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Characteristics of Patent Examiners Who Issue Litigated / Invalidated Patents

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S. Sean Tu is a Professor of Law at the West Virginia University College of Law. Professor Tu’s research focuses on the empirical analysis of patent examiner behavior. He has published numerous articles in the area including three books and articles in journal such as the Stanford Technology Law Review, the Duke Law and Technology Review, and the Vanderbilt Journal of Entertainment and Technology.

In a set of two studies, I determine: (1) which examiners are sending patents to litigation and, of those, (2) which examiners are sending invalidated patents to litigation. Together, these studies determine what conditions might predict the likelihood of an examiner’s patents getting litigated or invalidated. Somewhat surprisingly, just because an examiner issues a higher percentage of patents does not mean he will have a similarly higher percentage of invalidated patents.

Patent litigation can act as a mechanism to “correct” erroneously granted patents. Patent trials are expensive and can cost about $700,000 for cases with less than $1 million at risk and as much as $4 million for cases with $25 million or more at risk. Furthermore, patent trials can take a long time, with approximately 2.5 years for a patent case to even get to trial. Accordingly, litigation can be a costly and time-consuming process used to correct erroneously granted patents. A better and more cost-effective way to prevent costly litigation is to prevent erroneously granted patents from ever entering the marketplace in the first place.

Examiners who are just out of the primary signatory authority program, and thus are no longer under strict review, are the examiners who disproportionately issue litigated patents and litigated patents that are later found invalid. Interestingly, my studies found that the highest volume primary examiners (examiners who, on average, grant more than one hundred patents per year and have more than ten years of experience) issue very few litigated patents that are later found invalid. Examiners issuing the most patents are actually permitting “better” patents—ones that are unlikely to be litigated or invalidated. These data suggest that the PTO should “reset” the docket for those primary examiners who recently gained full signatory authority to prevent allowance of later invalidated patents.

I. Background

Like Saint Peter standing at the Pearly Gates, the USPTO’s mission is to allow “good” patents to issue while preventing “bad” patents from getting to the marketplace. However, unlike Saint Peter, examiners do not work miracles and can make mistakes based on the information that they are given and the time constraints they work under. Accordingly, it is important to understand the characteristics of those who issue good patents and those who disproportionately issue bad patents. Once we know which examiners are issuing invalidated patents, we can determine if there are common characteristics associated with these examiners so that we might target their dockets for further review to prevent more bad patents from issuing.

II. Datasets

In two previous studies, I created three new patent databases. The first database included approximately 1.7 million patents (every patent issued from 2001 to 2012) and their corresponding examiners. The second database included approximately 12,000 patents that were litigated between 2010 and 2011. The third database segmented the 12,000 litigated patents to just those patents that were found invalid. These datasets were then combined and assembled to include information about: (1) the litigation, (2) the patent, and (3) the examiner(s) associated with the litigated patent. The following data were collected from litigation records:

1. Case name, citation, and termination date;
2. Whether the patent was held valid or invalid;
3. Whether the patent was infringed or non-infringed;
4. Whether the court decided litigated validity issues based on:
   a. Enablement;
   b. Written description;
   c. Best mode;
   d. Claim indefiniteness;
   e. Patenable subject matter;
   f. Utility;
   g. Section 102 prior art;
   h. Section 102 non-prior art;
   i. Obviousness;
   j. Double-patenting;
   k. Incorrect inventorship; or
   l. Inequitable conduct or latches;

5. If a prior art reference was cited in a 35 U.S.C. § 102 or § 103 rejection, what type of reference was cited (US patent, US published patent application, foreign patent, foreign published patent application, non-patent literature, or foreign non-patent literature);

6. If a prior art reference was cited in a 35 U.S.C. § 102 or § 103 rejection, whether the prior art reference was cited in the prosecution history; and

7. If the prior art reference was cited in the prosecution history, whether the prior art was interpreted differently by the court.

As an initial matter, it is important to note that the examiner data covers only the years from 2001 to 2012. Accordingly, if an examiner had years of experience prior to 2001, it is not captured by this dataset. If an examiner had more than eleven years of experience, the data could only capture the examiner’s work history between 2001 and 2011. Information regarding the examiners includes:

1. Patent numbers, technology center, and art unit;
2. Primary examiner name;
3. Secondary examiner name (if applicable);
4. File date;
5. Issue date;
6. Number of years as a patent examiner as of date when invalidated patent was issued (covers 2001 to 2011 only, so if an examiner joined the USPTO in 2002 and issued a patent in 2006 that was invalidated in 2010, I coded the examiner as having four years of experience);
7. Number of patents issued during the year that invalidated patent was issued;
8. Total number of years as a patent examiner during the 2001 to 2011 period;
9. Average number of patents issued per year (sum total of all patents issued between 2001 and 2012, divided by the number of years examiner was at the office between 2001 and 2011).

Finally, in a previous study, I created a database of every patent issued between 2001 and 2011. Although I coded for both the primary and the secondary examiner (if applicable), the examiner linked with the litigation is the “working” examiner. The working examiner is the examiner who did the most direct work on that application. Thus, the working examiner would be the secondary examiner (if present) or the primary examiner if there was no secondary examiner.

