Senator Tillis Questions for Professor Wasserman

1. I'm curious to know more about the data you have to show that more examination time will result in higher quality examination. Can you elaborate on your research and data points?

Why would extending examiners more time to review applications result in the Patent Office issuing fewer legally invalid patents? Patent applications are legally presumed to comply with the statutory patentability requirements when filed. As a result, a patent examiner that is not able to conduct a sufficient search of prior art and articulate a proper basis of rejection during their allotted review time is legally expected to allow the application. Thus, examiners who do not have enough time to properly evaluate applications are likely to grant invalid patents.

Scholars and commentators have long believed that examiners are not given sufficient time to conduct a thorough and comprehensive analysis, though they had generally provided little evidence to support this assertion.[1] To fill this gap, our research sought to move beyond anecdotal sentiments and empirically test the extent to which patent examiners' time allocations cause them to grant invalid patents.[2]

The Patent Office sets a patent examiner's time allocation based on two key factors: the technological field in which the examiner is working and her position in the general schedule ("GS") pay scale.[3] A patent examiner in a more complex field is provided more hours to review an application than an examiner of the same GS-level who is working in a less complex field.[4] The higher the pay grade of an examiner within a technology area, the fewer hours the Patent Office extends to that examiner.[5] To demonstrate the degree to which time allocations scale with GS-level changes, we present in Table 1 the examination time expectations facing a patent examiner working in one of the most complex fields, artificial intelligence, and one of the least complex fields, compound tools (e.g., a hammer).[6] A promotion to each subsequent pay grade is roughly equated to a 10% to 15% decrease in the number of allocated examination hours.[7] Examiners operating at GS-level 7 are given the greatest amount of time in reviewing patents in compound tools and artificial intelligence—

---

1. Michael D. Frakes & Melissa F. Wasserman, *Is the Time Allocated to Review Patent Applications Inducing Examiners to Grant Invalid Patents?: Evidence from Micro-Level Application Data*, 99 REV. ECON. & STAT. 550, 550 (2017) (summarizing anecdotal evidence that patent examiners are time-crunched).

2. *Id*.

3. U.S. DEP'T COMM., OFFICE OF INSPECTOR GEN., USPTO SHOULD REASSESS HOW EXAMINER GOALS, PERFORMANCE APPRAISAL PLANS, AND THE AWARD SYSTEM STIMULATE AND REWARD EXAMINER PRODUCTION 7 n.6 (2004), https://www.americanbar.org/content/dam/aba/migrated/intelprop/109legis/CommerceDept_IGReportonPTO.authcheckdam.pdf ("Expectancy goals vary among examiners and are based on the individual examiner's grade level and the complexity of the technology under review.").

4. Andy Faile, Deputy Comm'r for Patent Operations, Examination Time and the Production System, Presentation at the Santa Clara-Duke Quality Conference (Sept. 9, 2016), http://1x937u16qcra1vnejt2hj4jl-wpengine.netdna-ssl.com/wp-content/uploads/Faile-Examination-Time-and-the-Production-System.pptx [https://perma.cc/4S3N-GKDB].

5. *Id.*

6. *See* U.S. PATENT & TRADEMARK OFFICE, HOW THE USPTO DETERMINES PRODUCTION FOR USPTO PATENT EXAMINERS (on file with author).

7. *Id.* at 1.

19.7 hours and 45.1 hours, respectively—whereas examiners operating at GS-level 14 are expected to review the same patent in approximately half that time.

In our recent research, we embraced the variation made possible by these schedules to test the link between examination time and the granting practices of examiners. More specifically, we followed individual examiners throughout the course of their careers and tracked the evolution of their examination behavior as they experienced GS-level promotions that diminished the amount of examination time at their disposal.[8] Our methodological design was structured so as to explore this relationship between grant rates and the occurrence of time-allocation-reducing promotions while accounting for the potentially confounding influence of other factors—e.g., increases in examiner years of experience—that may be correlated with such promotions and that may independently affect examiner granting tendencies. Accordingly, in estimating this relationship between GS-levels and grant rates, our underlying regression specifications included a series of fixed effects and other controls: (1) year fixed effects, based on the year in which the application is disposed of, to account for general Patent Office trends and granting practices; (2) examiner experience fixed effects (in two-year bins), to better isolate the time-allocation aspect of GS-level promotions and account for the correlation between GS-levels and experience; (3) examiner fixed effects, to account for the possibility, among other things, that higher GS-level examiners have fundamentally different granting styles from their more junior counterparts; (4) technology-by-year fixed effects, to alleviate concerns that examiners may be reassigned to different technologies as they ascend to higher pay grades and that such reallocation schemes may change over time; and (5) various individual characteristics of the applications, including the entity size of the applicant (large versus small), the length of time between the filing and the disposition of the application, and the foreign priority status of the application (previous filings at the European Patent Office ("EPO") and Japanese Patent Office ("JPO"). Our recent research also included various additional empirical exercises to support the proposition that our methodological design captured variations in time allocations—e.g., we tested for and found stronger relationships in the case of time-sensitive bases of rejecting patent applications.[9]

To execute our empirical strategy, we utilized novel data on 1.4 million patent applications disposed of between 2002 and 2012, merged with rich, examiner roster data received from the Patent Office pursuant to a series of Freedom of Information Act ("FOIA") requests.

We found that as an examiner is given less time to review an application—as identified by these time-reducing promotions—the less active she becomes in searching for prior art, the less likely she becomes to make time-intensive rejections, and the more likely she becomes to grant the patent.[10] The magnitude of the result is quite striking. A patent examiner who has been promoted to GS-level 14 has a grant rate that is 13% to 29% higher than it was when she was at a GS-level 7.[11]

8. Frakes & Wasserman, *supra* note 1, at 550.
9. *Id.*
10. *Id.*
11. *Id.*

TABLE 1: EXAMINATION HOURS ALLOCATED TO EXAMINER AS A FUNCTION OF GS-LEVEL[12]

	(1)	(2)
GS-level	Compound Tools	Artificial Intelligence
GS-7	19.7	45.1
GS-9	17.3	39.5
GS-11	15.3	35.1
GS-12	13.8	31.6
GS-13	12.0	27.5
GS-13, partial signatory	11.0	25.3
GS-14	10.2	23.4

