January 8, 2010

My 2010 wishes for the U.S. Patent Examiner

Ron D Katznelson, *Bi-Level Technologies*

My 2010 wishes for the U.S. Patent Examiner

By Ron D. Katznelson

When asked what wishes pertaining to patents I have for the New Year, I began thinking about the large number of problem areas for which I wish fundamental change, improvements and solutions. The problem list grew longer but all have a single common underlying cause. All of the problems would likely not have developed had the U.S. patent office been functional and timely in granting quality patents. For the most part, past actual and perceived USPTO dysfunction stem from long-term failure to invest in our Nation's patent examiner corps. This is the reason that for this New Year, I make my wishes for the USPTO *Patent Examiner*.

I wish that 2010 became the year during which we have a new and different conversation on the role, status and skill level we should expect from USPTO examiners. I wish that this conversation would lead to the national realization that we have severely under-funded, under-resourced and under appreciated the role and status of the patent examiner profession. Although the implications of my wish may appear radical and expensive to some, I believe the conversation should focus on three fundamental elements. The first is the recognition that proper examination of patent applications for inventions in leading areas of technology requires professional knowledge and expertise in the art comparable to, if not exceeding, that of inventors in the field. The second is the recognition that basic changes in examiners' working conditions, production goals and incentives are required to ensure that examiners have adequate time for examination and for acquiring technical knowledge, and that they are easier to recruit and retain. The third component is the proper alignment of examiner quality measures and incentives with the societal costs of patent examination errors. In addressing these issues, I cite historical facts and policy practices of previous USPTO administrations in order to highlight what I believe to have been mistakes that should have been avoided, and I wish would be avoided in the future.

(1) Examiners as knowledgeable scientific and technical professionals

Patent applicants respect their examiners. I believe that examiners should be able to earn our elevated respect and recognition as peers. When prosecuting my patent application, I expect an examiner who is well versed with the latest developments in my field and one who comprehends the problems my invention solves. A way to achieve this goal is to attract top technical experts to become patent examiners, an area in which the USPTO has had limited success. In order to develop and retain the expertise in the examining corps, it is essential to provide examiners with more time to specialize in their fields, the same way that their peers do: reading the technical literature, participating in conferences and attending technical trade shows. In my view, the examining corps expertise should rest on two "pillars:" examiners should first be scientists, engineers or technical experts in their art area, and second be specialists in patent examination procedures. While many examiners currently fit both of these "pillars," the USPTO today lacks the resources to ensure and foster the former. U.S. patent examiners' expertise, proficiency and professionalism should be regarded as a national asset worthy of investment to no lesser degree than recent national infrastructure investments under the stimulus package, as I elaborate below.

A good indicator of resource allocation by an agency for the first "pillar" is manifested by technical and scientific publications. Although there is no question that USPTO personnel are "well published" in terms of office actions, patentability opinions and legal briefs, these publications relate primarily to the second "pillar" of their job – not to the first scientific and

technical "pillar". Note that the USPTO is not the only government agency that employs scientists and technical experts to implement and exercise the agencies' authority to issue permits, award rights, regulate, or grant licenses to individuals or corporations. Agencies such as the EPA, FDA, NIH and USDA come to mind in that respect. Most relevant publication types for our comparison purposes are review articles rather than original contribution articles because patent examiners are not hired to perform basic research in their field. Analyzing citations of scientific and technical papers, I counted only the number of ***review*** papers published in the last 10 years by authors affiliated with the U.S. government agencies mentioned above. The numbers are tabulated below.

Number of technical/scientific review articles published during the last ten years having a US Government agency author

Number of review articles	Author/co-author affiliation
559	Environmental Protection Agency (EPA)
479	Food And Drug Administration (FDA)
679	National institute of health (NIH)
890	US Department of Agriculture (USDA)
1	US Patent and Trademark Office (USPTO)

Source: *ISI Web of Science* search result as of Dec-18-2009. Limited to 1999-2009 articles of a *"Review"* type and to "OG=" agency name variants selection of each agency listed above.

Only one review paper by an author affiliated with the USPTO was found. To be sure, because patent examiners are not hired to perform basic research in their field, we should not expect examiners or their line managers to publish hundreds or even tens of review papers in a decade. Moreover, I stipulate that my analysis is non-scientific and is rather sweeping, as it contains no normalization of agency staff or budgets directed at solely issuing permits, awarding rights, or granting licenses. For example, I acknowledge that my approach for comparing the FDA to the USPTO under this criterion is arguably like comparing "apples to oranges." I maintain, however, that these are still "two pieces of fruit" worthy of juxtaposition. First, I do not count articles for original research. I only count published review articles, although the article count likely includes papers published by FDA authors who may be engaged exclusively in research. Second, it is safe to conclude that a substantial number of published FDA authors are scientists from the centers directly responsible for processing, examining, rejecting or approving applications filed by commercial entities seeking FDA approval for their products.

I do not suggest or expect that USPTO examiners and their line managers spend a substantial amount of the aggregate corps time on writing and publishing papers. However, I do believe that more resources and non-examination time should be made available for professional career development that fosters specialization within the Office's technology art workgroups. This will permit and encourage expert examiners' compilation and occasional publication of "state of the art" reviews in peer-reviewed technical and scientific journals. I envision such publications to include all sources and particularly review new technical knowledge that became public through patent disclosures and through the unique USPTO repository of millions of commercial technical documents found in applicants' Information Disclosure Statement (IDS) filings.

This published "state of the art" research, compilation and publication activity should review the art in conjunction with the description of the pertinent patent ***subclasses*** and perhaps the rationale for their establishment at the Office. These published works would inform researchers, inventors and examiners alike. This composite documentation activity can help restore the

patent classification system to its important rightful place, after years of cuts in the Office's patent classification resources. Figure 1 shows the decline of classification establishment activity from an average of about 4,000 new subclasses per year, to one third of that in the last decade, despite the unabated continued exponential growth in new original patent applications in that period.

