

STRATEGIC DECISION MAKING IN DUAL PTAB AND DISTRICT COURT PROCEEDINGS

Saurabh Vishnubhakat, Arti K. Rai & Jay P. Kesan[†]

ABSTRACT

The post-grant review proceedings set up at the U.S. Patent and Trademark Office's Patent and Trial Appeal Board (PTAB) by the America Invents Act of 2011 have transformed the relationship between Article III patent litigation and the administrative state. Not surprisingly, such dramatic change has itself yielded additional litigation possibilities: *Cuozzo Speed Technologies v. Lee*, a case addressing divergence between the manner in which the PTAB and Article III courts construe patent claims, will soon be decided by the U.S. Supreme Court.

Of the three major new PTAB proceedings, two have proven to be popular as well as controversial: *inter partes* review and covered business method review. Yet scholarly analysis of litigant behavior in these proceedings has been limited thus far to descriptive data summaries or specific policy perspectives on these types of post-grant challenges, such as their impact on the well-rehearsed patent troll debate. In this article, we present what is to our knowledge the first comprehensive empirical and analytical study of how litigants use these *inter partes* review and covered business method review proceedings relative to Article III litigation.

A major normative argument for administrative ex post review is that it should be an efficient, accessible, and accurate substitute for Article III litigation over patent validity. We assess the substitution hypothesis, using individual patents as our general unit of analysis as well as investigating patent-petitioner pairs and similar details in greater depth. Our data indicate that the "standard model" of explicit substitution—wherein a district

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court defendant subsequently brings an administrative challenge to patent validity—occurs for the majority (70%) of petitioners who bring *inter partes* review challenges. An important implication of this effect is that the PTAB should use a claim construction standard that mirrors that of the district court. With a uniform standard, PTAB claim constructions could be used by district courts in any subsequent proceedings, and the benefits of substituting administrative process for judicial process would thereby be most fully realized.

Notably, however, standard substitution is not the only use of the PTAB: particularly in the area of *inter partes* reviews, we also see a surprising percentage of cases (about 30%) where the petitioner is not the target of a prior suit on the same patent. The frequency of these nonstandard petitioners, as well as their tendency to join the same petitions as an entity that has been sued, varies by technology. Our data on nonstandard petitioners provide some insight into the extent to which patent challengers are engaging in collective action to contest the validity of patents. Depending on the details of how nonstandard petitioning and collective action are being deployed, this activity could provide a social benefit or constitute a form of harassment.

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I. INTRODUCTION

This is the first paper in a multipart project studying the new post-grant review proceedings set up at the U.S. Patent and Trademark Office (USPTO) Patent and Trial Appeal Board (PTAB) by the America Invents Act of 2011 (AIA).¹ These new administrative trial-type proceedings represent a significant change in the relationship between the system of patent litigation in Article III courts and the administrative state. One case involving this relationship, *Cuozzo Speed Technologies, LLC v. Lee*,² is already before the U.S. Supreme Court and others are in the pipeline.

Although PTAB proceedings have proved to be quite popular, scholarly analysis of litigant behavior has thus far been limited to descriptive data summaries or specific policy perspectives on post-grant challenges, such as their impact on the well-rehearsed patent troll debate.³ This Article is the first comprehensive empirical and analytical study of how litigants use these administrative procedures relative to Article III litigation. In addition to assessing the behavior of litigants, we analyze the behavior of both the PTAB and the courts.

Under the AIA, defendants, potential defendants, and third parties now confront the question of whether and when to challenge the validity of patents by filing one or more petitions for *inter partes* review (IPR) or, if applicable, petitions for covered business method (CBM) review. IPR petitions are filed against individual patents (and claims thereof), but multiple petitions against a patent may be filed by the same or different parties, and a single petition may be filed or joined by multiple parties. Similarly, CBM petitions are filed against individual patents and claims that are directed to eligible business method-related inventions.⁴

Meanwhile, patent owners still face the question of which patents to assert, when and where to assert them, and against whom to assert them. The AIA's anti-joinder provision for Article III litigation arguably increases complexity by substantially reducing owners' ability to sue multiple defendants in a single case.⁵ Thus, patent owners wishing to sue multiple

1. Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284.

2. No. 15-446.

3. *E.g.*, Brian J. Love & Shawn Ambwani, *Inter Partes Review: An Early Look at the Numbers*, 81 U. CHI. L. REV. DIALOGUE 93 (2014).

4. In ongoing work, discussed in summary below, we are looking in detail at patents that are the subject of more than one petition. We are dividing these patents into two categories: those that are challenged by the same petitioner multiple times, and those that are challenged by different petitioners. We are further subdividing the two categories by claims and grounds.

5. 35 U.S.C. § 299. *See generally* David O. Taylor, *Patent Misjoinder*, 88 N.Y.U. L. REV. 652 (2013) (discussing rationale for anti-joinder provision).

defendants on a given patent generally have to sue them individually. More importantly for our purposes, the rise of the PTAB forces patent owners to factor in the strong possibility of retaliatory or even preemptive patent validity challenges at the PTAB. As a result, two complex frameworks of resolving patent disputes now coexist: ordinary infringement litigation and declaratory judgment actions in Article III courts, along with administrative invalidation actions in the PTAB.

Multiple proceedings with many potential parties offer a number of strategic possibilities. Two examples of ongoing litigation involving certain highly asserted and highly petitioned patents provide an illustration of the complexities and the correspondingly complicated strategic questions. Although these cases are hardly representative, they do provide clear examples of the multiple, perhaps even combinatorial, strategic possibilities.

In a set of seven cases filed between July 1 and July 9, 2013, Zond, a plasma discharge technology developer, asserted a suite of patents in Massachusetts district court against nine defendants.⁶ Intel, one of the defendants, responded by filing IPR petitions on all of the asserted patents.⁷ In April 2014, Intel persuaded the Massachusetts district court to grant a stay of the litigation.⁸ Within two months of the court granting a stay to Intel, all but one of the defendants had filed IPR petitions on the same claims and the same grounds.⁹ All of the petitioning defendants received stays, and the PTAB joined them to the Intel petitions. Although Intel ultimately settled, PTAB review of the challenged patents continues, albeit with a new lead petitioner.¹⁰

6. Zond, Inc. v. Gillette Co., No. 1-13-cv-11567 (D. Mass., July 1, 2013); Zond, LLC v. Advanced Micro Devices, Inc., No. 1-13-cv-11577 (D. Mass., July 2, 2013); Zond, LLC v. Intel Corp., No. 1-13-cv-11570 (D. Mass., July 2, 2013); Zond, Inc. v. SK Hynix Inc., No. 1-13-cv-11591 (D. Mass., July 3, 2013); Zond, Inc. v. Toshiba America Elec. Components, Inc., No. 1-13-cv-11581 (D. Mass., July 3, 2013); Zond, Inc. v. Renesas Elecs. Corp., No. 1-13-cv-11625 (D. Mass., July 8, 2013); Zond, Inc. v. Fujitsu Ltd., No. 1-13-cv-11634 (D. Mass., July 9, 2013).

7. The 27 *inter partes* review petitions filed by Intel are listed in Table 1 of Appendix C.

8. Order Granting Motion to Stay Pending Inter Partes Review, Case No. 1-13-cv-11570, Paper No. 120 (D. Mass. Apr. 18, 2014).

