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Measuring Patent Quality and Reducing the Backlog at the USPTO

Dr. Ani Harutyunyan and Dr. William Matcham

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This policy brief presents recent empirical findings on patent quality, highlights the limitations of patent invalidation rates as a measure of patent quality, and proposes viable reforms aimed at reducing application backlogs while maintaining high patent quality.

The content in this brief builds on the policy report, "Patent Quality in the United States: Findings and Suggestions for Policymakers" by Harutyunyan et al. (2024), which collates the empirical evidence on patent quality and invalidation rates, thereby providing a solid evidence base for policy debates on patent quality in the United States.

1. Robust Empirical Evidence on US Patent Quality

According to the statutory definition of patent quality, as adopted by the USPTO, a high-quality patent must: (i) satisfy the criteria for patent subject matter eligibility, (ii) be sufficiently novel, (iii) be non-obvious, and (iv) be clearly and sufficiently claimed and described.

There are two primary kinds of patent examination errors, both of which reduce patent quality:

1) **Incorrect Grants** occur when applications that do not meet the statutory requirements are erroneously granted a patent.

2) **Incorrect Rejections** occur when applications meeting all statutory requirements are erroneously rejected.

Incorrect Grant rates at the USPTO are in the single digits and are significantly lower than those of comparable global patent offices. Conversely, Incorrect Rejection rates are substantially higher, frequently over double that of the Incorrect Grant rate. The higher rates of Incorrect Rejections highlight a significant issue whereby legitimate innovations often fail to receive patent protection, potentially hindering economic growth and technological

advancement. These findings are based on three independent studies that use distinct methodologies and different datasets, yet converge on the same qualitative conclusions.

Suggestion: Rebalance resources and policy discussions toward lowering Incorrect Rejection rates.

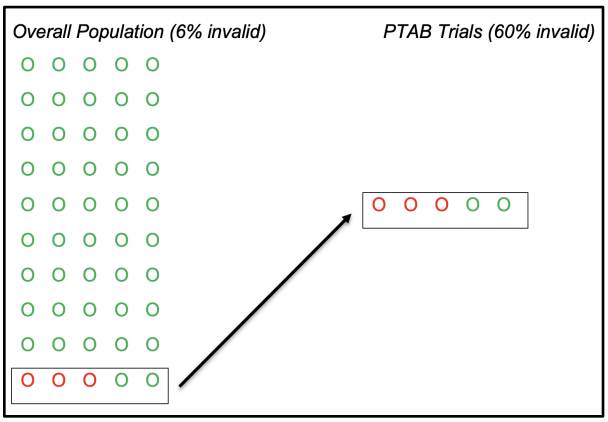
2. The Inappropriateness of Invalidation Rates as Measures of Quality

A contentious feature of policy debate concerns inferences on patent quality drawn from patent invalidation rates in Patent Trial and Appeal Board (PTAB) and district court cases. In particular, high invalidation rates in PTAB trials are creating concerns that US patents are not "born strong" (IPWatchdog, 2025).

In what follows, we clarify how the PTAB invalidation rate can be as high as 60% when the Incorrect Grant rate is in single digits. The crux is that the set of patents going to trial does not represent the overall patent pool, with dubious patents more likely to end up in PTAB challenges and resultantly in PTAB final trials. As a result of this so-called "selection bias", invalidation rates cannot be used as a proxy for overall patent quality.

To illustrate how selection bias can create significant disparities between the PTAB invalidation rate and the level of invalid patents in the overall population, consider the following example, as shown in Figure 1. Suppose we have 50 patents, of which three are invalid, meaning that the overall patent pool contains 6% Incorrect Grants. Suppose there are 5 PTAB trials, involving the three that are invalid and two that are valid. In this case, the invalidation rate would be 60% even though the overall invalid rate is 6%.

Figure 1: Disparities in Patent Quality and Invalidation Rates



Notes: While only three out of 50 (6%) patents in the population are invalid (those in red), if those three make up five of the patents in PTAB trials, the PTAB invalidation rate would be 60%.

Three primary factors contribute to why patents in PTAB challenges are not a representative sample of the entire patent population.

1. Patents challenged through litigation or post-grant proceedings are systematically unrepresentative of the overall population of patents: they tend to be commercially valuable, concentrated in certain areas of technology, and more likely to be owned by small firms (Harutyunyan et al, 2024).

2. The second feature of the PTAB process that contributes to the selection bias in PTAB trials is that only PTAB challenges that pass the initial institution stage can proceed to trial. The initial institution process discards any cases for which there is an insufficient likelihood of invalidation in a subsequent trial. This initial screening, which removes up to 16% of cases, eliminates precisely the patents that are valid (even if only marginally so) from PTAB trials. The result is that the cases remaining after institution for PTAB final trials are a selected subset, in the sense that the institution examiner considered them to be invalid.

3. Third, after institution and before the final trial, the challenger and patentee frequently agree to settle, in response to improved clarity on the most likely outcome of the impending final decision. Consequently, cases that reach final trial are likely to be highly uncertain. Previously recorded invalidation rates (between 40% and 60%) are consistent with long-advanced theories of litigation, which predict trial outcomes to be a virtual toss-up, with only the knife-edge cases failing to settle (Priest and Klein, 1984).

Based on the above factors, invalidation rates are fundamentally inappropriate as indicators of overall patent quality.

Suggestion: Policymakers should not use invalidation rates as indicators of overall patent quality.

