THE U.S. PATENT SYSTEM: IS IT BROKE? AND WHO CAN FIX IT IF IT IS?

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Gary, thanks so much for that introduction. I can't begin to tell you all what a pleasure it is for me to be here today to discuss the current state of the U.S. patent system, and to describe some efforts that might result in serious proposals for serious reform. Also, those of you who have heard Rob Merges speak will quickly recognize that I am a poor substitute. Anyone who can imagine the title *"As Many as Six Impossible Patents Before Breakfast"*[2] for a scholarly article about software and business methods patents, as Rob did, certainly has a head start on most of us.

As Gary mentioned I have continued an interest in the U.S. patent system, both through my consulting work, as well as by writing and publishing, and by participation in various conferences. Charlie Renfrew is the person you should blame for that continued interest. Shortly after I retired from Kodak, but while Charlie was still at Chevron, he gave my name to Bob Taylor, who was then at the firm that was then Pillsbury, Madison & Sutro, who was looking for a provocative speaker about the U.S. patent system for an ABA program. I made the presentation, which didn't seem to provoke anyone, and the research I had done for it led me subsequently to write a paper proposing simplification and reform of the U.S. patent system. That paper was published in 1993, and I have been at it ever

[1] Presented May 11, 2001 at the Spring Meeting of the Association of General Counsel. Mr. Quillen is a Senior Advisor at Cornerstone Research, an economic consulting firm, and is the former General Counsel of Eastman Kodak Company, where he was a Senior Vice President and member of the Board of Directors. The views expressed are Mr. Quillen's, and should not be attributed to Cornerstone Research or to Eastman Kodak Company.

[2] Merges, *As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 Berkeley Tech. Law J. 577 (1999).

since. So, if you don't like what I say here today, you should blame Charlie. I should add though that working for patent reform is the perfect pro bono activity. There is virtually no prospect for success, and absolutely no hope of financial reward.

Gary and I had a bit of a tussle over the title for my talk. Gary suggested that I use the title "Crisis in the U.S. Patent System." I told him that I thought not, because there are a lot of people, many of them employed in your patent departments, who do not believe there is a crisis at all, and think that all talk of a patent crisis is manufactured by enemies of the republic who are out to gut the U.S. patent system and thereby destroy the Constitution. That apparently is the view of the current chairman of the ABA Intellectual Property Law Section whose most recent newsletter to the members is titled *"Another Round of Patent Bashing*."[3] So I suggested to Gary the title should be "The U.S. Patent System: Is It Broke? And Who Can Fix It If It Is?" If you take a look at your agenda, you will notice that Gary fixed my grammar.

Let me turn to the topic at hand, which I plan to deal with in four parts. First I will describe where we are today, and then I will describe the consequences and costs of being there. Following that I will take up the question of how we got there, and then finally to the questions of whether it can be fixed, and who must do the "fixing" if it can.

As to where we are today (not counting extensions of the patent system to include things like computer software and business methods that until recently

[3] See Chair's Bulletin, ABA Section of Intellectual Property Law, Vol. 5, No. 8 (April 2001).

could not be the subject of a patent at all), there are three features that distinguish our present system from where it used to be. The standards for patentability have been lowered, additional and unnecessary uncertainty has been introduced into the system, and patent damages awards are frequently in excess of what patentees would have made if there had been no infringement at all. All of these changes have been brought about by the Court of Appeals for the Federal Circuit entirely on its own initiative, and without benefit of legislative changes, Supreme Court decisions, or improvements in the U.S. Patent Office.

As to the standards for patentability, before the advent of the Federal Circuit, something like two-thirds of litigated patents were found invalid. Shortly after the Federal Circuit came into existence this statistic was reversed, and only about one-third of litigated patents were found invalid, with the remaining two-thirds being found valid.[4] This lowering of the standard for patentability was brought about by the Federal Circuit by two concurrent changes in the application of the nonobviousness requirement of 35 U.S.C. Sec 103 from that prescribed by the Supreme Court in Graham v. John Deere and U.S. v. Adams.[5] Section 103 of the statute is the section which requires, as a condition of patentability, that an invention, in order to be patentable, must not only be "new" but, in addition, must

[4] Lee, *The Most Significant Patent Cases Relating to Obviousness Under 35 U.S.C. Sec. 103*, read August 12, 1985 at the Annual Meeting of the American Bar Association. A more recent study of all written, final validity decisions from early 1989 through 1996 found the validity rate for jury trials was 67.1% and 57.1% for bench trials. See Allison and Lemley, *Empirical Evidence on the Validity of Litigated Patents*, 26 AIPLA Quarterly Journal 185 (1998).

[5] Graham v. John Deere, 383 U.S. 1 (1966), and United States v. Adams, 383 U.S. 39 (1966), decided by the Supreme Court on the same day in 1966, prescribed the statutory test for determining whether an invention has met the nonobviousness requirement of 35 U.S.C. Sec. 103. The statutory test required a three-step factual analysis: (1) determining the scope and content of the prior art, (2) ascertaining the differences between the prior art and the claims at issue, and (3) resolving the level of ordinary skill in the pertinent art. The question of obviousness or nonobviousness was resolved against this factual background.

not have been obvious to a person having ordinary skill in the art to which the invention pertains.

The first of the changes by the Federal Circuit involved the "person of ordinary skill in the art" who, as I have just suggested, resides in Sec. 103 of the statute and is the custodian of the nonobviousness standard above which all inventions must rise in order to be patentable. In the Supreme Court cases that person was someone of intelligence and imagination who kept himself or herself informed of developments in the arts pertinent to his or her work. The Supreme Court in Graham said that:

> [T]he ambit of applicable art in given fields of science has widened by disciplines unheard of half a century ago. It is but an evenhanded application to require that those persons granted the benefit of a patent monopoly be charged with an awareness of these changed conditions.

This is to be contrasted with the person of ordinary skill in the Federal Circuit cases who is said to be "[O]ne who thinks along the line of conventional wisdom . . . and is not one who undertakes to innovate."[6] He (or she) apparently is a literalist, without imagination or creativity, unaware of developments pertinent to his or her work; one who is incapable of considering collectively the combined teachings of relevant prior art references unless "motivated" to do so by explicit directions in the references themselves.[7] This requirement for "motivation" is absent from the Supreme Court cases, which assumed that the person of ordinary

[6] Standard Oil v. American Cyanamid, 774 F.2d 448, 454 (Fed. Cir. 1985).

[7] Federal Circuit "motivation" cases include Ashland Oil v. Delta Resins, 776 F.2d 281, 293 (Fed.Cir. 1985), Panduit v. Dennison, 774 F.2d. 1082, 1093 (Fed.Cir. 1985), ACS Hospital v. Montefiore, 732 F.2d. 1572, 1577 (Fed.Cir. 1984), Lindemann v. American Hoist, 730 F.2d. 1452, 1462 (Fed.Cir. 1984), and Medtronic v. Cardiac, 721 F.2d 1563, 1575 (Fed.Cir. 1983).

skill had sufficient imagination to consider collectively the teachings of relevant art, even if the references did not themselves suggest that they be considered together.

This change has narrowed the scope of prior art considered in the three-step statutory analysis prescribed by Graham, and has rendered patentable inventions that once could not have been the subject of a valid patent. More than one commentator has suggested that the effect of this change is to have read Sec. 103, the requirement for nonobviousness, out of the statute entirely, and to have made patentable all inventions that are not "identically described or disclosed" in a single reference.

The second of the changes by the Federal Circuit is the elevation of nonstatutory factors, the so-called "secondary considerations", from their position of conditional relevance under the Supreme Court cases - - where they were to be considered only if doubt remained after application of the three-step statutory test - - to primary factors that must always be considered, and which, if sufficiently present, can even render patentable inventions that are obvious by the statutory test.[8] This has not only lowered the standard but has injected uncertainty into the evaluation of inventions and patents because the only analysis prescribed by the Federal Circuit for weighing the nonstatutory factors against a determination of obviousness under the statutory test is to consider the evidence "collectively", whatever that may mean. Thus one cannot know in the absence of litigation and

[8] Graham and subsequent Supreme Court and regional court of appeals cases made it plain that nonstatutory factors, the so-called "secondary considerations", are only of conditional relevance in ascertaining whether the nonobviousness requirement has been met, to be considered only if there is doubt remaining after application of the three-step statutory test. No amount of "secondary considerations" could overcome a determination of obviousness under the three-step statutory test.

appeal to the Federal Circuit whether a patent that is obvious under the statutory test is nonetheless valid because of the presence of some undefined quantum of nonstatutory factors.