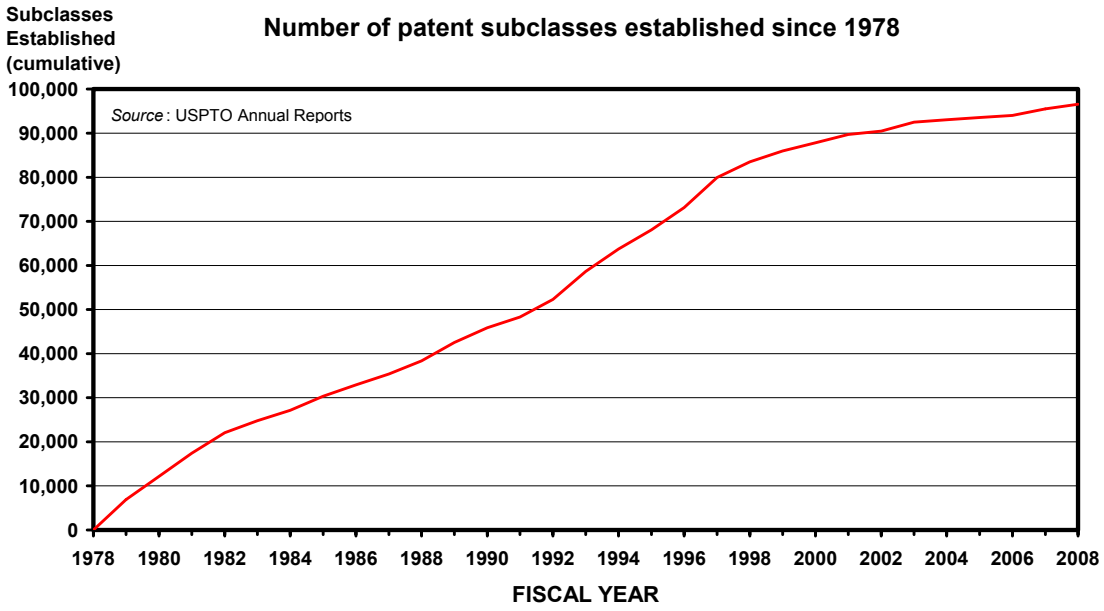

Figure 1 USPTO patent classification activity had slowed down significantly in the last decade.

The USPTO's apparent under-investment in the classification infrastructure of our national knowledge repository system is troubling. The classification system is an important patent quality tool, as it facilitates efficient search and identification of the most relevant prior-art, which often cannot be accomplished by keyword search tools alone. Permitting the speciation of the subclass system to deteriorate into effectively coarser subclasses detracts from its value and utility in supporting applicants' and examiners' search and the examination process. In addition, such degradation that weakens examination tools also weakens the proficiency of examiners.

Figure 2 shows one possible indicator of applicants' concerns about USPTO examiners' professional knowledge and search proficiency compared to their European colleagues. Such concern is likely a significant factor in the USPTO's low 'market share' (less than 17%) as the applicant-selected International Search Authority (ISA) among the Trilateral Patent Offices. This is a troubling fact, given that the USPTO receives about half of the PCT applications filed with these three offices. PCT International search fees are uniform, mandatory and somewhat duplicative of national phase search fees. As a U.S. applicant, I have often selected the EPO as the ISA for my PCT applications in order to get additional search results as a "second opinion," knowing that I also receive the USPTO examiner's search results for my counterpart national U.S. application. Similarly, because foreign PCT applicants (virtually all of whom designate the U.S in their PCT applications) originate about half of the Trilateral Offices PCT applications, I would expect them to appoint the USPTO as their ISA in order to obtain an opinion second to that of their Offices. Thus, under ***equally perceived examiner proficiencies and diligence***, I would not have expected the EPO's PCT search 'market share' to exceed that of the USPTO. The fact that it does so by more than a factor of four, is telling.

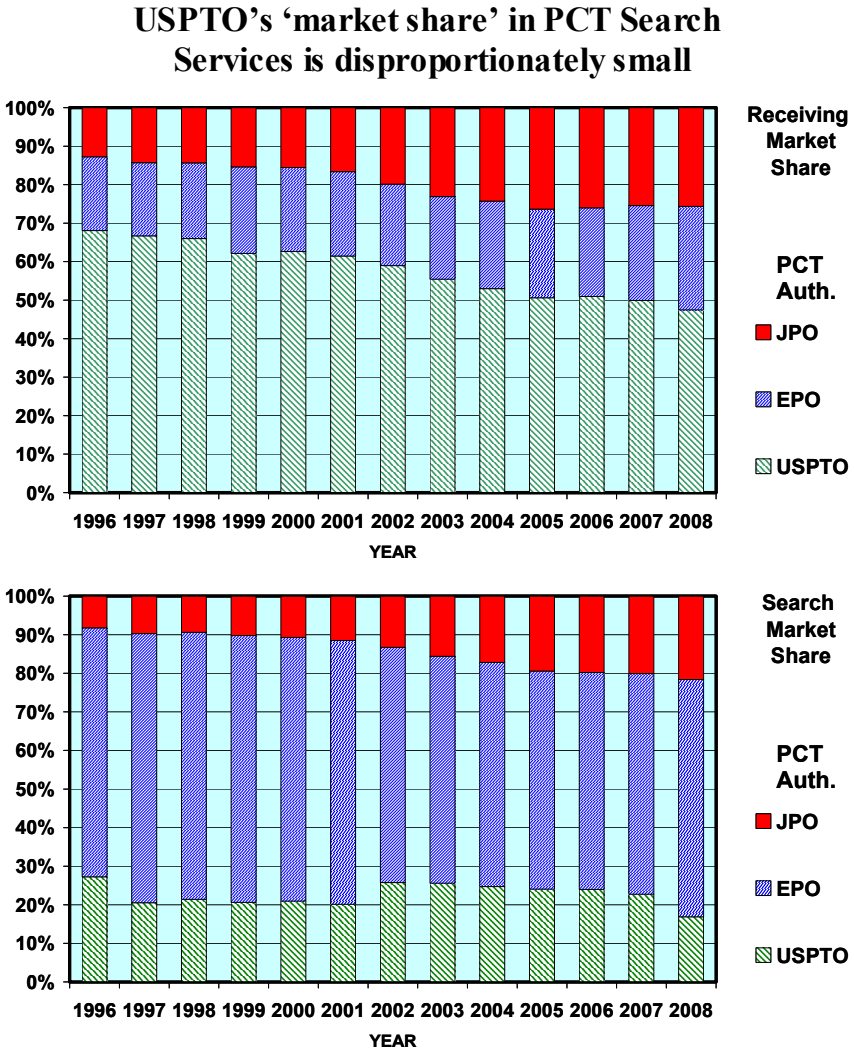

Figure 2 Relative share of PCT applications received and searched by the three major patent office *Source*: Trilateral Patent Offices Statistical Reports. At http://www.trilateral.net/statistics/tsr.html.

