Board Statistics*, at 10 (2016) https://www.uspto.gov/sites/default/files/documents/aia_statistics_october2016.pdf. (presenting the disposition of IPR petitions completed as of October 31, 2016).



The data above show that in the four years following the creation of the IPR, time to complete claim construction fell by four and a half months to 15.9 months, compared to 20.4 months in the four years immediately prior to the creation of the IPR. Additionally, there has been a drop in patent litigation filings in the past two years, perhaps in part due to the availability of IPRs. In 2015, there was a 2% year-over-year drop in patent case filings.¹¹⁶ This continued a downward trend from the high point of filings reached in 2013.¹¹⁷

One possible reason for the shift of patent litigation filings to IPRs is the comparative cost.¹¹⁸ A 2015 AIPLA study found the median cost for an IPR proceeding through the PTAB

¹¹⁶ Chris Barry et al., 2016 Patent Litigation Study: Are we at an inflection point? PwC 2016 Patent Litigation Study 1 (PricewaterhouseCoopers 2016), <http://www.pwc.com/us/en/forensic-services/publications/patent-litigation-study.html>

¹¹⁷ Chris Barry et al., 2015 Patent Litigation Study: a change in patentee fortunes 3 (PricewaterhouseCoopers 2015) <http://www.pwc.com/us/en/forensic-services/publications/patent-litigation-study-2015.html> (finding a 13% drop year-over-year in patent litigation cases filed in 2014)

¹¹⁸ Brief of Intell. Prop. Owners Assoc. as Amicus Curiae Supporting Neither Party at 15; *Cuozzo Speed Technologies v. Lee*, (136 S.Ct. 2131) (2014) (No. 15-446) (noting IPRs are becoming the vehicle of choice for challenging a patent's validity)

hearing was \$275,000.¹¹⁹ The IPR presents an inexpensive route to challenge patent validity when compared to the cost of litigation.¹²⁰

6. Conclusion and Suggestions

As both my data and commentary suggest, Supreme Court decisions addressing claim indefiniteness concerns seem to have had little practical effect on streamlining the claim construction process. Thus, the question remains: can effective measures can be taken to reduce the costly problem of indefinite patent claim boundaries?¹²¹ As discussed above, there have been recent policy changes and major court decisions addressing indefiniteness, but current data suggest that further reform is in order.¹²² It seems that the Federal Circuit will do everything in its power to maintain its authority over the claim construction process, despite applicable Supreme Court decisions, to the detriment of trial court judges, litigants, and future innovators alike.

Perhaps, then, the Patent Office is in the best position to promote definiteness in claims, thus reducing litigation and uncertainty costs.¹²³ As Professor Menell writes, “clearer claims promise to reduce the need to litigate as well as the number and complexity of claim construction

¹¹⁹ AIPLA, Report of the Economic Survey 2015, 38 (2015) (finding median cost of an IPR through the PTAB hearing was \$275,000 and median cost of an IPR through appeal was \$350,000).

¹²⁰ AIPLA, Report of the Economic Survey 2015, 36 - 8 (2015) (finding the 2015 median total litigation cost for patent infringement suits to be \$600,000 when there was less than \$1 million, with increasing cost as amount at risk increases, and \$275,000 the median cost of an IPR through PTAB hearing).

¹²¹ Brief of Peter S. Menell as Amicus Curiae Supporting Neither Party at 14, *Nautilus, Inc. v. Biosig Instruments, Inc.*, (134 S.Ct. 2120) (2013) (No. 13-369) (noting lax attention to the scope of patents at the front end of the patent system creates the notice failure and externalities that are very costly to competitors, future entrepreneurs and district courts).

¹²² Council of Economic Advisers, Exec. Office of the President, *The Patent Litigation Landscape: Recent Research and Developments*, at 7 (Mar. 2016). (acknowledging that recent policy changes, legal changes, and executive actions appear to help curtail abusive litigation but noting that the data suggests further reform is warranted).