Another area of uncertainty is claim construction. The Supreme Court in the Markman case affirmed a Federal Circuit decision that claim construction is a question of law for judges, not a question of fact for juries, and district court judges began holding "Markman hearings" to construe claims before submitting the case to the jury. Unfortunately for the district court judges and those who hoped this decision would bring clarity, the Federal Circuit accords no deference to claim construction decisions by district court judges and, according to a 1998 report, reversed 40 percent of them. In addition, it was reported that the Federal Circuit reversed, in whole or in part, 53 percent of patent infringement decisions by district court judges.[9] According to a more recent report, this has led many district court judges to hold only perfunctory "Markman hearings" since the Federal Circuit accords their decisions no weight, and deals with them de novo, as if the district courts didn't exist.[10] Rob Merges is said to have suggested that claim construction may be a more difficult task than previously thought. Another possibility is that claims which are susceptible to multiple interpretations are ambiguous, and the patents containing them should have been ruled invalid for failing to claim their inventions with the particularity required by Sec. 112 of the patent statute.

Our own Polaroid case is perhaps a good illustration of the uncertainty that exists in U.S. patent law. Kodak was adjudged to have followed a patent clearance

[9] National Law Journal, June 15, 1998.

[10] National Law Journal, January 15, 2001.

process that is "a model for what the law requires." Yet we lost on 7 of the 12 patents in suit for a 0.417 batting average. Uncertainty has certainly triumphed when the best a "model process" can do is 0.417.

The uncertainties that exist in U.S. patent law, those introduced by the Federal Circuit and those which were already there, are one of its worst failings. Any legal regime is supposed to inform those affected by it of their rights and duties in advance so they can act accordingly. Our system of patent laws does not meet that test. There are many areas, including claim interpretation and whether a patent is valid or not, where the answers cannot be known in the absence of litigation and an appeal to the Federal Circuit, which is certainly not the mark of a legal regime that is doing its job.

The third area I want to talk about is excessive damages. Here I am not talking about enhanced damages for willful infringement. Rather I am talking about the compensatory damages provided for in the statute (35 U.S.C. Sec. 284) which states that such damages are to be "adequate to compensate for the infringement, but in no event less than a reasonable royalty." The Supreme Court told us in the Aro case[11] that this means that patent damages are "the difference between [the patentee's] pecuniary condition after the infringement, and what his [pecuniary] position would have been if the infringement had not occurred." That is to say the object of the patent damages statute as interpreted by the Supreme Court is to restore the patentee to the position he or she would have enjoyed had there been no infringement.

[11] Aro v. Convertible Top, 377 U.S. 476 (1964).

However, damages determined in accordance with decisions of the Court of Appeals for the Federal Circuit more often than not place the patentee in a better position than if the infringement had never occurred. Just one example should suffice.[12] Federal Circuit cases require that the patentee recover lost profits damages on the infringer's sales the patentee would have made in the absence of the infringement (i.e., on "but for" the assumption that the infringer was absent from the market), and, in addition, award reasonable royalty damages on any additional sales by the infringer which could not have been made by the patentee (i.e., on the contrary "but for" assumption that the infringer was in the market and licensed by the patentee). This "but-for" world in which the alleged infringer is assumed to be simultaneously absent from and present in the market is not at all like the real world, which the Supreme Court in Aro said we are supposed to emulate. In the real world, licensing and not licensing are mutually exclusive, and the patentee does one or the other, but not both simultaneously. He or she either licenses and faces competition, or does not license and does not face competition. A damages rule that would emulate the real world in accordance with Aro would not combine lost profits and reasonable royalty damages as Federal Circuit decisions mandate, but instead would award the patentee his or her lost profits on their lost sales, or a reasonable royalty on all of the infringer's sales, whichever is the greater, but not some combination of the two which is larger than either, and which puts the patentee in better financial position than if the infringement had never occurred.

The damages award in Polaroid v. Kodak was just such a combined award, as mandated by Federal Circuit decisions, and the completeness of Judge

[12] A comprehensive critique of Federal Circuit damages law can be found at O'Brien, *Economics and the Key Patent Damages Cases*, forthcoming in the University of Baltimore Intellectual Property Law Journal.

Mazzone's findings permits the excess to be determined. A compensatory damages award would have been about $197 million, based on the royalty rate the court said would have been acceptable to Polaroid, since that was more than an award based on Polaroid's lost profits from its lost sales. But the district court believed it was compelled by Federal Circuit decisions to enter a judgment combining lost profits and reasonable royalties, and we paid $873 million, plus post-judgment interest. Now the difference between the $873 million we paid and the $197 million that would have been adequate to compensate Polaroid for the infringement is a lot of money and a real windfall, and gives patentees a tremendous incentive to sue rather than settle. The consequence I suspect, is that a lot of patent infringement suits which should have settled, or never been brought at all, were pursued by patentees hoping to win the lottery.

Turning now to the effects of these changes, I want to talk first about the lowered standards. Those of you who are innovators, i.e., those who commercialize new products and new processes, undoubtedly wish to do so with as little interference from others' patents as possible. To that end, a common, perhaps universal, strategy is to seek patents on those of your patentable inventions you expect to use commercially. To the extent you are successful in getting such patents you have preempted your competitors from doing so, and have enhanced your freedom to go forward and commercialize your own work without interference from others' patents. Even if you are not entirely successful in preempting all of the patents that might affect your innovation, the ones you do get might be useful or even necessary for your competitors, and thus provide you with trading material to obtain the licenses you might need.

Prior to the advent of the Federal Circuit, when the higher standards for patentability prevailed, innovators could rely on the courts to protect them from patent harm from those patents that never should have been granted in the first place, the two-thirds of litigated patents that were found invalid. But, after the lowering of the standards for patentability by the Federal Circuit, innovators could no longer rely on the courts to protect them. Instead they had to engage in "self help" and seek patents on their once unpatentable inventions in the hope of preempting others so as to protect themselves from patent harm and preserve the opportunity to commercialize their own research and development work with a minimum of interference from others' patents.

I want to show you a couple of charts I used at Kodak to illustrate the thought process a company whose business depends on the introduction of new products and new processes should follow in deciding which inventions to seek to patent, and how that was changed by the advent of the lowered standards brought to us by the Federal Circuit. This chart[13] is a conventional 2x2 matrix and illustrates the point that such a company should seek patents on those of its inventions which are believed to be patentable, and which it might use commercially, or which its competitors might use commercially to compete with it. These, after all, are the patents of value to a company that depends on innovation -- the manufacture and sale of new products -- and where the object is to offer customers the new products they want with as little interference from others' patents as possible.

[13] Slide 1 - Chart 1 from Innovation and the U.S. Patent System Today (1992).

The chart changed with the advent of the lowered standards brought upon us by the Federal Circuit. And, as shown on the second chart,[14] as the standards came down and more inventions became patentable, a "patentability gap" was created, and it became necessary for such a company to seek patents on its once unpatentable inventions in its effort to preempt competitors and be able to offer new products and use new processes with a minimum of patent interference from others. But their competitors had the same necessity to seek and obtain patents on their once unpatentable inventions. As a consequence, all filed more patent applications and obtained more patents, all had higher costs, and no one obtained an advantage

The increased numbers of patents resulting from the lowered standards has meant that innovators face more patents of others that must be considered for possible infringements and dealt with in the course of commercializing their new products and new processes. This has meant more infringement studies, more validity investigations, more consultations with outside patent advisers, and, of course, more licensing, since patents that once could safely have been disregarded as not infringed or invalid can no longer be ignored.[15] And sometimes it has meant no new product or process, because a license is unavailable or too costly, even though the patent is one that would not have been valid under the prior, higher standards.

[14] Slide 2 - Chart 2 from Innovation and the U.S. Patent System Today.

[15] In some industries this task has become so overwhelming that infringement studies are seldom done in the expectation that the threat of reciprocal litigation can induce cross licensing if infringement issues ever arise. See Hall and Ziedonis, *The Patent Paradox Revisited: An Empirical Study of Patenting in the U.S. Semiconductor Industry, 1979-95*, forthcoming in the Rand Journal of Economics.

The effect has been to increase the cost of innovation. In order to get more patents, and do more infringement and validity studies, one has to employ more patent attorneys. More frequent consultations with outside patent advisers mean higher legal fees. And to take (and grant) more licenses, one has to increase the size of one's licensing staff -- and pay more and larger licensing fees. And perhaps one has to defend more infringement suits as well. Most important of all, large amounts of the time and energy of one's R&D staff must be diverted to the task of assisting patent attorneys, rather than devising new products that customers might like, or new and more efficient processes for their manufacture.

The increase in application filings as a consequence of the lowered standards has been quite dramatic. This slide is from a paper by Jon Merz and Nicholas Pace that was published in 1994 and illustrates the increase in application filings and patent grants that followed formation of the Federal Circuit in 1982.[16] More recent work has determined that the trend observed and analyzed by Merz and Pace has continued unabated. This slide is from a more recent paper by Bob Hunt of the Federal Reserve Bank of Philadelphia and shows that the increase in application filings and patent grants continued through 1999.[17] These additional filings are a direct consequence of the Federal Circuit's lowered standards for patentability, which have made it necessary for innovators to file more patent applications.

