KEEPING UP WITH THE GAME: THE USE OF THE NASH BARGAINING SOLUTION IN THE CALCULATION OF REASONABLE ROYALTY DAMAGES IN PATENT INFRINGEMENT CASES

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by Lance Wyatt

Determining damages are an integral stage in the patent litigation process. Since 1970, reasonable royalty damages have been calculated using the factors set forth in the seminal decision, Georgia-Pacific Corp. v. United States Plywood Corp. However, these factors are prone to manipulation and abuse by damages experts. Using a solution to a two-person bargaining situation developed by John Nash, Jr. in 1950, damages experts have utilized the Nash Bargaining Solution as a method to calculate reasonable royalty damages in patent infringement cases. Since its introduction in patent infringement cases, courts have been reluctant to admit the use of the NBS to calculate reasonable royalty damages because damages experts often fail to apply the specific facts of the case to their calculations or adequately explain the NBS.

This article argues that courts should allow the use of the NBS by damages experts as a viable method to calculate a reasonable royalty in patent infringement cases. First, courts should allow the use of the NBS because, if properly used, it adequately applies the facts of each specific case to its analysis. Second, courts should allow the use of the NBS because it is grounded in sound, unmanipulable economic theory that can be adequately explained. Finally, courts should allow the use of the NBS because it is more impartial than the use of the Georgia-Pacific factor analysis.

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I. INTRODUCTION

Determining damages are an integral stage in the patent litigation process. Section 284 of the Patent Act governs damages in these cases and provides that, at a minimum, a patent holder should receive a reasonable royalty for the use made of the invention by the infringer upon a finding of infringement.\(^1\) Reasonable royalty damages are the prevalent form of relief in patent cases.\(^2\) The Court of Appeals for the Federal Circuit has defined a reasonable royalty as “the amount of money which the owner of a patent would accept who is desirous of licensing another to use her patent in return for a royalty, but is not forced by financial need or other compulsion to do so, and the amount which a person would be willing to pay as a royalty who is desirous of obtaining a license to use the invention, but who is not compelled to do so.”\(^3\)

Since 1970, reasonable royalty damages have been calculated using the factors set forth in the seminal decision, *Georgia-Pacific Corp. v. United States Plywood Corp.*\(^4\) These factors

\(^4\) Georgia-Pacific Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970) The factors include:

1. The royalties received by the patentee for the licensing of the patent in suit, proving or tending to prove an established royalty.

2. The rates paid by the licensee for the use of other patents comparable to the patent in suit.

3. The nature and scope of the license, as exclusive or non-exclusive; or as restricted or non-restricted in terms of territory or with respect to whom the manufactured product may be sold.

4. The licensor's established policy and marketing program to maintain his patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve that monopoly.

5. The commercial relationship between the licensor and licensee, such as, whether they are competitors in the same territory in the same line of business; or whether they are inventor and promotor.
are used to construct a hypothetical negotiation between a patent holder and an infringer at the
time the patent was first infringed. However, these factors are prone to manipulation and abuse
by damages experts. Because of these problems with existing methods, damages experts have
introduced new methods to calculate a reasonable royalty.

6. The effect of selling the patented specialty in promoting sales of other
products of the licensee; the existing value of the invention to the licensor as a
generator of sales of his non-patented items; and the extent of such derivative or
convoyed sales.

7. The duration of the patent and the term of the license.

8. The established profitability of the product made under the patent; its
commercial success; and its current popularity.

9. The utility and advantages of the patent property over the old modes or
devices, if any, that had been used for working out similar results.

10. The nature of the patented invention; the character of the commercial
embodiment of it as owned and produced by the licensor; and the benefits to
those who have used the invention.

11. The extent to which the infringer has made use of the invention; and any
evidence probative of the value of that use.

12. The portion of the profit or of the selling price that may be customary in the
particular business or in comparable businesses to allow for the use of the
invention or analogous inventions.

13. The portion of the realizable profit that should be credited to the invention as
distinguished from non-patented elements, the manufacturing process, business
risks, or significant features or improvements added by the infringer.

14. The opinion testimony of qualified experts.

15. The amount that a licensor (such as the patentee) and a licensee (such as the
infringer) would have agreed upon (at the time the infringement began) if both
had been reasonably and voluntarily trying to reach an agreement; that is, the
amount which a prudent licensee -- who desired, as a business proposition, to
obtain a license to manufacture and sell a particular article embodying the
patented invention -- would have been willing to pay as a royalty and yet be able
to make a reasonable profit and which amount would have been acceptable by a
prudent patentee who was willing to grant a license.

Id. at 1120.

5 See Jarosz, supra note 2, at 772.
In 1950, John Nash, Jr. developed a solution to a two-person bargaining situation. While it’s establishment in sound economic theory has been solidified over 60 years, the Nash Bargaining Solution (NBS) has only recently burst onto the scene in the calculation of reasonable royalty damages in patent infringement cases. In its simplest terms, the NBS “compares the profits for each party—proceeding rationally, competently, and fully informed—both in entering and not entering into the completed transaction. Relative bargaining positions determine how the parties split the gains provided by the contemplated agreement.”

Economists William Choi and Roy Weinstein tailored the NBS in 2001 for the calculation of reasonable royalty damages in patent infringement cases. Additionally, Mark Lemley and Carl Shapiro tailored the NBS as a method to calculate reasonable royalty damages in 2007. Since then, countless legal scholars have examined the NBS in relation to reasonable royalty damages. The NBS first found its way onto the patent infringement landscape in 2011.

Since its introduction in patent infringement cases, courts have been reluctant to admit the use of the NBS to calculate reasonable royalty damages. Two reasons have fueled this reluctance. First, damages experts often use the NBS improperly, failing to apply the specific facts of the case to their calculations. Second, damages experts typically fail to adequately explain the NBS to courts and juries. While most courts have not allowed the use of the NBS in patent cases, some courts have allowed its use.

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11 See Oracle, 798 F. Supp. 2d at 1119.
12 See id.
Instead, this article argues that courts should allow the use of the NBS by damages experts as a viable method to calculate a reasonable royalty in patent infringement cases. First, courts should allow the use of the NBS because, if properly used, it adequately applies the facts of each specific case to its analysis. Second, courts should allow the use of the NBS because it is grounded in sound, unmanipulable economic theory that can be adequately explained. Finally, courts should allow the use of the NBS because it is more impartial than the use of the Georgia-Pacific factor analysis.

While many legal scholars have examined the NBS generally in relation to patent damages, few scholars have examined the NBS in light of recent district court opinions, either disallowing or significantly limiting its use. Even still, few scholars have advocated for the use of the NBS as a viable method used to calculate a reasonable royalty in patent cases. This article analyzes the recent court decisions regarding the NBS, and advocates for its use, despite the significant judicial hostility.