9. The 90 *inter partes* review petitions filed by defendants are listed in Table 2 of Appendix C.

10. Joint motions to terminate proceedings, all filed simultaneously on Sept. 12, 2014, settled the Intel-initiated IPR petitions on Zond's patents. The settlement agreement between Intel and Zond that governs the termination of all these proceedings is confidential.

In another set of cases, e-Watch sued eleven firms on two digital signal transmission patents in the Eastern District of Texas.¹¹ A third-party firm filed the first PTAB petition related to those patents.¹² Subsequently, HTC, a defendant, instituted a petition, and the institution of the HTC petition triggered other petitions.¹³

A major normative argument for administrative ex post review is that it should be an efficient, accessible, and accurate substitute for Article III litigation over patent validity.¹⁴ In this paper, we assess the substitution hypothesis, using individual patents as our basic unit of analysis and also investigating patent-petitioner pairs and similar details in greater depth. Our data indicate that the “standard model” of substitution—wherein a district court defendant subsequently brings an administrative challenge to patent validity—is indeed occurring. The majority (about 70 percent) of petitioners who bring *inter partes* review challenges fit the standard model. In fact, our data indicate that both explicit substitution and potential settlement in the shadow of an IPR challenge might be occurring. This substitution effect would suggest that the PTAB should use a claim construction standard that mirrors that of district courts. With a uniform standard, PTAB claim constructions could be used by district courts in any subsequent proceedings, and the benefits of substituting administrative process for judicial process would thereby be most fully realized.

Notably, however, standard substitution is not the only use of the PTAB: particularly in the area of IPRs, we also see a surprising percentage

11. e-Watch, Inc. v. LG Elecs., Inc., No. 2-13-cv-01064 (E.D. Tex., Dec. 9, 2013); e-Watch, Inc. v. Samsung Elecs. Co., No. 2-13-cv-01062 (E.D. Tex., Dec. 9, 2013); e-Watch, Inc. v. Apple Inc., No. 2-13-cv-01061 (E.D. Tex., Dec. 9, 2013); e-Watch, Inc. v. HTC Corp., No. 2-13-cv-01063 (E.D. Tex., Dec. 9, 2013); e-Watch Inc. v. BlackBerry Ltd., No. 2-13-cv-01078 (E.D. Tex., Dec. 10, 2013); e-Watch Inc. v. Sharp Corp., No. 2-13-cv-01074 (E.D. Tex., Dec. 10, 2013); e-Watch Inc. v. ZTE Corp., No. 2-13-cv-01071 (E.D. Tex., Dec. 10, 2013); e-Watch Inc. v. Sony Corp., No. 2-13-cv-01073 (E.D. Tex., Dec. 10, 2013); e-Watch Inc. v. Nokia Corp., No. 2-13-cv-01075 (E.D. Tex., Dec. 10, 2013); e-Watch Inc. v. Huawei Tech. Co., No. 2-13-cv-01076 (E.D. Tex., Dec. 10, 2013); e-Watch Inc. v. Kyocera Commc'ns, Inc., No. 2-13-cv-01077 (E.D. Tex., Dec. 10, 2013).

12. Petition for Inter Partes Review by Iron Dome LLC, No. IPR2014-00439 (P.T.A.B. Feb. 18, 2014).

13. The twelve *inter partes review* petitions filed are listed in Table 3 of Appendix C.

14. Others (including one of us) have argued that to the extent the procedures set up by the AIA resemble formal adjudications, they could serve as a vehicle not simply for error correction but also for legal and policy development. See, e.g., Arti K. Rai, *Patent Validity Across the Executive Branch: Ex Ante Foundations for Policy Development*, 61 DUKE L.J. 1237 (2012); Melissa F. Wasserman, *The Changing Guard of Patent Law: Chevron Deference for the PTO*, 54 WM. & MARY L. REV. 1959 (2013). In this Article, however, we focus on error correction.

of cases (about 30 percent) where the petitioner is *not* the target of a prior suit on the same patent. The frequency of these nonstandard petitioners, as well as their tendency to join the same petitions as an entity that has been sued, varies by technology. Our data on nonstandard petitioners thus provide some insight into the extent patent challengers are engaging in collective action to challenge patents.

Depending on the details of how nonstandard petitioning and collective action are being deployed, this activity could provide a social benefit or constitute a form of harassment. As we discuss in Part II, many commentators have noted that challenging an invalid patent, particularly in expensive Article III litigation, represents a collective action problem. Administrative alternatives may ease the collective action problem, but they may also provide opportunities for harassing patent owners.¹⁵ As another indicator of potential harassment and delay, we also look at the frequency of serial petitioning on a given patent.

Of course, substitution of any sort (as contrasted with duplication) can occur only if administrative review is accurate and efficient, and courts generally stay any related Article III litigation pending administrative review. In the case of declaratory judgment (DJ) litigation, the AIA both bars a DJ litigant from bringing a subsequent administrative review and provides for automatic stays of any subsequent DJ actions.¹⁶ So the issue of duplication primarily arises in the context of infringement litigation brought by the patent owner. Although a full answer to the duplication issue awaits further decision making in cases currently before the PTAB and the courts, we provide some initial data on the question.

In this Article, Part II discusses the normative arguments for and against administrative *ex post* validity review as a substitute for judicial review. It reviews these arguments as they developed in earlier incarnations of administrative review and as they developed in the far more robust AIA proceedings. Part III provides the large-scale empirical data we have gathered. It discusses various indicia of a general substitution effect in the context of particular technologies and in particular district courts. We also discuss the phenomenon of nonstandard petitioners and the collective action in which they sometimes engage. Additionally, Part III presents data

15. *E.g.*, Gregory Dolin, *Dubious Patent Reform*, 56 B.C. L. REV. 881 (2015); Jay P. Kesan, *Carrots and Sticks to Create a Better Patent System*, 17 BERKELEY TECH L.J. 145, 165 (2002) (discussing the dangers of delay and harassment in post-issuance patent office proceedings); Raymond A. Mercado, *Ensuring the Integrity of Administrative Challenges to Patents: Lessons from Reexamination*, 14 COLUM. SCI. & TECH. L. REV. 558 (2013).

16. Perhaps not surprisingly, since patents became available for PTAB review, DJ actions have fallen both in absolute terms and as a percentage of case filings.

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regarding multiple IPR petitions filed against the same patent. Based on these data, Part III examines agency and court decision-making in the face of strategic behavior by the parties before them. Part IV discusses our major findings, suggests directions for further research, and outlines our ongoing agenda to advance these research goals.

II. AGENCY OR COURT: STRATEGIC CHOICES

To describe more fully how these doctrinal frameworks operate in practice, we offer here the largest-scale empirical study to date of ex post administrative scrutiny of patent validity. Our analysis is based on a new dataset of all IPR and CBM petitions filed in the USPTO since the creation of these procedures under the AIA, as well as data on Article III patent cases filed contemporaneously with IPR and CBM petitions, and on requests for litigation stays pending the outcome of administrative challenges to patent validity. Our findings provide a comprehensive view of ex post administrative review that assimilates the more localized findings of prior empirical studies.¹⁰⁹ We begin with the individual patent as our basic unit of analysis and further explore patent-petitioner pairs and other details. Unless otherwise specified, our time period is from September 16, 2012 through June 30, 2015.

