In Search of the "Right" Reversal Rate at the Board: a Statistical Analysis Using Issue-Level *ex Parte* Patent Trial and Appeal Board Decision Data

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What is the usefulness of *ex parte* appeal decision data from the Patent Trial and Appeal Board (PTAB) to a practitioner or the United States Patent and Trademark Office (USPTO)? USPTO-wide, each *ex parte* appeal decision from the Board issues 13.7 months after the appeal docketing notice[2]. Before the docketing notice, an additional 6-8+ months (based on the author's experience) passes from the filing of the notice of appeal through filing a pre-appeal brief (optional), appeal brief, the examiner's answer, and a reply brief. The time for each of these activities adds up. Decisions by the Board for the period of May – July 2019 likely lagged the issue date of the examiner's final rejection by at least 19.7 – 21.7 months. Given the length of time before a panel of PTAB judges weighs in, the small percentage of final rejections that are appealed, and the even smaller percentage that result in a Board decision, how relevant is *ex parte* appeal data to patent prosecution in the present?

This paper examines practical use of issue-level *ex parte* appeals data in evaluating what the "right" reversal rate by the PTAB of the examining corps. To begin, below is a chart constructed using the PTAB's own reported USPTO-wide outcome data including the percentages of total decisions that are affirmed, affirmed-in-part, and reversed decisions[3456]:

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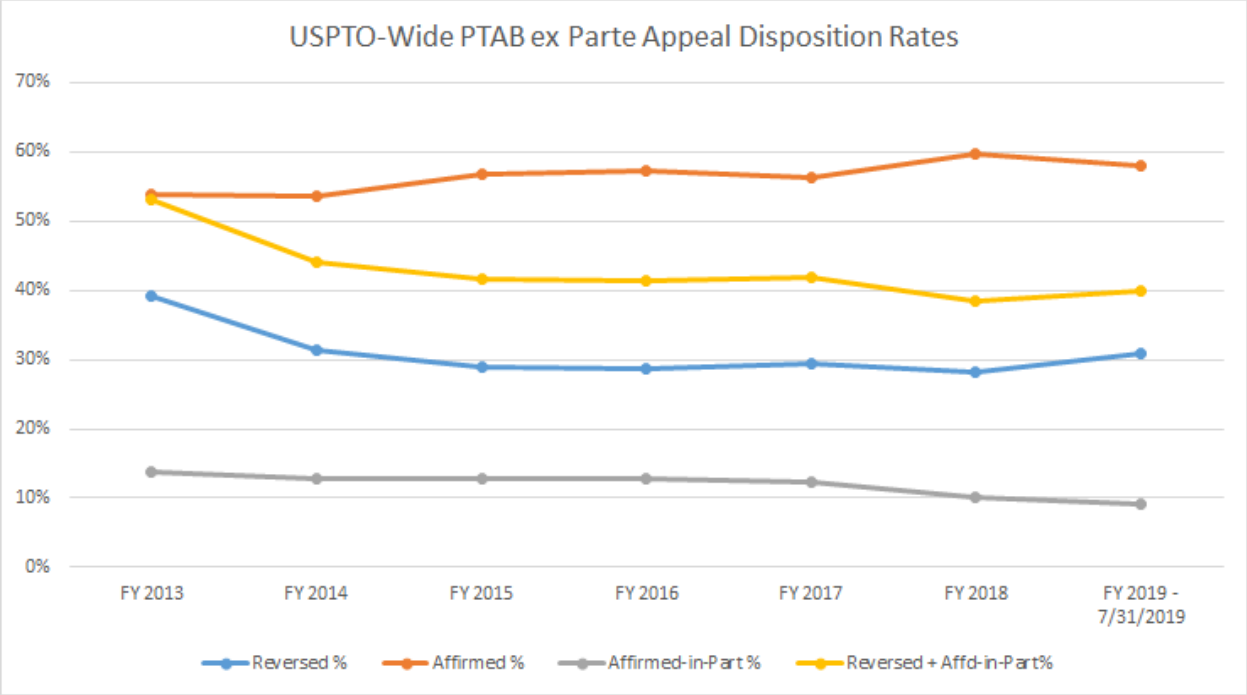
[2] UNITED STATES PATENT AND TRADEMARK OFFICE, PATENT TRIAL AND APPEAL BOARD, *Appeal and Interference Statistics*, July 31 2019, slide titled *Pendency of decided appeals in FY18 and FY19* https://www.uspto.gov/sites/default/files/documents/Appeal%20and%20Interference%20Statistics%20-%20July.pdf.