Many methods have been used to calculate reasonable royalty damages, including the longstanding Georgia-Pacific analysis, the analytical approach, the entire market value rule, the established royalty for the patent, the cost savings approach, and the rule of thumb approach. In 2011, the 25 percent rule of thumb, used by courts as a tool to determine a reasonable royalty in patent cases, was held inadmissible. The rule presumed that a licensee in a hypothetical negotiation would be willing to pay a royalty rate of 25 percent of profits on the product that incorporated the patent at issue. However, in Uniloc, the Federal Circuit abolished the rule as a “fundamentally flawed tool for determining a baseline royalty rate in a hypothetical negotiation,” holding that “[e]vidence relying on the 25 percent rule of thumb is thus inadmissible under

13 Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292 (Fed. Cir. 2011).
14 Id. at 1312.
Daubert and the Federal Rules of Evidence, because it fails to tie a reasonable royalty base to the facts of the case at issue.” 15 Although Uniloc attempted to apply the Georgia-Pacific factors to bring the 25 percent royalty rate up or down, the court explained that, because the analysis started from a fundamentally flawed premise, “adjusting it based on legitimate considerations specific to the facts of the case nevertheless results in a fundamentally flawed conclusion.”16

Since 2011, courts have been quick to reject the NBS for the same reasons articulated by the Federal Circuit in abolishing the 25 percent rule of thumb in Uniloc. Most courts quickly assume that the NBS is a 50 percent rule of thumb shrouded in complex mathematics.17 However, as this article demonstrates, the NBS is a sound economic theory that often produces royalty rates other than 50 percent. While most courts have not allowed the use of the NBS in patent cases, some courts have allowed its use, but under very narrow circumstances. For example, one court allowed a damages expert to use the NBS “as a check on the reasonableness of the rate reached through his Georgia-Pacific analysis.”18 Nonetheless, only two courts have allowed the use of the NBS as the sole method for calculating a reasonable royalty.19

In patent cases, courts have generally stated that the use of the NBS to calculate a reasonable royalty is inadmissible because it cannot be adequately explained and it does not apply the specific facts of the case to its calculations. However, this article will demonstrate that the NBS can become a viable method used by damages experts to calculate a reasonable royalty without running afoul of the concerns expressed by the judiciary.

15 Id. at 1315.
16 Id. at 1317.
The NBS has been in existence for over 50 years, and since then, has been peer-reviewed by countless economists and legal theorists. Based upon the theory developed by Nobel Prize winning economist, John Nash, economists and damages experts, William Choi and Roy Weinstein, developed equations that tailored the NBS to the reasonable royalty calculation. The variables in these equations force damages experts to apply the specific facts of a case to the NBS. These variables include “the disagreement payoff for the patent holder, representing the profit the patent holder expects to receive if the negotiation fails[,] . . . the disagreement payoff for the infringer[,] . . . the feasible payoff from licensing . . . , which is the total profit from licensing[,] . . . [and] the profit for the patent holder and infringer, respectively, from licensing.” Finally, utilization of these formulas provides impartial results. These impartial results are favorable when compared to the easily manipulable Georgia-Pacific factor analysis.

Utilization of the NBS as a viable method used to calculate a reasonable royalty in patent cases would have many positive implications. First, it would provide impartial results that would be difficult to manipulate. Second, it would ground the damages calculation in sound economic theory, rather than manipulable factors that are burdensome and difficult to explain. Finally, it would allow for judicial uniformity among Federal district courts.

This article will demonstrate why courts should allow the use of the NBS as a viable method to determine reasonable royalties in patent infringement cases. In Part II of this article, I provide an overview of the NBS and its relation to determining reasonable royalty damages. Next, in Part III, I examine patent cases that have either allowed or rejected the use of the NBS. In Part IV, I explain why courts should use the NBS by demonstrating its incorporation of the facts of each case, its ability to be adequately explained, and its impartiality compared to the

20 See Choi, supra note 10.
21 See id. at 54–55.
Georgia-Pacific factor analysis. Finally, in Part V, I conclude the article by urging damages experts and courts alike to utilize the NBS to determine reasonable royalty damages.

II. OVERVIEW OF THE NASH BARGAINING SOLUTION

In 1950, John Nash, Jr. developed a solution to a two-person, cooperative bargaining situation. This area of economics is known as game theory, and Nash’s solution was eventually awarded a Nobel Prize in 1994. Nash described his solution as “a determination of the amount of satisfaction each individual should expect to get from the situation, or, rather, a determination of how much it should be worth to each of these individuals to have this opportunity to bargain.

For more than 60 years, Nash’s solution has garnered praise throughout the economic community and has been widely accepted as sound economic theory.

An understanding of the NBS is enhanced by a cursory overview of the theory of bilateral monopoly, a market with one buyer and one seller. This theory teaches that a negotiated price

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22 Nash, supra note 6.
between one buyer and one seller cannot be precisely specified, but rather will be found in an indeterminate range. As economists, Roy Weinstein, Frank Stabile, and Ken Romig, explain:

This range is determined by each party’s “walk away” price. For the buyer (i.e. the defendant or hypothetical licensee), this price represents any price above the highest possible price it is willing to pay. For the seller (i.e. the plaintiff or hypothetical licensor), the walk-away price represents any price below the lowest possible price it is willing to accept. The range of prices between the seller’s minimum price and the buyer’s maximum price constitute a range of mutually acceptable prices.

The NBS, therefore, allows one to narrow or, in some cases, eliminate this range of indeterminacy by providing “a generally accepted framework for identifying and evaluating factors that influence negotiation outcomes between parties.”

In 2001, economists, William Choi and Roy Weinstein, realized that the NBS could be used to calculate reasonable royalty damages in patent infringement cases. First, they noted the conditions, or axioms, that Nash used in his theory. These axioms are as follows:

1. Pareto efficiency; that is, there should be no other feasible allocation that is (a) better than the solution for one negotiator and (b) not worse than the solution for the other negotiator.

2. Negotiators must collectively behave in a rational manner such that neither side gets less in the bargaining solution than could be obtained in disagreement.

3. The solution is independent of any numeric specification; that is, if we change the way we measure the payoffs when we construct a two-person bargaining problem, then the solution corresponds to the same outcome.

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26 Id.
27 Id.
28 Id. at 555.
29 See Choi, supra note 10.
30 Id. at 53.
4. Eliminating alternatives other than the disagreement profits (opportunity costs from licensing) that would not have been chosen should not affect the solution.

5. If the disagreement profits of the two parties are equal in the bargaining problem, then the solution also should treat them equally.31

With these conditions as a foundation, the authors noted that “Nash demonstrated that satisfying these conditions defines a unique solution where the bargaining outcome simply rests on each negotiator’s back-up alternative and the potential benefits of cooperation.”32 In other words, the satisfaction of these conditions results in an outcome dependent upon the bargaining parties’ back-up alternatives and the benefits arising from a mutual cooperation.