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[16] Slide 3 - Figure 3 from Merz and Pace, *Trends in Patent Litigation: The Apparent Influence of Strengthened Patents Attributable to the Court of Appeals for the Federal Circuit*, 76 Journal of the Patent and Trademark Office Society 579 (1994).

[17] Slide 4 - Figure 2 from Hunt, *Patent Reform: A Mixed Blessing for the U.S. Economy*, November/December 1999 Business Review, Federal Reserve Bank of Philadelphia, page 15. Also see Dr. Hunt's working Paper No. 99-3 titled *Nonobviousness and the Incentive to Innovate: an Economic Analysis of Intellectual Property Reform*, available at www.phil.org/econ/wps/wp99.html.

The increased application filings, given the lack of rigor by the U.S. patent Office, have resulted in more patents, as shown on both the Merz and Pace slide and on Bob Hunt's slide. Clearly the "patent thicket" has been thickened as a consequence. And dealing with these additional patents, as I have already suggested, has further increased the costs that innovators must bear in commercializing their innovations.

There is a further dimension to dealing with the patent thicket that I am not going to discuss here today, simply in the interest of finishing in my allotted time. That is the contracting practices innovators have developed in their effort to protect themselves from patent harm and to assure their ability to commercialize their new products and new processes. Unfortunately many of these practices have attracted the attention of antitrust enforcers (and plaintiffs' attorneys), and some of you have had the privilege of explaining to agencies and courts why these practices are not anticompetitive and in fact have been made necessary by the patent proliferation that has resulted from the lowered standards. Carl Shapiro of the University of California at Berkeley has an excellent paper on this topic, a portion of the title of which is *Navigating the Patent Thicket*.[18]

Turning now to the increased uncertainty, there are two effects that must be taken into account, one easily quantified and the larger one not so easily quantified.

The larger one that is difficult to quantify is the increased cost of capital for innovation investments that is a consequence of the increased uncertainty. The financial markets deal with risk and uncertainty through the cost of capital. Capital

costs are higher for risky projects than for less risky projects. A concrete illustration of the effect of risk and uncertainty on the cost of capital can be found in the acquisition and leveraged buy-out adventures of the 1980s. These highly leveraged transactions were regarded by the capital markets as very risky ventures with uncertain outcomes. As a consequence, the cost of capital for these ventures (i.e., the interest rates on the "junk" bonds that financed them) was extraordinarily high -- because the projects were risky and uncertain of success. A count of those which had to undergo financial reorganization or defaulted on their debt and entered bankruptcy in the '90s certainly vindicates the judgment of the capital markets in the '80s.

Our Polaroid case provides an illustration of the effect of uncertainty on the cost of capital for innovation investments. The case was bifurcated and the initial damages judgment was in 1990, five years after the liability judgment in 1985. During this interval there was uncertainty as to the amount of damages Polaroid would be awarded. The damages judgment was announced at $905 million (later reduced to $873 million) and the equity market value of Kodak immediately increased by $921 million ($795 million at the fifth day after announcement).[19] Thus elimination of the uncertainty as to the amount of damages was followed by an immediate increase in Kodak's market equity value, and a corresponding decrease in the cost of Kodak's equity capital. Given that the market equity value of Kodak was $11.2 billion immediately prior to the judgment, this represented a decrease of about 7% in the cost of Kodak's equity capital. Imagine if you will the

[18] Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, forthcoming in Innovation Policy and the Economy, Vol. 1, Jaffe, Lerner and Stern, eds., MIT Press, 2001. Currently available at http://haas.berkeley.edu~shapiro/thicket.pdf.

[19] Demasi, *Essays on the Effects of Public Policy*, Harvard University Thesis for Ph.D. in Economics, page 50 (1991).

savings to Kodak if the cost of its equity capital had been 7% less throughout the entire fifteen years the Polaroid litigation was pending, or even the five year interval between the liability judgment and the initial damages judgment. Those are truly astounding sums and should give some appreciation of the additional cost of capital borne by American industry as a consequence of the uncertainty that is the product of our present patent system.

The other effect of the unnecessary uncertainty in our patent system is to increase the amount of patent litigation, since answers to many of the key questions about a patent, e.g., whether there is infringement, or whether the nonstatutory factors can trump a determination of obviousness under the statutory test, cannot be known in the absence of litigation and an appeal to the Federal Circuit. This, and the excessive damages awards, combine to turn patent litigation into a "lottery" in which the plaintiff's litigation costs are simply the price of the lottery ticket for the chance at a windfall damages award. The uncertainty, and the risk of excessive, possibly crippling, damages also combine to make patent lawsuits and threats thereof frequent instruments of extortion. In this regard the current issue of Fortune has an article on the late Mr. Lemelson that you may find of interest.[20]

Merz and Pace, in their work, documented this increase in patent litigation and tied the increase directly to formation of the Federal Circuit whose decisions are the source of much of the uncertainty, and of the damages rules that result in excessive awards. This slide, which is also taken from their 1994 paper, shows the

[20] Fortune, May 14, 2001, at page 202.

statistical lines through the "cloud" of litigation filings.[21] The essential facts are that the litigation line was flat before 1982, it jumped in 1982 when the Federal Circuit began deciding cases, and has continued to rise ever since. This increased litigation, of course, must be paid for, and those costs must eventually manifest themselves as increased innovation costs.

As we have seen, the changes brought to us by the Federal Circuit, lowered standards, increased uncertainty, and excessive damages have had the effect of increasing the costs for innovation. The consequences of the increased innovation costs can be illustrated with a couple of charts I used at the ABA speech for Bob Taylor that failed to provoke. If the law of supply and demand applies to innovation -- and it almost certainly does -- this chart[22] perhaps illustrates how the equilibrium quantity of innovation in any economy might be determined. This is a conventional supply-demand chart and the intersection of the demand curve and the marginal cost (supply) curve determines the equilibrium quantity, and cost/price of innovation. And if -- as I have suggested -- through our patent system we have increased the cost of innovation, then this second chart[23] illustrates the inevitable result. We get less innovation, and it costs us more.

The next item to take up is the question of how we got here. And to do this we need to go back in history, to well before creation of the Federal Circuit, and then come forward in time to understand the reasons for the current state of the U.S. patent system. The Patent Office has never been particularly rigorous in its examination of patent applications, and, given the low standards for patentability

[21] Slide 5 - Figure 2 from Merz and Pace, supra.

[22] Slide 6 - Chart 3 from Innovation and the U.S. Patent System Today.

applied in the Patent Office, persistent applicants could get almost anything allowed. There has long been a symbiotic relationship between the Patent Office and those who practice before it, and those who litigate its results. Each has depended on the other for their livelihoods. Historically the way it worked was that the Patent Office would issue a few more patents each year, which would require a few more patent applications, which would require a few more patent attorneys and patent examiners, and on and on and on. These steady increases in the numbers of patents and patent applications, and the consequent growth in the need for more examiners and more patent attorneys, assured job security and attractive incomes for both, and also assured that neither had the slightest interest in changing the system.

The courts however, led by the Supreme Court, applied a substantially higher standard than the Patent Office, and regularly admonished the Patent Office to follow the higher standards prescribed by the courts. The Supreme Court's admonition in Graham v. John Deere was perhaps typical:

> We have observed a notorious difference between the standards applied by the Patent Office and by the courts. While many reasons can be adduced to explain this discrepancy, one may well be the free rein often exercised by Examiners in their use of the concept of "invention." In this connection we note that the Patent Office is confronted with a most difficult task. Almost 100,000 applications for patents are filed each year. Of these 50,000 are granted and the backlog now runs well over 200,000. [Citation omitted] This is itself a compelling reason for the Commissioner to strictly adhere to the 1952 Act as interpreted here. This would, we believe, not only expedite disposition but bring about a closer concurrence between administrative and judicial precedent.

[23] Slide 7 - Chart 4 from Innovation and the U.S. Patent System Today.

Such judicial admonitions hung like a "Sword of Damocles" over the "patent crowd", the patent examiners and patent attorneys whose jobs and incomes depended on the filing of patent applications and the granting of patents. Had the Patent Office ever followed the Supreme Court's admonition and adhered to the higher standards for patentability prescribed by the courts, the numbers of patents granted would have been reduced, perhaps by as much as two-thirds, with the consequence that the numbers of patent applications soon would have been reduced by a similar amount. And, with fewer patents and patent applications, the numbers of patent examiners and patent attorneys required would have been similarly reduced.

But opportunity presented itself in the late 1970s with the proposal to form a new Federal court of appeals by merging the Court of Customs & Patent Appeals, (CCPA) and the Court of Claims into a single Federal appellate court with exclusive appellate jurisdiction over patent infringement appeals and several other areas of Federal law, including copyright, environment, tax, trademarks, etc. The CCPA heard appeals from the Patent Office, and had always managed to ignore the high standards prescribed by the Supreme Court that were applied by the regional courts of appeals. As the discussion progressed all except patent appeals and a few other specialized areas of Federal law escaped from the jurisdiction of the proposed new appellate court.

