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Rewinding Time: Advances in Mitigating Hindsight Bias in Patent Obviousness Analysis

Jun Wu¹

INTRODUCTION

For an invention to merit patent protection, it must satisfy several validity requirements codified in the Patent Act,² among which the nonobviousness requirement³ is the most critical. The nonobviousness requirement provides that a patent should not be granted "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."⁴ That is, the nonobviousness requirement mandates that a patentable invention embody a significant leap forward in the field. If the improvement is so trivial and routine that the invention is "obvious" to an ordinarily skilled person in the field, the subject matter would not warrant a patent. This validity requirement represents "a careful balance between the need to promote innovation and the recognition that imitation and refinement through imitation are both necessary to invention itself and the very lifeblood of a competitive economy."⁵ In practice, obviousness is the most frequently litigated patent validity issue and the most common reason to invalidate a patent.⁶

In determining whether a claimed invention "as a whole would have been obvious at the time the invention was made" to a person having ordinary skill in the art,⁷ decision-makers, including judges, jurors, and patent examiners at the United States Patent and Trademark Office (USPTO), must step back in time to make an objective judgment as if the invention

¹ J.D. expected, May 2009, University of Kentucky College of Law. The author would like to thank Professor Harold Weinberg for reading an earlier draft of this Note and providing many thoughtful comments.


⁴ Id.


were unknown, even though the accomplished invention is repetitive in front of them. Unfortunately, humans are cognitively incapable of ignoring what they have learned of the outcome when judging past events. Due to this deeply ingrained and highly robust hindsight bias, decision-makers overestimate the likelihood of a known outcome and thereby perceive the invention to be more obvious than it actually was at the time of invention. The bias-tainted judgment, in effect, heightens the threshold for a true invention to merit patent protection and reduces the incentive to innovate.

Over the past several decades, courts, particularly the U.S. Court of Appeals for the Federal Circuit (Federal Circuit), have struggled to establish a consistent and coherent obviousness analysis that can effectively curb hindsight bias. The struggle culminated in the United States Supreme Court's recent decision in *KSR International Co. v. Teleflex Inc.* This decision, widely recognized as the Court's most important obviousness opinion in more than forty years, sets a milestone in the courts' long fight against hindsight bias.

In Part I, this Note briefly reviews the impact of hindsight bias on legal decision-making in general. This part also introduces helpful insights from psychological studies in developing strategies against the bias. Part II summarizes the courts' efforts to confront hindsight bias in obviousness analysis before the *KSR* decision. Part III discusses that decision and its implications for future efforts to reduce hindsight bias. This Note argues that the *KSR* Court's renewed flexible standard left many uncertainties to be answered by the judicial system and at the USPTO level. This Note concludes that *KSR* offers a new starting point rather than a final destination in the long pathway to fighting hindsight bias in the patent obviousness analysis.

## I. REDUCING HINDSIGHT BIAS IN LEGAL DECISION–MAKING

People often fall victim to hindsight bias. Everyone has had the feeling of “I-knew-it-all-along” after watching a basketball game, making

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a stock investment, or reading a detective novel. Once the outcome is known, people are incapable of preventing that information from tainting their analysis of past events and exaggerate their ability to predict the likelihood of the actual outcome.\textsuperscript{12} Hindsight bias is prevalent in everyday life, including legal decision-making. Many experimental studies have also explored the methods of reduction and elimination of hindsight bias. Hindsight bias, however, has been proven to be extremely robust, and even the most effective method can only mitigate its effect moderately in lab settings.

Human incapacity to ignore \textit{ex post} information has been well documented in the legal world. One example is tort actions where a defendant's negligence must be determined after the fact.\textsuperscript{13} Often jurors are presented with an adverse outcome (e.g., an injured plaintiff) and are asked to assess whether the outcome was foreseeable and whether the defendant's conduct was reasonable. Ideally, reasonableness must be assessed in light of the risk apparent to the defendant \textit{at the time the adverse event occurred}, and the standard is one of conduct, not of consequence.\textsuperscript{14} Unfortunately, in the real world, the defendant's level of care is always reviewed through the retrospectoscope. Because the tragic outcome shows that the defendant's conduct was inadequate to avoid the plaintiff's injury, the "you-should've-known-all-along" hindsight makes the outcome more foreseeable, and the defendant's level of care thereby appears much less reasonable. Even if at the time of the conduct the risk was not apparent to the defendant, hindsight bias increases the possibility that the reasonably acting defendant will be unfairly subjected to liability. Moreover, the size of hindsight bias is linked to the severity of the adverse outcome, with more severe injuries causing larger bias.\textsuperscript{15} Decision-makers tend to attribute blame more readily when the outcome is serious. As a result, in a medical malpractice case, a severely injured patient may obtain a larger damage award.\textsuperscript{16}