The authors then applied Nash’s theory to reasonable royalty damages, stating that “the NBS requires only knowledge or estimation of (1) the ‘disagreement’ profits of both the licensee and licensor and (2) the total profits from a licensing agreement.”33 First the authors defined the variables that would need to be defined to perform the NBS in a reasonable royalty context.34 One of the variables included the disagreement profits of the patent holder.35 Disagreement profits represent the profits a patent holder expects to receive in the event that negotiation fails.36 The authors defined this variable as \(d_1\).37 Next, the authors defined the variable of the disagreement profits of the infringer/licensee as \(d_2\).38 This variable represents the profits that an infringer/licensee expects to receive in the event that negotiation fails.39 The disagreement profits

31 Id.
32 Id.
33 Id.
34 See id. at 54.
35 Id.
36 Id.
37 Id.
38 Id.
39 Id.
are representative of each party’s relative bargaining position.\textsuperscript{40} If either party has backup plans in the event that negotiation fails, their bargaining position increases, relative to the value of the backup plans. Additionally, the authors defined the variable $\Pi$ as the total incremental profit from licensing.\textsuperscript{41} Finally, the authors defined the variables $\pi_1$ and $\pi_2$ as “as profit for the patent holder and infringer/licensee, respectively, from licensing.”\textsuperscript{42}

After defining the variables, the authors developed equations combining the defined variables and the Nash axioms.\textsuperscript{43} First, the authors explained that Nash’s theory demonstrated that the only point that satisfies his axioms is the one obtained by solving the following maximization problem:

$$\max_{\pi_1, \pi_2} (\pi_1 - d_1)(\pi_2 - d_2)$$  \hspace{1cm} (1)

subject to the following conditions:

$$\pi_1 \geq d_1,$$ \hspace{1cm} (2)

$$\pi_2 \geq d_2,$$ \hspace{1cm} (3)

$$\pi_1 + \pi_2 \leq \Pi.$$ \hspace{1cm} (4)

From there, the authors examined the effects of transfer payments being permitted between the two parties.\textsuperscript{45} This examination provided the authors with three factors that fully characterized the bargaining problem: (1) the disagreement payoff for the patent holder; (2) the disagreement

\textsuperscript{40} Id.\textsuperscript{41} Id.\textsuperscript{42} Id.\textsuperscript{43} Id.\textsuperscript{44} Id.\textsuperscript{45} Id.
payoff for the infringer/licensee; and (3) the total transferable wealth available to the two parties from licensing. The authors then established the conditions for the equilibrium payoffs as:

\[ \pi_1^* - d_1 = \pi_2^* - d_2, \]  
\[ \pi_1^* + \pi_2^* = \Pi, \]

where \( \pi_i^* \) represents the equilibrium payoff for firm \( i \).

Next, the authors solved the conditions for the equilibrium payoffs, yielding the NBS:

\[ \pi_1^* = d_1 + \frac{1}{2} (\Pi - d_1 - d_2), \]  
\[ \pi_2^* = d_2 + \frac{1}{2} (\Pi - d_1 - d_2), \]  
\[ \pi_1^* + \pi_2^* = \Pi. \]

The authors then explained the implications of these equations. First, the authors noted that equations (7) and (8) demonstrate that the parties “bargain over the partition of total profits (\( \Pi \)); they first agree to give each other the payment that they respectively would obtain from not reaching agreement; then, they split the remaining profits equally.” For either party, the agreement payoff is greater when its disagreement point is higher than the disagreement point of the opposing party. Therefore, the relative bargaining power is dependent upon either side’s “respective outside opportunities.”

The authors concluded their development of the NBS for the calculation of reasonable royalty damages by noting:

The fundamental insight of the NBS is that the alternatives to agreement that are available to each side limit how good a
bargain the other partner can obtain. These alternatives set a lower limit on the share each side willingly will accept. Under the NBS, the two sides called upon to split a pie will divide the bargaining surplus—which is bounded by each bargainer’s threat point or reservation price—down the middle, so that each has an equal share. The equal split-of-bargaining-surplus solution, although a theoretical construct, has an intuitive and normative appeal as a solution in the sense that it satisfies both issues of efficiency and fairness.

An alternative way of thinking about the NBS is in the framework of an implicit arbitrator who tries to distribute the gains from trade or, more generally, from cooperation in a manner that reflects fairly the bargaining strength of the two negotiators. Once each side’s disagreement payoffs are determined, an arbitrator applies the NBS to obtain an efficient and fair solution. In the following section, we apply the NBS to the calculation of a reasonable royalty.52

Choi and Weinstein’s development of the NBS in the context of patent damages provides a useful method to calculate reasonable royalty damages that is grounded in sound economic theory.

Other scholars have applied the NBS in the context of patent damages.53 For instance, in 2007, Mark Lemley and Carl Shapiro, developed mathematical equations that applied the theory of the NBS to the reasonable royalty damages calculation.54 These equations were more simplified than the equations developed by Weinstein and Choi. First, Lemley and Shapiro

52 Id. at 55–56.
54 Lemley, supra note 9.
defined the variables of their equations. The noteworthy variables included:

- **V**: The Value per unit of the patented feature to the downstream firm in comparison with the next best alternative technology. For example, if the patented feature enhances the value of the product to consumers by $1 over the next best alternative, then \( V = \$1 \). Similarly, if it reduces the cost of manufacturing the good by $1, then \( V = \$1 \).

- **\( \theta \)**: The Strength of the patent, i.e., the probability that litigation will result in a finding that the patent is valid and infringed by the downstream firm’s product.

- **B**: The Bargaining skill of the patent holder, as measured by the fraction of the combined gains from settling, rather than litigating, that are captured by the patent holder. This variable falls between 0 and 1. Equal bargaining skill, \( B = 0.5 \), is a common assumption.

Using these variables, Lemley and Shapiro explained that “the benchmark royalty rate for an ironclad patent is equal to \( B \times V \).” Additionally, the authors demonstrated that “[m]ore generally, the benchmark royalty rate is given by \( \theta \times B \times V \ldots \)”. While Lemley and Shapiro’s equations can be useful, the analysis of this article will focus solely on the equations developed by Choi and Weinstein. This reasoning is based upon Choi and Weinstein’s use of more fact-specific variables when compared to the equations set forth by Lemley and Shapiro. Now that the economic theory behind the NBS has been explained, it is useful to briefly look at other reasonable royalty methods that have been used in the past. The methods used before the introduction of the NBS in patent cases set the context for the remainder of the article.

**III. Patent Damages Case Law Prior to the Introduction of the Nash Bargaining Solution**

Before an in-depth analysis of the case law surrounding the NBS is made, it is useful to provide a brief overview of patent damages case law prior to the introduction of the NBS. This

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55 *Id.* at 1996–97.
56 *Id.*
57 *Id.* at 1999.
58 *Id.*
overview highlights other damages models that have been used without providing a detailed analysis of each method. This overview helps frame the forthcoming analysis of the article.

The predominant method for calculating a reasonable royalty rate has been the use of the Georgia-Pacific factors to construct a hypothetical negotiation.\(^{59}\) However, other methodologies have been used with varying success.\(^{60}\) For example, one methodology that has been used is the analytical approach.\(^{61}\) This approach “involves calculating damages based on the infringer’s own internal profit projections for the infringing item at the time the infringement began, and then apportioning the projected profit between the parties as a percentage of sales. The patentee’s percentage is then applied to the sales dollars for the actual infringing sales to determine the reasonable royalty damages.”\(^{62}\) Additionally, plaintiffs began using the 25 percent rule of thumb to calculate a reasonable royalty.\(^{63}\) The 25 percent rule of thumb “presumed that a licensee in a hypothetical negotiation would be willing to pay a royalty rate of 25 percent of profits on the product that incorporated the patent at issue.”\(^{64}\)


\(^{60}\) See id.