Our analysis can be replicated using data from the DocketNavigator service, which provides free and low-cost access to coded metadata about patent cases in the U.S. federal courts as well as the PTAB.¹¹⁰ Like LexMachina¹¹¹ and other widely used patent litigation data services, DocketNavigator obtains its underlying litigation data from the federal judiciary's Public Access to Court Electronic Records (PACER) service,¹¹²

108. *VirtualAgility Inc. v. Salesforce.com, Inc.*, 759 F.3d 1307, 1309–10, 1320 (Fed. Cir. 2014).

109. *E.g.*, Love & Ambwani, *supra* note 3.

110. DOCKETNAVIGATOR, <http://home.docketnavigator.com/ourstory> [<http://perma.cc/B4AP-SB4M>].

111. LEXMACHINA, <https://lexmachina.com/what-we-do/how-it-works> [<http://perma.cc/WA5J-UEDV>].

112. PACER, <http://www.pacer.gov> [<http://perma.cc/YP39-UJZ3>]; *see* Judy L. Heier, *Researching Patent Litigation Made Easy*, RECORDER (May 13, 2013), <http://home>

which is the principal data source of many innovation studies.¹¹³ Neither PACER nor the commercial services that rely on it permit researchers to disclose significant portions of their database. Accordingly, we describe the DocketNavigator data we used with the understanding that other researchers can readily access it to replicate our study.¹¹⁴

A. LITIGANT BEHAVIOR

Like the administrative *ex post* validity challenge mechanisms that preceded the AIA, the IPR and CBM review procedures were established to provide more affordable, more expert, and more accessible adjudication than litigation. However, what would-be patent challengers regard as barriers¹¹⁵ to contesting validity, are safeguards from the perspective of patent owners. We are quite interested, therefore, in discovering whether and under what circumstances IPR and CBM reviews are serving as defensive tools for defendants previously charged in district court with infringement; as tools for preemptive attacks upon patent owners; as mechanisms for harassment and abuse; or as a mix of these functions.

In general, we show that most patents challenged in the PTAB are also challenged in Article III litigation. However, there is no clear relationship between the number of times a patent is challenged in the PTAB and the numbers of times it is asserted in district court. Additionally, while Chemical patents are disproportionately likely to be the subject of a PTAB-only challenge, Computers and Communications (CCM) patents are disproportionately *unlikely* to be challenged only in the PTAB.

.docketnavigator.com/wp-content/uploads/2013/08/The-Recorder-Article.pdf [http://perma.cc/3ERK-XS3T] (stating that DocketNavigator obtains litigation data from PACER).

113. *E.g.*, John R. Allison, Mark A. Lemley & David L. Schwartz, *Understanding the Realities of Modern Patent Litigation*, 92 TEX. L. REV. 1769, 1772 (2014) (identifying Lex Machina, which obtains and cleans original PACER information, as the data source); Christopher A. Cotropia & Mark A. Lemley, *Copying in Patent Law*, 87 N.C. L. REV. 1421, 1440–41 (2009) (identifying PACER as the data source); Jay P. Kesan & Gwendolyn G. Ball, *How Are Patent Cases Resolved? An Empirical Examination of the Adjudication and Settlement of Patent Disputes*, 84 WASH. U. L. REV. 237, 266 (2006) (identifying PACER as the data source).

114. *See infra* Appendix A.

115. Such barriers include, for example, potential estoppel in the federal courts from initiating an administrative validity challenge in the USPTO. *Supra* Section I.C.3. More generally, as discussed in detail in Part II, patent challengers face a significant collective action problem. *See* Thomas, *supra* note 37, at 333 (noting that third parties to a successful validity challenge “may readily free ride from the efforts of the former patentee and the opponent, employing the teachings of the invalidated patent to practice the invention without compensation to anyone”).

We also studied behavior at the level of the individual petitioner. For both CBM reviews and IPRs, the standard substitution model describes the majority of cases. Notably, however, in the context of IPRs, the percentage of petitioners who fall outside the standard model because they have not *themselves* previously been sued on the patent in question is surprisingly substantial, on the order of 30 percent. This percentage is particularly high with respect to Drugs and Medical patents. Also notable is the extent to which petitioners that have not previously been sued join the same petitions as those that have been sued. In the case of Drugs and Medical patents, for example, petitioners that have not previously been defendants disproportionately appear to be engaged in collective action with those that are defendants.

1. *IPR and CBM Petitions: Descriptive Statistics*

a) IPR Petitions

Through the end of June 2015, petitioners have filed 3,157 petitions for *inter partes* review. As Figure 1 shows, 116 of these filings began slowly in September 2012, when the IPR procedure became available, and have risen from twenty petitions per month to roughly 140 petitions per month.

These petitions have been distributed unevenly across technology areas. The National Bureau of Economic Research (NBER) categorizes patents into six different technology areas: (1) Chemical (excluding Drugs); (2) Computers and Communications (CCM); (3) Drugs and Medical; (4) Electrical and Electronics; (5) Mechanical; and (6) Others.¹¹⁷ As Figure 2 shows, IPR petitions disaggregated by NBER's six-part category scheme have predominantly challenged CCM-related patents, which account for just over half (50.4%) of all IPR petitions. Figure 3 confirms this trend has persisted from the start, with cumulative filings in CCM-related IPR petitions rising considerably faster than those in all other technology areas.

Although IPR petitions may challenge patent claims as to either novelty or nonobviousness, nonobviousness challenges predominate across all major technology areas. As Figure 4 shows, nearly all IPR petitions include a nonobviousness challenge, whereas the proportion of IPR petitions that include a novelty challenge varies considerably by technology. The

116. Figures are presented in Appendix B

117. See generally Bronwyn H. Hall, Adam B. Jaffe & Manuel Trajtenberg, *The NBER Patent Citations Data File: Lessons, Insights and Methodological Tools* 13 (Nat'l Bureau of Econ. Research, Working Paper No. 8498, 2001), <http://www.nber.org/patents> [<http://perma.cc/NY76-VHVV>] (articulating and defining the NBER classification system and its concordance with the U.S. Patent Classification system).

preference for including nonobviousness as a basis for challenge is not surprising. While a novelty-based challenge must rest on a single reference, a nonobviousness-based challenge can presumably take advantage of the ability of PTAB judges to engage in complex reasoning that combines multiple references.¹¹⁸

b) CBM Petitions

Compared to IPR petitions, usage of the CBM procedure has been considerably smaller in scale. Through the end of May 2015, petitioners have filed 362 petitions for CBM review. As Figure 5 shows, these filings have averaged between ten and fifteen petitions per month. Moreover, because CBM proceedings are oriented by definition toward business-method-related technologies such as information and communications, it is unsurprising that an overwhelming majority (82.2%) of CBM petitions challenge Computers and Communications-related patents. Mechanical-related patents make up another 15.9% of CBM petitions, and only a negligible share of CBM petitions fall in any other category. Figure 6 illustrates these trends.

Unlike IPR petitions, CBM petitions may challenge patent claims on a fuller range of patentability requirements: in addition to novelty and nonobviousness, subject-matter eligibility, enablement, written description, and indefiniteness are available grounds. Across this range of options, however, petitioners have focused their attention primarily on subject-matter eligibility and nonobviousness. As Figure 7 shows, 68.6% of CBM petitions challenged the subject-matter eligibility of the patent in dispute, and 71.1% challenged the nonobviousness of the patent. Just under half (48.3%) challenged novelty. By contrast, challenges as to enablement, written description, and indefiniteness each arose in fewer than 20% of petitions.