[3] FY2013-FY2016 data from UNITED STATES PATENT AND TRADEMARK OFFICE, PATENT TRIAL AND APPEAL BOARD, *Appeal and Interference Statistics*, slide titled *Outcomes in Appeals in FY16* https://www.uspto.gov/sites/default/files/documents/Appeal%20and%20Interference%20Statistics%20September%202016.pdf.

[4] FY2017 data from UNITED STATES PATENT AND TRADEMARK OFFICE, PATENT TRIAL AND APPEAL BOARD, *Appeal and Interference Statistics*, slide titled *Appeal Outcomes in FY2017*, https://www.uspto.gov/sites/default/files/documents/appeals_interferences_statistics_sept17.pdf,

[5] FY2018 data from UNITED STATES PATENT AND TRADEMARK OFFICE, PATENT TRIAL AND APPEAL BOARD, *Appeal and Interference Statistics*, slide titled *Appeal Outcomes in FY18*, https://www.uspto.gov/sites/default/files/documents/Appeal%20and%20Interference%20Statistics%20-%20September%202018.pdf.

[6] FY2019 data from UNITED STATES PATENT AND TRADEMARK OFFICE, PATENT TRIAL AND APPEAL BOARD, *Appeal and Interference Statistics*, July 31 2019, slide titled *Appeal Outcomes in FY19*, https://www.uspto.gov/sites/default/files/documents/Appeal%20and%20Interference%20Statistics%20-%20July.pdf,.



The graph indicates the total affirmed percentage has been between 53.8% in FY2013 to 58% in the period through July 31, 2019. If the total percentage of cases identified as the examining corps' "loss rate" includes affirmed-in-part decisions, the "loss rate" ranges between 53.1% in FY2013 to 40% in FY2019. From this data, over time, the examining corps' loss percentage has decreased over this period—leading to the conclusion that the PTAB is observing the quality of examination improving. While there are many possible definitions for patent quality, in this article, examination quality is regarded as the percentage of the time the PTAB judges agree that the examiner, in the final rejection, correctly found the facts and applied the law so that the panel could affirm. Since the author is unaware of any particular initiatives by the USPTO to increase the observed affirmance rate at the Board, it appears the USPTO and PTAB are presently content with a yearly affirmance rate USPTO-wide of between 53% to 58%.

Examining this proposition critically, however, means that the examining corps is winning only 3% to 8% of the time more than 50%. Since each *ex parte* Board decision represents a conscious decision in an appeal conference including the examiner who wrote the final office action and two supervisory level examiners to send the case to the Board[7], this success rate seems low. Basic probability theory teaches that flipping a United States quarter a sufficiently large number of times gives the probability of getting either heads or tails is 50% of the time. The PTAB's own statistics indicate that the examining corps, in the judgment of the Board, collectively is only beating using a coin flip in their appeal conferences 3% to 8% of the time over the past 7 fiscal years.

So what is the right reversal rate at the Board? What is driving this low affirmance rate? The answer cannot be found using any of the data the PTAB itself publishes on its site or via the

[7] See UNITED STATES PATENT AND TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 2676 (8th rev. 2015) and § 1207.01 (8th rev. 2017) for appeal conference procedures.

e-FOIA page where it publishes its decisions[8]. The inability to use raw PTAB data results from the methodology the Board uses to count a case as affirmed, reversed, or affirmed-in-part. The PTAB's approach confounds the issue-level contribution for all appeals that involve multiple legal issues. A few examples will suffice[9]. If an appeal involves a novelty[10] rejection and an obviousness[11] rejection of the same or different claims, the Board makes separate findings as to the validity of each rejection in its decision[12]. If the Board reverses the novelty rejection, but affirms the rejection of all claims on obviousness grounds, the case is counted by the PTAB as affirmed. If the Board reverses the novelty rejection, but affirms the rejection of all but one of the claims for obviousness, the case is counted by the PTAB as affirmed-in-part. Only if the Board reverses the rejection of all the claims for both novelty and obviousness will the case be counted by the PTAB as reversed. Note that in all examples, the novelty ground of rejection was reversed, but invisibly, as the PTAB counts only the overall outcome.