\(^{61}\) Id. (“The Federal Circuit approved this method in TWM Manufacturing Co. v. Dura Corp., 789 F. 2d 895 (Fed. Cir. 1986), cert. denied, 479 U.S. 852 (1986). There, the infringer had an internal memo just before infringement began projecting a gross profit of about 50% for each infringing sale, from which the projected net profit was computed to be about 40% of the anticipated sales price. As the standard industry net profit was about 10% of the sales price, the special master awarded the patentee a reasonable royalty damages rate of the difference – 30%. This rate was then applied to the infringer’s actual sales figures to calculate the reasonable royalty damages. It had nothing to do with any hypothetical negotiation. Instead, it was strictly an apportionment based on the infringer’s projections. The Federal Circuit not only affirmed, but it also expressly rejected the infringer’s contention that the Georgia-Pacific approach was the only possible approach to computing reasonable royalty damages. The Federal Circuit made it clear that other approaches were possible, and this one was proper.”).

\(^{62}\) Id. (The authors also mention four other possible methodologies for calculating a reasonable royalty. Id. These methodologies include “Rule of Thumb,” “Established Royalty for the Patent,” “Many Licenses in a Small Range of Rates,” and “Cost Savings.” Id.).

\(^{63}\) Id.

\(^{64}\) Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1312 (Fed. Cir. 2011).
In 2011, the 25 percent rule of thumb was held inadmissible. In Uniloc, the Federal Circuit abolished the rule as a “fundamentally flawed tool for determining a baseline royalty rate in a hypothetical negotiation,” holding that “[e]vidence relying on the 25 percent rule of thumb is thus inadmissible under Daubert and the Federal Rules of Evidence, because it fails to tie a reasonable royalty base to the facts of the case at issue.” Although Uniloc attempted to apply the Georgia-Pacific factors to bring the 25 percent royalty rate up or down, the court explained that, because the analysis started from a fundamentally flawed premise, “adjusting it based on legitimate considerations specific to the facts of the case nevertheless results in a fundamentally flawed conclusion.” After the 25 percent rule was stricken, damages experts began utilizing the Nash Bargaining Solution to calculate reasonable royalty damages.

IV. PATENT CASES UTILIZING THE NASH BARGAINING SOLUTION

The cases that follow demonstrate how courts have treated the NBS in patent infringement cases, since its introduction in 2011. While some courts have allowed damages experts to use the NBS to calculate a reasonable royalty, many courts have not. Even still, most courts that have allowed damages experts to use the NBS have only allowed its use in conjunction with other methods. These cases demonstrate a current disparity among Federal district courts regarding the admissibility of the NBS.

A. Cases Excluding the Use of the Nash Bargaining Solution by Damages Experts

The United States District Courts for the Northern District of California and the Eastern District of Virginia are hot beds of patent litigation. However, both courts have excluded the use of the NBS by damages experts. For example, in Oracle, the District Court for the Northern

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65 Id.
66 Id. at 1315.
67 Id. at 1317.
68 See infra Part III-B.
District of California rejected the use of the NBS in determining a reasonable royalty in patent damages. The court explained that, although the damages expert “purported to use the Nash bargaining solution to project bargaining outcomes and calculate the resulting payments and royalties in the hypothetical negotiation,” he did not adequately explain this method or tie it to the facts of the case. More specifically, the court held that the damages expert “glossed over the axioms underlying the Nash solution without citing any evidence to show that those assumptions were warranted in the present case,” and therefore, allowing the expert to testify would have risked misleading the jury “as to the soundness of the foundation for his conclusions.” Additionally, the court explained that, because the NBS involves complex mathematics, “no jury could follow this Greek or testimony trying to explain it . . . [and the NBS] would invite a miscarriage of justice by clothing a fifty-percent assumption in an impenetrable facade of mathematics.” Therefore, the court excluded the testimony under Rule 403 of the Federal Rules of Evidence and advised the use of the Georgia-Pacific factors to guide a royalty analysis.

Additionally, in Suffolk, the District Court for the Easter District of Virginia, pursuant to Rule 702 of the Federal Rules of Evidence and Daubert, excluded the testimony of plaintiff’s damages expert, Roy Weinstein. Weinstein’s damages opinion provided an analysis of the “revenue stream associated with the putative infringing product” under the Georgia-Pacific factors and then a hypothetical negotiation under the NBS. Weinstein’s hypothetical negotiation resulted in a 50/50 split of the incremental profits attributed to the patent-in-suit.

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70 Id. at 1119 (internal quotations omitted).
71 Id.
72 Id. at 1120.
73 Id.
75 Id. at *4–5.
76 Id. at *5.
The court held that Weinstein’s 50/50 split was not tied to the facts of the case and therefore, “no different from the 25% rule of thumb rejected in Uniloc.”\textsuperscript{77} Although Weinstein used the Georgia-Pacific factors in his overall analysis, the court explained that “[t]he order in which the Georgia-Pacific factors are applied does not change the fundamental and fatal flow of both calculations, namely that the hypothetical rule of thumb was not tied to the facts of the case.”\textsuperscript{78}

B. Cases Excluding the Use of a 50/50 Split by Damages Experts

While some damages experts have simply applied a 50/50 split without further explanation or mention of the NBS, courts have excluded this practice and likened it to the NBS. For example, in Dynetix, the court excluded the opinion of Plaintiff’s damages expert, Dr. William H. Black. Dr. Black started his opinion with “the presumption that ‘one reasonable starting place’ for the licensing rate would be half of the gross margin of the infringing products.”\textsuperscript{79} The court held that Dr. Black’s analysis was improper under the Uniloc standard.\textsuperscript{80} The court opined that Dr. Black “considered no analogous facts of the case here other than the presumed validity of the patent[ and] . . . failed to cite any evidence to support his conclusion that the 50% starting place would apply to component parts . . . .”\textsuperscript{81} While Dr. Black did not mention the NBS in his analysis, it is worth noting that the court likened his analysis to the NBS, citing the Oracle decision.\textsuperscript{82}

Additionally, in Robocast, the court excluded the testimony of Plaintiff’s damages expert,
Creighton Hoffman. In Hoffman’s expert report, he used the Georgia Pacific factors to come to the conclusion “that an equal split of the benefits would be reasonable and could be negotiated by the parties to the hypothetical negotiation.” While Hoffman’s report did not mention NBS or game theory, the court concluded that “there is no doubt that the reasoning behind [Hoffman’s] purported 50/50 profit split is premised on these models.” From there, the court noted that Hoffman “did not discuss the relative bargaining power of Microsoft and Robocast.”

Furthermore, the court held that “Mr. Hoffman's discussion of the facts specific to this case would be insufficient even if the ‘relative bargaining power’ issue did not exist.” Finally, the court concluded its analysis by noting that “while the Nash Bargaining Solution of a 50/50 split has a more prestigious academic pedigree than the 25% rule of thumb, both are non-starters in a world where damages must be tied to the facts of the case.”