Hindsight bias is also present in other legal contexts. It has been shown to taint jurors' conclusions of the legality of police searches.\textsuperscript{17} Even when asked to award punitive damages based solely on the legality of the search,
mock jurors who were told that illegal drugs were discovered during the search awarded significantly smaller damages than did others who were informed that nothing was found.\textsuperscript{18} In business law, in order to caution against the human tendency to perceive adverse outcomes as foreseeable and overlook inherent market uncertainty \textit{ex post}, courts invoke the business judgment rule to protect corporate managers from liability as a result of negligent business decisions.\textsuperscript{19}

Ordinary lay jurors are not the only legal decision-makers susceptible to the effects of hindsight bias. Judges and experts are vulnerable too, even though they are trained to make careful and informed decisions in their areas of expertise. It has been shown that judges were biased by hindsight when evaluating auditor decisions.\textsuperscript{20} The same is true for skilled expert witnesses.\textsuperscript{21} In one such instance, medical doctors were presented with symptoms consistent with four different diagnoses. The doctors in each of four hindsight groups were told that one of the four possible diagnoses was the true diagnosis, while the foresight group was not informed of any outcome information. When asked to assign probabilities to the likelihood of each diagnosis, the hindsight group overestimated the likelihood of the least likely diagnoses, even though they were explicitly instructed to ignore outcome information and report the probabilities that they would have given had they not known the outcome.

A rich body of empirical studies has demonstrated that hindsight bias is stubbornly unyielding to attempts of mitigation, let alone elimination. Scholars have proposed theories that the bias is caused by deeply ingrained cognitive processes\textsuperscript{23} or significant motivational forces.\textsuperscript{24} Lab efforts in devising strategies to accurately evaluate the foreseeability of past events in mock courtrooms have been unsuccessful. This suggests that, even though courts recognize the presence of the bias, a remedy may be unavailable to

\textsuperscript{18} Id. at 104.

\textsuperscript{19} See, e.g., Joy v. North, 692 F.2d 880, 886 (2d Cir. 1982).


\textsuperscript{22} Arkes et al., supra note 21, at 253-54.


\textsuperscript{24} See, e.g., Elaine Walster, \textit{'Second Guessing' Important Events}, 20 HUM. REL. 239, 249 (1967).
legal decision-making.

Among cognitive strategies that have been attempted, passive manipulations generally have no mitigating effect at all on hindsight bias. These passive methods include warning against the bias,\textsuperscript{25} passive jury instruction to avoid the bias,\textsuperscript{26} and practice with feedback.\textsuperscript{27} Working on motivational factors, e.g., awarding decision-makers for correct judgments\textsuperscript{28} or forcing them to try harder,\textsuperscript{29} reduces the size of the bias only slightly.

On the other hand, more aggressive methods that compel decision-makers to change their mental strategies appear more promising. A number of studies have tried to shift decision-makers’ attention to alternative outcomes.\textsuperscript{30} When decision-makers were only instructed to think of all the possible alternative outcomes, no effect was exhibited.\textsuperscript{31} But when they were asked to generate their own alternative outcomes and articulate reasons in support of their alternative outcomes, hindsight bias was partially reduced.\textsuperscript{32} Usually in those studies, prior to assigning likelihood ratings, participants were asked to give reasons as to why each of the possible outcomes could have occurred. The typical finding was that, although hindsight participants (with knowledge of the actual outcome) usually still exhibit some bias compared to the foresight group (without knowledge of the actual outcome), the bias was significantly reduced. Promising as they are, however, these reason-articulating methods are very intrusive to jury deliberation and therefore may not be suitable for courtroom uses.

Finally, no strategy has been found that is capable of completely eliminating hindsight bias.\textsuperscript{33}


\textsuperscript{28} W. Hell et al., \textit{Hindsight Bias: An Interaction of Automatic and Motivational Factors?}, 16 Memory \& Cognition 533, 537 (1988).