As with IPR petitions, the relative preference for nonobviousness challenges over novelty challenges in CBM petitions is rational given the greater availability of combining prior art references in evaluating nonobviousness. In addition, the strong preference for subject-matter eligibility challenges is consistent with the widespread view among critics of

118. John Schroeder, *First Ever Inter Partes Review Decision Finds Claims Not Patentable*, LEXOLOGY (Nov. 25, 2013), <http://www.lexology.com/library/detail.aspx?g=d699d660-d5da-4953-af0f-a88e3d3152d2> [perma.cc/CW4C-DGK6] (noting “the general consensus that *inter partes* review may yield better results [than juries in district court litigation] when relying on complex invalidity arguments hinging on a combination of prior art references”).

business method patents that such patents are not just narrowly problematic for inadequate disclosure in the patent specification or lack clarity in the claims—problems that are more the purview of enablement, written description, and indefiniteness—but instead are outside the scope of what should be eligible for patent protection in the first place.¹¹⁹

Beyond these basic PTAB filing trends, we find that a number of patents have been targets of serial challenges spread across both multiple petitions and multiple challengers in IPR petitions. Patents in the Chemical, CCM, and Electrical areas are particularly prone to multiple petitions. As Figure 8 shows, a majority of patents in each of these fields were the subject of multiple IPR petitions: 60.6% of Chemical patents, 50.9% of CCM patents, and 58.4% of Electrical patents. Figure 9 shows how these serial challenges are distributed within technology categories, notably that the highest volume of serial challenges is in the CCM area. We are currently studying the precise nature of these serial challenges (for example, whether they are being brought by the same petitioner) to determine whether they could represent harassment and therefore are problematic from a policy perspective. The frequency of serial challenge to a patent may also be related to the number of defendants against whom the patent is asserted in court.

119. This view was held by Senators Schumer and Kyl, who proposed a version of the CBM provision as part of a floor managers' amendment on March 1, 2011. In his March 2011 Senate floor testimony, Senator Schumer described business method patents as "the bane of the patent world" and castigated the decision the Federal Circuit in *State Street Bank* to allow such patents. 157 CONG. REC. S1363 (March 8, 2011) (statement of Senator Schumer). Among many Senators on the Republican side, positions were equally strong. The Senate Republican Policy Committee's summary of § 18, introduced into the Congressional Record by Senator Kyl, stated (somewhat inaccurately):

Recent court decisions, culminating in last year Supreme Court decision in *Bilski v. Kappos*, have sharply pulled back on the patenting of business methods, emphasizing that these "inventions" are too abstract to be patentable. In the intervening years, however, PTO was obliged to issue a large number of business-method patents, many or possibly all of which are no longer valid. The Schumer proceeding offers a relatively cheap alternative to civil litigation for challenging these patents, and will reduce the burden on the courts of dealing with the backwash of invalid business-method patents.

157 CONG. REC. S1367 (Mar. 8, 2011) (statement of Sen. Kyl); *see also* eBay Inc. v. MercExchange, L.L.C., 547 U.S. 388, 396–97 (2006) (Kennedy, J., concurring) (emphasizing the "nature of the patent" as a newly relevant consideration in enforcement and accusing business method patents in particular of "potential vagueness and suspect validity").

We turn next to the general question of the relationship between patent challenges at the PTAB and patent litigation in the district courts.

2. *Article III Litigation*

Contemporaneous with petitions for IPR and CBM review in the USPTO, patent litigation in the federal courts has continued apace. To investigate the interaction between these two fora, we collected data on all 24,162 patent cases filed between September 16, 2011, and June 30, 2015, in the federal district courts.¹²⁰

Many of these cases involved multiple patents-in-suit, and we observed a total of 47,764 patent assertions across these cases,¹²¹ or an average of 1.98 assertions per patent case. Figure 10 shows the trend in patent cases over this period rising from 150 case filings per month in September 2011 to an average of over 500 case filings per month by June 2015. These petitions have also been distributed unevenly across technology areas. Figure 11 shows that patent cases have predominantly involved CCM-related patents, which far outpace all other technology areas, and that this trend has persisted from the start, with cumulative filings in CCM-related patent cases rising considerably faster than in all other technology areas.¹²²

During this time, a total of 14,218 patents were either challenged in an IPR or CBM petition, asserted in litigation, or both. A subset of 11,787 patents were involved in litigation alone; 324 patents were involved in a USPTO proceeding alone; and 2,107 patents were involved in both. Accordingly, about 15.2% of litigated patents are also being challenged in the PTAB,¹²³ and about 86.7% of IPR- or CBM-challenged patents are also being litigated in the federal courts.¹²⁴

120. We chose September 16, 2011 as our starting date for district court litigation because it represents the first date on which patents asserted in litigation could become the subject of a PTAB filing. Consistent with our interest in examining the interaction between assertion by patent owners and PTAB petitions, we excluded declaratory judgment actions. In any event, as discussed in the text, the AIA essentially makes declaratory judgment actions unavailable to those who file PTAB petitions. *See supra* Part I.

121. Though the data that we collected include cases where design and plant patents were asserted (either exclusively or together with utility patents), we focus our analysis on utility patents.

122. Because district court cases can (and frequently do) involve multiple-patents in a single suit—unlike IPR or CBM petitions, which are necessarily limited to a single patent—we calculate technology trends by aggregating a technology's relative share among the patents that were asserted in each case. For example, a patent case involving three CCM patents and two Electrical patents would have been counted as 0.6 of a CCM case and 0.4 of an Electrical case.

123. This is calculated as $2107 / (2107 + 11787) = 15.2\%$.

124. This is calculated as $2107 / (2107 + 324) = 86.7\%$.

These measures suggest validity challenges in the USPTO are, indeed, connected with the threat or fact of infringement litigation, for a large majority of challenged patents are also asserted in court. Indeed, our measures may *understate* the connection the connection between Article III litigation and assertion at the PTAB. According to Lex Machina analytics, of the patent cases filed in the U.S. district courts during the time period that we studied, 70.2% were likely settled. Moreover, three-quarters of those likely settlements occurred within 9.9 months. This pattern of likely settlement may have been prompted, at least in part, by a defendant's threat to file a challenge at the PTAB. In addition, typically only 10% of patent lawsuits reach the stage at which they would receive a claim construction ruling. This 10% figure is in line with our finding that 15.2% of litigated patents are being challenged in the PTAB. It is worth noting that a patent challenged at the PTAB would receive an early claim construction at the institution stage in the IPR/CBM process. That said, we do not imply that the same 10% of patent cases that reach the claim construction stage in district court are also the same patents that are the subject of a challenge at the PTAB.

Our data indicate that patents challenged in the PTAB are, on average, also asserted at least three times in court. As Figure 12 indicates, however, this average reflects considerable variation (as shown by the error bars representing one standard deviation of the mean). At least when the group of patents involved in IPR and CBM proceedings is considered as a whole—that is, without disaggregation by technology and district court—the relationship between the number of IPR or CBM petitions that were filed on a patent and the number of times that the patent was asserted in district court is not monotonic. Finally, of course, most patents asserted in district court are not challenged at the PTAB.