The patent bar was split, to an extent. The Washington patent bar and most corporate patent attorneys (who for the most part determined the positions of their employers) were strongly in favor of the proposed new court. These were the people who made their livings practicing before the Patent Office, and whose incomes were most in jeopardy if the Patent Office ever followed the Supreme

Court's admonitions. If the new court turned out to be dominated by the Court of Customs & Patent Appeals, then it too might be able to evade the Supreme Court's high standards, just as the CCPA had done, with the result that there would no longer be pressure from the courts for the Patent Office to adopt the higher standards. Private patent practitioners outside of Washington who did patent litigation and were comfortable in the regional courts of appeals, were less enthusiastic. They were not unsympathetic to the notion of income preservation, but were afraid that the result of creating such a court in Washington would be that Washington would become the center of the "patent universe" and they would lose business to their Washington colleagues.

The debate, of course, was not conducted in such crass terms. The proponents pointed to circuit-to-circuit variations in the outcome of patent cases in the various regional courts of appeals, and even claimed there was one circuit that had never found a valid patent. Neither the variation in outcomes nor the absence of a valid patent in one of the circuits should have been surprising given that there were very few patent appeals in those days, and, with only about one-third of litigated patents being valid, there just weren't enough valid patents to go around among the eleven regional courts of appeals then existing.

Another claim was that forum shopping by alleged patent infringers because of variations among the circuits resulted in an "unseemly" race to the courthouse, and that this would be eliminated by creation of a single appellate court for patent cases. The opponents did not challenge this assertion, although it was most certainly untrue, and even if true and a problem, could have been resolved by amendment of the venue statutes governing patent litigations, and did not require a new court.

A further claim was that the Supreme Court had paid insufficient attention to patent law. This too was false. The Supreme Court had been attentive to patent law, for example revisiting and reaffirming the nonobviousness standard of Graham and Adams on at least three subsequent occasions. As of the time of the debate regarding formation of the Federal Circuit, there were no significant patent law issues that had not recently been dealt with by the Supreme Court, save for a couple still in the lower Federal courts and not yet ripe for Supreme Court consideration. The Supreme Court problem for the proponents was its repeated decisions imposing high standards that were being followed by the regional courts of appeals and which, if followed by the Patent Office, would have resulted in fewer patents and patent applications, and thus less work for them.

The legislation passed, and the Court of Appeals for the Federal Circuit began its work on October 1, 1982. It immediately fulfilled the expectations of its proponents. The standards for patentability were lowered and the "Sword of Damocles" that threatened the jobs of patent attorneys and patent examiners was removed. The Federal Circuit decisions which required the consideration of non-statutory factors, those which introduced additional uncertainty into patent litigation, and those which mandated excessive damages awards, assured that there would be more patent litigation, and that it would be more complicated and costly, all to the benefit of the litigating attorneys who conducted it, including those outside of Washington who had feared what the new court might do to them.

Since those days the Patent Office, with the blessing of the Federal Circuit, has continued to expand the scope of its activities, and the job opportunities for its employees, for those who practice before it, and for those who litigate its results.

We now have patents on computer software and business methods solely as a result of administrative and judicial decisions, and without any legislative determination that those industries were suffering from a lack of innovation, or that they would benefit from having the patent system and its costs imposed upon them.[24]

The Patent Office, however, has not improved its performance. Slim Webster, who was Kodak's Assistant General Counsel responsible for our Patent Department during my time, and part of Gary's as well, and I recently were able to complete an analysis of the performance of the U.S. Patent Office using published data from the Patent Office's Annual Reports in conjunction with unpublished data obtained from the Patent Office after repeated requests, and then only in response to a request they chose to treat as a FOIA request. The performance of the Patent Office cannot be determined from its published data alone. We found that the number of patent applications allowed by the USPTO is 95-97% of the number of original patent applications filed with it. This is to be contrasted with the European and Japanese Patent Offices where the corresponding numbers are 67-68% for Europe, and 64-65% for Japan, and with Germany where the number for the 1977 cohort of German applications was 41.7%. The astonishingly high percentage for the USPTO can be attributed to the symbiotic relationship of which I spoke and to the fact that in the United States applicants can file continuing applications as a matter of right, so the only way the USPTO can get rid of a persistent applicant is to allow his or her application, and even that does not prevent an applicant from

[24] Dr. Hunt has also written on software and business method patents. See *You Can Patent That? Are Patents on Computer Programs and Business Methods Good for the New Economy*, Q1 2001 Business Review, Federal Reserve Bank of Philadelphia, page 5. For an analysis of innovation in the software industry following the availability of software patents, see Bessen and Maskin, *Sequential Innovation, Patents and Imitation*, a working paper available at www.researchoninnovation.org.

filing a further continuing application.[25] Continuing applications are also the means by which people like Jerome Lemelson keep applications pending for the purpose of redrafting their claims in an effort to ensnare innovations of others commercialized after the filing date of their original application. Our study is to be published in the August 2001 issue of the Federal Circuit Bar Journal, and may well cause the "patent crowd" to put out a contract on us.[26]

I should also make a point about the absence from our patent system of the self-correcting structure that governs other areas of American law. Under the normal structure neither a regional court of appeals nor the district courts within that region are constrained by stare decisis by a decision of another regional court of appeals, and issues which have been decided by one of the regional courts of appeals can be reconsidered on their merits when they subsequently arise in another region. Eventually, if the regional circuit courts disagree, the Supreme Court can take a case which presents the issue as to which the circuits have split and resolve the matter confident that all sides of the issue have been debated time and again, and that it will hear the most compelling arguments, and have a reasonable opportunity for reaching the right result.

However, in our current patent system, once the Federal Circuit has decided an issue, there is no opportunity for alternative views to develop free of the

[25] Allison and Lemley, in analyzing a random sample of 1000 utility patents issued in the United States in the two-year period from June, 1996 through May, 1998 determined that, on average, the number of U.S. applications in a priority chain, counting the application on which the patent was granted, was 1.50, and that some patents claimed priority based on as many as nine different applications. See *Who's Patenting What: An Empirical Exploration of Patent Prosecution*, 53 Vanderbilt Law Rev. (No. 6) 2099 (2000).

[26] Quillen and Webster, *Continuing Patent Applications and Performance of the U.S. Patent Office*, forthcoming in the August 2001 issue of the Federal Circuit Bar Journal. The 41.7% rate for the 1977 cohort of German patent applications is from a study by Dietmar Harhoff, F. M. Scherer and Katrin Vopel which is cited in the Quillen-Webster paper.

constraints of stare decisis, and it is a rare district court judge who will disagree with a prior Federal Circuit decision knowing his or her judgment will be appealed to the Federal Circuit. In fact, I know of only one, and it was not a district court judge but rather a court of appeals judge sitting by designation. The judge was Frank Easterbrook of the 7th Circuit Court of Appeals and the case was Grain Processing v. American Maize. Judge Easterbrook tried the damages part of the case after the death of the district court judge who had tried liability. Judge Easterbrook decided that the patentee was not entitled to lost profits, and that the reasonable royalty to which the patentee was entitled should be no more than the additional cost to manufacture a noninfringing substitute product. The case was appealed to the Federal Circuit, which reversed on the basis that the noninfringing substitute was not commercially available to the defendant during the infringement period and did not have all of the features of the patented product, and returned the case to Judge Easterbrook with directions to determine lost profits damages. Judge Easterbrook did not follow the instructions of the Federal Circuit but instead wrote a second opinion in which he said, in very polite judge-talk, that he was right the first time, that the Federal Circuit didn't even understand its own cases and was wrong in reversing him, and that he was re-entering his earlier judgment. The case was appealed again. The second time around the Federal Circuit, either convinced by Judge Easterbrook's logic or intimidated by his reputation, did not follow its earlier decision, but instead reversed itself and affirmed Judge Easterbrook. You should read Judge Easterbrook's second opinion, the one that was affirmed. It is a treasure![27] The important point of course is that we should give patent law the benefit of the same self-correcting judicial structure that governs other areas of American law, and not have to depend on super-courageous district court judges

[27] Judge Easterbrook's second opinion can be found at 979 F. Supp. 1233 (1997). The Federal Circuit opinion affirming Judge Easterbrook is at 51 U.S.P.Q. 2d 1556 (Fed. Cir. 1999).

(or Court of Appeals judges sitting by designation) to correct erroneous legal doctrine.

So, is there a patent crisis? Maybe the most telling data pertinent to that point is this chart from a paper by John Barton of Stanford Law School that was published last year in Science magazine, the Journal of the American Association for the Advancement of Science.[28] This chart shows the ratio, over time, of the number of intellectual property lawyers in the United States to research and development expenditures in the United States. It is obvious that growth in the numbers of IP lawyers, beginning in about 1985, has vastly exceeded growth in R&D expenditures. These additional lawyers are required to file the additional patent applications made necessary by the lowered standards brought to us by the Federal Circuit, to evaluate the increased number of patents that result from those lowered standards, and to deal with the additional litigation that results from the additional uncertainty and excessive damages.