This "lump sum" data reporting methodology obscures what is going on, and invites a closer look at *ex parte* appeals data—an issue level look. Pareto charting of the legal reasoning used by the Board to affirm, affirm-in-part, or reverse each legal issue on appeal deepens the ability to know why the Board is reversing the examining corps[13]. In this paper, such data is taken from the commercial database available at Anticipat.com. In the database, the outcome for each legal issue in each Board decision along with a list of the legal reasoning discussed as the basis of the Board's decision is recorded for each decision[14]. So for a case involving a novelty issue reversed by the Board and an obviousness issue affirmed by the Board, the novelty issue would be recorded as reversed while the obviousness issue would be recorded as affirmed. If the legal reasoning discussed by the panel for reversal for 102 was the failure of the cited reference to disclose each and every element of the claim as arranged in the claim, the novelty issue includes a database tag "All Elements Rule[15]."

The author performed an analysis for all *ex parte* appeals decisions for FY2013-FY2019 up to July 26, 2019 that included at least one novelty issue from the database of *ex parte* appeals decisions at Anticipat.com[16]. A chart showing the issue-level novelty outcomes for this time period is below. The total number of decisions represented in the chart is 13,065.

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[8] UNITED STATES PATENT AND TRADEMARK OFFICE, PATENT TRIAL AND APPEAL BOARD, FINAL DECISIONS OF THE PATENT TRIAL AND APPEAL BOARD, https://e-foia.uspto.gov/Foia/PTABReadingRoom.jsp.

[9] This way of counting the outcome of each case is reflected in the stated disposition in each PTAB decision.

[10] The conditions for novelty are set forth in 35 U.S.C. § 102 (2019).

[11] The conditions for non-obvious subject matter are set forth in 35 U.S.C. § 103 (2019).

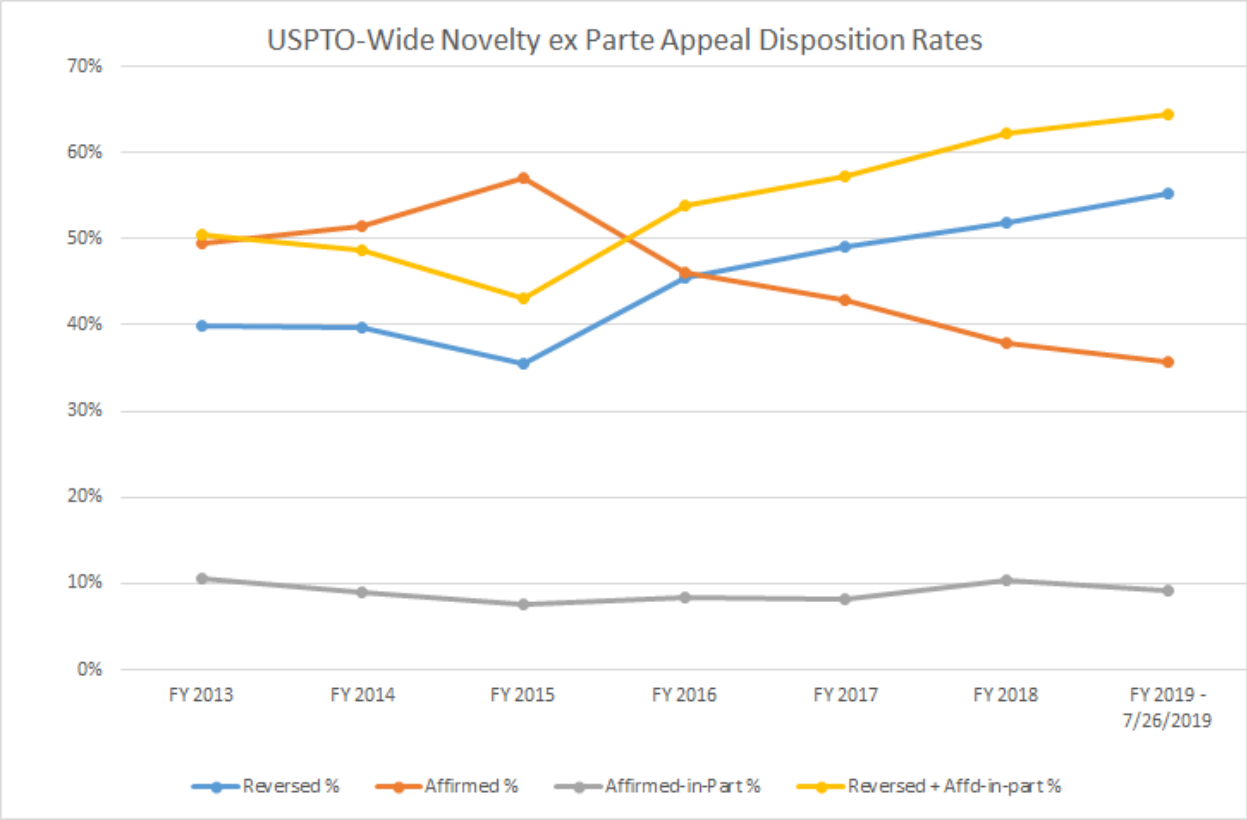
[12] There are some infrequent exceptions observed by the author to this general rule where the panel occasionally will decline to rule on each rejection if they determine one legal issue disposes of all of the claims in the application. Other situations where this has been seen is if the issue involves indefiniteness where the panel cannot determine the meaning of a claim term and, as a result, either non-substantively affirms or reverses the remaining novelty or obviousness rejections because of an inability to apply the art to the indefinite claims (these are reflected as the "non-substantive" outcomes in the Anticipat.com database).