To further investigate the relationship between PTAB challenges and Article III assertions, we evaluated a series of measures constructed from the underlying data.

a) IPR and CBM Reviews with Litigation in the Offing

In light of the intended uses of IPR and CBM review as substitutes for federal court litigation, notably, in a number of cases, a given patent was challenged in a PTAB petition *before* that patent was asserted in litigation. This is a relatively rare occurrence. As of June 30, 2015, 2107 patents have been the subjects of both a PTAB challenge (either in IPR or CBM) and of district court litigation. Only fifty-eight of these patents (2.75%) were challenged in district court litigation simultaneously with or after the first PTAB challenge, rather than before.

Their small number notwithstanding, these cases arguably represent a challenge to the standard model of a PTAB challenge as a substitute for ongoing litigation. However, a relatively small variation to that standard model could encompass the case where litigation was actually imminent. In other words, in these circumstances the filing of a petition in the PTAB was similar to a declaratory judgment action. That is, indeed, what we find. Of the fifty-eight patents that were challenged in the PTAB before any litigation, forty-seven patents (81.0%) were challenged by petitioners who were subsequently named as defendants in federal court litigation over the same patents.

b) IPR and CBM Reviews with No Related Litigation

Another phenomenon that must be reconciled with the standard model is that some patents are challenged in the PTAB but have not been observed in litigation at all, either before or after the petition for IPR or CBM review. Though a PTAB validity challenge is a reasonable substitute for litigation that has already begun or is imminent, it may be a potentially counterproductive approach for anyone else:¹²⁵ particularly in the case of an IPR (where, as contrasted with the CBM review, the petitioner does not have to be charged in any way with infringement), such a challenger might simply raise unwanted attention to its potentially infringing activities. Indeed, IPRs or CBM reviews with no related litigation are a somewhat rare occurrence. As of June 30, 2015, only 324 patents (13.3% of all patents challenged in the PTAB) have been challenged in the PTAB with no related litigation observed in the federal courts. But even the existence of such a subset might be considered peculiar.

There are several potential reasons for this unexpected subset. One is statistical censoring: the PTAB challenges are simply so recent that the patent owner has not filed responsive litigation yet, but may do so in the relatively near term. Censoring, however, does not appear to explain the subset fully. Petitions on such “PTAB-only” patents have been filed from the earliest days of IPR and CBM review in September 2012. Of the 324 patents challenged in the PTAB with no related litigation, 163 (50.3%) had been challenged in petitions filed more than one year before June 30, 2015 – that is, in or before June 2014. In other words, many of the patent owners

125. For example, the filing fees for IPR are \$9,000 at the petition stage and \$14,000 at the post-institution stage. 37 C.F.R. § 42.15(a). The filing fees for CBM review are even higher: \$12,000 at the petition stage and \$18,000 at the post-institution stage. 37 C.F.R. § 42.15(b). Contemporaneous estimates of average attorney costs were over \$130,000. Olga Berson, *Challenging Patent Validity Under the AIA: Strategic and Tactical Considerations When Deciding Whether to Pursue Ex parte Reexamination or Inter Partes Review As Part of the Overall Litigation Strategy*, 2012 WL 6636452, *12 (2012).

have had ample time to bring infringement actions against the petitioners who filed for IPR or CBM review and have not yet done so. So it is still possible, but increasingly unlikely, that a patent owner who has not asserted a patent against an IPR or CBM challenger will do so now.

A second possible reason for this phenomenon is statistical selection, including technology-specific selection: where a PTAB validity challenge is sufficiently strong, and a patent owner's countervailing infringement claim against the PTAB challenger is sufficiently weak, an invalidity challenge might arise without any corresponding infringement assertion. This kind of selection effect, however, would require that both parties have information *ex ante* about the relative merits of each other's case, *i.e.*, about the boundaries and legal viability of the patent in dispute, that is both adequate and roughly symmetric. Such *ex ante* clarity may be possible for Chemical and Drugs and Medical patents, where technical nomenclature is standardized and the boundaries of the invention are amenable to delineation.¹²⁶ *Ex ante* clarity may even be possible for Electrical and Mechanical patents if the patent discloses sufficiently detailed structural information. However, patents on CCM inventions that are claimed in functional terms would be much less likely to provide enough *ex ante* clarity that a PTAB challenge would be so plainly strong, and a retaliatory infringement suit so plainly weak, as to produce an IPR or CBM review with no litigation in response.

Additionally, in at least some technology areas, the number of patents that are clearly "important" as a matter of potential litigation risk may be relatively small and easy to identify. Particularly in the context of IPRs (which can be filed even without any assertion of infringement on the part of the patentee), the high volume of CCM-related patents may make it unclear which patents are most important.

The data are consistent with technology-specific selection effects across the three subsets of (1) patents that were only challenged in the PTAB, (2) patents that were only asserted in litigation, and (3) patents that were both challenged in the PTAB and asserted in litigation as summarized in Figure 13. Comparing PTAB-only patents with district court-only patents, the technology distributions were mostly similar. In both subsets, CCM patents accounted for about a third (32.8% and 37.1%, respectively); Drugs and Medical patents about a fifth (20.6% and 19.7%, respectively); Electrical

126. Peter S. Menell & Michael J. Meurer, *Notice Failure and Notice Externalities*, 5 J. LEGAL ANALYSIS 1, 36 (2013). Indeed, in the case of certain drugs (so-called small molecule drugs), patents asserted to cover the drug are specifically on the FDA "Orange Book."

patents a little less than a seventh (13.9% and 11.3%, respectively); and Mechanical patents a little more than a tenth (11.5% and 10.1%, respectively).¹²⁷ Only Chemical patents occupied a significantly greater share of PTAB-only patents (12.5%) than of district court-only patents (4.9%).¹²⁸

The most notable difference was for patents that were both challenged in the PTAB and asserted in district court. A majority of these PTAB-and-district-court patents (54.7%) were in the CCM technology area, as compared with 32.8% of PTAB-only patents.¹²⁹ This underrepresentation of CCM patents in the PTAB-only group is consistent with the expected lower likelihood that CCM patents offer enough *ex ante* clarity and evidence of importance to produce PTAB challenges in situations where there is no federal court litigation.

Having considered the special cases of PTAB validity challenges that either precede a district court litigation or have no related litigation at all, we now turn to the standard model of PTAB validity challenge as a direct response by a defendant in prior infringement litigation.

c) CBM and IPR Challenges As Direct Self Interest

As we have discussed, a defendant that challenges a patent's validity in the USPTO *after* the patent has been asserted in litigation is the standard use of CBM and IPR petitions. The USPTO's expertise substitutes for the generalist orientation of the courts. We find that, overall, CBM and IPR petitions are in fact predominantly assertions of the petitioners' own direct interests with respect to infringement liability on the particular patent being challenged.

In the majority of cases, petitioners for CBM review have previously been defendants in federal court litigation where the same patent was asserted. Two related measures support this finding. One is the share of CBM *petitioners* (77.9%) who have previously been defendants in district court litigations involving the patents they later challenge in CBM review. The other is the share of CBM *petitions* (82.7%) in which at least one petitioner was previously a defendant as to the patent now being challenged. These results are perhaps unsurprising, as CBM petitions can only be

127. These differences were not statistically significant ($p > 0.05$ using a two-tailed test of proportions).

128. Conversely, "Other" patents occupied a greater share of district court-only patents (16.9%) than of PTAB-only patents (8.8%).