We update the analysis from this prior work to include five additional years of application data.[13] We find nearly identical results. In the preferred empirical specification that we present, we find a roughly 27% (or 19 percentage-point) higher grant rate for an examiner at GS-level 14 relative to GS-level 7.[14] Figure 1 uses these updated results to plot the relationship between a given examiner's grant rate and the occurrence of each of the indicated GS-level promotions, wherein GS-level 7 serves as the omitted reference group and wherein the indicated relationships partial out the influence of those other factors mentioned above (e.g., examiner experience-level bins).[15] As Figure 1 demonstrates, examiner grant rates ascend strongly and monotonically with each GS-level promotion. In addition to the rich level of controls that we include in the regression design underlying this figure, the analysis also supports a causal interpretation of the observed pattern in light of certain institutional features of the Patent Office. Mainly because patent applications are randomly assigned to examiners within their technological groups, there is no reason to believe that examiners at higher GS-levels are being assigned more patent-worthy applications than examiners at lower GS-levels.[16]

Our updated analysis implies that if examiners are given double the amount of time to review applications, the Patent Office's overall grant rate would fall by roughly 19 percentage points, amounting to roughly eighty thousand fewer patents issued per year. What is the nature of these eighty thousand patents? Are they valid or invalid? If we were to expand time allocations so as to knock out patents, we would hope that the affected patents would indeed be invalid patents. Fortunately, our previous study was able to explore the nature of those patents issued on the margin as a result of binding time constraints.[17] To do so, we relied on the fact that many U.S. applicants likewise file for patent protection with the EPO and the JPO, two offices that are known to invest substantially more resources per application in the examination process while having essentially similar patentability

12. *Id.* at online app. at 2–3 tbl.A1.

13. S*ee* Frakes & Wasserman, *supra* note 1.

14. *See infra* Figure 1.

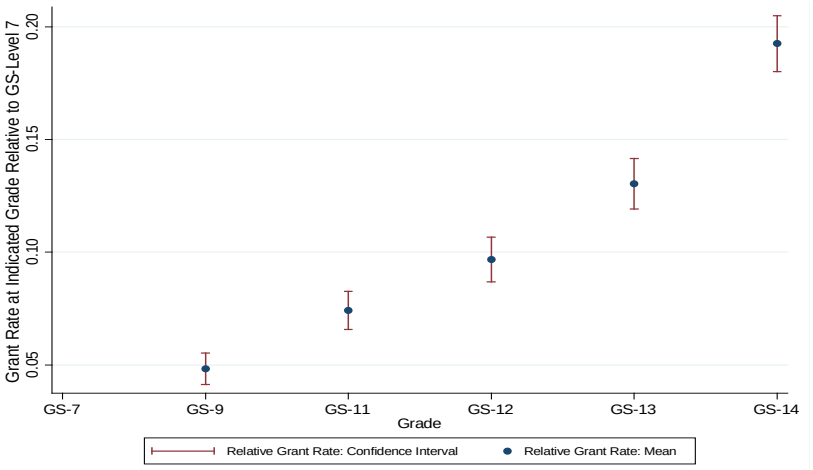
15. Frakes & Wasserman, *supra* note 1, at 556.

16. A recent paper by Cesare Righi and Timothy Simcoe documents evidence of examiner specialization within technology-group assignments, as well as specialization within technology subgroups. Cesare Righi & Timothy Simcoe, *Patent Examiner Specialization*, 48 RES. POL'Y 137, 141 (2019). However, Righi and Simcoe's analysis finds "little evidence" suggesting that applications are assigned to examiners based on the importance or claim breadth of the applications or on their patent worthiness. *Id.* at 147.

17. Frakes & Wasserman, *supra* note 1**Error! Bookmark not defined.**, at 553.

standards.[18] Accordingly, we considered the sample of issued patents in which the relevant U.S. applicant likewise sought protection at the EPO and the JPO and used outcomes at these foreign offices as a benchmark—albeit an imperfect one—to assess what the outcome at the U.S. Patent Office would have been (at least generally speaking) if the U.S. examiners were given more time and resources to determine the patentability of the relevant invention.[19] We found evidence that the promotions of interest in our study were associated with a reduction in the frequency by which the inventors of U.S.-issued patents are successful in securing patent protection for the relevant inventions at the EPO and the JPO.[20] The implication of this finding is that the marginal patents being issued as a result of binding time constraints are indeed of questionable legal validity.

FIGURE 1: RELATIONSHIP BETWEEN EXAMINER GS-LEVELS AND GRANT RATE



This Figure presents results from a regression of the incidence of a granted application on dummy variables representing each GS-level between 7 and 14. The dummy variable for GS-level 7 is omitted, representing the reference group. The vertical bars represent 95% confidence intervals for the estimated coefficients. The underlying regression producing this relationship accounts for fixed differences in granting practices across technology groups, across examiners, and across years, while also controlling for examiner experience levels.

In summary, our results from our prior research suggest that examiners are facing binding time constraints and that these time constraints are inducing examiners to grant invalid patents.[21]

---

18. Pierre M. Picard & Bruno van Pottelsberghe de la Potterie, *Patent Office Governance and Patent System Quality*, 104 J. PUB. ECON. 14, 16–17 (2013) (presenting "stylized facts on differences between the U.S. Patent and Trademark Office (USPTO), the European Patent Office (EPO), and the Japan Patent Office (JPO)").

19. To assess the quality of these marginal patent issuances, we consider the full sample of patents that were issued in the United States and also sought protection in the EPO and the JPO and then estimate how the mean incidence of such patents likewise being granted by the EPO (and/or the JPO) changes as examiners experience GS-level promotions that reduce the amount of examination time available to them. Consistent with expectations, we find that relative to the patents issued at GS-level 7, the patents issued at GS-level 14 are seven percentage points (or roughly sixteen percent) less likely to be allowed by both the EPO and the JPO (when using success at both foreign offices to signify the strongest benchmark of quality). Frakes & Wasserman, *supra* note **Error! Bookmark not defined.**, at 560.

20. *Id.*

21. Frakes & Wasserman, *supra* note 1, at 554–55.

2. How does your proposal allow examiners more time to examine the patents while also reducing prosecution expense? If additional funding for more examination time is needed, how would you suggest your proposal be paid for – would this be paid for by Congress, or would fees be passed along to stakeholders (as you know the USPTO has traditionally been a fully user-fee funded agency)?

A possible savings associated with increasing examiner time allocations is a decrease in prosecution expenses to patent applicants. Nevertheless, it is theoretically ambiguous whether giving patent examiners more time will lead to a decrease in costs incurred by the prosecuting attorneys (and hence patent applicants).

Increasing the time allocations of patent examiners could result in examiners making clearer and better thought out rejections, which in turn could enable the prosecuting attorney to either more quickly obtain a patent grant or determine that the application should be abandoned because it fails to meet the patentability standards. Because the patent examination process involves a back and forth between the patent examiner and the prosecuting attorney, it is possible that improved examination could decrease the number of rounds of review at the Patent Office, resulting in a financial savings to the patent applicant. Our prior empirical work lends some support to the contention that if a patent examiner makes an initial low-quality rejection, which our evidence suggests examiners often do under time pressures near deadlines, this low-quality rejection will increase the time an application is under review at the Patent Office and result in additional rounds of review.[22] In short, when examiners make quick, low-quality rejections in early rounds of review in order to meet deadlines—rejections that are nonfinal in nature—they will need to make up for these initial low-quality rejections in later rounds. The implication is that time pressures may cause examiners to waste rounds of review.