[13] See ANTICIPAT.COM, https://www.anticipat.com/analytics.

[14] A combination of computerized analysis of each decision along with human review are involved in generating the issue-level data for each decision.

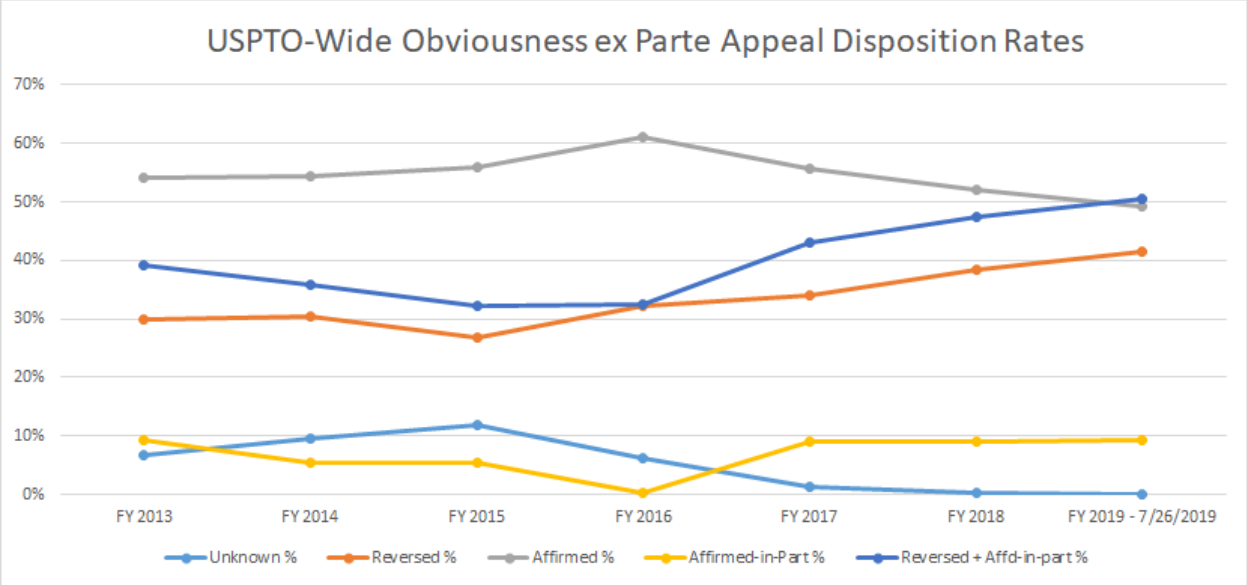
[15] The author has observed in personal research that the All Elements Rule is the leading reason for reversal for novelty given by Board and happens 3 times more often than any other legal ground used for novelty.