Can the system be fixed? I don't know. The National Academy of Sciences through the Science, Technology & Economic Policy Board of its National Research Council has undertaken a multi-year study that might result in serious recommendations for serious change.[29] And such recommendations just might have a chance because of the prestige of the National Academy of Sciences.

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[28] Slide 8 – from Barton, *Reforming the Patent System*, Science, Vol. 287, page 1933 (2000).

[29] Particulars of the studies by the Board on Science, Technology and Economic Policy can be found through the Board's website, ww4.nas.edu/pd/step.nsf.

But the NRC STEP Board recommendations, if they are recommendations for serious change, will necessarily go to the heart of the matter and deal with the standards for patentability as applied in the courts and the Patent Office, elimination of the uncertainties that exist in our patent laws, and the excessive nature of patent damages awards. And, if they are really serious, they will recommend restoration of appellate jurisdiction in patent infringement cases to the regional courts of appeals so that our patent system will have the same self-correcting structure that governs other areas of American law. The changes needed to fix U.S. patent law so as to restore it to its proper place in fostering innovation in the United States are summarized on this slide.[30]

If the STEP Board should make such serious recommendations they will be opposed by the organized patent bar, including your patent staffs. After all it was their predecessors (and maybe some of them) who brought us our current system, and they are the beneficiaries of it. At the PTO's hearing on the nonobviousness standard in 1994, they denied to a man that the Federal Circuit had changed the law, and asserted that all was well with the system, and that the courts and Patent Office were faithfully following the Supreme Court and Graham v. John Deere. They will be attracted to peripheral changes, like those touted by the 21st Century Patent Coalition a few years ago, for which you all paid a lot of money, or to the "world patent", which seems to be the current rage.

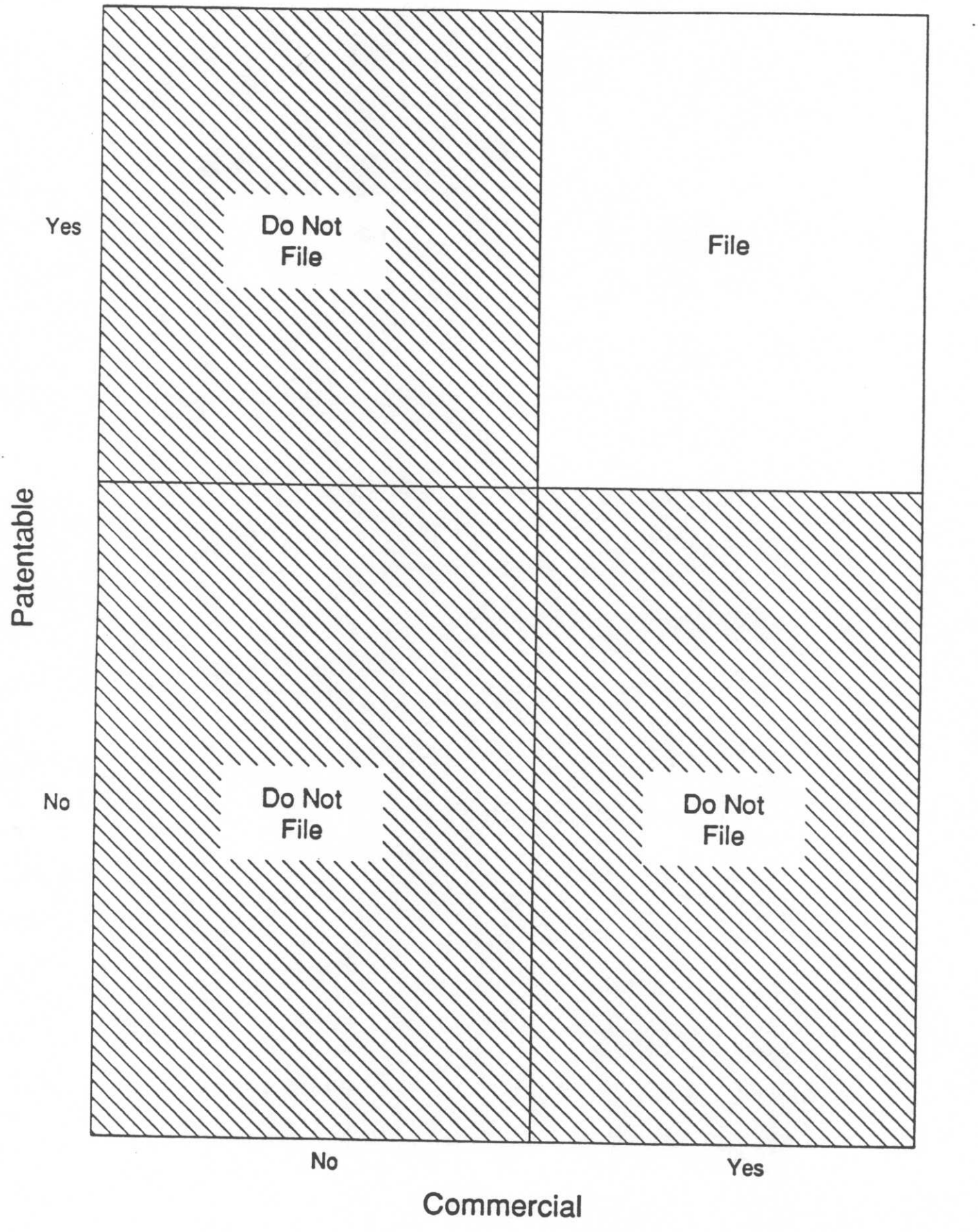
So, if you think the system is broken and you want it fixed, you are going to have to do it yourselves. You can't rely on your patent staffs. They are conflicted. They never had it so good. And they certainly won't want to change it.

[30] Slide 9 – How to "Fix" the U.S. Patent System.

And the first thing you should do is to let the STEP Board know that you think there is a problem and give them any thoughts you might have about fixing the problem. The Intellectual Property Rights Study is being directed by two members of the STEP Board, Rick Levin, who is the President of Yale, and Mark Myers, who is the retired Xerox Senior Vice President for Research & Technology. The Executive Director of the STEP Board is Dr. Stephen Merrill. They can all be reached at this address:

Board on Science, Technology, and Economic Policy
2101 Constitution Avenue, NW FO-2014
Washington, DC 20418
202-334-2200
Fax: 202-334-1505
Email: step@nas.edu