\textsuperscript{29} Fischhoff, supra note 25, at 356.


\textsuperscript{31} Kamin \& Rachlinski, supra note 26, at 98.

\textsuperscript{32} See Fischhoff, supra note 25, at 355-56.

\textsuperscript{33} See D. J. Lowe \& M. J. Reckers, \textit{The Effects of Hindsight Bias on Jurors’ Evaluations of Auditor Decisions}, 25 Decision Sci. 401, 414 (1994). The most effective de-biasing study only reduced the bias to slightly more than one-half of the difference between ordinary hindsight and foresight judgments.
II. Hindsight Bias in Obviousness Analysis: Pre-KSR Treatment

Patent obviousness analysis exemplifies a classic hindsight task: it requires a decision-maker, either an examiner, a judge, or a jury, to perform an *ex ante* judgment of whether an invention was obvious when made while ignoring abundant *ex post* information. Obviousness analysis requires a decision-maker to make the judgment whether a claimed invention was obvious at the time it was made; however, when a patent application or a patent comes to an examiner or a court, an invention has been achieved and a problem has been solved. In today's commercial world, an invention may have been widely enjoyed even when its patent application is still pending. Furthermore, it is a statutory mandate that an inventor must disclose in the patent application the method by which the invention was made and the prior art on which it relied. This information is fully available to decision-makers. In fact, this information is also available to an alleged patent infringer asserting an obviousness defense who may use it as a roadmap for reconstructing the invention as obvious.

One should not forget that an invention's obviousness is judged against a person having the ordinary skill in the art (PHOSITA), which exacerbates the problem. In determining the skill level of the PHOSITA, a decision-maker must again rewind time. Because the skill level has been increased at the time of the judgment, a decision-maker may perceive the PHOSITA knew more than he actually did. Judged against this elevated level of ordinary skill, an invention is more likely obvious. As the combined effect, hindsight bias exerts a greater impact on obviousness analysis.

The influence of hindsight bias is large enough to be of concern to the legal system. An empirical study has reported that hindsight bias significantly influenced mock jurors' obviousness judgments. In addition, the magnitude of jurors' hindsight bias in the obviousness judgment was greater than that reported for other legal judgments. The tainted obviousness analysis results in a systematic error, distorting the patent validity standard, heightening the threshold for a true invention to merit patent protection, and lowering the incentive to innovate. To this end, it runs afoul of the constitutional mandate that patents promote progress.

Courts have recognized that they "must be continually on guard against

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37 *Id.* at 1394.
38 *Id.*
39 U.S. CONST. art. I, § 8, cl. 1, 8 ("Congress shall have Power ... To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries ... "). *See* Graham v. John Deere
the natural tendency to treat as obvious something which appears simple in the light of hindsight, but which may not actually have been so at the time of the invention."

In *Graham v. John Deere Co.*, the seminal case on obviousness analysis, the Supreme Court held that obviousness is a question of law that depends upon critical factual inquiries. The Court provided a procedural framework for the factual determinations under 35 U.S.C. § 103: first, the scope and content of the prior art—the state of the knowledge in the relevant technological fields at the time the invention was made—must be ascertained; second, the differences between the claimed invention and the prior art are assessed; and, finally, the level of ordinary skill of a PHOSITA in the pertinent art is determined.

However, these three prongs (dubbed the "Graham test") merely translate the statutory language into a sketchy list of necessary steps in often highly technical inquiries, and overlook the fact that judges and jurors may not have adequate knowledge to understand technical or scientific subject matters of the invention at issue. Furthermore, the Graham test does not offer clear guidance on how to make a factual finding whether a PHOSITA would have seen the claimed invention as obvious without being affected by hindsight bias. It is not surprising that experimental studies have found that mock jurors who are given an instruction that simply stated the Graham procedure performed no better than hindsight judgments.

Partially in response to the influence of hindsight bias, the Court permitted use of "secondary considerations"—a list of economic evidence—in addition to the Graham inquiry. The Court encouraged making reference to these secondary factors because they "give light to the circumstances surrounding the origin of the subject matter sought to be patented" and "guard against slipping into the use of hindsight." Those secondary considerations include, but are not limited to the following: "commercial success, long felt but unsolved needs, [and the] failure of others." Clearly these factors no longer focus on the technological merits of an invention, which to some extent eases the courts' struggle with

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42 *Id.* at 18.