3. Reducing the Backlog Without Compromising Quality

The USPTO faces a significant backlog, with over 800,000 pending patent applications. Howard Lutnick, U.S. Secretary of Commerce, has pledged to tackle the “unacceptable” patent

backlog (Bloomberg Law, 2025a, 2025b). Efforts to address pendency risk harming patent quality as an unintended consequence. The Government Accountability Office's recent report argued that pressures to complete application reviews in a timely manner compete with pressures to issue high-quality patents (GAO-25-107218, 2025). While patent pendency and examination quality are central issues for the USPTO, it has not been clear how to improve one without compromising the other.

We now have a working model of the US patent examination process available, which can be used to analyze the effect of reforms on examination speed (which interacts with pendency) and patent quality (Matcham and Schankerman, 2025). A key feature of the model is the interaction between the examiner and the applicant in negotiation over patent rights. This feature is relevant to the backlog discussion since, if reforms attempting to reduce the backlog incentivize more applications and/or applicants to push for broader patent rights, then the backlog can increase as an unintended consequence of reforms.

The model can analyze reforms to patent examination aimed at trading off patent quality with examination speed. There are three findings relevant to the backlog:

1. Politically feasible increases to applicant fees and changes to examiner credits to incentivize timely grants will ***not*** significantly improve examination speed or quality.

2. Reducing the number of allowable negotiation rounds (specifically, Requests for Continued Examination) improves examination speed and deters spurious applications, both of which can reduce the backlog. This change also reduces USPTO administrative costs, which can be reinvested into hiring more examiners. When applicants know they have fewer opportunities to negotiate, low-quality applicants either do not apply or, if they do apply, they are less likely to hold up examiners during the negotiation process.

3. Decreased examiner motivation would increase the backlog and reduce quality. Reduced examiner motivation encourages the submission of low-quality applications and incentivizes applicants to broaden their

requests for property rights. Hence, cost-cutting reforms that decrease examiner motivation, such as asking examiners to work extra hours or increasing their production targets, may have the unintended consequence of both worsening the backlog and reducing patent quality.

Suggestion: Consider policy reforms to limit the number of negotiation rounds. In that case, reinvest the resulting administrative savings in hiring and training examiners, thereby directly addressing the backlog without compromising examination quality.

Conclusion

Effective patent policy must strike a balance between efficiency (reducing the backlog) and accuracy (maintaining high quality). By focusing on reforms that target not only Incorrect Grants but also Incorrect Rejections, cautiously interpreting invalidation rates, and reducing unnecessarily lengthy examinations, the USPTO can enhance the robustness of granted patents and promote American innovation.

References

Bloomberg Law (2025a), "Patent Office Focuses on Backlog as GAO Flags Quality Issues"

Bloomberg Law (2025b), "Lutnick Pledges to Tackle Patent Backlog, China 'Abuse' of USPTO"

GAO (2025), "Intellectual Property: Patent Office Should Strengthen Its Efforts to Address Persistent Examination and Quality Challenges," GAO-25-107218.

Harutyunyan, A., Chervenak, M., Schankerman, M., Matcham, W. and Shrestha, N. (2024), “Patent Quality in the United States: Findings and Suggestions for Policymakers.” North Bethesda, MD: Sunwater Institute.

IPWatchdog (2025), "Squires Calls for 'Born Strong' Patents in Light of USPTO's Dire 'Defective' Patent Rate."

Matcham, W., & Schankerman, M. (2025), “Screening Property Rights for Innovation”. Available at SSRN 4519999 http://dx.doi.org/10.2139/ssrn.4519999

Priest, G.L. & Klein, B. (1984), “The selection of disputes for litigation.” The Journal of Legal Studies, 13(1), 1-55. https://doi.org/10.1086/467732

About the authors

Ani Harutyunyan, PhD is a Practitioner in Residence at IPPI. She was previously an Edison Innovation Law and Policy Fellow at C-IP^2, Scalia Law School, GMU, and was the Director of Research at Sunwater Institute, spearheading its IP program. As a Principal Investigator, she has led several research initiatives funded by various organizations, including the National Science Foundation (NSF) and Council for Innovation Promotion (C4IP).

Dr. Harutyunyan holds a PhD in Economics and has published widely in top economics and multidisciplinary scientific journals, such as PNAS. Her work has received several awards, including the Bergson Prize for the best published paper from the Association for Comparative Economic Studies.

She is a contributing author to the recent *Handbook of Innovation and Intellectual Property Rights* and led the publication of multiple influential policy reports, including "*Patent Quality in the United States: Findings and Suggestions for Policymakers*," which has been featured in *Law360*, *IPWatchdog*, *ClaimWise*, *TheWellNews*, and other media outlets.

More information about her research can be found at www.AniHarutyunyan.com.

William Matcham, PhD is an Assistant Professor of Economics at Royal Holloway University of London and a Research Affiliate of STICERD at the London School of Economics. He holds a PhD in Economics and an MSc and BSc in Econometrics and Mathematical Economics, all from the LSE. At LSE, he was awarded the Ely Devons and Undergraduate Performance prizes.

William's research studies innovation in the United States, focusing on the quality of patent screening. Recent research (summarized here) estimates economic models to evaluate the social costs of the United States patent examination process.

William has presented his research at NYU, Stanford, Boston University, the NBER, and Oxford. He lectures in industrial economics and has other research projects at the intersection of law and economics and finance.

About IPPI: The IP Policy Institute

IPPI: The IP Policy Institute is a Washington, D.C.-area based intellectual property law research center founded in early 2025 with The University of Akron School of Law. The IPPI team comes from the former Center for Intellectual Property x Innovation Policy (C-IP^2), which operated at George Mason University Antonin Scalia Law School from 2012 to early 2025.

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Contact Information

IPPI: The IP Policy Institute
The University of Akron School of Law
1201 Wilson Boulevard
Arlington, VA 22209

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