

Using Conjoint Analysis To Apportion Patent Damages¹

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Introduction

To support their calculations of reasonable-royalty damages in patent infringement cases, experts increasingly introduce survey evidence to provide real-world evidence of consumers' valuations of patented technology.² Although U.S. courts typically treat surveys as admissible evidence of consumer preferences, in some cases courts have found that evidence to be unreliable and inadmissible because the surveys were improperly designed and executed and, as a result, suffered from sample bias and measurement error.³

In a handful of high-stakes patent infringement cases, experts have introduced evidence from a particular type of survey methodology—conjoint analysis—which is commonly used in marketing studies to measure the tradeoffs that consumers make among salient features of a product.⁴ In those cases, damages experts have used conjoint surveys—surveys structured to provide data usable in conjoint analysis study—to estimate consumers' average willingness to pay for a patented feature in a multicomponent product (such as a smartphone), relative to that product's other features.⁵ Evidence of consumers' average willingness to pay for a feature is relevant for calculating patent damages because it provides an estimate of (1) the implementer's increased profits from incorporating the patented feature in its products and, therefore, (2) the implementer's maximum willingness to pay for the patented technology in a

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² See Shankar Iyer, *Patent Damages in the Wake of Uniloc v. Microsoft*, 23 INTEL. PROP. LITIG. 9, 12–13 (2012).

³ See *infra* Section I.B.

⁴ See *infra* Section II.

⁵ See *infra* Section II.

hypothetical negotiation with the patent holder at the moment immediately before first infringement.⁶

Part I of this Article explains the legal requirement for apportioning damages to a patented technology in the United States, as well as the courts' general approach to evaluating survey evidence. Part II describes conjoint analysis and explains how one can use it to support an apportionment exercise. Part III assesses whether evidence from conjoint analysis can meet the standards for admissibility established in Federal Rule of Evidence 702 and interpreted in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*⁷ and subsequent Supreme Court decisions.⁸ Part III further explains the criteria that the U.S. courts have adopted for determining the admissibility of conjoint surveys as evidence of consumers' willingness to pay for a patented feature. A conjoint survey can estimate, without extrapolation, the consumers' valuation of the patented technology only at the time at which the expert conducts the survey.⁹ That is, a conjoint survey conducted after the moment of first infringement does not perfectly measure consumers' valuation of the patented technology immediately before first infringement, which is the question of fact ultimately relevant to determining patent damages.¹⁰ Because it does not directly measure the consumers' valuation of the patented technology immediately before first infringement, the conjoint survey's findings do not necessarily reveal the implementer's willingness to pay for the patented technology at the time of the hypothetical negotiation.¹¹ Therefore, the findings of a conjoint survey conducted during litigation are relevant to the damages calculation, and in an evidentiary sense are helpful to the finder of fact, only to the extent that one can use those findings (that is, the consumers' *current* valuation of the patented technology) to infer the consumers' valuation of the patented technology at the moment immediately before first infringement.

Part IV examines how one can use evidence from conjoint analysis to argue that a feature in a multicomponent product drives the demand for that product, which is relevant to the legal test for determining whether the patent holder may obtain an injunction and for identifying the appropriate royalty base for calculating damages. The Federal Circuit has not provided comprehensive guidance on how to determine whether a patented feature drives demand for a downstream product for purposes of deciding whether

⁶ See *infra* Section II.

⁷ 509 U.S. 579, 586–98 (1993); see *infra* Section III.B.

⁸ See, e.g., *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999); see also *General Elec. Co. v. Joiner*, 522 U.S. 136 (1997).

⁹ See *infra* Section III.A.

¹⁰ See *infra* Section III.A.

¹¹ See *infra* Section III.A.

a patent holder may obtain an injunction. Other Federal Circuit decisions indicate that, to argue that the entire multicomponent product incorporating the infringing feature is the appropriate royalty base for an expert witness to use to compute damages for patent infringement, the expert must show evidence that a patented feature motivates consumers to purchase the multicomponent product at issue.¹²

I. Using Survey Data to Meet the Legal Requirement of Apportioning Damages to a Patented Technology

When calculating reasonable-royalty damages in a U.S. patent infringement case involving products that contain both infringing and non-infringing features, a damages expert must apportion damages to the allegedly infringing feature.¹³ Although U.S. courts have found that survey evidence can provide “real-world” evidence of consumers’ valuation of a patented feature or functionality, courts scrutinize the admissibility of such surveys.¹⁴ Before courts will determine that survey evidence is sufficiently reliable to be admissible, and thus be evaluated by the jury, that evidence must (1) comply with accepted statistical principles and (2) relate to the facts of the case by focusing on consumers’ valuation of the specific patented technology in question.¹⁵

A. Apportioning Damages to a Patented Technology

Section 284 of the Patent Act requires that courts award patent damages that are “adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer.”¹⁶ The Supreme Court has said that damages for patent infringement “should be consistent with Congress’ overriding purpose of affording patent owners complete compensation.”¹⁷ Damages for patent infringement may consist of the profits that the patent holder would have earned in the absence of the infringement, a reasonable royalty, or a combination of both.¹⁸ In determining reasonable-royalty damages, a damages expert typically identifies the bargaining range within which the parties to a hypothetical negotiation would have

¹² See *infra* Section IV.B.