On the other hand, increasing the time allocations of patent examiners is likely to result in a more rigorous examination in which better, more comprehensive rejections are made. It is possible that as the quality of examination increases, it will require prosecuting attorneys to spend more time responding to these rejections, which may generate added social costs not potential savings. This may be especially true if patent examiners begin making more complicated or complex rejections, such as obviousness rejections that include a large number of prior art references.[23]

---

22. Michael D. Frakes & Melissa F. Wasserman, *Procrastination in the Workplace: Evidence from the U.S. Patent Office* 6 (Nat'l Bureau of Econ. Research, Working Paper No. 24159, 2018). In the Online Appendix, we spell out in greater detail the essence behind the prediction that greater examination time may lead to fewer rounds of review. Online Appendix, *supra* note **Error! Bookmark not defined.**.

23. We note, however, that one may not necessarily expect prosecution costs to increase substantially following examiner time increases in that the vast majority of costs of obtaining a patent are associated with drafting of the initial application, which are fixed at the time of filing. AIPLA 2017 REPORT, at 30–31 (preparing and filing an original

As such, there may be some reason to think that prosecution costs will go down and some reason to think they will go up by giving examiners more time. Accordingly, we attempt to provide empirical insight into this question. Our empirical inquiry will consist of two parts, each bearing on the points raised in the above conceptual discussion: (1) we will explore whether more examination time can eliminate some degree of the unproductive back and forth between examiners and prosecutors and diminish the number of rounds of review (also known as "office actions") and (2) we will explore whether more examination time leads to more complex rejections in a given round of review and hence increased per-office-action expenses.

We test the first question directly, by following examiners throughout promotions that reduce the amount of time they have to review applications and observes the impacts of such time-reducing promotions on the number of rounds of reviews associated with the application (all while controlling for other factors that may correlate with these promotions and with the various application outcomes—e.g., years of examiner experience). All told, this empirical exercise provides no evidence to support any claim that greater examination time leads to a greater number of rounds of review. In fact, the evidence is consistent with the above prediction that greater examination time may lead to fewer wasted rounds of review.

In our preferred specification, we find that doubling examination time is associated with 0.56 fewer rounds of review per application, implying that greater examination time may cut prosecution expenses to the extent that greater time leads to less back and forth between examiners and applicants. The approximate savings implied by these estimates are considerable. To derive these estimated savings, the analysis assumes that all rounds of review are of modest complexity, parallel to that of mechanical fields, an assumption (per Table 5) that suggests a cost of $2,500 per round. In light of (1) this cost, (2) the estimated reduction of 0.56 rounds, and (3) the fact that the Patent Office disposes of roughly 430,000 applications per year, these elements suggest that the patent system may experience upward of $602 million savings per year in reduced prosecution expenses in connection with doubling examination time. We acknowledge that this aggregate estimate assumes that costs per round of review remain flat in connection with changes in time allocations.

It is of course important to look beyond the decreased rounds of review and examine whether an expansion in examination time may lead to increased costs per round of review. To confront this second question, we conduct a simple empirical exercise in which we attempt to provide a rough estimate of increased prosecution expenses per office action stemming from an increase in time allocations. Should the complexity of rejections that prosecutors must respond to increase, it is possible that prosecutors would increase their per-office-action fees in response. To test this, we exploit the fact that the Patent Office increased the time allocations to all patent examiners by two hours in 2010—representing a roughly 12% increase in time.[24] By looking at the reported fees charged by patent attorneys for prosecuting patent applications immediately before 2010 and then shortly thereafter, we can attempt to identify whether an increase in time allocations of this magnitude resulted in increased prosecuting fees. The AIPLA reports the median

application of minimal complexity has a median legal charge of $7,000 whereas preparing and filing a response to an office action has a median legal charge of $2,000; preparing and filing an original application in the field of biotechnology and chemistry has a median legal charge of $10,000 whereas preparing and filing a response to an office action has a median legal charge of $3,200; preparing and filing an original application in the field of electrical and computer technology has a median legal charge of $10,000 whereas preparing and filing a response to an office action has a median legal charge of $3,000; preparing and filing an original application in the mechanical field has a median legal charge of $8,500 whereas preparing and filing a response to an office action has a median legal charge of $2,800).

24. Frakes & Wasserman, *supra* note 1, at online app. at 2.

charges for patent services every two years based on a survey of its members,[25] Table 5 reproduces the median attorney's fees associated with responding to a patent examiner's rejection in 2008, 2010, and 2012 for a variety of technologies and by complexity of application.

TABLE 5: MEDIAN CHARGES FOR SERVICES: U.S. UTILITY PATENTS[26]

APPLICATION AMENDMENT/ARGUMENT	2008	2010	2012
Minimal complexity[27]	$1,850	$1,800	$1,800
Relatively complex—biotechnology/chemical	$3,200	$3,000	$3,000
Relatively complex—electrical/computer	$3,000	$3,000	$3,000
Relatively complex—mechanical	$2,500	$2,500	$2,500

Notably, the attorney's fees associated with responding to a patent examiner's rejection stayed flat or decreased from 2008 to 2012. Thus, it does not appear that the Patent Office's 2010 two-hour increase in time allocations increased the legal charges associated with prosecuting a given round of review. This natural experiment is, of course, not perfect. There are certainly other factors that may impact the legal charges associated with prosecuting a patent, potentially confounding this analysis.[28] For instance, changes in the legal market (i.e., law firm mergers) or economic conditions could artificially depress legal charges associated with prosecuting patents during this time period, which may otherwise mask increases in prosecution costs stemming from increased examination time. We note, however, that median litigation costs for patent infringement were also constant during this time period.[29] Thus, if one thought that changes in the legal market or economic conditions were artificially depressing legal charges associated with prosecuting patents during our time of inquiry, then one might expect to see corresponding changes in litigation costs for patent infringement. Ultimately, this exercise tends to support that an increase in examiner time allocations does not lead to notable increases in prosecution expenses.[30]

If patent examiner time allocations are increased then we believe the Patent Office should increase the fees it charges to patent applicants to cover the expenses associated with hiring needed additional patent examiners. More specifically, we propose increasing examination fees and eliminating issue fees. Examination fees were originally set below examination costs in order to increase access to the Patent Office. Thus, one concern is that a substantial increase to examination fees could have a negative effect on the number of high-quality patent applications filed. In

25. AIPLA 2017 REPORT, at 1.

26. *See id.* at 30–31.