44 *Graham*, 383 U.S. at 17–18.

45 *Id.*

46 *Id.* at 36 (quoting Monroe Auto Equip. Co. v. Heckthorn Mfg. & Supply Co., 332 F.2d 406, 412 (6th Cir. 1964)).

47 *Id.* at 17.
complicated technical inquiries, which they are incompetent to undertake. To courtroom decision-makers, the evidence of the invention’s commercial success, its resolution of a long-felt unresolved need, or its success in the area where others had failed, seems more comprehensible, more objective, and thus less susceptible to hindsight bias.

Although the Graham Court did not state when and how secondary considerations can prove nonobviousness, secondary considerations have grown in importance since their inception. The Federal Circuit has expanded the list of secondary considerations to include another person’s copying or licensing of the patented invention, unexpected results of invention, and skepticism of those in the art before the invention was made. The Federal Circuit has elevated the significance of the secondary factors and has held that courts should consider this evidence as a mandatory part of the “totality of the evidence” used to reach a conclusion regarding obviousness.

On the other hand, many critics noticed that secondary considerations are much less reliable indicators of an invention’s merits than they appear. For example, commercial success may have nothing to do with significant technical advance, for it may result from a number of confounding factors, including marketing, advertising, market access, etc. The nexus between the claimed technical superiority and the commercial success becomes more complex when the claimed invention is only part of a product. The other items on the list, such as long-felt need, and copying or licensing by others have come under similar attacks. Although some have suggested that introducing secondary considerations into patent obviousness judgment resembles courts’ general reliance on established medical guidelines in resolving medical malpractice litigation—both being the products of courts’ distrust of triers’ competence in judging highly specialized subject matter—secondary considerations lack the required clarity and definiteness that are the core of the ex ante norms of medical guidelines.

Critics of secondary considerations find support in a survey conducted on all reported federal courts’ obviousness cases during an eighteen-month period.

49 See, e.g., In re Sernaker, 702 F.2d 989, 996 (Fed. Cir. 1983).
51 See, e.g., id. at 52.
52 See, e.g., Vandenberg v. Dairy Equipment Co., 740 F.2d 1560, 1567 (Fed. Cir. 1984); Richardson–Vicks Inc. v. Upjohn Co., 122 F.3d 1476, 1483 (Fed. Cir. 1997).
54 Id. at 872.
55 Id. at 872–73.
56 Rachlinski, supra note 9, at 615.
57 Mandel, supra note 36, 1422–23.
period from 2004 to 2005. This survey reported a number of interesting statistics: the secondary consideration evidence was relevant to the holding that the invention was not obvious only in less than one third of decisions;\(^{58}\) and, under further scrutiny, the evidence was dispositive in no more than 2 percent of reported cases.\(^{59}\) The impact of secondary considerations "appears to be a drop in the bucket compared with the strong effect of the hindsight bias."\(^{60}\)

To fill in the blanks left by the amorphous *Graham* test, the Federal Circuit has tried to fashion rules that can provide greater certainty and reduce hindsight bias. The rules are collectively called the "teaching, suggestion, or motivation" (TSM) test. The Federal Circuit believes that the best defense against the "subtle but powerful" influence of hindsight bias in obviousness judgment is the "rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references."\(^{61}\)

Because the core innovation in most inventions is a combination of what has already been known in new and unforeseen ways,\(^{62}\) patentability is not foreclosed simply because an invention can be reconstructed from prior arts. In fact, one true measure of the significance of an innovation is the uniqueness and ingenuity of the combination. The Federal Circuit had embraced this approach and insisted that the standard was that, in order to find an invention obvious, a PHOSITA must "not only have had some motivation to combine the prior art teachings, but some motivation to combine the prior art teachings in the particular manner claimed [in the invention]."\(^{63}\) Although the basic requirement of proving existence of teaching, suggestion, or motivation of making the combination still falls within the *Graham* test, the Federal Circuit has rigorously applied the additional requirement: the motivation to make the particular combination in the disputed invention must be *expressly* present in prior arts. Absent such an express record, the invention would be deemed to be not obvious. As the Federal Circuit has repeatedly stressed in its obviousness decisions, the inventor's own disclosure cannot be used by challenging parties as a "blueprint for piecing together the prior art to defeat patentability—the essence of hindsight."\(^{64}\)