The EPO's disproportionately high PCT search 'market share' has a salutary effect of exposing EPO examiners to a growing number of sources and published art. It enhances the EPO's examiner corps' technical proficiency, thereby increasing even further its PCT search 'market share.' According to a 2005 EPO report, EPO examiners perform about three times more searches per claim than examinations per claim - a ratio that is substantially higher than that of their USPTO colleagues. As a result, EPO examiners spend more time in studying the art and less time in examining and writing office actions. Moreover, their time is well paid for by PCT search fees - an important revenue stream for the EPO, helping in attracting more examiners and retaining them. For every PCT International search ***not*** performed by a USPTO examiner, the USPTO loses $2,080 in PCT search fees. A substantial fraction of these PCT cases move to the U.S. national phase, whereupon a USPTO examiner must perform a search anyway, fetching only $540 in U.S. national search fees. In contrast, every national phase PCT application, for which the USPTO is selected as the ISA, fetches a total of $2,620 in search fees for search work that is not much different.

Therefore, investments in USPTO examiners' ability to elevate applicants' confidence in their work and seize search-services 'market share' from their European colleagues can not only

improve overall USPTO patent quality, but also bring large returns that would help pay for these investments. Unfortunately, this change appears to require major shifts in USPTO's management's approach: just as EPO's success in gaining search services share caused a self-propelling ability to gain even larger share, the USPTO's declining share denies its examiner corps' the resources and personnel to spend more time on these PCT searches, as the growing USPTO examination backlog takes precedence. This has caused a spiral of self-propelling deterioration.

In conclusion, a modest but sufficient increase in USPTO investments in its workgroups' ***non-examination*** time in areas described above is required for elevating USPTO examiners' proficiencies and status, for advancing their professional development and for increasing their retention and the respect they deserve. This investment will also enable the USPTO to gain market share in PCT search services, with all the concomitant benefits entailed, including revenue support for a larger examining corps.

(2) Examiners' workload and production goals

I wish that in 2010 the USPTO would commence a thorough review and conduct serious statistical performance studies and measurements in order to design a better examiner production-goal system. The following historical facts are worth mentioning. Recent USPTO annual reports and GAO studies attribute the current examiner production goal system to a 1976 agreement with the Examiners' Union. The goals were set after a "study" that apparently had been kept unpublished. However, the 1976 USPTO Annual Report mentions that the '76 production goal system had provided for a 6% increase in the average time for a disposal, setting the corps' new average goal at 19.5 GS-12 equivalent hours. I could find no evidence that the workgroup quotas set then were based on any measurements or objective performance facts. These objective performance facts might be examination error rates under different time allotments, choosing the shortest periods that yield acceptable examination error rates.

It appears that the ***relative*** quotas of examiner workgroups were not changed much in 1976 and that those had been determined earlier. To be more specific, they were determined in 1965, when the Office reorganized its patent examination Groups and created 108 Art Units in the Groups. The Office's 1965 Annual Report explains:

> In connection with program management, each Group Manager had been assigned ***a standard cost per disposal*** for his Group taking into account complexity of art and experience level of the examiner staff. This standard was developed through the joint efforts of the Superintendent, the Directors, and the Group Managers." (Emphasis added).

Thus, it appears that no objective measurements had been made of the number of hours required (the cost) to achieve acceptable error rates in relation to application attributes in order to "take into account complexity of art and experience level of the examiner staff." The reorganization of the corps was completed in 1966 and it is safe to conclude that the USPTO has been operating under this ad-hoc examiner production quota since then.

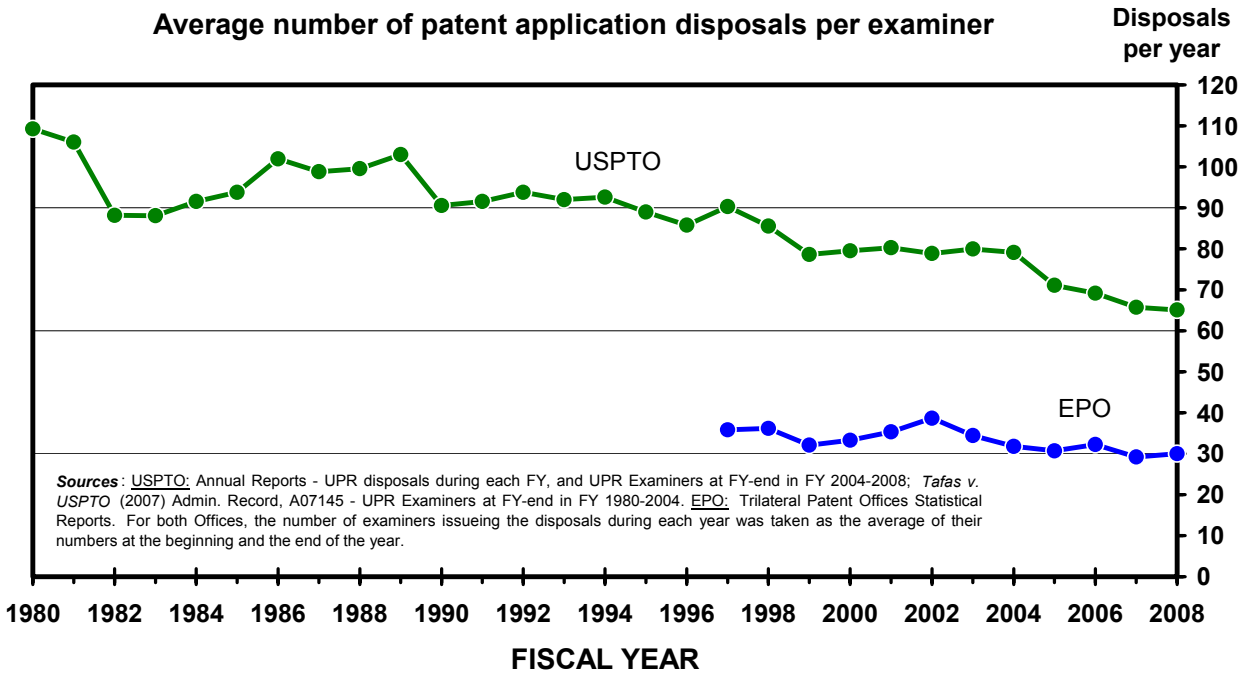

Figure 3 Average patent examination production rates at the USPTO and the EPO

At year-ends 1975 and 1976, the USPTO had 1,118 and 1,047 examiners respectively, corresponding to an average of 1083 examiners during 1976. They disposed of 113,312 patent applications during that year – an average of 105 disposals per year per examiner.[1] As the UPR statistics in Figure 3 show, this production rate had not changed much during the 1980's, although it had gradually declined in the last two decades. Note that USPTO examiners have examined more than twice the number of applications than their EPO colleagues. There are several contributing factors to this difference. In part, this is due to EPO's performing many more searches than examinations, as discussed above. Furthermore, evidence discussed below suggests that USPTO examiners are not given enough time per application, which adversely affects their work product's quality.