129. This difference was highly statistically significant ($p < 0.0001$ using a two-tailed test of proportions).

brought by those sued for, or charged with, infringement. Additionally, though it is not particularly meaningful to speak of technology differences among CBM petitions,¹³⁰ Figures 14a and 14b show that the finding also persists for each NBER technology category.

Similarly, in the case of IPRs, the majority (70%) of IPR petitioners have previously been defendants in district court litigations involving the patents they now challenge. The remaining 30% of cases in which petitioners are not prior defendants do, however, represent an interesting puzzle, particularly if one looks across technologies, and also at the percentage of petitions in which at least one petitioner was previously a defendant. We turn next to this puzzle.

d) IPR Challenges by Entities That Were Not Prior Defendants

As Figure 15a shows, the percentage of IPR petitioners who were not prior defendants varies substantially across technologies. Notably, because only about 48% of petitioners in the Drugs and Medical area have previously been sued, over half of all petitioners in this technology are non-standard. In some cases, generic firms may be filing even prior to being sued in order to clear the path toward eventual entry into the market. In other cases, we know from reading IPR petitions to identify petitioners that third parties have been active. One active third party is J. Kyle Bass, the principal of Hayman Capital Management and of the Coalition for Affordable Drugs, who, as of June 30, 2015, had filed at least twenty-eight petitions.¹³¹ Another is Erich Spangenberg, the chief executive of the IP Navigation Group and of nXn Partners, who is a co-petitioner on those twenty-eight petitions.¹³² Both Mr. Bass and Mr. Spangenberg have thus far focused their validity challenges entirely on Drugs and Medical-related patents.

Figures 15a and 15b also reveal substantial disparities in certain technology areas between the share of *petitioners* who were previously sued and the share of IPR *petitions* with at least one petitioner who was previously

130. This is because the availability of CBM review is defined, and limited, by technology, and as a result, CCM patents have accounted for 82.2% of all CBM Petitions, with 15.9% coming from Mechanical patents and 1.9% from Other patents. *See infra* Figure 6.

131. Joseph Walker & Rob Copeland, *New Hedge Fund Strategy: Dispute the Patent, Short the Stock*, WALL ST. J., Apr. 7, 2015, <http://www.wsj.com/articles/hedge-fund-manager-kyle-bass-challenges-jazz-pharmaceuticals-patent-1428417408> [<http://perma.cc/X26M-53QM>].

132. David Segal, *Has Patent, Will Sue: An Alert to Corporate America*, N.Y. TIMES, July 13, 2013, <http://www.nytimes.com/2013/07/14/business/has-patent-will-sue-an-alert-to-corporate-america.html> [<http://perma.cc/R2X6-8D49>].

a defendant on the challenged patent. Specifically, the petitioner vs. petition disparities are quite substantial in the categories of Drugs and Medical (48.5% vs. 70.8%), Mechanical (53.1% vs. 70.2%), and Other (65.5% vs. 82.6%). The disparities reveal that, in each of these technology areas, petitioners who are not prior defendants are joining petitions filed by prior defendants.

Arguably, this collective action is socially beneficial, as it directly addresses the general collective action problem in challenging invalid patents.¹³³ However, to the extent collective action takes the form of serial petitions that are joined later to the petition of a prior defendant, it could be seen as harassment and delay. Currently, our data do not allow us to determine exactly *when* nondefendant petitioners are joining the petitions of defendants. PTO regulations do require, however, that a joinder request be filed no later than one month after the institution date of any *inter partes* review for which joinder is requested.¹³⁴ In ongoing research, we are parsing the joinder data more finely to look at timing and how the regulations are being applied.

In this regard, it bears mention that fostering collective action is the explicit mission of organizations such as Unified Patents, which files patent validity challenges on behalf of its member companies in order to reduce their patent litigation risk.¹³⁵ We expect that, in order to be effective, such member-based organizations would likely file significant numbers of IPR petitions and focus their efforts largely on a single technology area. During the time period of our study, Unified Patents had, for example, filed at least twenty-four petitions of which seventeen (71%) are against CCM-related patents.

e) Timing Between the Courts and the USPTO

Closely related to the “non-standard” petitioner issue is the question of time lag between Article III assertion and PTAB challenge. Unless the petition includes a request for joinder, a petitioner cannot file an IPR challenge more than a year after it has been sued for infringing a particular patent.¹³⁶ As a result, administrative validity challenges filed more than one year after the last federal court lawsuit prior to a petition are likely to reflect either non-standard petitioners and/or petitioners seeking joinder to earlier petitions.

133. See *supra* text accompanying notes 36–38.

134. 37 C.F.R. § 42.122(b).

135. UNIFIED PATENTS INC., <http://www.unifiedpatents.com/faq> [<http://perma.cc/K4XC-4Y23>].

136. See 35 U.S.C. § 315(b).

To investigate these issues further, we measured the time lag between the first IPR petition on a given patent and the federal court litigation on that patent filed *most recently prior* to the first IPR petition. (By definition, the first IPR petition cannot request joinder.) As an additional frame of reference for these results, we calculated the lag between the first IPR petition on a given patent and the *earliest* observed federal court litigation on that patent. The latter measure takes a broad view of how court-agency lags are distributed and is likely to contain a small, but non-trivial, number of instances where the lag is greater than one year. The reason is that, for repeatedly-asserted patents, the first defendant sued need not be the one that mounts a validity challenge in the USPTO.

As Figure 17 shows, quite a few patents fit this latter profile: nearly a quarter of the distribution (23.4%) exceeds the one-year lag from the earliest observed federal court litigation on a given patent, reaching upwards of three years for some patents. Notably, a small share of patents, roughly 3.3%, shows a negative lag indicating the first IPR petition against the patent *preceded* the first federal court assertion of the patent¹³⁷ For these patents, administrative validity challenges are not defensive in the traditional sense, as no offensive litigation has yet been observed; rather, they are, at most, preemptive. Most IPR petitions, however, fall within the zero-to-one-year range, distributed symmetrically about a median lag of six months, with a modal spike at the one-year deadline.

Meanwhile, measuring from the *last* pre-IPR federal court lawsuit to the first IPR petition is likely to capture not only non-standard petitioners but also cases where earlier lawsuits against others have revealed useful information about the patent owner's enforcement strategy so that less time is needed to decide whether and how to prepare an IPR challenge. This is, in fact, what the data reveal in Figure 18. The majority of cases fall again within the zero-to-one-year range, but with a median lag roughly four months less than in Figure 17. A far smaller share of the distribution (11.4%) exceeds one year—presumably this 11.4% comprises non-standard petitioners only. As before, a modal spike near and at a one-year lag indicates that litigants wait for the statutory deadline.

These direct and indirect measures suggest that challenges to patent validity through *inter partes* review are primarily—though not exclusively—a defensive response to existing litigation. In most cases, a prior defendant files an administrative challenge. Other entities, acting on this revealed information, may also respond with petitions for validity review.

137. As we have discussed, these preemptively-challenged patents may reflect litigation in the offing or else no related litigation. See *supra* Sections III.A.2.a-b.