¹³ See *Garretson v. Clark*, 111 U.S. 120, 121 (1884).

¹⁴ See *infra* Section I.B.

¹⁵ See *infra* Section I.B.

¹⁶ 35 U.S.C. § 284 (2012).

¹⁷ *General Motors Corp. v. Devex Corp.*, 461 U.S. 648, 655 (1983).

¹⁸ See *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 377 U.S. 476, 507 (1964); *Yale Lock Mfg. Co. v. Sargent*, 117 U.S. 536, 552–53 (1886); *Panduit Corp. v. Stahl Bros. Fibre Works, Inc.*, 575 F.2d 1152, 1156 (6th Cir. 1978).

negotiated a reasonable royalty if they had voluntarily entered into a license immediately before the first infringement.¹⁹

In a hypothetical negotiation, the lower bound on the bargaining range is the minimum royalty that the patent holder will accept for the license, and the upper bound on the bargaining range is the maximum royalty that the implementer is willing to pay for the license.²⁰ The patent holder's minimum willingness to accept is the patent holder's opportunity cost of licensing to the implementer.²¹ In general, at least for patents that have not been declared essential to a standard, the implementer's maximum willingness to pay is the incremental profit that the implementer expected to earn at the time of the hypothetical negotiation by incorporating the infringed patent into its products rather than using the next-best non-infringing alternative (if any such alternative was available and acceptable at the time of the hypothetical negotiation).²² When identifying the bargaining range and calculating a reasonable royalty within that range, courts typically consider the *Georgia-Pacific* factors²³—a set of fifteen factors that “provide a reasoned economic framework for a ‘hypothetical negotiation, . . . [which] attempts to ascertain the royalty upon which the parties would have agreed had they successfully negotiated an agreement just before infringement began.’”²⁴

The Supreme Court has long held that, when a patented technology comprises one part of a multicomponent product, “[t]he patentee . . . must in every

¹⁹ See, e.g., J. Gregory Sidak, *The Meaning of FRAND, Part I: Royalties*, 9 J. COMPETITION L. & ECON. 931, 933 (2013); J. Gregory Sidak, *Bargaining Power and Patent Damages*, 19 STAN. TECH. L. REV. 1, 5 (2015); Memorandum Opinion and Order at 5–6, *ContentGuard Holdings, Inc. v. Amazon.com, Inc.*, No. 13-cv-01112 (E.D. Tex. Aug. 6, 2015), ECF No. 825 (Gilstrap, C.J.) (discussing the analysis of the economic expert, Dr. David Teece, who applied the Rubenstein bargaining model to determine at what point within the bargaining range the parties would have reached agreement in a hypothetical negotiation).

²⁰ See, e.g., Sidak, *The Meaning of FRAND, Part I: Royalties*, *supra* note 19, at 935–39; Sidak, *Bargaining Power and Patent Damages*, *supra* note 19, at 13–17.

²¹ See, e.g., Sidak, *The Meaning of FRAND, Part I: Royalties*, *supra* note 19, at 938; Sidak, *Bargaining Power and Patent Damages*, *supra* note 19, at 13–15.

²² See, e.g., Sidak, *The Meaning of FRAND, Part I: Royalties*, *supra* note 19, at 935; Sidak, *Bargaining Power and Patent Damages*, *supra* note 19, at 15–17.

²³ *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *modified, and aff'd*, 446 F.2d 295 (2d Cir. 1971), *cert. denied*, 404 U.S. 870 (1971) (including factors such as “royalties received by the patentee for the licensing of the patent in suit,” “[t]he rates paid by the licensee for the use of other patents comparable to the patent in suit,” “[t]he nature and scope of the license,” and so forth).

²⁴ *Whitserve, LLC v. Computer Packages, Inc.*, 694 F.3d 10, 27 (Fed. Cir. 2012) (alteration in original) (quoting *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1324 (Fed. Cir. 2009)).

case give evidence tending to separate or apportion the defendant's profits and the patentee's damages between the patented feature and the unpatented features."²⁵ In other words, the damages expert must employ a methodology that will enable him to disaggregate the profit that is "properly and legally attributable to the patented feature" from the profit that is attributable to the non-infringing features of the multicomponent product.²⁶

U.S. courts have accepted different methodologies to calculate reasonable-royalty damages for a patented technology in a multicomponent product. For example, damages experts have used evidence of the royalties specified in comparable licenses to calculate reasonable-royalty damages.²⁷ From an economic perspective, evidence from comparable licenses reveals the price that the market considers fair compensation for the use of the patented technology. Consequently, calculating reasonable-royalty damages using evidence from comparable licenses likely obviates further apportionment. An alternative methodology involves identifying a royalty base.²⁸ In simple terms, one typically calculates total damages by multiplying a royalty rate by a royalty base. The royalty base could be the entire price of the downstream product, to which a damages expert applies a relatively low royalty rate.²⁹ Alternatively, the royalty base could be the price of an intermediate component product that incorporates the patented feature (the smallest salable patent-practicing component, or "SSPPC"), to which a damages expert applies a higher royalty rate.³⁰ If performed correctly, each of those methodologies should yield the same result. Nonetheless, selecting the downstream product as a royalty base is appropriate as a matter of economic analysis if the patented feature creates complementarities of demand when combined with other features