According to the Federal Circuit, the goals of the TSM test are twofold:

\(^{58}\) *Id.*
\(^{59}\) *Id.*
\(^{60}\) *Id.* at 1423.
\(^{61}\) Teleflex, Inc. v. KSR Int'l Co., 119 F. App'x 282, 285 (Fed. Cir. 2005) (quoting *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999)).
\(^{62}\) *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998) ("'virtually all [inventions] are combinations of old elements.'") (quoting Environmental Designs, Ltd. v. Union Oil Co., 713 F.2d 693, 698 (Fed. Cit. 1983)).
\(^{63}\) *Teleflex*, 119 F. App'x at 286 (emphasis added).
\(^{64}\) *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cit. 1999).
(1) eliminating the use of hindsight in obviousness determinations, and (2) improving the uniformity and predictability of the obviousness analysis.

If applied properly, the Federal Circuit's approach would bring predictability and certainty to the difficult task of quantifying obviousness standard and provide a bulwark against hindsight bias. However, requiring an explicit showing of a teaching, suggestion, or motivation to combine prior art is not the only way to assess the substantiality of an innovation. For this reason, high-tech industries have sharply criticized the requirement of an expressed motivation found in prior art as lowering the bar for the nonobviousness requirement. Even though a combination might be obvious by common sense, the evidence required by the Federal Circuit often is unavailable, simply because the motivation to combine is too obvious to be worth recording. Because the TSM test relentlessly requires a specific finding that points unequivocally to the patent at issue, it had been criticized as rigid, prophylactic, and conservative.

It seems that neither the overly flexible *Graham* framework nor the uncompromising TSM test can adequately mitigate hindsight bias. On one end of the spectrum, the *Graham* test would invalidate many true innovations as obvious under unchecked influence of hindsight bias; on the other end, the Federal Circuit's overly rigid application of TSM test would make some unworthy patents difficult to invalidate.

**III. Obviousness Analysis After KSR**

**A. KSR Decision**

The Engelgau patent at issue in *KSR* claimed a means for electronically controlling the throttle of a vehicle's engine by combining (1) an electronic sensor with (2) an adjustable gas pedal with a fixed pivot point. Each of these two elements was individually known in the prior art references; therefore the Engelgau patent was a classic example of adaptation of old techniques (the traditional adjustable pedal) to new techniques (the addition of an electronic sensor). The district court granted summary judgment for the defendant KSR, holding that the Engelgau patent was invalid, because it would have been obvious to a PHOSITA to combine these fully disclosed prior art elements, and the technological advance of the industry would have suggested the combination, given the nature of the problem and the demands of the market.

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65 *In re Kahn*, 441 F.3d 977, 986 (Fed. Cir. 2006).
67 *Id.*
68 *Id.*
The Federal Circuit reversed on the basis that the district court had misapplied the TSM test. The proper application of the test, according to the Federal Circuit, would have required the district court to make factual findings showing that the "specific understanding or principle within the knowledge of the skilled artisan that would have motivated one with no knowledge of [the] invention to make the combination in the [particular] manner claimed" by the Engelgau patent. Because the prior arts addressed different problems than those did by the Engelgau patent, the Federal Circuit concluded that those prior arts could not supply the teaching, suggestion, or motivation to combine them in the manner claimed in the Engelgau patent. Amicus curiae briefs before the Supreme Court on KSR divided on whether the Graham test should be restored or whether the TSM test should be retained in its entity.

The Supreme Court reversed and remanded the Federal Circuit's decision. The KSR opinion represents neither doctrinal overhaul nor repudiation. The Court seems to be rewinding time itself—back 40 years to the Graham test. Although there still must be a finding of "reasons" to combine the prior art for the purpose of proving obviousness, the reason does not have to be as required by the TSM test. Any legitimate reason to combine, including common sense and common knowledge, market demands, or the motivation to try with reasonable expectations of success, may justify an obviousness finding. However, beyond disavowing the rigid rules that Federal Circuit had applied for years, the KSR Court's substantive holding was limited.