C. Cases Allowing the Use of the Nash Bargaining Solution, but not as the Sole Method

Other courts have also allowed damages experts to use the NBS, but in these cases, the NBS is used in conjunction with other methods. For example, in Mformation, the Northern District of California allowed the use of the NBS as a “check” on an analysis under the Georgia-Pacific factors. Defendants moved to exclude the testimony of plaintiff’s damages expert, Roy Weinstein (“Weinstein”), arguing that the NBS, used in determining a reasonable royalty, was an impermissible rule of thumb. The court held that, because Weinstein had performed an extensive analysis under the Georgia-Pacific factors, his use of the NBS “as a check on the

84 Id. at 2–3.
85 Id. at 3.
86 Id. at 7.
87 Id.
88 Id. at 9.
90 Id. at *14.
reasonableness of the rate reached through his Georgia-Pacific analysis” did not constitute a ground for exclusion of his testimony. The court further explained that exclusion was not necessary because “Weinstein used [the NBS] in addition to, rather than in lieu of, the Georgia-Pacific analysis.” This case provides an example of when courts allow the use of the NBS but only in a limited sense. This court did not allow the use of the NBS as the sole method in calculating a reasonable royalty.

Additionally, in Summit 6, Judge Reed O’Connor of the Northern District of Texas allowed plaintiff’s use of the NBS. Defendant argued that Plaintiff’s damages expert, Benoit, used a flawed analysis, combining the use of a non patent-practicing component of the device, reliance on market research surveys, and application of the NBS. Defendant argued that the use of the NBS was an improper 50% rule of thumb that had been rejected by courts. However, “Benoit testified that the NBS only looks to surplus profit, and allows for a variance in dividing the surplus profit where there is an otherwise unquantifiable difference in the bargaining position.” Accordingly, the court found that Benoit’s use of the NBS was not an improper 50% rule of thumb, but actually “based on his belief that because neither party had a stronger negotiating positions, they would have split the profits evenly. The court also emphasized that “the Federal Circuit's explanation that a district court should not use Daubert ‘to evaluate the correctness of facts underlying an expert's testimony. Questions about what facts are most relevant or reliable to calculating a reasonable royalty are for the jury. The jury was entitled to

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91 Id. at *15–16, n.19.
92 Id. at *16, n.19.
94 Id.
95 Id. at 36–37.
96 Id.
97 Id.
hear the expert testimony and decide for itself what to accept or reject.”

D. Cases Allowing the Use of the Nash Bargaining Solution as the Sole Method to Calculate Reasonable Royalty Damages

Since the introduction of the NBS in patent cases, a few courts have allowed damages experts to use the NBS as the sole method to calculate a reasonable royalty. For example, in *Sanofi-Aventis*, the court allowed the use of the NBS by the plaintiffs’ damages expert. The defendants, Glenmark Pharmaceuticals, moved to preclude the plaintiffs from offering expert testimony utilizing the NBS. Defendants argued that the NBS is indistinguishable from the 25 percent rule of thumb because it essentially applies a 50 percent rule of thumb to determine the reasonable royalty rate. Defendants argued that the damages expert “mechanically applied a 50/50 profit split” between the parties. On the other hand, plaintiffs argued that the NBS is “the standard model in economics for calculating the outcome of a negotiation, is recognized as a scientific method in determining reasonable royalty rates, and is unrelated to the 25 percent rule rejected in *Uniloc*.” Additionally, plaintiffs argued that the damages expert reached his result under the NBS “after considering the facts of the case, specifically the relationship between the parties and their relative bargaining power, the relationship between the patent and the accused product, the standard profit margins in the industry, and the presumed validity of the patent.” Ultimately, the court determined that the damages expert “did not arbitrarily apply a 50/50 profit split akin to the 25 percent rule rejected in Uniloc but rather based his reasonable royalty analysis

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98 *Id.* (quoting *i4i Ltd. P’ship v. Microsoft Corp.*, 598 F.3d 831, 856 (Fed. Cir. 2010)).
100 *Id.*
101 *Id.* at *36.
102 *Id.*
103 *Id.*
104 *Id.*
on the specific facts of this case.”

Additionally, in *Gen Probe*, the U. S. District Court for the Southern District of California ruled on a Daubert motion to exclude testimony of Gen-Probe’s damages expert, Michael Wagner. Wagner’s damages report was based on the NBS. Becton Dickinson argued that Wagner’s calculations were based on arbitrary profit splits similar to the 25 percent rule of thumb. Gen-Probe countered that Wagner’s calculations “were influenced, appropriately, by the facts of the case, including the competitive environment and Gen-Probe’s policy of exploiting its own patents—considerations approved in Rite-Hite Corp. v. Kelley Co., 56 F.3d 1538, 1554 (Fed. Cir. 1995).” The court agreed with Gen-Probe, holding that Wagner’s analysis was tied to the facts of the case and that his testimony would not be excluded on those grounds.

Finally, in *VirnetX*, Judge Leonard Davis of the U.S. District Court for the Eastern District of Texas allowed plaintiff’s use of the NBS. Defendant argued that the testimony of plaintiff’s damages expert, Roy Weinstein, should have been excluded because of his use of the NBS. Defendant maintained that Weinstein’s use of the NBS was improper because he failed to use generally accepted methods of applying the NBS, failed to explain why a 45%–55% profit split between the parties would have occurred, and arbitrarily applied a profit split “akin to the disdained 25% rule,” having “no basis in reality.” The court held, however, that Weinstein adequately supported his NBS-based theory, providing substantial evidence to support his

105 Id. at *37.
107 Id.
108 Id.
109 Id.
111 Id. at *52.
112 Id. at *52–53.
theory. First, Weinstein calculated the contribution of the patented feature to defendant’s total profits “by estimating the price differential between the accused product and the last previous version of the product not capable of supporting the feature.”

Next, Weinstein reduced the revenue by the percentage of the revenue associated with the addition of the patented feature, relying on the price of the technology that enabled the feature. Finally, Weinstein accounted for the 45%–55% profit split, “explaining that [plaintiff] would have been in a weaker bargaining position at the time of the negotiation because of its financial situation.” Weinstein’s use of the NBS was admissible because it was adequately applied to the facts of the case. This case demonstrates that the resulting royalty rate under the NBS will not always be 50%. Instead, the bargaining power of either party has the potential to bring the rate up or down. While the examples are few and far between, Weinstein’s use of the NBS was proper, and as a result, was allowed by the court.

V. THE NASH BARGAINING SOLUTION SHOULD BE A Viable METHOD USED IN calculating REASONABLE ROYALTY DAMAGES IN PATENT INFRINGEMENT CASES

Courts should allow the use of the NBS by damages experts as a viable method to calculate a reasonable royalty in patent infringement cases. First, courts should allow the use of the NBS because, if properly used, it adequately applies the facts of each specific case to its analysis. Second, courts should allow the use of the NBS because it is grounded in sound, unmanipulable economic theory that can be adequately explained. Finally, courts should allow the use of the NBS because it is more impartial than the use of the Georgia-Pacific factor analysis.