27. A "minimal complexity" patent application is defined as an application that has a ten-page specification and ten claims. *Id*. at 5.

28. It is also possible that attorney's fees do not scale linearly with the time allocations of patent examiners. That is, a modest increase of two hours in time allocations may not result in any additional legal charges, but, for instance, doubling the time an examiner spends reviewing a patent application could have an impact on attorney's fees. Even if this is the case, it is important to note that the vast majority of the legal costs associated with prosecuting a patent application are associated with the initial drafting of the patent application. *Id.* at 30.

29. *Id*. at 41.

30. We note that our analysis assumes that practicing attorneys would be able to monetize their greater efforts by increasing the legal charges associated with prosecuting patent applications. While fixed-fee arrangements may initially dampen efforts to do so, if greater examiner time allocations do lead to greater levels of time and effort by applicant's attorneys, increases in fixed-fee levels would be possible over time as new client and/or fee relationships are established.

evaluating this concern, it is important to note that the Patent Office has the lowest examination fees of any of the three major international patent offices.[31] Furthermore, small increases in patent examination fees appear to have a negligible effect on the volume of patent filings.[32] Because the actual fees paid to the Patent Office for the examination of a patent application are a fraction of the overall cost of securing a patent (which includes attorney fees for preparing and prosecuting a patent), there is reason to believe that even a two- or three-fold increase in examination fees will not substantially impede access to the U.S. patent system. As a bonus, increasing examination fees will likely also result in raising the quality of patent applications filed with the Patent Office, as applicants become more judicious in selecting the inventions for which they wish to pursue patent rights.

Concerns regarding access to the patent system are arguably more important for patent applicants that qualify for small- and micro-entity status; evidence suggests these entities are particularly innovative. Currently the Patent Act authorizes entities that qualify for small and micro-entity status to pay reduced examination fees. Because we propose that the Patent Office align examination fees with patent application review costs, small- and micro-entities would no longer receive a fixed examination fee discount.

We also propose to abolish the Agency's issuance fees (i.e., the fee paid when a patent is granted). Issuance fees have been used to subsidize the examination costs of unsuccessful patent applicants. However, this will no longer be necessary when the Patent Office increases its examination fees to cover its operational costs. Moreover, because the AIA does not permit the Patent Office's aggregate fee income to exceed its operational costs, an increase in the level of examination fees would necessitate a decrease in the level of post-allowance fees. This requirement would be partially satisfied by eliminating issuance fees.

Importantly, we do not advocate eliminating or diminishing renewal fees. Unlike issuance fees, renewal fees perform a valuable social function. Renewal fees effectively shorten the lifetime of a patent: when a patent holder opts not to pay a renewal fee, the invention becomes part of the public domain. This can prove socially beneficial in various ways—e.g., freeing up other innovators who may now use this patented invention in their own work. An out-right elimination of renewal fees could substantially increase the costs of patents to society by maintaining unnecessary obstacles to innovation.

However, we do recommend that Congress decouple the renewal fee income from the revenue stream that the Patent Office can immediately access for funding. While this decoupling goal may be achieved in various ways, we propose the most straightforward approach: Congress would abolish the requirement that the Agency's aggregate fee income not exceed its operational costs. Renewal fees would then be allocated to a separate fund, similar to the Patent and Trademark Fee Reserve Fund, and earmarked for Patent Office use only. This fund would then be used to provide rebates to small- and micro-entities. As a replacement for the guaranteed fee discount for any given small- or micro-entity application, the Agency's excess renewal fee income would be utilized to subsidize the small-entity and micro-entity examination fee.

The difference between a guaranteed fee discount to small- and micro-entities and a subsidy paid to those groups out of the proposed renewal fee funds comes down to risk. Under

---

[31] To examine a patent application with twenty claims the European Patent Office would charge approximately $5,000 and the Japanese Patent Office would charge approximately $2,000. In comparison, U.S. Patent Office examination fees are $1,600.

[32] de Rassenfosse and van Pottelsberghe de la Potterie, *On the Price Elasticity of Demand for Patents*, 74 OXFORD BULLETIN OF ECON. & STAT. 58 (2012).

the current approach, regardless of the number of small-entity and micro-entity applications, those applicants will receive the same discount. Under our proposed approach, it is possible that if small- and micro-entity applicant pools grow disproportionately quickly, there may be a small reduction in the discount extended per application.

While our proposal offers the advantage of alleviating funding risks for the Agency and eliminating any granting bias arising from its fee structure, it arguably creates a disadvantage in placing greater fee-level risks of this nature on the small- and micro-entity applicant pool. If this disadvantage proves too important, Congress could consider alternative means—unrelated to the Agency's user fees—to subsidize access to the patent system by small- and micro-entities (e.g., subsidies paid out of general revenues).[33] Finally, if Congress prefers to maintain the current examination fee schedule for small- and micro-entities, we encourage aligning examination fees with costs for large entities, at a minimum. Given that the vast majority of patent applications are filed by large entities, aligning fees with costs for these entities would be a positive step towards providing the Patent Office with a sustainable funding model and eliminating the incentives of the Agency to grant invalid patents.[34]

3. Are there other prior art searching strategies that the USPTO could employ to perhaps save examination time, but increase patent quality?

We support increasing examiner's access to prior art, especially non-patent prior art, as Professor Chien has advocated.

[33] Direct congressional funding of subsidies to small and micro entities may also obviate difficult design choices regarding the timing of our proposed subsidies. Ideally, subsidies would be paid to small and micro entities at the time of application, especially in light of potential liquidity constraints. At that time, the Patent Office would adjust the level of the subsidy in light of the current (and projected) status of the renewal fee fund that we proposal creating and in light of prevailing (and projected) small and micro-entity application levels.

[34] Instead of removing issuance fees altogether, Congress and the Agency may also wish to simply treat issuance fees in the same manner we propose treating renewal fees—that is, retaining them but decoupling their revenues from the Agency funding process. After all, the issuance fee may be seen as the first renewal fee, to the extent it is often paid subsequent in time to when the applicant has been notified of the allowance of their patent.

Prof. Melissa Feeney Wasserman –
Promoting the Useful Arts:
How can Congress prevent the issuance of poor quality patents?
Questions for the Record
Submitted November 6, 2019

QUESTIONS FROM SENATOR COONS

1. According to the 2018 USPTO Performance and Accountability Report, examiners are correctly applying the statutory patentability criteria between roughly 92 and 97 percent of the time. Do you dispute these numbers? More generally, do you believe that the patent quality issues alleged in your research result from incorrect patentability analyses or shortcomings in identifying the most relevant prior art?