Although it may appear from Figure 3 that over the years, USPTO examiners progressively spend more time per application, this is not the case within each art area because the average production quota for USPTO workgroups have not changed since 1976. The disposal rates shown in the figure are an average over all examiners in ***all*** workgroups. It declined over the years because workgroups dealing with more complex applications (allotted with more time per application) have expanded and added more examiners in proportion to workgroups that deal with less complex and more mature technologies (allotted with fewer hours per application). Hence, the Office's examiner corps is now skewed towards groups dealing with more complex applications. The Office calls this phenomenon the "Complexity Creep."

The "complexity creep" relates only to changes in the ***mix*** of applications examined by the Office, but not to the increase over the years in complexity or the size parameters of applications received in a ***specific*** given art area. Indeed, there is evidence that the size parameters in the same art area do increase substantially over time. For example, the number of references cited in

[1] Note that the 1976 USPTO Annual Report lumps the number of Utility Plant and Reissue (UPR) examiners with Design patent examiners. Because of the very small numbers of design patent examiners and their relative number of disposals, the results above are approximately the same for UPR workloads.

liquid crystal patent applications had grown substantially over the last several decades. However, it does not appear that the USPTO has considered complexity growth ***within*** art areas since it has not adjusted the allotted examination hours per application. Therefore, the Office's term "complexity creep" is a misleading term that is better stated as "complexity mix creep." The fact remains that the USPTO had not dealt with patent applications' true "complexity Creep" since 1976.

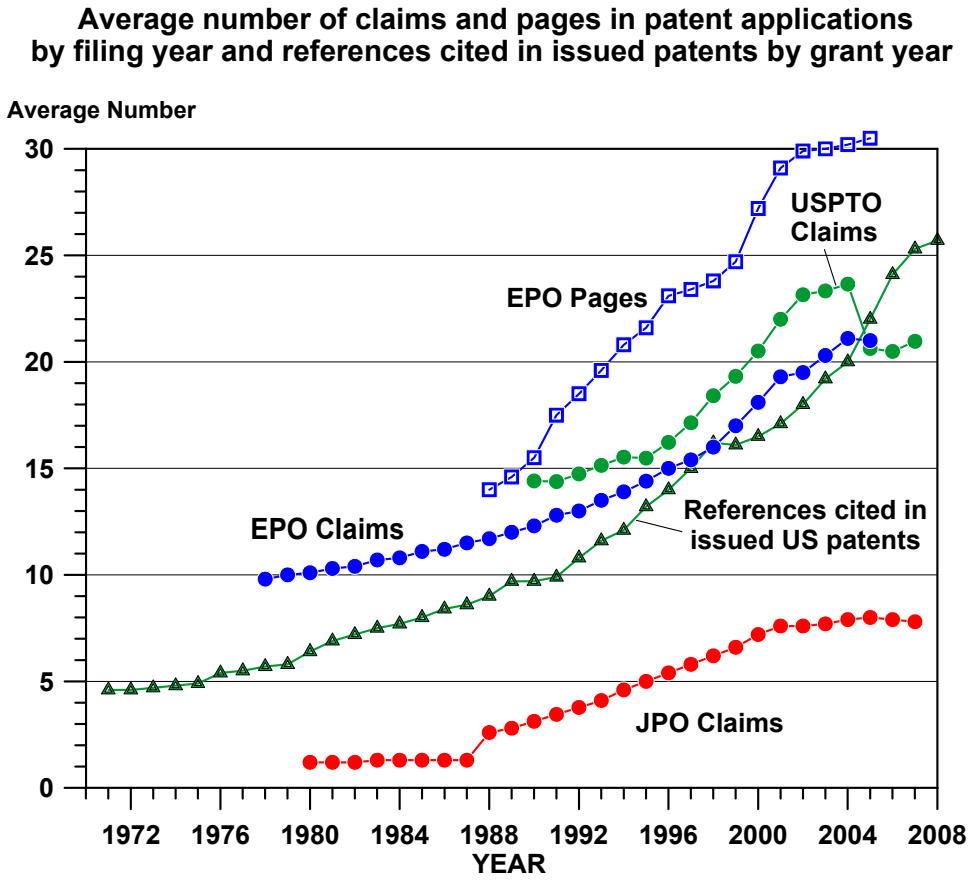

Figure 4 Patent application size parameters' growth trends. *Sources*: USPTO Claims: Sources detailed in R.D. Katznelson (2007) p. 13, at http://works.bepress.com/rkatznelson/16/. EPO Claims and Pages: N. van Zeebroeck et al. *World Patent Information*, **30**, pp. 43–52, (2008); E. Archontopoulos et al. *Information Economics And Policy,* **19**(2), pp. 103-132, (June 2007). JPO Claims: A. Goto and K. Motohashi, *Institute of Intellectual Property*, Tokyo, Japan (2006) at http://www.iip.or.jp/e/patentdb/paper.pdf. (The grand average was estimated by using the technology sector data of Figure 5 weighted by the number of applications for each technology sector shown in Figure 2). References cited in issued US patents: D. Crouch (2008) (sum of patent and non-patent references), at http://www.patentlyo.com/patent/2008/09/information-dis.html.

The composite of the "complexity mix creep" ***and*** the complexity growth within art areas over time is shown for several parameters in Figure 4. These include averages of the total number of claims in patent applications, the total number of pages in applications (including specification, drawings and claims) and the total number of references cited on the face of granted U.S. patents. More time is required for searching and examining an average patent application filed today in a given art area, compared to an average application filed in 1976 in that art area.