Chart 1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No
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No
Yes
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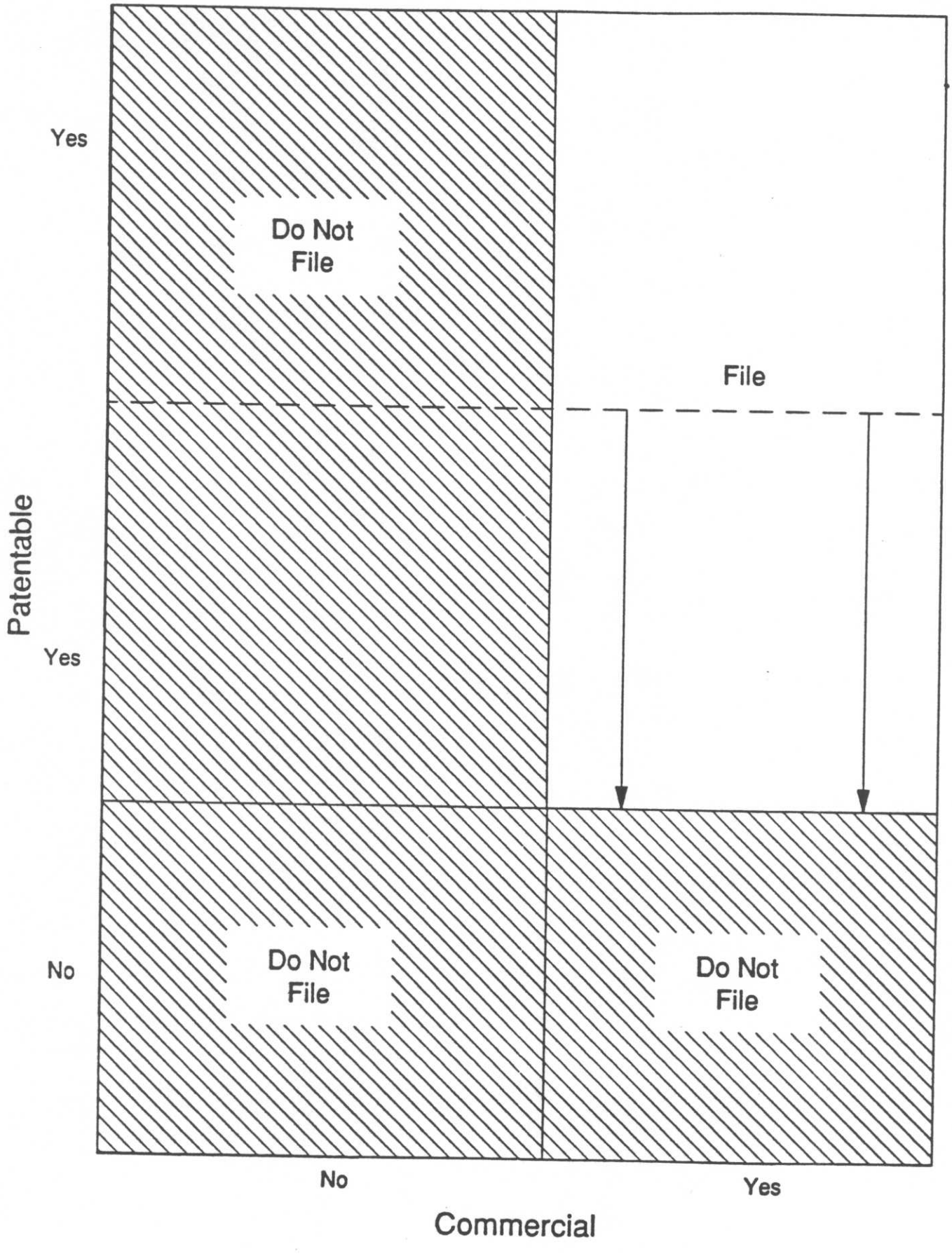
Chart 2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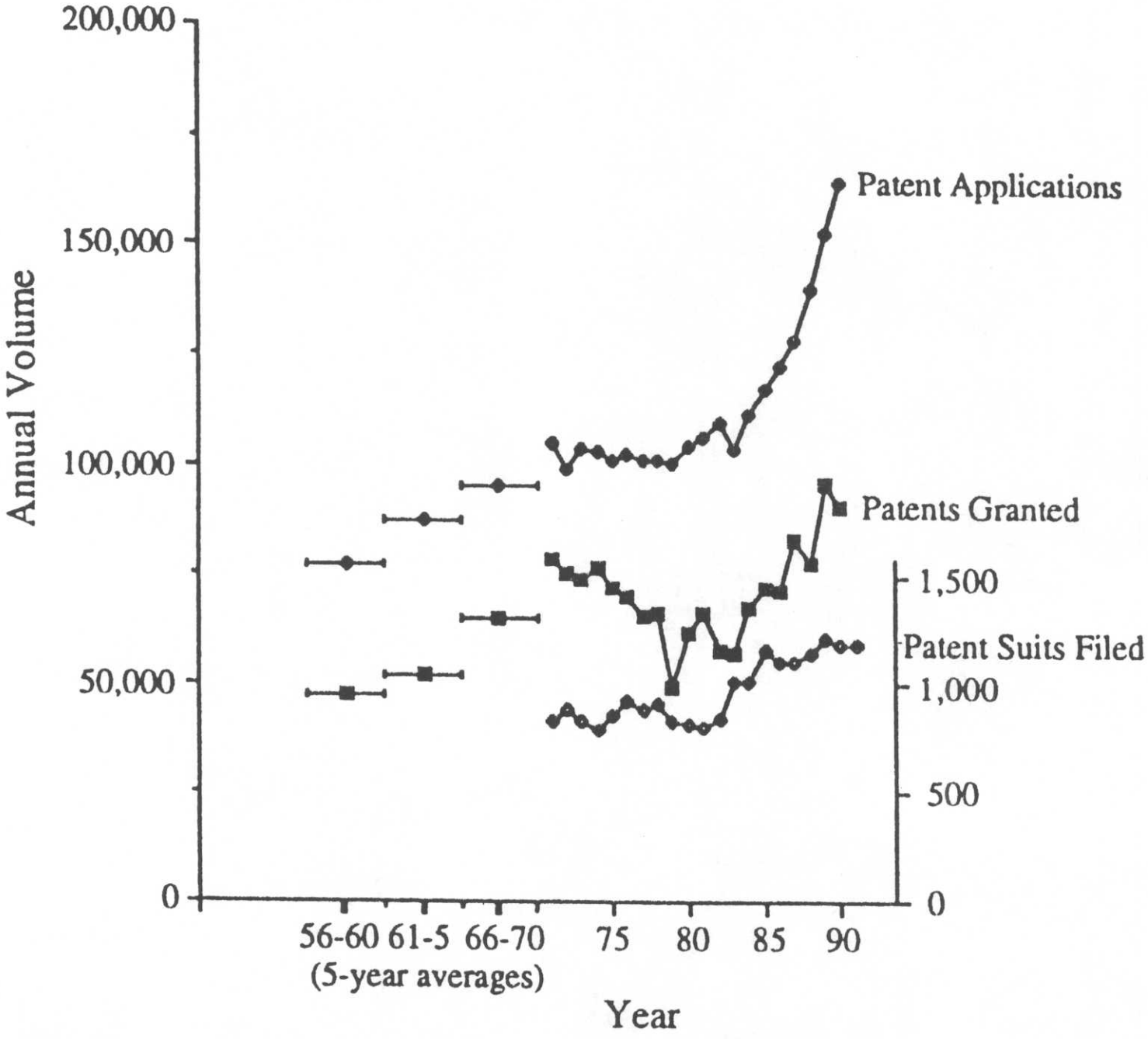
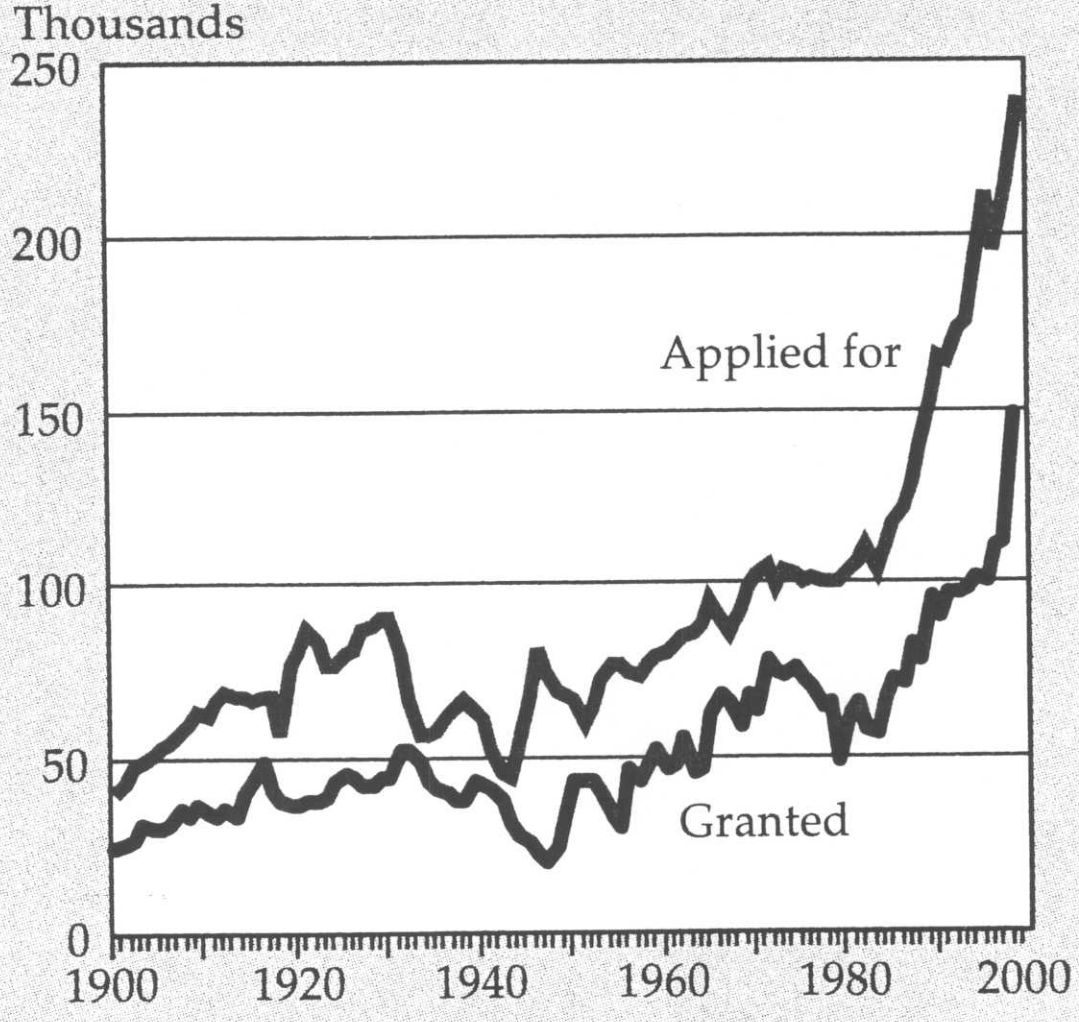


Figure 3 Utility patent grants and applications, 1956 through 1991 (calendar years), and patent suit filings for the period 1971 to 1991 (statistical years). Note that the left scale applies to the patenting activity curves and the right scale applies to patent litigation.