Our work on the determinants of examiners' grant rates suggests that the 2018 USPTO Performance and Accountability Report is overly optimistic with its estimation that examiners are correctly applying the statutory patentability criteria between roughly 92 and 97 percent of the time. For instance, we find that the year an examiner was hired and how the examiners was trained has a substantial effect on her granting behavior over the course of her career at the Patent Office.[1] In other wrods, we find that the culture promulgated by the Director during the beginning of an examiner's employment plays an important role in shaping her behavior throughout her career.[2] In our prior research, we utilized variation in the nature of the Patent Office's quality-assurance program to help map out three distinct regimes of the Agency's "allowance culture" over the period ranging from 1993 to 2012: (1) a more permissive granting culture throughout the 1990s; (2) a less permissive granting culture in the mid- to late-2000s; and (3) a more permissive granting culture in the 2010–2012 period.[3] We emphasize that these regimes are relative to one another. That is, we suggest only that the attitude of the Agency in the 1990s was more permissive with respect to granting than it was in the mid- to late-2000s. We do not attempt to classify these cultural eras relative to some normatively optimal benchmark.

We found that examiners hired under a more permissive granting culture had higher grant rates that remained high during the course of their career than examiners hired under a more restrictive granting culture.[4] One would next expect to see such dramatic differences in patent examiners' grant rates by the year they were hired and the training they received if all examiners were applying the statutory patentability criteria the same way the vast majority of the time.

In another study, we examine whether examiner time allocations are inducing examiners to allow patents of low quality. The Patent Office sets a patent examiner's time allocations based on two key factors: the technological field in which the examiner is working and her position in the general schedule ("GS") pay scale.[5] A patent examiner in a more complex field is provided

---

1 Michael D. Frakes & Melissa F. Wasserman, *Patent Office Cohorts*, 65 Duke L. J. 1601 (2016).
2 *Id.*
3 *Id.*
4 *Id.*
5. U.S. DEP'T COMM., OFFICE OF INSPECTOR GEN., USPTO SHOULD REASSESS HOW EXAMINER GOALS, PERFORMANCE APPRAISAL PLANS, AND THE AWARD SYSTEM STIMULATE AND REWARD EXAMINER PRODUCTION 7 n.6 (2004),

more hours to review an application than an examiner of the same GS-level who is working in a less complex field.[6] The higher the pay grade of an examiner within a technology area, the fewer hours the Patent Office extends to that examiner.[7] To demonstrate the degree to which time allocations scale with GS-level changes, we present in Table 1 the examination time expectations facing a patent examiner working in one of the most complex fields, artificial intelligence, and one of the least complex fields, compound tools (e.g., a hammer).[8] A promotion to each subsequent pay grade is roughly equated to a 10% to 15% decrease in the number of allocated examination hours.[9] Examiners operating at GS-level 7 are given the greatest amount of time in reviewing patents in compound tools and artificial intelligence—19.7 hours and 45.1 hours, respectively—whereas examiners operating at GS-level 14 are expected to review the same patent in approximately half that time.

In our recent research, we embraced the variation made possible by these schedules to test the link between examination time and the granting practices of examiners. More specifically, we followed individual examiners throughout the course of their careers and tracked the evolution of their examination behavior as they experienced GS-level promotions that diminished the amount of examination time at their disposal.[10] Our methodological design was structured so as to explore this relationship between grant rates and the occurrence of time-allocation-reducing promotions while accounting for the potentially confounding influence of other factors—e.g., increases in examiner years of experience—that may be correlated with such promotions and that may independently affect examiner granting tendencies. Accordingly, in estimating this relationship between GS-levels and grant rates, our underlying regression specifications included a series of fixed effects and other controls: (1) year fixed effects, based on the year in which the application is disposed of, to account for general Patent Office trends and granting practices; (2) examiner experience fixed effects (in two-year bins), to better isolate the time-allocation aspect of GS-level promotions and account for the correlation between GS-levels and experience; (3) examiner fixed effects, to account for the possibility, among other things, that higher GS-level examiners have fundamentally different granting styles from their more junior counterparts; (4) technology-by-year fixed effects, to alleviate concerns that examiners may be reassigned to different technologies as they ascend to higher pay grades and that such reallocation schemes may change over time; and (5) various individual characteristics of the applications, including the entity size of the applicant (large versus small), the length of time between the filing and the disposition of the application, and the foreign priority status of the application (previous filings at the European Patent Office ("EPO") and Japanese Patent Office ("JPO"). Our recent research also included various additional empirical exercises to support the proposition that our methodological design captured variations

---

https://www.americanbar.org/content/dam/aba/migrated/intelprop/109legis/CommerceDept_IGReportonPTO.authcheckdam.pdf ("Expectancy goals vary among examiners and are based on the individual examiner's grade level and the complexity of the technology under review.").

6. Andy Faile, Deputy Comm'r for Patent Operations, Examination Time and the Production System, Presentation at the Santa Clara-Duke Quality Conference (Sept. 9, 2016), http://1x937u16qcra1vnejt2hj4jl-wpengine.netdna-ssl.com/wp-content/uploads/Faile-Examination-Time-and-the-Production-System.pptx [https://perma.cc/4S3N-GKDB].

7. *Id.*

8. *See* U.S. PATENT & TRADEMARK OFFICE, HOW THE USPTO DETERMINES PRODUCTION FOR USPTO PATENT EXAMINERS (on file with author).

9. *Id.* at 1.

10. Michael D. Frakes & Melissa F. Wasserman, *Is the Time Allocated to Review Patent Applications Inducing Examiners to Grant Invalid Patents?: Evidence from Micro-Level Application Data*, 99 REV. ECON. & STAT. 550 (2017).

in time allocations—e.g., we tested for and found stronger relationships in the case of time-sensitive bases of rejecting patent applications.[11]

To execute our empirical strategy, we utilized novel data on 1.4 million patent applications disposed of between 2002 and 2012, merged with rich, examiner roster data received from the Patent Office pursuant to a series of Freedom of Information Act ("FOIA") requests.