The Court found several errors in the Federal Circuit's overly restrictive obviousness analysis. Specifically, the Federal Circuit had erred in (1) "holding that courts and patent examiners should look only to the problem the patentee was trying to solve;" and (2) assuming "that a person of ordinary skill attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem;" and (3) by concluding

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71 Id. at 288 (quoting In re Kotzab, 217 F.3d 1365, 1371 (Fed. Cir. 2000)).
72 Teleflex, 119 F.App'x at 290 (rev'd 550 U.S. at 398).
75 Id. at 1742.
76 Id.
77 Id.
“that a patent claim cannot be proved obvious merely by showing that the combination of elements was ‘obvious to try.’” As the result, this formalistic application of the TSM test denied factfinders “recourse to common sense.” The “common sense” of a person skilled in the art is now sufficient to support a finding of a necessary motivation element, and the claimed invention must show that it “is more than the predictable use of prior art elements according to their established functions.” In place of the TSM test, the Court emphasized that “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.”

One primary purpose of the rigorous TSM test has been to ward off impermissible hindsight bias. After this approach was disfavored by the Court, to the disappointment of many awaiting a solution, the Court did not craft a clear rule that seriously contemplated mitigating hindsight bias. It seems that the Court felt more frustrated by the Federal Circuit's rigid approach, after weighing the danger of hindsight bias that the Federal Circuit has repeatedly warned against and the risk of over-issuing patents as the consequence of the TMS analysis. Without offering much explanation, the Court pointed out that the Federal Circuit “drew the wrong conclusion from the risk of courts and patent examiners falling prey to hindsight bias,” noting that “[r]igid preventative rules that deny factfinders recourse to common sense, however, are neither necessary under our case law nor consistent with it.”

However, this does not mean that the Court allows “common sense,” whether guided by hindsight or not, to play an equal role in obviousness analysis. Otherwise, it would be saying that if it seems obvious in hindsight, it is, and decades of judicial efforts in fighting hindsight bias would evaporate under KSR. The Court timely warned that “[a] factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning.” Unfortunately the Court did not advance an operable guideline to confront hindsight bias.

When the Court opted for obviousness analysis under the Graham framework, secondary considerations survived. In the wake of KSR, which dismissed rigid applications of the TSM test as excessive prevention against hindsight bias, inventors would be expected to rely more on secondary considerations for this purpose, particularly given the Federal

78 Id.
79 Id.
80 Id. at 1740.
81 Id. at 1739.
82 Id. at 1742.
83 Id. at 1742–43.
84 Id. at 1742.
85 Id. at 1739.
HINDSIGHT BIAS

Circuit's elevation of their significance to the most probative evidence available on obviousness. In the future, these economic or motivational indicators of nonobviousness should be presented with more rigor to fight hindsight bias. For example, commercial success of the invention and the existence of licenses or copying by others are only entitled to "substantial significance in an obviousness decision" if they include a nexus to the claimed invention. Patent owners must take care to introduce evidence that ties sales and licenses to the superiority of the invention and not to other confounding factors, such as marketing, advertising, and access to the market. However, although secondary considerations represent an inventor's best hope of demonstrating nonobviousness, their effectiveness against hindsight bias remains in question.

The key message of the KSR court is that, when a decision-maker examines the teachings of prior art for sources of information that show how and why a claimed invention would have been obvious to a PHOSITA, he should remain flexible in his approach. The sources of information should include the common sense and knowledge of the PHOSITA, the relevant teachings of multiple prior art references, and the motivation to try under the demand of the marketplace. However, this renewed analysis has the same problem as the overly flexible Graham test: hindsight bias remains unchecked.

We have to look into the procedural effects of KSR in order to find its impact on mitigating hindsight bias. A positive aspect of the KSR decision, from the standpoint of mitigating hindsight bias, is the Court's demand that a patent rejection on the ground of obviousness must have an explicit analysis demonstrating the obviousness of the invention. According to the Court, "[t]o facilitate review, this analysis should be made explicit." The Court cited, with approval, a recent Federal Circuit's opinion: "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." Under this explicit evidentiary requirement, decision-makers would reasonably be expected to engage actively in weighing alternative outcomes, determining the proper skill level of a PHOSITA, and articulating reasons to support the obviousness finding. This type of mental strategy has been shown to

88 See Mandel, supra note 36, 56-59.
89 KSR, 127 S. Ct. at 1741.
90 Id.
91 Id. (quoting In re Kahn, 441 F.3d 977, 988 (Fed. Cir. 2006)).
moderately reduce hindsight bias. Its implication will be further explored in the next section where the USPTO's implementation of this procedural requirement is discussed.