[16] ANTICIPAT.COM, https://www.anticipat.com/research.



By inspection, the total reversal rate for novelty varies from 39.92% in FY2013 to 55.16% by July 26, 2019 of FY2019. During this same period, the total affirmed-in-part rate has remained flat from 10.57% in FY2013 to 9.24% in FY2019. Combining the reversal and affirmed-in-part rates indicates that, as the Board is deciding cases today, the Applicant will prevail for at least one claim rejected on novelty grounds 64.41% of the time. What is also notable about the data is that since FY2015, the USPTO-wide reversal rate has steadily climbed upward. The total reversal rate standing alone is the single driving factor. At present, the examiners at the appeal conferences for the cases being decided today would be doing statistically better at the Board if they decided whether to write an Examiner's answer by just flipping a coin before ever reading the appeal brief.

The author also performed a similar analysis for all *ex parte* appeals decisions for FY2013-FY2019 up to July 26, 2019 that included at least one obviousness issue. This data is preliminary, as the database at Anticipat.com for obviousness decisions back to 10/1/2012 contains a certain percentage of decisions for obviousness that, unlike for novelty, require additional (mainly human) review and so show that the resolution is unknown. The author's experience indicates that these unknown decisions are a mix of affirmed, reversed, and affirmed-in-part outcomes but tend to favor affirmed-in-part because these decisions are harder for computerized review to disambiguate. The total number of decisions reflected in this chart is 49,602.



Examination of this chart indicates that a preliminary estimate of the reversal rate for obviousness in FY2013 was 29.96%. Over the 3 most recent fiscal years, however, due to the very low percentage of unknown outcome decisions, the marked trend upward in the reversal rate can be confidently relied on. As with novelty, the affirmed-in-part rate for obviousness is flat over time. Combining the reversal and affirmed-in-part rates shows the Applicant will prevail for at least one claim rejected on obviousness grounds 50.58% of the time as the Board is deciding cases in FY2019. The upward trend in pure reversal rates began in FY 2016, and, like novelty, the total reversal rate is the single factor driving the increase. Statistically in FY2019, the examiners at the appeal conferences for those decisions being decided would have done as well by flipping a coin for every case before considering the appeal brief.

Given the sample sizes of decisions that are issued for each fiscal year, the observed results are statistically significant. The trends also indicate that, beginning in FY2013-2014 timeframe, a decrease in the quality of the final rejections involving both novelty and obviousness is being detected by the Board. By contrast, during this same period, the USPTO's reported statistics appear to show improvement. It is evident, then, that using issue-level *ex parte* appeals data gives far greater insight into the results of the examination process than the USPTO's way of reporting the numbers. There can be little argument that the examining corps' losing over 50% of cases for obviousness and 64% of cases for novelty reflects poorly on not just one examiner's ability to pick winners and losers, but at least three examiners, including individuals with many years of experience.

But can these results be extrapolated as reflective of the quality of examination for all cases handled by the examining corps? If so, then the issue-level *ex parte* appeals data could be effectively used as an end-of-line control monitor for the quality of the entire USPTO examination process. Then the issue-level *ex parte* data could be used to identify and qualify in-line monitors that have a statistically significant effect on examination quality. Examiners could then identify what is preventing their ability to reduce the variability of the data collected at each

of the in-line monitors. The bleeding of cases that never should have been issued a final office action in the first place then can begin to stop.

To test the hypothesis as to whether issue-level *ex parte* appeals data can be an end-of-line monitor, the author consulted the USPTO's Data Visualization Center[17] to determine what total inventory the examining corps is processing and determined how many decisions were concurrently being issued by the PTAB. If the number of decisions regularly being issued by the PTAB is equivalent or better than a total quantity of random samples from the total inventory needed to estimate population statistics, then the PTAB would potentially be providing a sufficient quantity of data.