We found that as an examiner is given less time to review an application—as identified by these time-reducing promotions—the less active she becomes in searching for prior art, the less likely she becomes to make time-intensive rejections, and the more likely she becomes to grant the patent.[12] The magnitude of the result is quite striking. A patent examiner who has been promoted to GS-level 14 has a grant rate that is 13% to 29% higher than it was when she was at a GS-level 7.[13]

TABLE 1: EXAMINATION HOURS ALLOCATED TO EXAMINER AS A FUNCTION OF GS-LEVEL[14]

	(1)	**(2)**
GS-level	**Compound Tools**	**Artificial Intelligence**
GS-7	19.7	45.1
GS-9	17.3	39.5
GS-11	15.3	35.1
GS-12	13.8	31.6
GS-13	12.0	27.5
GS-13, partial signatory	11.0	25.3
GS-14	10.2	23.4

Figure 1 plots the relationship between a given examiner's grant rate and the occurrence of each of the indicated GS-level promotions, wherein GS-level 7 serves as the omitted reference group and wherein the indicated relationships partial out the influence of those other factors mentioned above (e.g., examiner experience-level bins).[15] As Figure 1 demonstrates, examiner grant rates ascend strongly and monotonically with each GS-level promotion. In addition to the rich level of controls that we include in the regression design underlying this figure, the analysis also supports a causal interpretation of the observed pattern in light of certain institutional features of the Patent Office. Mainly because patent applications are randomly assigned to examiners

11. *Id.*
12. *Id.*
13. *Id.*
14. *Id.* at online app. at 2–3 tbl.A1.
15. Michael D. Frakes & Melissa F. Wasserman, *Is the Time Allocated to Review Patent Applications Inducing Examiners to Grant Invalid Patents?: Evidence from Micro-Level Application Data*, 99 REV. ECON. & STAT. 550, 556 (2017).

within their technological groups, there is no reason to believe that examiners at higher GS-levels are being assigned more patent-worthy applications than examiners at lower GS-levels.[16]

Our analysis implies that if examiners are given double the amount of time to review applications, the Patent Office's overall grant rate would fall by roughly 19 percentage points, amounting to roughly eighty thousand fewer patents issued per year. What is the nature of these eighty thousand patents? Are they valid or invalid? If we were to expand time allocations so as to knock out patents, we would hope that the affected patents would indeed be invalid patents. Fortunately, our study was able to explore the nature of those patents issued on the margin as a result of binding time constraints.[17] To do so, we relied on the fact that many U.S. applicants likewise file for patent protection with the EPO and the JPO, two offices that are known to invest substantially more resources per application in the examination process while having essentially similar patentability standards.[18] Accordingly, we considered the sample of issued patents in which the relevant U.S. applicant likewise sought protection at the EPO and the JPO and used outcomes at these foreign offices as a benchmark—albeit an imperfect one—to assess what the outcome at the U.S. Patent Office would have been (at least generally speaking) if the U.S. examiners were given more time and resources to determine the patentability of the relevant invention.[19] We found evidence that the promotions of interest in our study were associated with a reduction in the frequency by which the inventors of U.S.-issued patents are successful in securing patent protection for the relevant inventions at the EPO and the JPO.[20] The implication of this finding is that the marginal patents being issued as a result of binding time constraints are indeed of questionable legal validity.

16. A recent paper by Cesare Righi and Timothy Simcoe documents evidence of examiner specialization within technology-group assignments, as well as specialization within technology subgroups. Cesare Righi & Timothy Simcoe, *Patent Examiner Specialization*, 48 RES. POL'Y 137, 141 (2019). However, Righi and Simcoe's analysis finds "little evidence" suggesting that applications are assigned to examiners based on the importance or claim breadth of the applications or on their patent worthiness. *Id*. at 147.

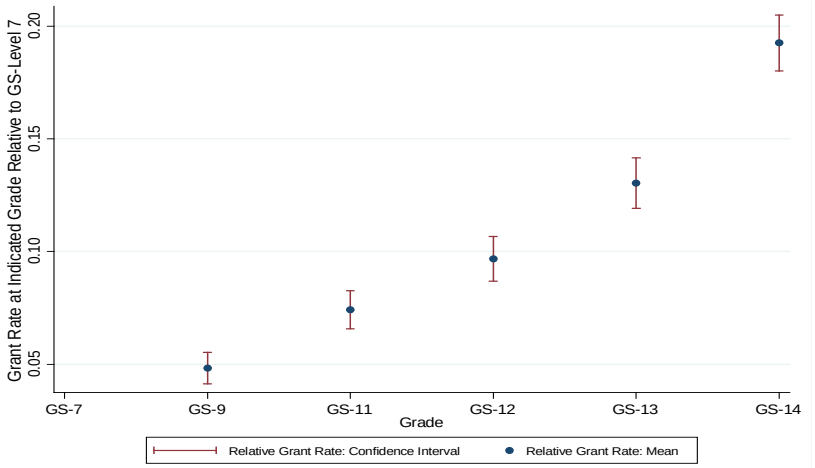
17. Michael D. Frakes & Melissa F. Wasserman, *Is the Time Allocated to Review Patent Applications Inducing Examiners to Grant Invalid Patents?: Evidence from Micro-Level Application Data*, 99 REV. ECON. & STAT. 550, 553 (2017).

18. Pierre M. Picard & Bruno van Pottelsberghe de la Potterie, *Patent Office Governance and Patent System Quality*, 104 J. PUB. ECON. 14, 16–17 (2013) (presenting "stylized facts on differences between the U.S. Patent and Trademark Office (USPTO), the European Patent Office (EPO), and the Japan Patent Office (JPO)").

19. To assess the quality of these marginal patent issuances, we consider the full sample of patents that were issued in the United States and also sought protection in the EPO and the JPO and then estimate how the mean incidence of such patents likewise being granted by the EPO (and/or the JPO) changes as examiners experience GS-level promotions that reduce the amount of examination time available to them. Consistent with expectations, we find that relative to the patents issued at GS-level 7, the patents issued at GS-level 14 are seven percentage points (or roughly sixteen percent) less likely to be allowed by both the EPO and the JPO (when using success at both foreign offices to signify the strongest benchmark of quality). Michael D. Frakes & Melissa F. Wasserman, *Is the Time Allocated to Review Patent Applications Inducing Examiners to Grant Invalid Patents?: Evidence from Micro-Level Application Data*, 99 REV. ECON. & STAT. 550, 560 (2017)..

20. *Id*.

FIGURE 1: RELATIONSHIP BETWEEN EXAMINER GS-LEVELS AND GRANT RATE



This Figure presents results from a regression of the incidence of a granted application on dummy variables representing each GS-level between 7 and 14. The dummy variable for GS-level 7 is omitted, representing the reference group. The vertical bars represent 95% confidence intervals for the estimated coefficients. The underlying regression producing this relationship accounts for fixed differences in granting practices across technology groups, across examiners, and across years, while also controlling for examiner experience levels.

In summary, our results suggest that examiners are facing binding time constraints and that these time constraints are inducing examiners to grant invalid patents and also suggest that examiners are not applying the statutory patentability criteria correctly over 90 percent of the time.[21] Our results suggests that examiners are struggling not only to find the most relevant prior art but also in making time intensive rejections—such as obviousness which requires piecing together multiple references to reject the claims at issue.[22]

2. You propose doubling the amount of examination time for each patent application and shifting more patent fees to the application stage. Have you analyzed the impact of any corresponding upfront fee increases on those applying for patents, particularly independent inventors, universities, and startups? If so, to what extent would your proposals discourage inventors from pursuing patent protection?