FIGURE 2

Patent Activity



Source: U.S. Patent and Trademark Office

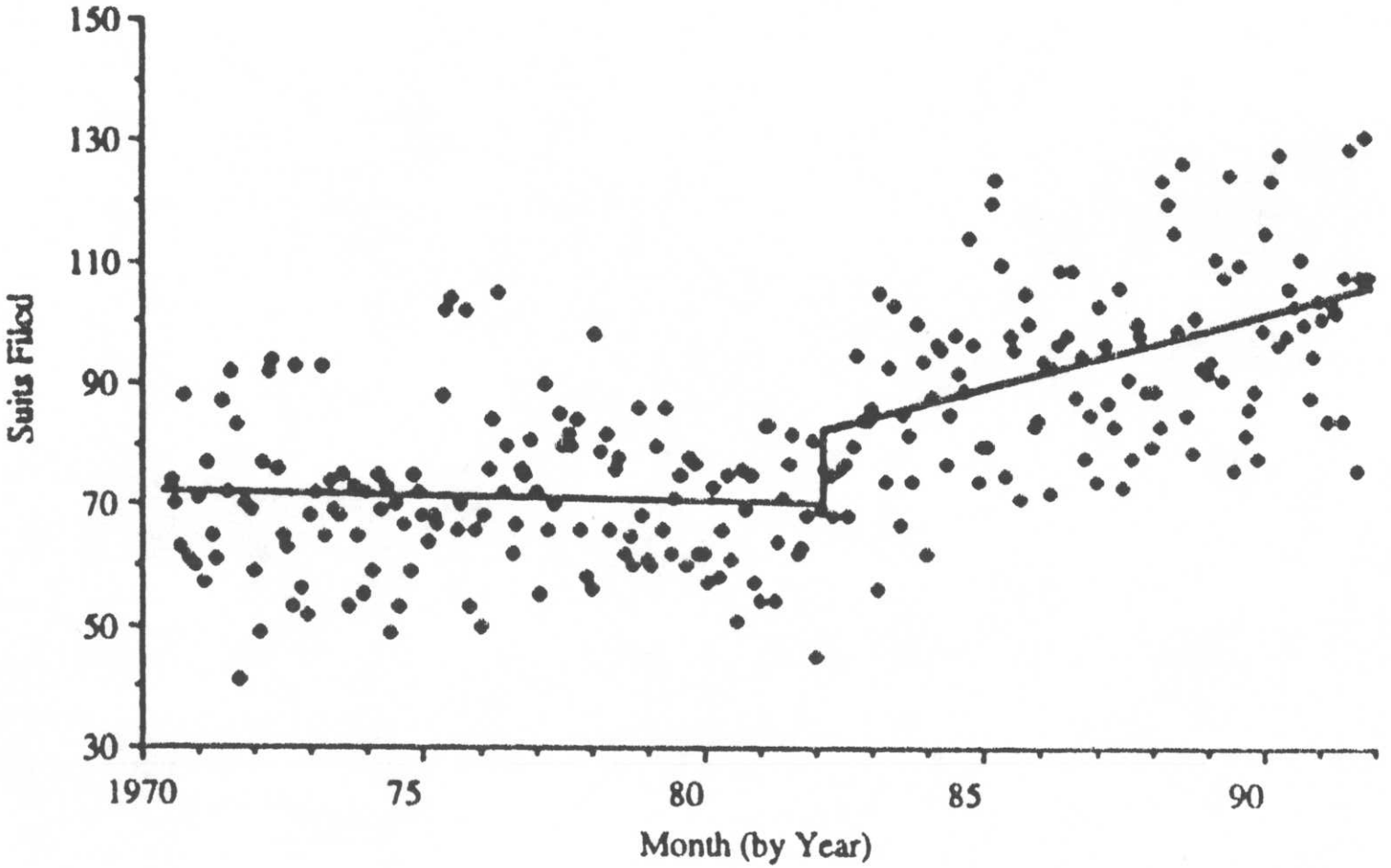
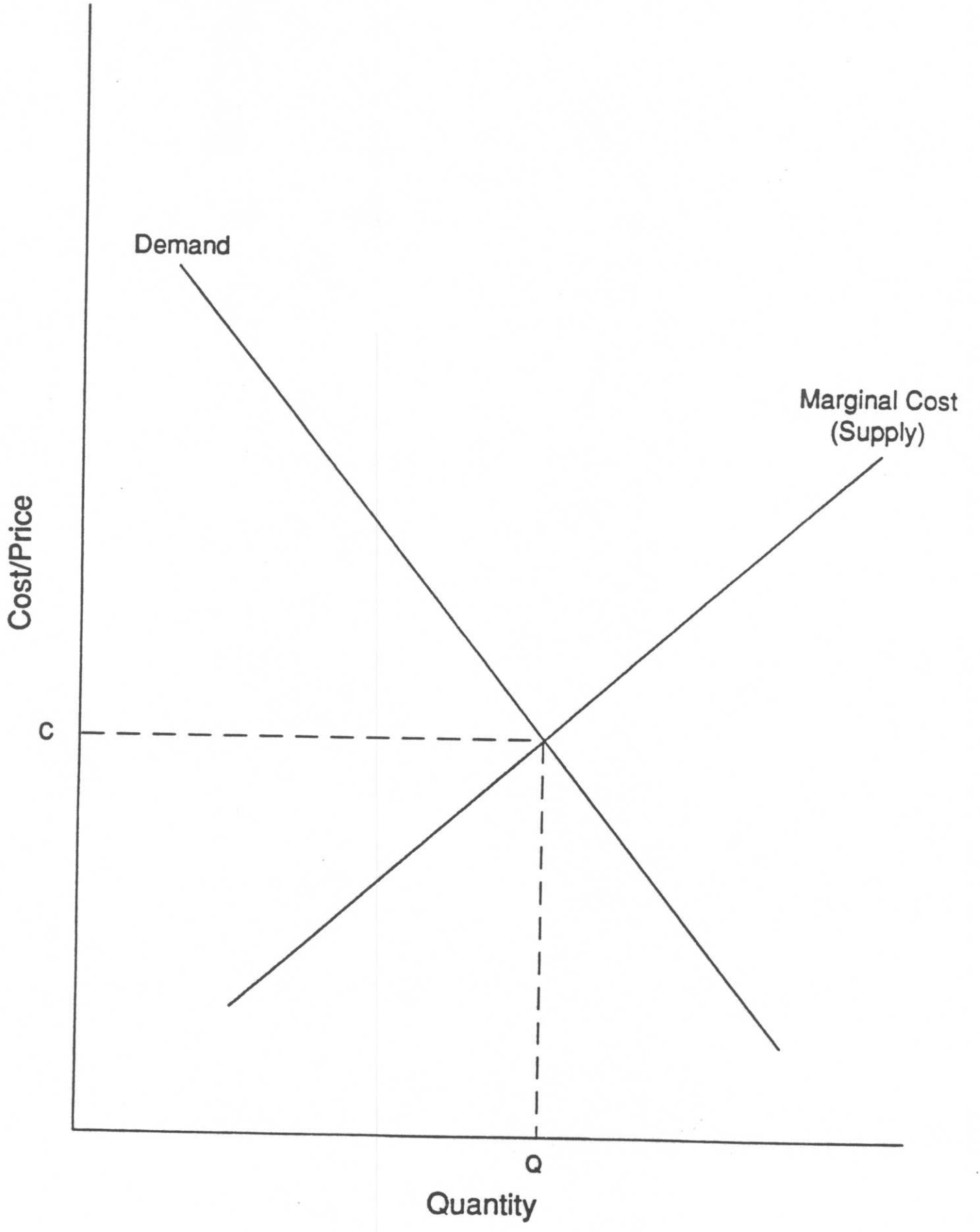
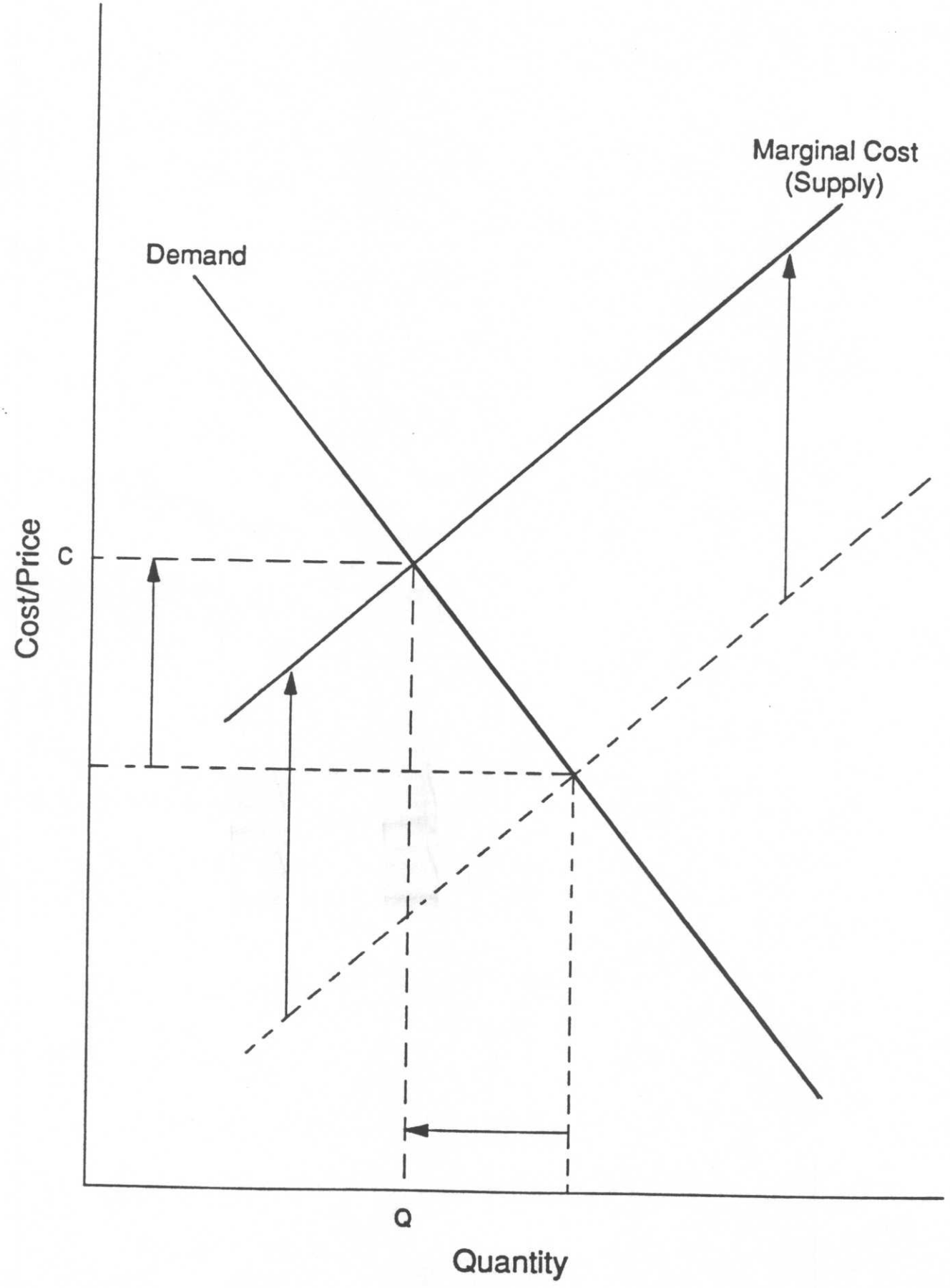