We now turn to another aspect of strategic behavior in patent litigation that has previously presented policy concerns: the tendency of patent cases to be filed disproportionately in a few judicial districts, so much so that these districts are now widely identified with patent litigation.

f) District-Specific Effects

Skewed distribution of patent litigation toward particular high-volume judicial districts and litigant forum-shopping, which not only results from this skew but also contributes to it, are well documented.¹³⁸ It is likely, then, that such leading patent courts should send commensurately greater numbers of patents into PTAB validity challenges as well. Yet in this regard, the data show a surprising effect. Of the eight leading district courts—which together account for nearly 70% of litigated patents during the observed time period—the top three courts were *overrepresented* in sending patents into PTAB validity challenges, and the remaining five were *underrepresented*.

Figure 16 depicts the fraction of *all litigated patents* that were litigated at least once in a given court and the fraction of all *IPR-challenged patents* that were litigated at least once in the same court, across the top eight districts for patent litigation. The latter fraction was significantly higher than the former for the District of Delaware (41.1% vs. 34.4%), the Eastern District of Texas (41.4% vs. 28.5%), and the Northern District of California (21.6% vs. 15.2%),¹³⁹ indicating that patents litigated in those districts were unusually likely to be challenged in *inter partes* review. The effect was reversed for the other high-volume patent districts, including the Central District of California (14.1% vs. 16.0%), the District of New Jersey (10.0% vs. 13.0%), and the Northern District of Illinois (4.8% vs. 9.6%).¹⁴⁰

The great disparity we see in the Eastern District of Texas is unsurprising—the court's strong pro-patentee reputation¹⁴¹ would be expected to drive defendants to a more strategically favorable forum. This effect is likely in spite of the apparently low likelihood of defendants either

138. See generally notes 29–34 and accompanying text.

139. These differences were highly significant ($p < 0.0001$ using a two-tailed test of proportions).

140. These differences were all significant as well ($p < 0.05$ using a two-tailed test of proportions).

141. See, e.g., Vishnubhakat, *supra* note 31, at 65 (discussing the reputation of the Eastern District of Texas for producing pro-patentee outcomes).

filing or being granted stays in the Eastern District of Texas.¹⁴² In the cases of the District of Delaware and the Northern District of California, the reasons for disproportionately high IPR filings are less clear. Defendants may be encouraged, however, by the high rate of stay grants in these districts.¹⁴³

B. AGENCY DECISIONS

When petitioned, the PTAB must decide whether to institute an IPR or CBM review on the grounds petitioned. If it decides to institute a review, the PTAB must then adjudicate the case on its merits. Decisions on institution and on the merits are interdependent in that the legal standard for instituting an IPR is whether the petitioner is reasonably likely to succeed as to at least one claim, and the legal standard for instituting a CBM review is whether the petitioner is more likely than not to prevail as to at least one claim.¹⁴⁴ Therefore, the rates of institution are particularly important because the very fact of institution is, by statutory design, a credible signal about the ultimate outcome of the validity challenge.

In the case of IPR, an early study that examined petitions filed as of March 31, 2014 found that, of those petitions that had reached an institution decision by the time of the authors' analysis in late 2014, 84.0% had been granted as to at least one challenged claim.¹⁴⁵ Our analysis, which runs through June 30, 2015, confirms this point estimate but reveals a slow and consistent decline in the institution rate. Figure 19 compares over time (1) the running total number of IPR petition filings, (2) the running total number of institution decisions, and (3) the running total number of institution decisions granting at least one challenged claim. Calculating the institution rate as (3) divided by (2) over time, Figure 20 shows that the rate has been declining and is currently 74.8%.

The earlier study also found that 74.0% of at-least-partially instituted petitions were fully instituted. Our data conflict on this point. We find that 41.2% of at-least-partially instituted decisions made on petitions filed by March 31, 2014 were fully instituted.¹⁴⁶ As of June 30, 2015, 51.4% of at-

142. *PTAB Stay Stats: 2012 to May 31, 2015*, WINSTON & STRAWN LLP, <http://www.winston.com/en/thought-leadership/winston-publishes-stats-on-ptab-stays.html> [<https://perma.cc/3W7H-Y3Q4>].

143. *Id.*

144. See 35 U.S.C. § 324(b), *supra* note 91; LEXMACHINA, *supra* note 110, and accompanying text.

145. Love & Ambwani, *supra* note 3, at 100.

146. With respect to petitions filed by March 31, 2014, we observed 851 IPR institution decisions (roughly similar to the 823 in the earlier study) and 699 decisions

least-partially instituted petitions were fully instituted, and 38.4% of petitions that received an institution decision were fully instituted. These trends are summarized in Figure 21.

In addition to general institution rates, we also disaggregate institution rates by technology area and by the grounds on which patent validity was challenged. Figure 22 shows the rates at which institutions are granted and denied across technologies for petitions arguing a lack of novelty. Petitions on Drugs and Medical-related patents have a 59.9% likelihood of being denied,¹⁴⁷ and in all other technologies, petitions are as likely as not to be instituted ($p > 0.05$). Figure 23 shows the rates at which institutions are granted and denied across technologies for petitions arguing a lack of nonobviousness. Perhaps not surprisingly, given the ability of expert judges to combine multiple references, nonobviousness petitions are more likely than not to be instituted across all technology areas. Nonobviousness challenges to Chemical patents are particularly likely to be granted, with an institution rate of 68.5%.¹⁴⁸

Meanwhile, for CBM petitions, comparing technology categories is not particularly meaningful, as the definition of covered business method patents in practice overlaps substantially with CCM-related patents. Instead, because CBM review allows the full range of legal grounds on which to challenge validity¹⁴⁹ and because petitioners themselves have availed themselves of these grounds to varying degrees,¹⁵⁰ comparing the rates at which CBM petitions have been instituted with respect to each of these grounds is more meaningful.

Figure 7 previously showed that subject-matter eligibility under § 101, novelty under § 102, and nonobviousness under § 103 were the major grounds on which CBM petitions have been filed whereas the enablement, written description, and definiteness requirements of § 112 have been employed relatively infrequently. Because CBM review arose out of categorical resistance to business methods as patent-eligible subject matter,

granting at-least-partial institution (roughly similar to the 691 in the earlier study). These small discrepancies may arise in part because we had the benefit of observing PTAB actions on petitions over a longer time horizon. Truncation does not, however, explain our disparate findings on rates of full institution.

147. The differences between respective likelihoods of grant and denial are highly significant ($p < 0.001$ using a two-tailed test of proportions).

148. The differences between respective likelihoods of grant and denial are significant ($p < 0.05$) for Mechanical-related petitions, and highly significant for all other technologies ($p < 0.005$). Comparisons use a two-tailed test of proportions.

149. See 35 U.S.C. § 315(a)(2); Frontz, *supra* note 103; *supra* note 108.

150. See *infra* Figure 7.

and inception of CBM review coincided with Supreme Court decisions substantially strengthening patent eligibility requirements, we expected that subject-matter challenges would be the most fertile ground for decisions to institute CBM petitions. We expected that the remaining grounds would be likely to garner fewer PTAB institutions, though in the particular case of nonobviousness, the higher standard imposed by the Supreme Court's 2007 decision in *KSR Int'l Co. v. Teleflex Inc.*¹⁵¹ might have an impact.