113 Id.
114 Id.
115 Id.
116 Id.
117 Id.
A. The Nash Bargaining Solution Applies the Facts of the Case

When the NBS is properly used by utilizing the equations set forth by Choi and Weinstein, its analysis ties the specific facts of each case to its analysis. It is apparent that one of the main criticisms by courts about the NBS is the lack of tying the specific facts of the case to its analysis.\[^{118}\] However, it is noteworthy that none of the courts that have excluded the use of the NBS have explicitly held that the NBS, in and of itself, does not utilize the specific facts of the case.\[^{119}\] Rather, courts have admonished damages experts’ lack of tying specific facts of the case in their analysis of the NBS.\[^{120}\] It is evident, upon further examination, that the NBS equations developed by Choi and Weinstein require facts that are specific to the parties of the case.

First, the variables of the Choi and Weinstein equations require data that is specific to the parties involved in the hypothetical negotiation. For example, $d_1$ represents the disagreement profit of the patent holder.\[^{121}\] To effectively utilize these equations, this variable must be satisfied with a value that is specific to the patent holder at issue. Likewise, $d_2$ represents the disagreement profit of the infringer/licensee.\[^{122}\] This variable must also be satisfied with a value that is specific to the infringer at issue. Thus, these variables require use of the facts of the case.

As an example, let’s assume that the disagreement profits for both the patent holder and infringer is 0. A value of 0 for both of these variables would mean that “without a license, neither the licensor nor the licensee obtains benefits from the patented technology.”\[^{123}\] For purposes of the equations, $d_1=0$ and $d_2=0$. When these values are plugged into equations (7) and (8), the result becomes:

\[^{119}\] See supra Part III-C.
\[^{120}\] See Oracle, 798 F. Supp. 2d at 1119.
\[^{121}\] Choi, supra note 10 at 54.
\[^{122}\] Id.
\[^{123}\] Weinstein, supra note 25 at 556.
\[ \pi_1^* = \frac{1}{2} \Pi \]  
\[ \pi_2^* = \frac{1}{2} \Pi \] 

These resulting equations demonstrate that, when, without a license, neither party obtains benefit from the patented technology, each party receives half of the total incremental profit, \( \Pi \).\(^{124}\) This scenario demonstrates how the dreaded 50/50 split result from the NBS, admonished by courts, can occur.\(^{126}\) However, this split did not result without the use of the facts of the case.

The above calculation is the most simplistic use of the NBS in the patent damages context. Obviously, we live in a world with multiple suppliers, and one or both of the parties will typically have some disagreement profit—an alternative plan in the case that licensing negotiations fail. Therefore, \( d_1 \) and \( d_2 \) will rarely ever equal 0, but there are some cases when it will.\(^{127}\) For example, in a suit where infringement is found, the infringer will be required to stop utilizing the patented invention.\(^{128}\) Thus, \( d_2 \) will generally equal 0.\(^{129}\) Additionally, in cases where the patent holder is a non-practicing entity and does not offer products utilizing the patent, \( d_1 \) will equal 0 because there will be no profit to be made in the event that a license is not executed.\(^{130}\)

Even when the NBS calculation does not result in a 50/50 split of incremental profit, the calculation of the NBS still requires the application of the facts of the case. For example, Choi and Weinstein demonstrated the result of their equations in a two-supplier world, where both

\(^{124}\) Id.  
\(^{125}\) Id.  
\(^{126}\) See supra Part III.  
\(^{127}\) Weinstein, supra note 25 at 556–57.  
\(^{128}\) Id.  
\(^{129}\) Id.  
\(^{130}\) Id.
parties possess production capabilities. There, “the disagreement payoff for the patent holder is the profit it can earn as the high-cost, sole producer of its patented product.” This produces the following function for solving $d_1$:

$$d_1 = P_1 Q_1 - C_1 Q_1.$$  \hspace{1cm} (12)\textsuperscript{133}

In this equation, $C_1(\bullet)$ is the patent holder’s cost function, $P_1$ is the profit-maximizing price, and $Q_1$ is the profit-maximizing quantity, absent the infringer.\textsuperscript{134} Furthermore, the disagreement profit for the infringer is “equal to the [infringer’s] opportunity cost, which is the return foregone from manufacturing the technology.”\textsuperscript{135} This results in the following total incremental profit function from licensing:

$$\Pi = P_m Q_m - C_2 Q_m.$$  \hspace{1cm} (13)\textsuperscript{136}

Plugging these functions into equations (7) and (8) results in the following:

$$\pi_1^* = d_1 + \frac{P_m Q_m - C_2(Q_m) - d_1 - d_2}{2} = r Q_m,$$  \hspace{1cm} (14)

$$\pi_2^* = d_2 + \frac{P_m Q_m - C_2(Q_m) - d_1 - d_2}{2} = P_m Q_m - C_2(Q_m) - r Q_m,$$  \hspace{1cm} (15)

$$\pi_1^* + \pi_2^* = \Pi = P_m Q_m - C_2(Q_m).$$  \hspace{1cm} (16)\textsuperscript{137}

In these equations, $r$ represents the per-unit royalty.\textsuperscript{138} Solving for $r$ results in the following:

$$r = \frac{1}{2} [P_m - AC_2] + \frac{1}{2Q_m} [d_1 - d_2],$$  \hspace{1cm} (17)

where $AC_2$ represents the infringer’s average total cost.\textsuperscript{139} It is worth noting that “[i]f both sides

\begin{itemize}
  \item \textsuperscript{131} Choi, supra note 10 at 58.
  \item \textsuperscript{132} Id.
  \item \textsuperscript{133} Id.
  \item \textsuperscript{134} Id.
  \item \textsuperscript{135} Id. at 57.
  \item \textsuperscript{136} Id. at 59.
  \item \textsuperscript{137} Id.
  \item \textsuperscript{138} Id. at 57.
  \item \textsuperscript{139} Id. at 58. (The authors also develop a per-royalty function for the one-supplier world. Id. at 57–58. The function is as follows:
\end{itemize}
have equal disagreement payoffs, then the additional profits achieved from licensing are split equally.\textsuperscript{140} Furthermore, the royalty rates change as the disagreement payoffs change.\textsuperscript{141} “As one side’s outside opportunity improves, the terms of the licensing agreement become more favorable.”\textsuperscript{142}

While these equations are complex, and in most cases, will require a damages expert to calculate a reasonable royalty, it is easy to see that the NBS requires the use of the specific facts of each case. When used correctly, courts should not object to damages experts’ use of the NBS for the reason that it does not apply the specific facts of the case. However, courts have also complained that the NBS cannot be adequately explained.

B. The Nash Bargaining Solution Can Be Adequately Explained

Although mathematically complex, the theory behind the NBS can be adequately explained, such that even a lay juryperson could understand. Another common complaint among courts excluding the use of the NBS is the lack of adequate explanation of its theory.\textsuperscript{143} However, the theory behind Weinstein and Choi’s NBS equations can be adequately explained in a simplified manner.