III. Results

The results are broken down into two sections: (1) all litigated patents and (2) invalidated patents.

A. All Litigated Patents

In Figure 1 and Figure 2 below, the dotted line represents the “expected litigation” based on the proportion of patents issued by the examiner. The solid line represents the “actual litigation” rates seen. Thus, when the solid line is above the dotted line, the examiners in that group issue more litigated patents than expected. Conversely, when the dotted line is above the solid line, the examiners in that group issue less litigated patents than expected.

Figure 1 shows that primary examiners can be divided into three distinct populations. The first population, Group 1, includes those examiners who issue patents at a rate below 35 patents per year. This first population of examiners are issuing litigated patents at an only slightly higher-than-expected rate. The second population,
Group 2, includes examiners who issue patents at a rate of between 40 and 65 patents per year. This second population of examiners are issuing litigated patents at a much higher-than-expected rate. The third and final population, Group 3, includes examiner who issue more than 80 patents per year. Group 3 examiners issue patents at a much lower-than-expected rate.

As shown in Figure 2, primary examiners with 3–6 years of experience were issuing a disproportionate number of litigated patents. Surprisingly, it is not the primary examiners with the least experience (less than 2 years) who were issuing the highest number of litigated patents. One explanation could be that when an examiner first becomes a primary examiner, the examiner is still under review and could actually be under higher scrutiny since they are in a program which determines if the examiner should be granted full signatory authority. Thus, primary examiners with only one or two years of experience may be even more careful to only allow “good” cases since they are under additional review for promotion as part of the full signatory authority program.

Certain structural factors, combined with the Preist–Klein type selection may explain the phenomena that primary examiners with 3–5 years of experience have a higher than expected rate of litigated patents. During the first four or five years, when the junior examiner does not yet have full signatory authority, the junior examiner is under heavier scrutiny and her actions are reviewed by a primary examiner as well as Quality Control. During these years, the junior examiner removes easy cases from their docket by allowing the clearly allowable cases or by rejecting the clearly unpatentable cases, which builds up a docket of “on the fence” applications.

Once the junior examiner is promoted to a primary examiner, she is given partial signatory authority while she undergoes a rigorous training process that usually takes between 1 and 2 years. After the training period, she obtains full permanent signatory authority and her work is no longer heavily scrutinized. Production expectations also increase when a primary examiner acquires full signatory authority. The promotion comes with higher pay, higher authority, and a higher productivity rate. Although she is still subject to Quality Assurance reviews, fellow examiners will no longer assess her every issuance and rejection. Thus, these examiners are experiencing a higher workload and a larger docket of “on the fence” applications but with much less support than previously.

Applications that are “on the fence” are already likely to be more litigated than most patents. This is because strong patents could be allowed quickly by the examiner, and competitors probably avoid litigation by licensing these patents. Correspondingly, weak patents might take longer to issue, but would most likely not be litigated because of their weak standing, and competitors may license these patents at a significant discount. However, valuable patents where validity is unclear may require litigation. These more uncertain patents may be issued
at a higher rate when the primary examiner first receives full signatory authority (without supervision), thereby explaining the higher litigation rates in years 3–6.

There are many limitations to this study. First, the database is a broad database but suffers from some selection bias due to the examiner-matching step. Specifically, temporal selection bias occurs in the database since the examiner database contains only those patents that were issued between 2001 and 2012. Accordingly, the few litigations with “older patents” (i.e., those patents issued before 2001) are not included in our database. Additionally, since we only have data starting from 2001, there may be a “left justification” issue. Because we start at 2001, examiners who have worked prior to 2001 (inclusive) will be coded as working less years than they actually have worked. For example, if an examiner started working in 1998 and quit in 2003, our database would code the examiner as working for 3 years, while in actuality the examiner was at the office for 6 years. Accordingly, these results may be slightly positively skewed.

Another limitation is based on the fact that there are many reasons to bring litigation, but many of these reasons may not represent errors by the patent examiner. For example, a patent could be litigated and found invalid because of inequitable conduct. In this situation, the patent examiner may have issued a valid patent based on the fraudulent information given to her by the applicant. Another example deals with a patent that was found valid, but non-infringed. Here, the litigated patent may have been correctly issued, but litigated due to incorrect interpretation of the scope of the claims. Accordingly, simply because a patent is litigated, does not mean that there were errors made at the patent office. I address this issue in my second paper described below.

B. Invalidated Patents

To address the aforementioned limitations, I created a third database that included only those patents that have been litigated to final judgment and found invalid. I then connected these invalidated patents to their corresponding examiners to determine if there are any common characteristics among the examiners who issue invalidated patents. I note, however, that the pool of litigations that are litigated to final judgment reduces the sample size.