USPTO examiners operate under production goals set in 1976. They have very little choice but to meet these goals and in so doing, their actual average time spent per production unit (PU), which includes a first action and a disposal, is bound to be very close to the goals set by the

Office. This is shown in Figure 5, where actual allotted time per PU for each workgroup is presented for 2003 and 2004, with very little change between the years. Because the target goals had not changed since then, the hours spent per PU in these workgroups in subsequent years are expected to be substantially the same.

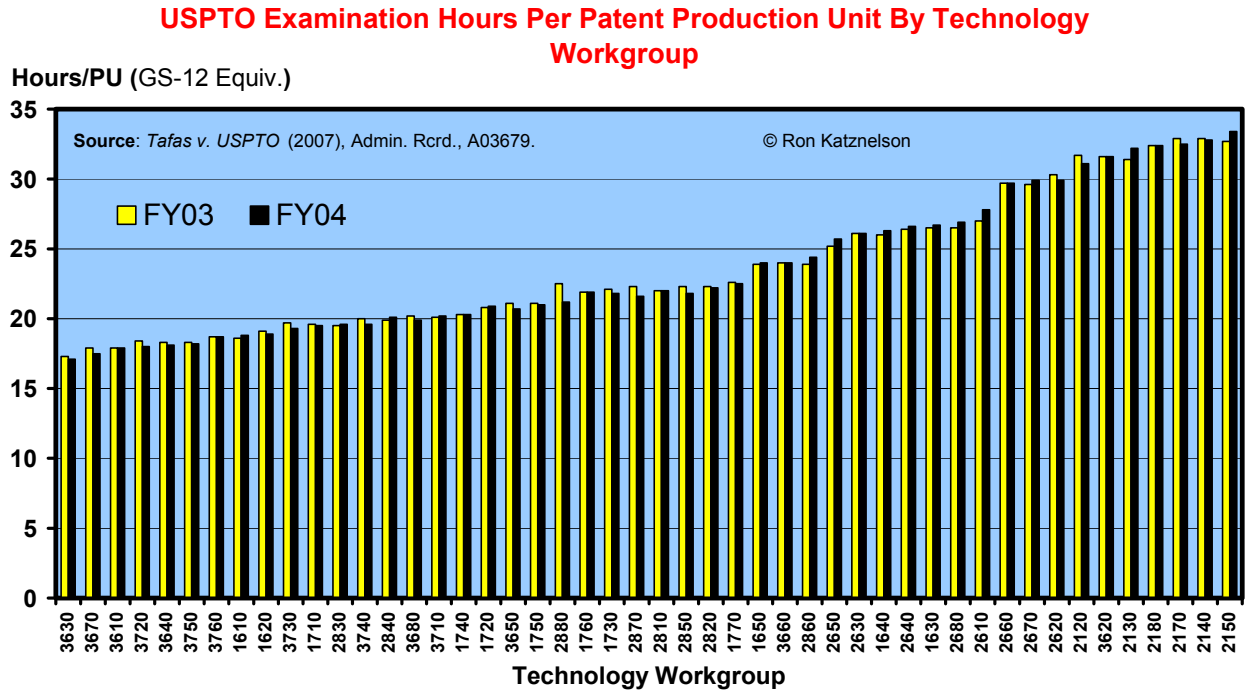

Figure 5 Examination time recorded per production unit in USPTO Technology Workgroups for Fiscal Years 2003 and 2004. Note that the year-to-year change is negligible, indicating performances near workgroup quotas.

Note that the range in the production time spent across workgroups covers nearly a factor of two, with about 17 hours per PU in Workgroup 3630 to about 33 hours per PU in Workgroup 2150. How was such a range for production goals arrived at? What basis does the Office have today to continue to believe that the growth since 1976 in the applications' number of pages, claims filed, references cited by applicants and those found by the examiner, has not changed materially the required time to review and consider the material and to examine the application? For example, is it likely that the more voluminous application material handled by examiners in Workgroup 1610 (Drugs, Bio-affecting and Body Treatment) today, could even be read and researched adequately, let alone examined, in about 18 hours on average?

GAO reports in 2005 and 2007 had identified the USPTO's archaic examiner production goal system as unrealistic, raising major concerns regarding examiner performance. In addressing calls for reevaluating these goals and their functional correctness, previous USPTO top management seemed to have adopted a circuitous and indirect indicator for the goals' adequacy and correctness: *examiner attrition statistics*. The previous USPTO Director responded in the following way to questions put to him in a February 27, 2008 congressional oversight hearing:

> *Mr. BERMAN:* Mr. Dudas, after the GAO report came out, the USPTO issued a press release in October stating that it will review assumptions the agency uses to establish production goals for patent examiners. What steps thus far has the agency taken to study these assumptions? When do you think we will have the results of your study? And will these results be made publicly available?

> *Mr. DUDAS*: Since that time, we have begun to look particularly at breaking down attrition and retention numbers not just across the board but specifically based on year. And we found that, as things are more focused, when you get more focus on things, you see patterns that begin to develop. [reporting on attrition statistical results].

Moreover, the previous Director had perceived no problem with the examiner production goals system:

> *Mr. CHABOT*: Mr. Undersecretary, I will begin with you… why did the USPTO wait until the 2007 GAO report to initiate a study on patent examiner production goals when a 2005 GAO report identified unrealistic production goals as a problem?
>
> *Mr. DUDAS*: Essentially, we are — we have not agreed with the conclusion that has come from GAO that it was intimated in 2005, and I think more directly said in 2007, the conclusion that what we need to do is adjust production goals and that that will somehow really increase production. And the reason being—and so, in 2004, I mentioned earlier, the inspector general did a report that said the opposite, essentially. It said we need to raise our production goals, not lower them. So I think what we are constantly looking at what should production goals be and how do they work. We are also looking in terms of what does it really mean in terms of attrition. What the GAO study did was gave a lot of good, raw data, but we have spent a lot of time doing—digging deeper under that data since earlier than 2005, really trying to find out what really is — what matters most for attrition and retention by year.

The previous Director appeared to conflate the production goal in hours per PU with the number of disposals an examiner completes per year. The USPTO had also followed up with written responses to the Subcommittee, showing that "Higher production requirements do not necessarily translate to higher attrition." The previous Director went further in denying any fault in the Office's production goal system:

> *Mr. DUDAS*: I think where I see attention is I think the conclusion that has come from the GAO study for many people is that what we need to do is lower standards across the board. And I would have to tell you, the USPTO disagrees that we need to lower standards for examiners. We are a performance-based organization with high achievers. And let me tell you what this means. It means that 60 percent of all of our folks work beyond the level they need, beyond 10 percent and beyond, to get higher bonuses. What we need to do is not lower standards. We need to increase opportunity. We need to increase flexibility. We need to let examiners have the opportunity to do what they do best from wherever they want, whenever they want, and however they want. [Providing more information on the Office's Tele-working program].