In the article by Weinstein, Romig, and Stabile, the authors, using the equations developed by Choi and Weinstein, point out how easily understandable the NBS is in the context

\[
\begin{align*}
    r &= \frac{1}{2} [P_m - AC_g] + \frac{1}{2Q_m} [d_1 - d_2]
\end{align*}
\]

\textit{Id.} Additionally, the authors’ equations provide flexibility for other factors. \textit{Id.} For instance, “if there exist viable and noninfringing substitutes to the patented product, then the elasticity of demand for the patented product is larger, which lowers the market power and profitability associated with the patent.” \textit{Id.} Furthermore, “[t]he existence of substitute products also will have the effect of lowering \(d_i\), which further lowers the royalty rate.” \textit{Id.}.

\textsuperscript{140} \textit{Id.} at 59.
\textsuperscript{141} \textit{Id.}
\textsuperscript{142} \textit{Id.} at 59–60.
\textsuperscript{143} See \textit{supra} Part III-C.
of reasonable royalty damages.\textsuperscript{144} The authors explain that:

As previously discussed, the NBS must satisfy two very simple conditions: (1) no other feasible outcome is better than one side and not worse than the other and (2) neither side is worse off reaching an agreement than if no agreement were reached. Additionally, the “complex mathematical formulas” can be reduced to a single sentence: each negotiating party receives the profit it would have made absent an agreement and splits the remaining profits equally. These concepts are easily understandable by jurors.\textsuperscript{145}

Because the NBS can be explained in a simplified manner, as demonstrated by Weinstein, Stabile, and Romig, its inadmissibility under Rule 403 of the Federal Rules of Evidence is unwarranted.\textsuperscript{146} Its simplified explanation, although grounded in complex mathematics, does not pose any of the risks contained in Rule 403—unfair prejudice, confusing the issues, misleading the jury, undue delay, wasting time, or needlessly presenting cumulative evidence.\textsuperscript{147} You will recall, in Oracle, the court took issue with the complex mathematics involved with the NBS and excluded the expert testimony under Rule 403.\textsuperscript{148} The court held that “no jury could follow this Greek or testimony trying to explain it . . . [and the NBS] would invite a miscarriage of justice by clothing a fifty-percent assumption in an impenetrable facade of mathematics.”\textsuperscript{149} However, because the NBS does not pose any threat admonished in Rule 403, exclusion of damages expert opinion utilizing the NBS under Rule 403 is a grave misapplication of the law.

Additionally, many opponents seek to exclude expert testimony of the NBS under Rule 702 of the Federal Rules of Evidence. Rule 702 explains that the role of an expert witness is to

\begin{itemize}
\item \textsuperscript{144} Weinstein, \textit{supra} note 25.
\item \textsuperscript{145} \textit{Id.} at 560.
\item \textsuperscript{146} \textit{FED. R. EVID.} 403
\item \textsuperscript{147} \textit{Id.}
\item \textsuperscript{148} Oracle Am., Inc. v. Google Inc., 798 F. Supp. 2d 1111, 1120 (N.D. Cal. 2011).
\item \textsuperscript{149} \textit{Id.}
\end{itemize}
“help the trier of fact to understand the evidence or to determine a fact in issue.” The rule ensures that the expert is credible by requiring that his testimony is based on sufficient facts or data, the testimony is the product of reliable principles and methods, and the expert has reliably applied the principles and methods to the facts of the case. Nowhere in the rule does it provide that an expert’s testimony may be excluded because of its complex nature. In fact, most expert testimony is complex in nature—they are, in fact, experts.

When the NBS is placed against the litmus test of Rule 702, it passes with flying colors. First, the testimony must help the trier of fact to understand evidence or determine a fact at issue. Here, the NBS is used to help the trier of fact determine a reasonable royalty rate—a fact at issue. Therefore, the NBS meets this condition.

Next, the testimony of the expert must be based on sufficient facts or data. As discussed in Part IV-A, the calculation of the NBS requires many data points that are derived directly from the facts. In fact, none of the variables involve values that do not stem from the facts of the case. Therefore, the NBS also meets this condition.

Additionally, the testimony must be the product of reliable principles and methods. As discussed previously, the NBS has been in existence for over 60 years. Over that span, many economists have tested its theory. Economic literature is replete with articles describing, testing, and commending the NBS. It is now held as generally accepted economic theory.

150 FED. R. EVID. 720.
151 Id.
152 Id.
153 Id.
154 See supra Part IV-A.
155 FED. R. EVID. 720.
156 See supra Part II.
157 Id.
158 Id.
159 Id.
This makes sense, given its receipt of a Nobel Prize in economics. Therefore, the NBS also meets this condition.

Finally, the expert must reliably apply the principles and methods to the facts of the case. As discussed in Part IV-A, when the values, stemming from the specific facts of the case, are inputted into the variables of the NBS, a reasonable royalty rate is calculated. Accordingly, when a practitioner uses the NBS properly, it is inevitable that the method and principles of the NBS will be applied with the specific facts of the case. Thus, the NBS meets this condition and satisfies all of the conditions of Rule 702.

However, the reliability inquiry of the NBS does not stop there. The testimony must also overcome a *Daubert* challenge. The notes of the advisory committee for Rule 702 explain:

> Daubert set forth a non-exclusive checklist for trial courts to use in assessing the reliability of scientific expert testimony. The specific factors explicated by the Daubert Court are (1) whether the expert's technique or theory can be or has been tested—that is, whether the expert's theory can be challenged in some objective sense, or whether it is instead simply a subjective, conclusory approach that cannot reasonably be assessed for reliability; (2) whether the technique or theory has been subject to peer review and publication; (3) the known or potential rate of error of the technique or theory when applied; (4) the existence and maintenance of standards and controls; and (5) whether the technique or theory has been generally accepted in the scientific community.

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160 *Id.*
161 FED. R. EVID. 720.
162 See *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 43 F.3d 1311, 1317 (9th Cir. 1995).
163 FED. R. EVID. 720 advisory committee’s note. “Courts both before and after *Daubert* have found other factors relevant in determining whether expert testimony is sufficiently reliable to be considered by the trier of fact. These factors include:

1. Whether experts are ‘proposing to testify about matters growing naturally and directly out of research they have conducted independent of the litigation, or whether they have developed their opinions expressly for purposes of testifying.’ *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 43 F.3d 1311, 1317 (9th Cir. 1995).

2. Whether the expert has unjustifiably extrapolated from an accepted premise to an unfounded conclusion. See General Elec. Co. v. Joiner, 522 U.S. 136, 146 (1997) (noting that in some cases a trial court ‘may conclude that there is simply too great an analytical gap between the data and the opinion proffered’).
It is apparent that these factors weigh in favor of the NBS’s reliability. Even still, a rejection of expert testimony is the exception rather than the rule.\textsuperscript{164}

Courts should not abandon the use of the NBS simply because it may be too complex for a jury to understand. Instead, courts should leave this determination in the hands of the jury. If a jury feels that the testimony involving the NBS is “a fifty-percent assumption in an impenetrable facade of mathematics,”\textsuperscript{165} they can choose to not give any weight to the expert’s testimony. The reliability of the NBS, however, is well established and should not provide a basis for courts to exclude its use.