To be clear, we don't think doubling examination time is optimal. We choose to look at doubling examination time in our research because we wanted to compare our analysis with the prior literature, which had assumed doubling examination time.[23] It is difficult to know the optimal increase in examiner time allocations. However, one approach the Patent Office could adopt is to equalize the grant rate of patent examiners across GS-levels. At this time, the likelihood that your patent application will be granted is dependent upon the GS-level of the examiner your application

21. Michael D. Frakes & Melissa F. Wasserman, *Is the Time Allocated to Review Patent Applications Inducing Examiners to Grant Invalid Patents?: Evidence from Micro-Level Application Data*, 99 REV. ECON. & STAT. 554-55 (2017).

22 *Id.*

23 *Compare* Michael D. Frakes & Melissa F. Wasserman, *Irrational Ignorance at the Patent Office*, 72 VAND. L. REV. 975 (2019) *with* Mark Lemley, *Rational Ignorance at the Patent Office*, 95 NW. L. REV. 1495 (2001).

happens to be randomly assigned.[24] Our research has demonstrated that examiners grant rate increase as they are promoted up the GS-level scale. While decreasing hour allotments upon promotion is sensible—after all, seasoned and proven examiners are likely to complete a review of an application faster than an examiner who has yet to demonstrate this competency—we nonetheless propose that the Patent Office adjust the rate at which it decreases time allocations upon examiner promotion. Our estimates of significantly higher grant rates upon reaching higher GS levels suggest that the current scaling of the time allotments upon promotion is too aggressive, providing insufficient time to more senior examiners. We propose that the Patent Office adjust the scaling factors so that an examiner's grant rate does not increase so dramatically upon experiencing time diminishing promotions. To the extent that these adjustments will create a more homogenous pattern of grant rates across examiners, such a change would increase the equity of the patent examination system, as similar applicants would be more likely to have similar patent office outcomes, regardless of the particular examiner chosen to process an application.

Examination fees were originally set below examination costs in order to increase access to the Patent Office. Thus, one concern is that a substantial increase to examination fees could have a negative effect on the number of high-quality patent applications filed. In evaluating this concern, it is important to note that the Patent Office has the lowest examination fees of any of the three major international patent offices.[25] Furthermore, small increases in patent examination fees appear to have a negligible effect on the volume of patent filings.[26] Because the actual fees paid to the Patent Office for the examination of a patent application are a fraction of the overall cost of securing a patent (which includes attorney fees for preparing and prosecuting a patent), there is reason to believe that even a two- or three-fold increase in examination fees will not substantially impede access to the U.S. patent system.

Concerns regarding access to the patent system are arguably more important for patent applicants that qualify for small- and micro-entity status; evidence suggests these entities are particularly innovative. Currently the Patent Act authorizes entities that qualify for small and micro-entity status to pay reduced examination fees. Because we propose that the Patent Office align examination fees with patent application review costs, small- and micro-entities would no longer receive a fixed examination fee discount.

We also propose to abolish the Agency's issuance fees (i.e., the fee paid when a patent is granted). Issuance fees have been used to subsidize the examination costs of unsuccessful patent applicants. However, this will no longer be necessary when the Patent Office increases its examination fees to cover its operational costs. Importantly, we do not advocate eliminating or diminishing renewal fees. Unlike issuance fees, renewal fees perform a valuable social function. Renewal fees effectively shorten the lifetime of a patent: when a patent holder opts not to pay a renewal fee, the invention becomes part of the public domain. This can prove socially beneficial

---

[24] Michael D. Frakes & Melissa F. Wasserman, *Is the Time Allocated to Review Patent Applications Inducing Examiners to Grant Invalid Patents?: Evidence from Micro-Level Application Data*, 99 REV. ECON. & STAT. 550 (2017).

[25] To examine a patent application with twenty claims the European Patent Office would charge approximately $5,000 and the Japanese Patent Office would charge approximately $2,000. In comparison, U.S. Patent Office examination fees are $1,600.

[26] Gaetan de Rassenfosse & B. van Pottelsberghe de la Potterie, *On the Price Elasticity of Demand for Patents*, 74 OXFORD BULL. ECON. & STAT. 58, 58–77 (2011).

in various ways—e.g., freeing up other innovators who may now use this patented invention in their own work. An out-right elimination of renewal fees could substantially increase the costs of patents to society by maintaining unnecessary obstacles to innovation. However, we do recommend that Congress decouple the renewal fee income from the revenue stream that the Patent Office can immediately access for funding. While this decoupling goal may be achieved in various ways, we propose the most straightforward approach: Congress would abolish the requirement that the Agency's aggregate fee income not exceed its operational costs. Renewal fees would then be allocated to a separate fund, similar to the Patent and Trademark Fee Reserve Fund, and earmarked for Patent Office use only. This fund would then be used to provide rebates to small- and micro-entities. As a replacement for the guaranteed fee discount for any given small- or micro-entity application, the Agency's excess renewal fee income would be utilized to subsidize the small-entity and micro-entity examination fee.

The difference between a guaranteed fee discount to small- and micro-entities and a subsidy paid to those groups out of the proposed renewal fee funds comes down to risk. Under the current approach, regardless of the number of small-entity and micro-entity applications, those applicants will receive the same discount. Under our proposed approach, it is possible that if small- and micro-entity applicant pools grow disproportionately quickly, there may be a small reduction in the discount extended per application.

While our proposal offers the advantage of alleviating funding risks for the Agency and eliminating any granting bias arising from its fee structure, it arguably creates a disadvantage in placing greater fee-level risks of this nature on the small- and micro-entity applicant pool. If this disadvantage proves too important, Congress could consider alternative means—unrelated to the Agency's user fees—to subsidize access to the patent system by small- and micro-entities (e.g., subsidies paid out of general revenues).[27] Finally, if Congress prefers to maintain the current examination fee schedule for small- and micro-entities, we encourage aligning examination fees with costs for large entities, at a minimum. Given that the vast majority of patent applications are filed by large entities, aligning fees with costs for these entities would be a positive step towards providing the Patent Office with a sustainable funding model and eliminating the incentives of the Agency to grant invalid patents.[28]

---

[27] Direct congressional funding of subsidies to small and micro entities may also obviate difficult design choices regarding the timing of our proposed subsidies. Ideally, subsidies would be paid to small and micro entities at the time of application, especially in light of potential liquidity constraints. At that time, the Patent Office would adjust the level of the subsidy in light of the current (and projected) status of the renewal fee fund that we proposal creating and in light of prevailing (and projected) small and micro-entity application levels.