The Office's previous management's approach appears to have had the following logic: "The examiner production goals are just fine and are ***not*** set too high. ***We know*** this based on the fact that examiners are meeting, and indeed exceeding, their goals to get bonuses." This logic indicates a profound misapprehension of the examination process and of basic examiner personal economics: Examiners work to bring home a paycheck (which may include a bonus). They will ***always*** need to bring that check home, for which they ***will meet*** most any hour per PU goal the Office will set. The goals will always be met on average - see Figure 5. The only question is what kind of work product and examination errors will result in the process. Moreover, knowing some of these goals to be unrealistic, examiners may not feel responsible for the resulting work product and would not necessarily leave the corps in dissatisfaction. Thus, none of the attributes that the previous USPTO management had "studied for years" have much to do with the substantive merits or suitability of the examiner production goal system. For the most part, the GAO had also failed twice to identify the relevant facts that can help ascertain how realistic the

examiner production goals are. It interviewed examiners about the reasonableness of the goals but avoided asking the basic question: How do we know whether the production goals are realistic? As I show below, these are quality measurement facts that were staring in the face of USPTO's top management, who apparently ignored them.

As discussed below, the USPTO's own measure of examination errors is one-sided, as it reports final allowance error rates but does not report final rejection error rates. Nevertheless, even by this allowance-error measure alone, the fundamental deficiencies of the Office's production goals appear evident. This is shown in Figure 6 below, where the average allowance error rate for each workgroup is plotted against the average allotted time per PU in the respective workgroup. While not conclusive, these results are particularly suggestive: the broken trend lines show a definite indication that, on average, the examiner goal system fails to provide the minimum baseline time required in many workgroups ***regardless of technology***. Of course, other factors also affect examination error rates, as can be seen by the spread and fluctuating individual workgroups' results across these two observed years. However, the inadequate average time goals set for many groups allotted with less than 25 hours appears consistent. Examiner performance at lower time allottment levels appear unreliable, with wide spread in error rates. These results suggest a closer review of the goals set for workgroups in these low allotted-time categories. The conclusion is clear: examiners do meet their goals – but at the expense of quality.

I expect that some observers would argue that the effects shown in Figure 6 do not exists in recent error rate results because average allowance error rates have declined by a couple of percent since 2004. That may be so, as a policy of 'reject, reject, and reject' does indeed reduce the allowance error rate. However, I have shown empirical evidence in my previous works that strongly suggests this must have been accompanied by an increase in the rejection error rates. As explained below, a proper measure of examination error rate should weigh both types of errors and I suspect that when such weighted error rate is considered, trends similar to those in Figure 6 remain today. I also expect some observers to speculate that the relatively lower error rates reported in Figure 6 for workgroups allotted more hours per PU in fact understate the true error rate. This, they may argue, is because the record only reflects lower incidences of ***detected*** errors in workgroups dealing with more complex and perhaps esoteric technologies, which the quality reviewers are less familiar with. If undetected errors indeed abound, then the Office's problems are far more fundamental - it would mean that, not only are examiners more prone to errors than reported (meaning that far more examiner time must be allotted), but that the quality review specialists themselves are not up to their task.

Under the new Director, Mr. David Kappos, the USPTO recently announced that it is adding to the examination quotas an additional two hours per PU across the board and that it will monitor the results of such a change. This is a first good step that will increase the corps average from 23 hours to 25 hours per PU in FY `10. However, this move must be followed by a more systematic fact-based study to determine the appropriate allocation of examiner hours.