In KSR, the Court reaffirmed that the validity of a patent is a question of law. Since the issue of "obviousness is a legal determination," the Court held it appropriate to reach its conclusion at the stage of the summary judgment. While such an action promotes a relatively inexpensive and quick judicial finding regarding obviousness, and is expected to be welcomed by the parties who have long sought such an efficient method for challenging questionable patents, it nevertheless encourages judges to engage themselves more in ex post judgments. However, it has been shown that judges are as susceptible to hindsight bias as ordinary jurors.

B. USPTO's Role in Future Obviousness Analysis

The KSR decision has impacted the patent examination process. In response to the Court's decision, the USPTO has revised its patent examination guidelines in order for examiners to make proper obviousness determinations. The examination guidelines, like the KSR decision itself, emphasize the continued importance of the approach originally delineated in Graham. In the guidelines' publishing announcement, the Commissioner for Patents stressed that the factual inquiries in Graham "remain the basis for every decision regarding obviousness" and patent examiners would continue to consider the three prongs prescribed by the Graham Court.

The new guidelines incorporate the test formed in KSR's decision that combinations of known elements must be "more than the predictable use of prior art elements according to their established functions." In resolving the level of ordinary skill of a PHOSITA, the guidelines again quote KSR: "A person of ordinary skill in the art is also a person of ordinary creativity, not an automaton," and "in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like

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92 See Arkes, supra note 30, at 306-07; Karmin & Rachlinski, supra note 26, at 97-99; Fischhoff, supra note 25, at 354-56.
93 KSR, 127 S. Ct. at 1745.
94 Id. at 1745-46 (citing Graham v. John Deere Co. of Kansas City, 383 US 1, 17 (1966)).
95 See Anderson et al., supra note 20.
99 Id. at 57528 (citing KSR, 127 S.Ct. at 1742).
The examiners may also take into account "the inferences and creative steps that a person of ordinary skill in the art would employ." The source of a PHOSITA's knowledge and ability can be either "documentary prior art, general knowledge in the art, or common sense." In addition to these factors, patent examiners "may rely on their own technical expertise to describe the knowledge and skills of a person of ordinary skill in the art." After all, examiners are generally trained in the technical field in which they review patent applications. Perhaps they are themselves PHOSITAs, or at least experts who can be expected to know what the level of skill in the art was at the time of the invention. The increasing role of the PHOSITA also boosts the importance of patent examiners.

When a PHOSITA is imbued with ordinary creativity and needs not rely on express suggestions or motivations to combine existing references, the flexibility comes at the cost of transparency and certainty. Therefore the risk of hindsight bias looms over the examiner's determination of the PHOSITA and the ultimate obviousness finding. Fortunately, the examination guidelines set forth tightened procedural requirements to alleviate the hindsight influence on examiners. The guidelines require that when an examiner is making a factual finding, he must:

> [E]nsure that the written record includes findings of fact concerning the state of the art and the teachings of the references applied. In certain circumstances, it may also be important to include explicit findings as to how a person of ordinary skill would have understood prior art teachings, or what a person of ordinary skill would have known or could have done.

Furthermore, the examiner's unsupported reliance on common sense or common knowledge, without more, is insufficient to warrant an obviousness rejection. To help patent examiners make obviousness rejections that are supported by appropriate factual findings and reasoning, the guidelines identify a number of rationales suggested by the KSR decision. For each rationale, the guidelines explain the underlying factual findings, and how to reason from the facts to the legal conclusion of obviousness. The guidelines explain the procedural requirements:

> The key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. The Supreme Court in KSR noted that the analysis supporting

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100 *Id.*
101 *Id.* (citing *KSR*, 127 S.Ct. at 1741).
102 *Id.* at 57527.
103 *Id.* at 57528.
104 *Id.* at 57527.
105 *Id.* at 57528–34.
a rejection under 35 U.S.C. 103 should be made explicit. The Court quoting In re Kahn stated that "'[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.'" 106

If this set of reason-articulating requirements is combined with the alternative outcomes analysis, studies have suggested it would be a very promising way to mitigate hindsight bias. 107

Doubting courts' ability to strike an appropriate balance between effectively combating hindsight bias and solving overissuance of substandard patents, some scholars have suggested that a better reform opportunity would lie at the USPTO level. 108 One reason for this suggestion is that USPTO's expertise can reduce the degree of hindsight bias involved in decision-making. However, the mere assumption that experts, or judges for that matter, are less susceptible to hindsight bias has been shown to be unfounded. 109 But a patent examiner's familiarity with the area of a patent application at hand makes him a more competent PHOSITA than a court that steps in later and hypothesizes the skill level of such a mythical figure. This is particularly important when the court's approach is moving away from a narrow view of finding specific motivation in the prior arts to the common sense and common knowledge possessed by a PHOSITA.