¹²³ Brief of Peter S. Menell as Amicus Curiae Supporting Neither Party at 9, *Nautilus, Inc. v. Biosig Instruments, Inc.*, (134 S.Ct. 2120) (2013) (No. 13-369). (noting judges struggled to determine the boundaries of patent claims because it was difficult to step into the shoes of “persons of ordinary skill in the art” at the time of filing).

disputes that arise.”¹²⁴ Menell goes on to say “[u]nless applicants have greater incentives to heed §112’s requirement, vague claims will persist.”¹²⁵ More well-defined claims will address the boundary issues and notice externalities that arise due to uncertainty of patent claim scope and are costly to society and future innovation. Menell and Meurer (2013) note that the jurisprudence of claim construction has been criticized for lacking coherence¹²⁶, and offer suggestions for the Patent Office as the mechanism to provide claim definiteness.¹²⁷ For example, they recommend requiring the prompt publication of all patent applications in order to inform future developers of the innovation landscape¹²⁸; increasing the burden on applicants to explain, clarify, and justify their filing, thus addressing litigated issues up front and early on in the patent lifecycle¹²⁹; and increasing maintenance fees to clear out uncommercialized patents.¹³⁰ Tightening the claim definiteness standard at the examination level reduces the opportunity for patent holders to sit on obfuscated rights and wait to sue until a competitor has invested significant resources in the allegedly infringing product.¹³¹

The IPR process appears to provide an attractive avenue for challenging patent validity in a quick and relatively low cost manner.¹³² There is also hope that the potential of an IPR

¹²⁴ Brief of Peter S. Menell as Amicus Curiae Supporting Neither Party at 39-40, *Nautilus, Inc. v. Biosig Instruments, Inc.*, (134 U.S. 2120) (2013) (No. 13-369).

¹²⁵ *Id.* at 40.

¹²⁶ Menell & Meurer, *supra* note 5, at 21.

¹²⁷ *Id.* at 30 (setting forth six notice-promoting elements (1) a publically accessible registration system; (2) full, clear disclosure by claimants; (3) reliable and prompt examination of claims; (4) transparent notice information and registry search tool; (5) clear and efficient marking of claimed resources; and (6) institutions for resolving boundary disputes, preferably before significant investments have been made).

¹²⁸ *Id.*

¹²⁹ *Id.* at 34.

¹³⁰ *Id.* at 40.

¹³¹ *Id.* at 42 (suggesting an imposition of penalties on patent holders for failing to assert their rights promptly upon learning of infringing activities).

¹³² Jonathan Tamimi, Note, *Breaking Bad Patents: The Formula for Quick, Inexpensive Resolution of Patent Validity*, 29 *Berkeley Tech. L.J.* 587, 594 (2014) (describing inter partes reviews as effective tools to challenge patent validity due to broadest reasonable interpretation standard, no presumption of patent validity, relatively low cost, and statutory restrictions on length of proceeding and discovery).

proceeding after patent grant will motivate patent applicants to draft claims in a more defined manner, so as to survive under the BRI claim construction of the IPR.¹³³

In conclusion, it is undisputed that patent clarity needs to be addressed. Unclear patent boundaries are costly to litigants, the public, and future innovation. It appears that judicial constraints are not an effective way to reduce the length of patent litigation. The Patent Office, through the examination process and post-grant procedures, should implement changes with a focus on incentivizing and requiring clearer claim scope prior to patent issuance.

¹³³ Stein et al., *supra* note 113, at *102-103 (setting forth patent claim drafting techniques, such as checking whether each claim term is necessary, clearly defined, and consistently used, to help lay the basis for patent owner's desired claim construction at the PTAB).

Appendix

The table below represents the comprehensive data reported by DocketNavigator with respect to the time to claim construction for each given period.

| Time to Claim Construction (Months from Filing) | | | | | |
|---|-------------|----------------|--------|----------------|---------|
| Period | Occurrences | First Quartile | Median | Third Quartile | Average |
| Period 1: before <i>Phillips v. AWH Corp.</i> (7/12/2005) | 288 | 12.6 | 16.4 | 22.3 | 17.7 |
| Period 2: <i>Phillips v. AWH Corp.</i> (7/13/2005) up to <i>Nautilus v. Biosig</i> (6/2/2014) | 3035 | 14.7 | 19.8 | 27 | 22.7 |
| Period 3: <i>Nautilus v. Biosig</i> (6/3/2014) to <i>Teva Pharmaceuticals v. Sandoz, Inc.</i> (1/20/2015) | 309 | 14.8 | 19.6 | 27 | 22.7 |
| Period 4: on or after <i>Teva Pharmaceuticals</i> (1/21/2015) | 712 | 13.5 | 19.4 | 29.5 | 24.4 |
| | | | | | |
| Four Years Before IPR (9/15/2008 - 9/15/2012) | 1739 | 15 | 20.4 | 27.8 | 23.1 |
| Four Years After IPR (9/16/2012 - 9/16/2016) | 962 | 12.2 | 15.9 | 21.1 | 17.5 |