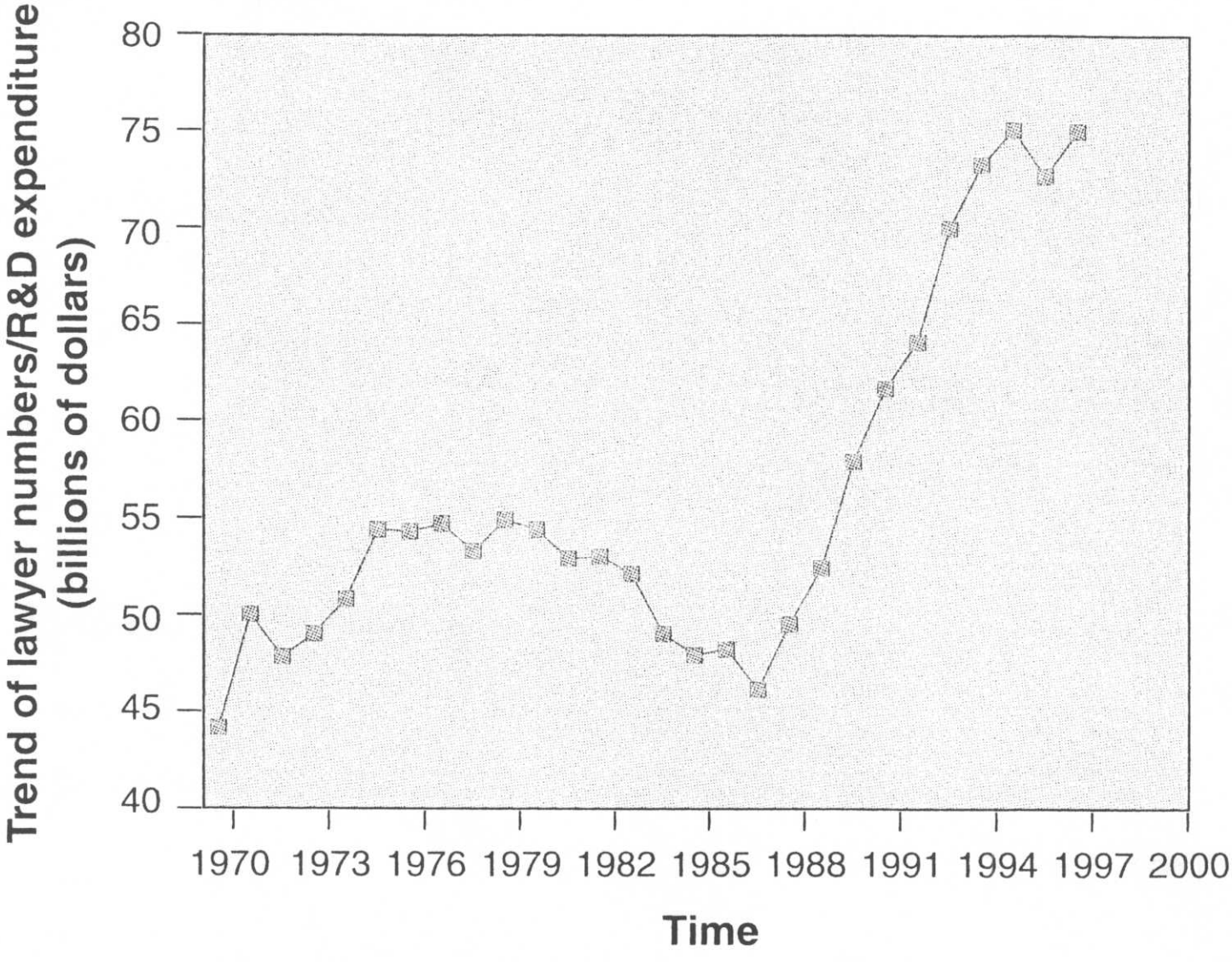
Figure 2 Monthly patent litigation, with fitted regression line.

Innovation



Innovation





Numbers of intellectual property lawyers per unit of research expenditures in billions of dollars (*1*).

HOW TO "FIX" THE U.S. PATENT SYSTEM

1. Undo the Federal Circuit's misinterpretation of Graham v. John Deere and restore the higher and more certain standards for patentability that prevailed in the Federal Courts before the advent of the Federal Circuit. Return the statutory presumption of validity to the evidentiary standard which existed prior to the Federal Circuit. Abolish entirely the nonstatutory "secondary factors" as indicators of nonobviousness.

2. Require the U.S. Patent & Trademark Office to adhere to the restored higher standards. This will necessitate abolition of continuing applications (including voluntary divisionals and requests for continued examination) so that applicants can no longer avoid final patentability determinations and put the USPTO in the position of being able to rid itself of persistent applicants only by allowing their applications.[1] In addition, management practices and policy changes within the USPTO will also be necessary.

3. Eliminate the remaining sources of unnecessary uncertainty. Changes to do this should include:

    1). Abolish the doctrine of equivalents

    2). Change to "first-to-file" rather than "first-to-invent"

    3). Publish all pending U.S. patent applications 18 months after their "effective" filing dates and permit inspection and copying of the USPTO files of all published U.S. patent applications.

    4). Eliminate "hidden" prior art, but provide a noninfringement defense for a prior user/inventor.

    5). Etc.

4. Eliminate excessive damages for nonwillful patent infringement.

5. Return appellate jurisdiction in patent infringement cases to the regional courts of appeals so that the U.S. patent system has the same self-correcting judicial structure as other areas of U.S. law.

6. Undertake legislative reconsideration of the administrative/judicial decisions extending patent coverage beyond the "new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof" authorized by statute, i.e., the decisions extending patentability to intangibles such as business methods, computer software, etc.

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[1] Elimination of continuing applications will also limit the ability of applicants to maintain an "inventory" of pending applications for the purpose of redrafting their claims to ensnare innovations commercialized by others after the filing date of the original application, and, along with the inspection and copying of published pending applications as contemplated in #3. 3)., should substantially diminish or eliminate the "hold-up problem."