Allowance error rate vs. allotted examination time by Technology Workgroup

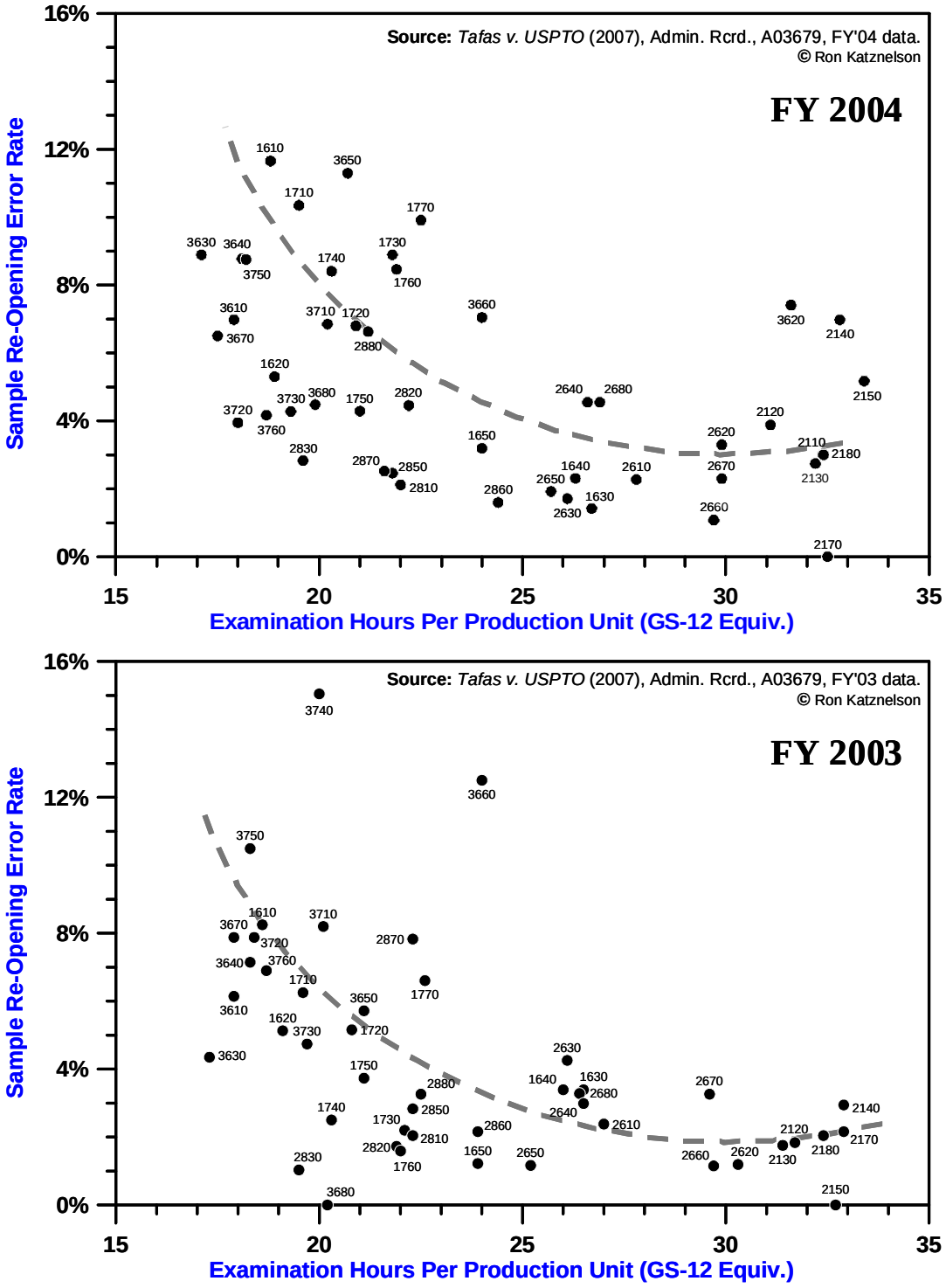

Figure 6 USPTO's Reported allowance error rate vs. allotted time per production unit by technology workgroup.

Figure 6 resolves only one dimension in this inquiry. Some of the variations in the error rates may well be due to unaccounted applications' size attributes such as the average numbers of claims, prior art references, drawing figures, drawing item reference designators, and pages in the disclosures - all of which are definite factors in the required examination time. A proper

assessment and redesign of the examiner production goal system would therefore require setting various experimental production goals, measuring the respective examination error rates and submitting the results to a multidimensional regression analysis of the variables listed above to discover the most influential of these variables. Adopting an acceptable error rate target can then form the basis for establishing the necessary number of hours in workgroup production goals on an application-by-application basis, depending on the most influential variables. I recognize that the Office cannot approach this task solely based on these considerations and that it is faced with the unenviable position of having to balance these goals with practical operational considerations and unintended consequences of such production goal changes. Nevertheless, I do envision proper production goals to be tiered not only by technology workgroup, but also by key application size attributes.

Recent welcome developments under Director Kappos include the Office's decision to expand non-examining time allotments for examiners. These involve examiner-initiated interviews and increased resources available for examiner certification. The Office has also begun reaching out to its former examiners in an effort to recruit them back. These important actions should be followed by an aggressive effort not only to increase the Office's force but also to build confidence in the Office's management's ability to project requirements and sustain the growth of the force.

No recent time stands out as more fateful in the current predicament in which the Office finds itself than the year 2003, when its *21st Century Strategic Plan* was introduced. The profound inability of the USPTO to project application loads and the deficiencies of its workforce planning were evident in the USPTO's grossly overoptimistic Strategic Plan published on February 3, 2003. Based on its projections at that time, the USPTO stated the following goals as achievable:

> Achieve first Office action patent pendency of 14.7 months in fiscal year 2008.
> Achieve an interim patent pendency goal of 27 months by fiscal year 2008. ….
> ***Reduce*** total patent examiner hires through fiscal year 2008 by ***2,400*** compared to the 2003 Business Plan projection." (Emphasis supplied).

As we have known for a while, the Office failed spectacularly with respect to the first two goals, as first Office action patent pendency was 25.6 months and total patent pendency was 32.2 months in FY 2008. Most remarkable, however, is the radical change during early 2003 in the USPTO's perceived need for examination resources. In a sweeping change of workload projections, the USPTO apparently believed it could achieve all these production goals ***and*** avoid hiring the 2,400 examiners that ***it projected*** it would need in its 2003 business plan only one year earlier. In view of USPTO management's failure at that time to explain its true needs as expressed in the original 2003 business plan, it is perhaps not surprising that Congress had diverted $100M in user fees in 2004. Unfortunately, the USPTO had not disclosed its application filing and pendency models' details and projections methodology to permit the public and Congress to assess the basis for its radical change in workload projections.

The history since 2003 in this regard manifests continuous failure of the Office to project and build its examiner corps. Blindsided by "unexpected" growth in applications, the USPTO in 2006 attributed its growing backlog to applicants' "abuse" of the continuation procedure and to applicants' propensity to file "excessive" number of claims. The Office had no basis for these assertions and, in fact, had data and evidence that it could have used in prior years, but had not used, to correctly project the growth in its workload. It had data showing that since 1980 the number of continuation applications had been consistently doubling every 6.5 years, as opposed

to original applications that had been doubling only every 14 years. Instead of using established scientific methods of modeling exponential growth of each application type at a distinct rate, the Office repeatedly underestimated the total filing rate because it used a trivial single component growth rate model, lumping all application types under one growth rate. The USPTO also had evidence that since 1990 the average number of claims in applications had been growing by 4.5% per year. This too, had not been taken into account as a trend to be reckoned with. None of these critical details were new and no surprise in workload increases would have been encountered had the USPTO taken these details into account.

The Office's pendency models' credibility is at an all-time low and it has done nothing to restore the credibility by refusing to release the model since the public's explicit requests to do so during and after the continuations and claims rulemaking proceedings in 2006. Indeed, a comparison of USPTO pendency projections in its FY-08 and FY-09 published budget plans suggests possible flaws in the Office's pendency model. As a change from the FY-08 budget plan, the FY 09 budget plan revised downwards the projected number of incoming applications for every year. It also revised upwards the rate of disposals for every year. If fewer applications enter the backlog pool and if the pool depletes at higher rates, one would normally expect this revision under these FY-09 assumptions to decrease pendency projections compared to the FY-08 projections. However the USPTO model of FY-09 produces higher projected pendencies than the FY-08 model for the years 2009-2011. Would a correct model produce this result?

The most recent Internet posting of USPTO's pendency model ***simulator*** supplies no answers and only raises questions as to its correctness and the analytics that the USPTO attempts to hide from the public. The Office deliberately omitted spreadsheet rows and cells that contain the key equations, logic and relationships among variables. It made available only the User Interface and hid the basic assumptions, equations and methodology by which results are obtained under this model. Is there any rational reason for the Office to continue to withhold its pendency model – a model that is so central to its operation? In keeping with the Administration's new commitment to open government, for the sake of the U.S. examiner and the U.S. patent system, I wish that 2010 marks the year during which the Office finally releases its pendency model.