Figure 24 confirms our hypothesis that subject matter eligibility would dominate the CBM procedure. Subject matter eligibility-based CBM petitions are overwhelmingly instituted, at a rate of 70.9%.¹⁵² For all other grounds, decisions *not to institute* predominate by large margins: challenges based on novelty were denied at a rate of 59.3%; nonobviousness, 56.9%; enablement, 100%; written description, 71.7%; and definiteness, 64.7%.¹⁵³

C. COURT DECISIONS

While the USPTO evaluates and decides invalidity petitions, federal courts must decide how to manage ongoing patent infringement litigation on which these validity challenges can have considerable impact. The most frequent decision for courts is when to issue a stay. The ability of defendants to obtain litigation stays pending the outcome of validity challenges is a powerful strategic consideration in managing both the immediate cost of litigation and the eventual threat of liability. Conversely, the tendency of courts to grant such stays is a powerful strategic consideration for patent owners to enforce their rights effectively and deflect potential harassment and abuse by challengers.

Table 1. Results of Motions to Stay Pending *Inter Partes Review*

<i>Inter Partes Review</i>	Fully Denied	Denied without prejudice	Denied in part granted in part	Granted
Motion to Stay Pending <i>Inter Partes Review</i>	67	47	22	113
Renewed Motion to Stay Pending <i>Inter Partes Review</i>	2	0	2	11
Stipulated/Agreed Motion to Stay Pending <i>Inter Partes Review</i>	0	2	2	1
Sua Sponte Motion to Stay Pending <i>Inter Partes Review</i>	0	0	0	1
Subtotal	69	49	26	126
Share	25.6%	18.2%	9.63%	46.7%

151. 550 U.S. 398 (2007).

152. The difference between likelihoods of grant and denial is highly significant ($p < 0.0001$ using a two-tailed test of proportions).

153. The differences between likelihoods of grant and denial were all significant ($p < 0.05$) and in many cases highly significant ($p < 0.005$) using a two-tailed test of proportions.

Table 2. Results of Motions to Stay Pending Covered Business Method Review

CBM Review	Denied	Denied without prejudice	Denied in part granted in part	Granted
Motion to Stay Pending CBM Review	12	7	9	26
Renewed Motion to Stay Pending CBM Review	1	0	0	7
Sua Sponte Motion to Stay Pending CBM Review	0	0	0	1
Subtotal	13	7	9	34
Share	20.6%	11.1%	14.3%	54.0%

Tables 1 and 2 provide basic statistics regarding motions for stays pending IPR and CBM proceedings, as well as federal court adjudications of such motions. As the statistics indicate, full denials of motions to stay (as contrasted to the combined total of “denials without prejudice,” partial grants, and grants) are relatively rare, particularly in the context of CBM reviews.

III. DISCUSSION

Our analysis yields several “top-line” findings regarding strategic choices by parties in PTAB proceedings. Most patents challenged at the PTAB are also in Article III litigation—PTAB petitions on patents that are not being litigated by any entity in an Article III court are relatively rare. Moreover, the standard substitution model – wherein a petitioner files a patent challenge at the PTAB after it has been sued on that patent in district court is operative not only in the CBM context but also in the majority (70%) of PTAB IPR cases. The high prevalence of standard substitution has clear implications for how the PTAB should conduct claim construction. In those cases where a patent claim is upheld by the PTAB, a claim construction standard that parallels that of the district court would increase efficiency, as the district court could rely on the PTAB claim construction in any subsequent proceedings.¹⁵⁴ Our findings on substitution are thus

154. Indeed, if the claim construction standards used by the PTAB and the district court were the same, and the parties involved in the two fora were the same, the doctrine of issue preclusion might *mandate* district court reliance upon the prior PTAB claim construction. In *B&B Hardware, Inc. v. Hargis*, 135 S.Ct. 1293 (2015), the Supreme Court recently held that issue preclusion applied when the same parties were litigating in district court a “likelihood of confusion” issue that had previously been decided at the USPTO’s Trademark Trial and Appeal Board. Identical claim construction standards could also mean that if the district court had issued a claim construction prior to the PTAB, the PTAB could rely on the district court construction. As a practical matter, however, because of the time that generally elapses before district court claim construction, and because PTAB claim construction occurs at the time of the institution decision, district court claim construction is unlikely to precede claim construction by the PTAB.

directly relevant to the claim construction dispute currently being litigated at the Supreme Court in *Cuozzo Speed Technologies v. Lee*.

If there is no Article III litigation, CCM patents are *particularly* unlikely to be challenged at the PTAB. In this area of technology, district court assertion may be necessary to force parties to overcome several technology-specific barriers to a petition. These barriers may include an absence of clarity regarding the merits of a validity challenge created by lack of boundary notice, as well as informational hurdles created by the sheer volume of CCM patents.

Just as Article III litigation disproportionately accompanies PTAB petitions on CCM patents, IPR petitions in the CCM field appear to be brought largely by the same entities that are defendants in Article III litigation. Both the share of CCM petitions involving at least one prior Article III defendant (81.5%) and the share of CCM petitioners who are themselves prior defendants (76.3%) are quite high. This result suggests that non-standard petitioners are, at least thus far, playing a relatively modest role in IPR petitions brought against CCM patents. Thus, to the extent we see a substantial amount of serial petitioning in the CCM area, this is being generated by prior defendants.

The most significant role for non-standard petitioners is in the Drugs and Medical area. For Drugs and Medical-related challenges, previously sued defendants make up only a minority of petitioners (48.5%). Non-standard petitioners also appear to be engaging in significant collective action with standard petitioners. A substantial majority (70.8%) of petitions in this area contains at least one petitioner who has previously been sued. Litigation defendants in the Drugs and Medical field are clearly bringing aboard entities that have not yet been sued. In order to address policy implications (e.g., whether it is socially beneficial collective action or possible harassment), we are currently investigating the important policy question of precisely *when* these other entities are getting on board.

In addition to technology-specific effects, we see district-specific effects. To a statistically significant degree, patents litigated in the “top three” district courts—the Eastern District of Texas, the District of Delaware, and the Northern District of California—are more likely to be the subject of an IPR than patents litigated in other districts. The statistically and numerically significant results for the Eastern District of Texas are unsurprising. Whether or not judges in the Eastern District grant stays for ongoing litigation (and the available data suggest defendants are less likely to seek or be granted stays than in other districts), the Eastern District’s “pro-plaintiff” reputation makes filing a PTAB petition an obvious choice for any defendant. In the case of Delaware and the Northern District of

California, the reasons for disproportionately high IPR filings are less clear. Defendants in those districts may be encouraged, however, by the high rate of stay grants in these districts.

Agency decision-making also exhibits some interesting patterns. Perhaps because high early rates of institution spurred petitioners to challenge somewhat stronger patents, the overall institution rate has decreased over time. Agency decision-making also exhibits differential patterns across technology: specifically, IPR institution rates are significantly higher for CCM patents than for Drug and Medical patents. Meanwhile, nonobviousness represents a stronger ground for securing a favorable institution decision on an IPR than novelty. As for CBM reviews, § 101 is clearly the best route for challengers.

In current ongoing work, we are investigating both more intensively and more formally the interrelated questions of collective action and potential harassment. Specifically, we are investigating the precise nature and timing of the collective action undertaken both by petitioners that are prior defendants and those that are not prior defendants. We are also interested in whether non-defendant petitioners do in fact become defendants at a later point in time. Additionally, we are developing regression models that assess, conditional on assertion in litigation, what factors influence the likelihood and frequency of a patent being challenged at the PTAB.