A stronger argument is that Congress has the authority and resources to devise a better solution than the courts could, because the balance between concerns of reducing hindsight cost and preventing the grant of substandard patents is ultimately a policy issue. 110 The USPTO, through delegated authority from the Congress and its expertise, can adopt creative solutions to address both concerns simultaneously. The USPTO may start with improving its administrative procedures in granting a patent, as it has done following the KSR decision. By requiring patent examiners to abide by examining procedures that are more immune to hindsight bias, it would reduce costly litigation down the road and, if a dispute came to the court, the examiner's decision would warrant more deference.

Scholars advocating reforms at the USPTO have also suggested

106 . Id. at 57528-29.
107 See Walster, supra note 24, at 249; Fischoff, supra note 25, at 354-56; Kamin & Rachlinski, supra note 26, at 97-98; Pohl & Mell, supra note 27, at 55; Hell, et al., supra note 28, at 535-36; Arkes et al., supra note 29, at 306-07.
109 See Arkes et al., supra note 21, at 253-54.
110 See U.S. CONST. art. I, § 8, cl. 1, 8 ("The Congress shall have power... To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries...".).
introducing an adversarial process into the patent examination procedure.\textsuperscript{111} In the current system, the adversarial process usually starts in court, where the decision-makers are burdened with examining new prior art references presented by parties who challenge the validity of the patent at issue. Judges and jurors, who often lack competence, are forced to take up patent examiners’ responsibilities in reviewing the new evidence and making patent validity judgments. Allowing adverse parties, who have a strong incentive to present prior art evidence up front, to do so would help the USPTO examiners make better-informed judgments and thereby reduce future litigation. This would alleviate courts from the unfit task of examining highly technical evidence in the event that a dispute ends up in the courtroom.

Conclusion

The question of whether an invention is obvious is at the core of the delicate balance struck by the patent system: its limited protection must be granted only to significant advances. Drawing clear lines along the obviousness threshold is an illusory affair, which is further complicated by the existence of intricate hindsight bias in decision-making.

It seems so far that \textit{KSR} does not represent the sea change that many were hoping to see. Although the Court rejected the rigid approach of the Federal Circuit, it did not reject the spirit of the TSM test. In the Court’s own words, “[t]here is no necessary inconsistency between the idea underlying the TSM test and the \textit{Graham} analysis.”\textsuperscript{112} By applying the TSM test, the Federal Circuit served a very important goal and “captured a helpful insight.”\textsuperscript{113} To fill in the blanks of the ambiguous \textit{Graham} test, the Federal Circuit made a worthy effort to fashion a set of consistent, predictable, and articulable rules in order to support its obviousness analysis and mitigate hindsight bias. However, after making a premature policy judgment, the Court renewed the overly flexible \textit{Graham} analysis, without providing new guidelines for confronting hindsight bias in the future or constructively commenting on the Federal Circuit’s efforts. This approach leaves inquiries under § 103 unpredictable, unsettled, and subject to the hindsight of courts.

Fortunately, though the \textit{KSR} decision favored an indecisively broad obviousness inquiry, procedurally it still required that “there must be some articulated reasoning with some rational underpinning to support the

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\item[113] \textit{Id.}
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legal conclusion of obviousness.\textsuperscript{114} Determining if there is an articulated reason requires analyses of various factors and many alternative outcomes. These analyses will fill in the large gaps of the \textit{Graham} test and also guard against hindsight bias.

In addition, because the Court's solution is unlikely to reduce hindsight bias problems in a systematic way, reforms should be encouraged to take place at the level of the USPTO, where examiners are likely to be slightly less influenced by, and better equipped to deal with, hindsight bias. Further strengthened procedural guidelines will facilitate this purpose.

\textsuperscript{114} \textit{Id.} (citing \textit{In re Kahn}, 441 F.3d 977, 988 (Fed. Cir. 2006)).