To achieve pendency reduction, the USPTO must not only articulate that as a goal, it must also be able to avoid underestimating its long-term application load. Projection based on the best information available must be made with ***added margin for error*** in order to assure stability. A sound policy would be to build-in the margin ***required for unexpected surges*** in applications or examiner attrition so that during periods of lower incoming application traffic, examiners can spend extra non-examination time on improving knowledge and proficiency as explained above. One can never overstaff the USPTO examiner corps.

I wish that in 2010 the USPTO management would be able to plan correctly and educate Congress on the true needs of the Office. I hope we can all help prevent the 2003 under-investment fiasco from repeating. Diversion of fees by Congress since then was merely a symptom of a profound failure of the patent community (including previous USPTO managements) to educate the public and the Congress of the consequences of under-investment in our examiner corps and our patent system. An economic stimulus package restoring over $500M in diverted user fees to the Office would cover an immediate shortfall of more that $200M and another $300M that would be required for offsetting startup transient revenue losses of a Deferred Examination system that can reduce workload by up to 25%. These infusions are required in order to put the USPTO on a successful long term quality-enhancing and pendency-reducing trajectory and should not be held hostage to a patent reform bill.

(3) Alignment of examiner quality measures and incentives with the societal costs of patent examination errors

Societal costs of examination errors comprise of costs to applicants, to the Patent Office, to third parties and society as a whole. Erroneously allowing applications that do not meet the statutory patentability requirements or erroneously rejecting meritorious patent applications are both harmful to society.

Examiner rejection errors

(a) deny inventors their constitutionally directed statutory rights to their inventions;
(b) deny society the benefit of private investments in, and development of, otherwise patentable innovations; and
(c) deny society the benefit of disclosure and teaching of new knowledge and discoveries, thereby slowing innovation.

Examiner allowance errors adversely affect third parties subject to erroneously issued claims by

(a) inflicting unwarranted legal costs; and
(b) deterring downstream innovation that are erroneously deemed infringing.

There appears to be no shortage of scholarship and literature focused ***solely*** on the societal costs of examiner allowance errors. However, there is a glaring paucity of such sources on the societal harm of erroneous rejection of meritorious applications for patentable inventions. Furthermore, I am unaware of ***any*** quantitative assessments of the ***relative costs*** of these two types of errors so that a balance between the two can be considered.

The USPTO's focus on allowance errors appears exclusive. It compiles and reports an "end-of process" allowance error rate but does not do so for final rejection error rates. The Office's In-Process Review (IPR) included tracking rejection errors among other error types, however, it does not produce or report an "end-of-process" Rejection Error Rate. Moreover, the USPTO recently announced that it would no longer look at final office actions in its IPR estimates. As opposed to allowance errors, no one knows the answer to this simple question: What is the fraction of all final rejections that are erroneous? The Office's historic use of the all-encompassing term "error rate" to mean only allowance error rate is evidence for its fundamentally biased metric and incentive systems.

It is therefore not surprising that the allowance-error-centric quality measures appear as the exclusive source of examiner's error performance review. Examiner allowance errors ***rather than rejection errors*** appeared to be the sole, or nearly the sole, source for examiner supervision actions involving errors in final actions:

(a) Warnings based upon a single clear error in Patentability Determination
(b) Warnings based upon multiple clear errors in Patentability Determination over multiple consecutive quarters during a fiscal year
(c) Failure of written warning improvement period on the basis such warnings
(d) Rating of record of less than Fully Successful for a fiscal year based upon clear error in Patentability Determination.

There is no 'free lunch.' Examination under finite average time per application cannot be made error-free: Examiners must trade off rejection errors with allowance errors given a finite time

per application. Their operating point in patentability determinations will depend on the relative costs they must bear in making each type of error. If it occurred, I have yet to hear about examiners being disciplined for erroneously rejecting a meritorious patent application. Had the Office had an infrastructure that penalizes examiners for making final rejection errors, we would have seen a different allowance rate trajectory over the last few years. We would not have seen a free-fall of the allowance rate from the mid 70% to the low 40% at the same time that RCE and appeal brief filings skyrocketed.

This state of affairs is remarkable. It means that the USPTO deems societal costs for making rejection errors negligible compared to societal costs for making allowance errors. This implied underlying premise lacks any basis and is counterfactual. In an upcoming paper on the subject of trading off patent examination error types, I prove the following proposition:

> ***The societal costs for making patent examination rejection errors are higher than the societal costs for making allowance errors.***

The proof of this proposition relies on the ***same societal cost-benefit analyses*** that lead many nations who had not found resources to institute a patent examination system to adopt instead a patent registration system, rather than abolish patents altogether.

The USPTO's apparent presumption that allowance errors are far more important to control than rejection errors is contrary to fundamental economic principles of the patent system. The Office must augment its quality measures to include a second final action measure: ***Final Rejection Error Rate***. Examiners' incentive and supervisory programs should weigh this second metric with no lesser weight than that accorded allowance error metrics.

Director Kappos articulated what should have been the Office's policy before his arrival: "***Patent quality does not equal rejection***." The Office has recently started to move away from the excessive weight on allowance errors. This is a welcome move in the right direction, coming from a leader who had experienced in his prior position the draconian effects of previous USPTO policies. It is not enough, however, to merely attenuate examiner costs for making rejection errors. The Office should pursue a ***balance*** in weighing these errors with rejection errors. Thus, it is my hope that the recent changes would be followed by a fresh review of the Office's quality programs, and that measures of final rejection error rates would be instituted and that the Office will use them to balance its examiner incentive and performance appraisal system.

(4) Conclusion

My observations and recommendations above are all about empowering U.S. patent examiners by investing more resources in their operations and by allotting more time for professional development. Management is working hard on increasing the ranks of the corps. Actions should also facilitate examiner's quality work by balancing their incentives. Growing patent backlog damage had been done over the last decade and the Office's new management cannot be expected to fix it overnight. The overarching and laudable goal of reducing pendency should not translate into extreme diversion of USPTO resources narrowly for the sake of reducing pendency, regardless of collateral outcome adverse to the examiner corps. It will take years to rebuild the corps and overcome the backlog harm. My 2010 wish for the U.S. Patent Examiner is that we start this year.