For February 2019, from the Data Visualization Center, the USPTO reported 550,193 non-RCE inventory, 29,890 RCE inventory, and 48,256 Design inventory for a total of 628,339 pending cases in total inventory[18]. For February 2019, the total number of *ex parte* appeal decisions issued by the PTAB reported by Anticipat was 686[19].

For a population of 628,339 pending cases, to obtain a population statistic (mean, median, etc.) at a 5% margin of error (confidence interval) at 99% confidence, a randomly selected sample size of 665 pending cases from that population would suffice[20]. Given that the PTAB generated 9,413 *ex parte* appeals decisions in 2018[21] and 11,382 decisions in 2017[22], the Board is handily generating more than 665 cases per month on average. Sufficient *ex parte* appeals decisions exist to provide a sample size for calculating population statistics relevant for the entire population of pending cases.

However, appeals are not taken totally at random from among the total inventory. However, in the aggregate, the Board decisions that issue each year can be argued to be sufficiently randomized to provide a statistically relevant sample for practical analysis. Examples of ways the decisions are randomized include 1) the ability of applicants to appeal across all technology centers, 2) the fact that any applicant has the right to appeal from a final rejection from any examiner, and 3) the essentially random process of when any particular application is filed relative to all other applications. Combined with the observation that when any particular *ex parte* appeal is filed, docketed, and decided is also random, a great deal of statistical randomization exists in the set of decisions the PTAB hands down each month. With this number of randomizing factors, the author is not aware of any statistical way to prove that non-randomized "clumps" of decisions exist in any particular day, month, or even year. Because of this, the author takes the position, that while *ex parte* appeals decisions are not purely random samples taken according to statistical methods, for those decisions that issue at any given time, the timing and location in the Office for each decided case has certainly been sufficiently

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[17] UNITED STATES PATENT AND TRADEMARK OFFICE, DATA VISUALIZATION CENTER, *Patents Dashboard*, https://www.uspto.gov/dashboards/patents/main.dashxml.
[18] *Id.* as reported by the February 2019 Patents Dashboard.
[19] ANTICIPAT.COM, https://www.anticipat.com/research.
[20] From sample size calculator published by CREATIVE RESEARCH SYSTEMS, SAMPLE SIZE CALCULATOR, https://www.surveysystem.com/sscalc.htm#one.
[21] ANTICIPAT.COM, https://www.anticipat.com/research.
[22] *Id.*

randomized to be regarded as representative random data points from the total pending inventory population.

The foregoing indicates that the hypothesis is statistically true—*ex parte* appeals decision data qualifies as a statistically valid end-of-line monitor reflecting how well the examining corps is applying the law and finding the facts. Because of this, the USPTO could use issue-level *ex parte* appeals data to identify and qualify other in-line monitors and find the statistically "right" reversal rate at the Board. This statistical validity of the *ex parte* appeals data and its reflection of how the Board is deciding cases today also means that practitioners can use and rely on examiner-level *ex parte* appeals data to determine what to do with any particular final office action. Each reversed decision by the PTAB statistically also probably represents one or more allowances made in error as reversed examiners apply the law and find the facts the same way for both their allowed as for rejected cases. Because of this, quality for allowed cases can be argued to be statistically suffering as much as is being observed in appealed cases.

What is the right reversal rate for *ex parte* appeals at the Board? Definitely not what it is today, whether measured by the PTAB or issue-level data. Issue-level data, however is the key for the USPTO and practitioners being able to benefit from the constant flow of information coming from the Board every day. Why are the reversal rates trending higher for novelty and obviousness? The answer is likely a combination of many factors, but what is certain is that reversal of the trend and shifting the baseline reversal rates cannot be done until the examining corps itself identifies what needs to change in policy and actual examining behavior. As an aid in this process, the author recommends the Office develop its own statistical quality control approach using in-line monitors statistically validated by issue-level *ex* parte appeals decision data. Such an approach is a proven scientific approach that could improve patent quality across the Office. Now is the time for the USPTO and for practitioners to put *ex parte* appeals data to work.