\textsuperscript{(3)} Whether the expert has adequately accounted for obvious alternative explanations. See Claar v. Burlington N.R.R., 29 F.3d 499 (9th Cir. 1994) (testimony excluded where the expert failed to consider other obvious causes for the plaintiff’s condition). Compare Ambrosini v. Labarraque, 101 F.3d 129 (D.C.Cir. 1996) (the possibility of some uneliminated causes presents a question of weight, so long as the most obvious causes have been considered and reasonably ruled out by the expert).

\textsuperscript{(4)} Whether the expert ‘is being as careful as he would be in his regular professional work outside his paid litigation consulting.’ Sheehan v. Daily Racing Form, Inc., 104 F.3d 940, 942 (7th Cir. 1997). See Kumho Tire Co. v. Carmichael, 119 S.Ct. 1167, 1176 (1999) (Daubert requires the trial court to assure itself that the expert ‘employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field’).

\textsuperscript{(5)} Whether the field of expertise claimed by the expert is known to reach reliable results for the type of opinion the expert would give. See Kumho Tire Co. v. Carmichael, 119 S.Ct. 1167, 1175 (1999) (Daubert’s general acceptance factor does not ‘help show that an expert's testimony is reliable where the discipline itself lacks reliability, as, for example, do theories grounded in any so-called generally accepted principles of astrology or necromancy.’); Moore v. Ashland Chemical, Inc., 151 F.3d 269 (5th Cir. 1998) (en banc) (clinical doctor was properly precluded from testifying to the toxicological cause of the plaintiff’s respiratory problem, where the opinion was not sufficiently grounded in scientific methodology); Sterling v. Velsicol Chem. Corp., 855 F.2d 1188 (6th Cir. 1988) (rejecting testimony based on ‘clinical ecology’ as unfounded and unreliable).

All of these factors remain relevant to the determination of the reliability of expert testimony under the Rule as amended. Other factors may also be relevant. See Kumho, 119 S.Ct. 1167, 1176 (‘[W]e conclude that the trial judge must have considerable leeway in deciding in a particular case how to go about determining whether particular expert testimony is reliable.’). Yet no single factor is necessarily dispositive of the reliability of a particular expert's testimony. See, e.g., Heller v. Shaw Industries, Inc., 167 F.3d 146, 155 (3d Cir. 1999) (‘not only must each stage of the expert's testimony be reliable, but each stage must be evaluated practically and flexibly without bright-line exclusionary (or inclusionary) rules.’); Daubert v. Merrell Dow Pharmaceuticals, Inc., 43 F.3d 1311, 1317, n.5 (9th Cir. 1995) (noting that some expert disciplines ‘have the courtroom as a principal theatre of operations’ and as to these disciplines ‘the fact that the expert has developed an expertise principally for purposes of litigation will obviously not be a substantial consideration.’” Id.\textsuperscript{164}Id.\textsuperscript{165} Oracle Am., Inc. v. Google Inc., 798 F. Supp. 2d 1111, 1120 (N.D. Cal. 2011).
C. The Nash Bargaining Solution is More Impartial Than the Manipulable Georgia-Pacific Factor Analysis

While the Georgia-Pacific factor analysis has been used for over 30 years to calculate a reasonable royalty rate, it is easily manipulable and should be abandoned in favor of the more impartial, NBS. As Choi and Weinstein point out, the Georgia-Pacific factor analysis “can produce a royalty rate unsupported by economic theory.”

First, the Georgia-Pacific factor analysis can be easily manipulated and difficult to understand. For example, a plaintiff, attempting to garner a high royalty rate, may emphasize a few factors, while leaving out other important factors that may be detrimental to its position. Vice versa, a defendant may emphasize only a few factors in an attempt to establish a low royalty rate. Choi and Weinstein explain that what can result is “an unsound calculation shrouded by ‘reliance’ on Georgia-Pacific.” Professor Tom Cotter from the University of Minnesota Law School, opined that the “Georgia-Pacific factors ... can be easily manipulated by the trier of fact to reach virtually any outcome.” Additionally, one commentator explained that, “[t]he factors do not give clear guidance on how to calculate damages awards because there is no standardized way to apply or prioritize the factors.” Moreover, courts have expressed aversion for the Georgia-Pacific factor analysis. For example, the Federal Circuit has described the Georgia-Pacific analysis as “a difficult judicial chore, seeming often to involve more the

166 See supra Introduction.
167 Choi, supra note 10 at 51.
168 See id.
169 See id.
170 Id.
talents of a conjurer than those of a judge.” ¹⁷³ Finally, in *Gasser Chair Co., Inc. v. Infanti Chair Mfg. Corp.*, the court held that “[i]t would be an affectation of research to cite the countless cases which simply reiterate the “Georgia–Pacific” factors to be considered in determining a reasonable royalty. . . . To set out those fifteen factors would also needlessly burden this decision.” ¹⁷⁴

Next, the NBS provides a more impartial reasonable royalty rate determination than the *Georgia-Pacific* analysis. Because the NBS is mathematical, it provides less wiggle room for manipulability than the *Georgia-Pacific* analysis. Conversely, because the *Georgia-Pacific* factors are not based upon mathematics, they are analyzed from a subjective perspective. It would be naïve, however, to assert that the NBS is wholly impartial. A damages expert could input incorrect values to manipulate the results, but this manipulation should be more readily apparent to a jury member. It would be easier for a jury member to ascertain that the cost variable of an NBS analysis has been manipulated, than it would to ascertain that a damages expert is advocating an unreasonable royalty rate by simply stating the basis for his rate as a subjective analysis of the various *Georgia-Pacific* factors.

While the NBS may be a better method than the *Georgia-Pacific* factor analysis, detailed analysis of the effectiveness of the *Georgia-Pacific* analysis is beyond the scope of this article. However, a future article may be useful to analyze the effectiveness of the NBS compared to the effectiveness of the *Georgia-Pacific* analysis.

**VI. CONCLUSION**

Courts should allow the use of the NBS as a viable method to calculate a reasonable royalty in patent infringement cases because, if properly used, it adequately applies the facts of

¹⁷³ *Fromson v. Western Litho Plate & Supply Co.*, 853 F.2d 1568, 1574 (Fed. Cir. 1988).
each specific case, it is grounded in sound, unmanipulable economic theory, and it is more impartial than the use of the Georgia-Pacific factor analysis. Courts have excluded the use of the NBS due to its improper use by damages experts. However, as shown here, the NBS, when used correctly, provides an impartial theory to calculate reasonable royalty damages. Its theory has been established as sound, accepted economic theory over the past 60 years, and it is the most useful way to determine an accurate reasonable royalty. Furthermore, a proper application of the NBS takes into account the relative bargaining positions of both parties, and adjusts the royalty rate accordingly.

Proper use of the NBS is vital to its viability as a proper method to calculate a reasonable royalty. Accordingly, proper use can be encouraged by a simple technique used by many mathematics teachers—show your work. If the equations by Choi and Weinstein are utilized, and damages experts show how they calculated the values for the variables involved, courts can rest assured that the damages experts are tying the specific facts of the case to their analysis.