Figure 3 shows that approximately one-third of patents litigated to final judgment are found invalid. Most invalidated patents are found in technology centers 1600, 2600, and 2700, which correspond to biotechnology and organic chemistry, communications, and computer science, respectively. Most patents are invalidated on prior art-type novelty and obviousness grounds. This study also determined that: (1) litigated patents mainly come from primary examiners, and (2) primary examiners who grant between thirty and sixty patents per year are issuing a higher number of invalidated patents. Like the “all litigated” patents dataset, the highest volume primary examiners (those who, on average, grant more than one
Figure 3

Invalidated versus Validated Patents

Figure 4

Figure 4 shows that most of the patents that were invalidated in this data set were done so via the prior art language of 35 U.S.C. §§102–03. Approximately 77 percent of the prior art references used to invalidate patents were not found by the US Patent and Trademark Office (USPTO) during examination. Additionally, 38 percent of the prior art references used to invalidate patents were US patents or US patent applications. Of those invalidating references that were US patents or patent applications, approximately 89 percent were not found by the examiner. These data imply that examiners may have failed to fully discover all prior art at the time of issuance and that improving PTO searching could improve patent quality.¹⁷

This study then focused on the prior art because § 102 and § 103 prior art rejections comprised the major method of invalidation in our data set. Specifically, I wanted to determine if the prior art references were being misinterpreted or if the prior art references were not being found by the USPTO. To determine this, I reviewed each of the references used in litigation to invalidate the patent. I then reviewed the prosecution history of each of these patents to see if the examiner found that same reference during prosecution. I looked at all prior art references, which may be foreign patents, US patents, or patent applications, and non-patent literature, in both non-final and...
IV. Conclusions

In many ways, patent quality is tied to not only good patent and claim drafting by the applicant but also to good USPTO examination. These studies attempt to characterize the common traits associated with examiners who issue litigated and invalidated patents. These two studies show that primary examiners with full signatory authority allow the most patents that are litigated and also later found invalid. Primary examiners with 3–5 years of experience issue a disproportionate amount of litigated and invalidated patents.

These studies also suggest that patent searching may play a greater role in improving patent quality. In particular, this study found that patents are invalidated mainly based on prior art references that were not found by either the applicant or the patent examiner. Specifically, 77% of the prior art references used to invalidate patents were not found by the USPTO. In cases where the invalidating prior art was a US patent or US patent application, the invalidating references were not found by the patent examiner 89 percent of the time. Given the ease of examiner access to US patent and US patent application references, this is surprising.

One possible solution to this issue is to divide patent examiners into two separate tracks. One track would focus on searching and finding the most appropriate and relevant prior art references (searching examiners). A second track would focus on generating appropriate office actions based on the prior art received from the searching examiners (office-action generation examiners). This division of labor would have the advantage of specialization, which might increase the quality of both the prior art reviewed during prosecution as well as substantively improving the quality of the office actions. Accordingly, if the USPTO could mimic more experienced high-volume examiners by specialization and division of labor, we might decrease the number of litigated patents that are later held invalid.

3. “Bad” patents are defined as those patents which were issued but later found invalid based on something that could have been prevented at the USPTO. An example of a “bad” patent would be if a patent was found to be invalidated by a piece of prior art that was not discovered during patent prosecution. However, a patent that issued due to inequitable conduct based on an applicant’s fraudulent behavior would not be considered a “bad” patent even though it was a patent that was invalidated after examination by the USPTO.
7. See 35 U.S.C. § 102 (2012) (defining “prior art” as prior art references such as patents, patent applications, or any printed publications).
8. See id. (defining “non-prior art” as including things such as the on-sale bar, public use, or otherwise available to the public).
9. I did not count those years in which an examiner issues one and only one patent. Accordingly, the data set is right censored in that I removed many of the examiners with the lowest allowance rates. Accordingly, I have removed examiners who could fall within these categories: (1) those examiners who were only briefly at the USPTO, but left before issuing more than one patent; (2) those examiners who are primary examiners who mainly review the work of secondary examiners but issued one patent by themselves; (3) those examiners who have issued one patent, but have not issued any since; (4) those examiners hired in December who may have issued only one patent because of the ramp up time, and (5) examiners who came back to the USPTO and needed time to ramp up during their return year. Additionally, these data do not capture those examiners who truly have a zero allowance.
rate, since this data set only records those examiners who have issued at least one patent.


11. Id. at 58.


16. In 2000, technology center 2700 (computers, communication and e-commerce) was split into 2100 (computer architecture, software and information security) and 2600 (communications). See also Office of the Chief Communications Officer, UNITED STATES PATENT AND TRADEMARK OFFICE, http://www.uspto.gov/web/offices/ac/ahrpa/opa/ptotoday/ptotoday11.pdf. S. Sean Tu, Invalidated Patents and Associated Examiners, 18 Vanderbilt Journal of Entertainment and Technology 135, Figure 3 (2015).

17. It is also possible that Defendants seek prior art that was not previously considered by the PTO because it is easier to persuade the jury to invalidate a patent based on a reference that was not previously considered by the PTO. See also John R. Allison and Mark A. Lemley, Empirical Evidence on the Validity of Litigated Patents, 26 AIPLA Q.J. 185 (1998).

18. There may be a selection bias issue if litigators are specifically searching for prior art references that were not considered during patent prosecution.