[28] Instead of removing issuance fees altogether, Congress and the Agency may also wish to simply treat issuance fees in the same manner we propose treating renewal fees—that is, retaining them but decoupling their revenues from the Agency funding process. After all, the issuance fee may be seen as the first renewal fee, to the extent it is often paid subsequent in time to when the applicant has been notified of the allowance of their patent.

3. Your research concludes that increasing examination time results in lower numbers of issued patents. Why do you believe that a lower grant rate implies higher quality? Does your research include any qualitative metrics for evaluating issued patent claims?

No we don't believe that lower grant rate necessarily means higher quality. However, our research specifically looks for markers of lower quality patents. For instance, in our work that has examined time allocations of patent examiners, we followed individual examiners over the course of their careers and tracked the evolution of their examination behavior as they experienced GS-level promotions that diminished the amount of examination time at their disposal.[29] Our methodological design was structured so as to explore this relationship between grant rates and the occurrence of time-allocation-reducing promotions while accounting for the potentially confounding influence of other factors—e.g., increases in examiner years of experience—that may be correlated with such promotions and that may independently affect examiner granting tendencies. Accordingly, in estimating this relationship between GS-levels and grant rates, our underlying regression specifications included a series of fixed effects and other controls: (1) year fixed effects, based on the year in which the application is disposed of, to account for general Patent Office trends and granting practices; (2) examiner experience fixed effects (in two-year bins), to better isolate the time-allocation aspect of GS-level promotions and account for the correlation between GS-levels and experience; (3) examiner fixed effects, to account for the possibility, among other things, that higher GS-level examiners have fundamentally different granting styles from their more junior counterparts; (4) technology-by-year fixed effects, to alleviate concerns that examiners may be reassigned to different technologies as they ascend to higher pay grades and that such reallocation schemes may change over time; and (5) various individual characteristics of the applications, including the entity size of the applicant (large versus small), the length of time between the filing and the disposition of the application, and the foreign priority status of the application (previous filings at the European Patent Office ("EPO") and Japanese Patent Office ("JPO"). Our recent research also included various additional empirical exercises to support the proposition that our methodological design captured variations in time allocations—e.g., we tested for and found stronger relationships in the case of time-sensitive bases of rejecting patent applications.[30]

To execute our empirical strategy, we utilized novel data on 1.4 million patent applications disposed of between 2002 and 2012, merged with rich, examiner roster data received from the Patent Office pursuant to a series of Freedom of Information Act ("FOIA") requests.

We found that as an examiner is given less time to review an application—as identified by these time-reducing promotions—the less active she becomes in searching for prior art, the less likely she becomes to make time-intensive rejections, and the more likely she becomes to grant the patent.[31] The magnitude of the result is quite striking. A patent examiner who has been

29. Michael D. Frakes & Melissa F. Wasserman, *Is the Time Allocated to Review Patent Applications Inducing Examiners to Grant Invalid Patents?: Evidence from Micro-Level Application Data*, 99 REV. ECON. & STAT. 550, 550 (2017).

30. *Id.*

31. *Id.*

promoted to GS-level 14 has a grant rate that is 13% to 29% higher than it was when she was at a GS-level 7.[32]

Our analysis implies that if examiners are given double the amount of time to review applications, the Patent Office's overall grant rate would fall by roughly 19 percentage points, amounting to roughly eighty thousand fewer patents issued per year. What is the nature of these eighty thousand patents? Are they valid or invalid? If we were to expand time allocations so as to knock out patents, we would hope that the affected patents would indeed be invalid patents. Fortunately, our previous study was able to explore the nature of those patents issued on the margin as a result of binding time constraints.[33] To do so, we relied on the fact that many U.S. applicants likewise file for patent protection with the EPO and the JPO, two offices that are known to invest substantially more resources per application in the examination process while having essentially similar patentability standards.[34] Accordingly, we considered the sample of issued patents in which the relevant U.S. applicant likewise sought protection at the EPO and the JPO and used outcomes at these foreign offices as a benchmark—albeit an imperfect one—to assess what the outcome at the U.S. Patent Office would have been (at least generally speaking) if the U.S. examiners were given more time and resources to determine the patentability of the relevant invention.[35] We found evidence that the promotions of interest in our study were associated with a reduction in the frequency by which the inventors of U.S.-issued patents are successful in securing patent protection for the relevant inventions at the EPO and the JPO.[36] The implication of this finding is that the marginal patents being issued as a result of binding time constraints are indeed of questionable legal validity.

32. *Id.*

33. *Id.* at 553.

34. Pierre M. Picard & Bruno van Pottelsberghe de la Potterie, *Patent Office Governance and Patent System Quality*, 104 J. PUB. ECON. 14, 16–17 (2013) (presenting "stylized facts on differences between the U.S. Patent and Trademark Office (USPTO), the European Patent Office (EPO), and the Japan Patent Office (JPO)").

35. To assess the quality of these marginal patent issuances, we consider the full sample of patents that were issued in the United States and also sought protection in the EPO and the JPO and then estimate how the mean incidence of such patents likewise being granted by the EPO (and/or the JPO) changes as examiners experience GS-level promotions that reduce the amount of examination time available to them. Consistent with expectations, we find that relative to the patents issued at GS-level 7, the patents issued at GS-level 14 are seven percentage points (or roughly sixteen percent) less likely to be allowed by both the EPO and the JPO (when using success at both foreign offices to signify the strongest benchmark of quality). Michael D. Frakes & Melissa F. Wasserman, *Is the Time Allocated to Review Patent Applications Inducing Examiners to Grant Invalid Patents?: Evidence from Micro-Level Application Data*, 99 REV. ECON. & STAT. 550, 560 (2017).

36. *Id.*

United States Senate Judiciary
Subcommittee on Intellectual Property

"Promoting the Useful Arts: How can Congress prevent the issuance of poor quality patents?"

Questions for the Record for Melissa Feeney Wasserman
Submitted by Senator Richard Blumenthal
November 6, 2019

1. As you know, the patent system is complex and technical. Many small inventors lack the knowledge and resources to navigate the system. For that reason, I am a major proponent of the Patent Pro Bono Program, which ensures that the patent system is open to any inventor with a good idea and is not just available for the wealthy and well-connected.

   The Pro Bono Program is also important to the patent quality debate. First, it gives inventors the help they need to submit clear and precise patents. Second, it ensures that as the PTO cracks down on poorly drafted patents, it does not unintentionally harm inventors with valid inventions but without the resources to hire top-dollar attorneys.

   a. Does the Pro Bono Program improve the quality of patent applications?

   Unfortunately, we are not aware of any data on the Pro Bono Program and thus unable to provide our views on this question.

   b. Do you believe that the Pro Bono Program helps small inventors avoid unintended harms that could be caused by efforts to reduce the issuance of poor quality patents?

   Unfortunately, we are not aware of any data on the Pro Bono Program and thus unable to provide our views on this question.