²⁵ *Garretson v. Clark*, 111 U.S. 120, 121 (1884), *quoted in* *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1227 (Fed. Cir. 2014) (quoting *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1318 (Fed. Cir. 2011)); *see also* *City of Elizabeth v. American Nicholson Pavement Co.*, 97 U.S. 126, 138–39 (1877); *Keystone Mfg. Co. v. Adams*, 151 U.S. 139, 147–48 (1894).

²⁶ *Garretson*, 111 U.S. at 121.

²⁷ *See, e.g.*, *Ericsson Inc. v. D-Link Sys., Inc.*, No. 6:10-cv-00473, 2013 WL 4046225, at *15–18 (E.D. Tex. Aug. 6, 2013), *aff'd in part, vacated in part, and overruled in part*, 773 F.3d 1201 (Fed. Cir. 2014).

²⁸ *Id.* at *13.

²⁹ *See, e.g.*, *Fonar Corp. v. Gen. Elec. Co.*, 107 F.3d 1543, 1552–53 (Fed. Cir. 1997); *Tekmax, Inc. v. Exide Corp.*, 215 F.3d 1339, 1999 WL 435755, at *7 (Fed. Cir. Jan. 27, 1999); *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1339 (Fed. Cir. 2009).

³⁰ *See, e.g.*, *LaserDynamics, Inc. v. Quanta Comput., Inc.*, 694 F.3d 51, 67 (Fed. Cir. 2012). The term "SSPPC" tends to replace the earlier phrase "smallest salable unit" (SSU).

of a complex product.³¹ In that scenario, using the value of the intermediate component product as a royalty base might result in a royalty that truncates the value that is properly attributable to the patented feature.

B. Using Survey Data to Support a Damages Calculation

Federal Rule of Evidence 702 provides that an expert witness's testimony will be admissible—that is, the jury may hear and weigh the testimony—if “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.”³² The Supreme Court stated that district courts should exclude expert testimony if it “does not relate to any issue in the case[, because it] is not relevant and, ergo, non-helpful.”³³ Therefore, district judges will exclude any expert testimony that they consider to depart from standard scientific principles or not to be sufficiently related to the specific facts of the case.³⁴

U.S. courts generally consider surveys to reveal evidence of consumer preferences.³⁵ Any shortcoming in methodology or survey design generally affects the weight, rather than the admissibility, of the survey evidence.³⁶ That general principle applies even in complex patent infringement cases. For example, in *Cornell University v. Hewlett-Packard Co.*,³⁷ Chief Judge Rader of the Federal Circuit, sitting by designation on the U.S. District Court for the Northern District of New York, having determined that Cornell had not shown that the asserted patent—a mechanism that issued instructions within a computer processor—drove the demand for the Hewlett-Packard servers and workstations that practiced that technology, concluded that the servers and workstations were therefore not the proper royalty base.³⁸ Chief Judge Rader said that evidence in the form of consumer surveys could have provided “real world support for Cornell’s royalty base claim.”³⁹

³¹ See J. Gregory Sidak, *The Proper Royalty Base for Patent Damages*, 10 J. COMPETITION L. & ECON. 989, 994–95 (2014).

³² FED. R. EVID. 702(c)–(d).

³³ *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 591 (1993).

³⁴ See, e.g., *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1315–16 (Fed. Cir. 2011); *VirnetX, Inc. v. Cisco Sys., Inc.*, 767 F.3d 1308, 1334 (Fed. Cir. 2014).

³⁵ See *Fortune Dynamic, Inc. v. Victoria’s Secret Stores Brand Mgmt., Inc.*, 618 F.3d 1025, 1036 (9th Cir. 2010).

³⁶ See *id.* at 1036–38; *Clicks Billiards, Inc. v. Sixshooters, Inc.*, 251 F.3d 1252, 1263 (9th Cir. 2001); see also *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1318 (Fed. Cir. 2014) (citing *i4i Ltd. v. Microsoft Corp.*, 598 F.3d 831, 853–54 (Fed. Cir. 2010)).

³⁷ 609 F. Supp. 2d 279 (N.D.N.Y. 2009).

³⁸ *Id.* at 282–85.

³⁹ *Id.* at 288–89.

Writing for the District Court for the Northern District of California in a *Daubert* order in *Sentius International, LLC v. Microsoft Corp.*,⁴⁰ Magistrate Judge Paul Grewal stated that, “[l]ong a staple of trademark, false advertising and antitrust cases [sic], consumer surveys are now de rigueur in patent cases.”⁴¹ In *Sentius*, Microsoft filed a *Daubert* motion challenging the admissibility of a survey conducted by Sentius’s expert that sought to measure respondents’ willingness to pay for spelling and grammar capabilities in Microsoft’s software products.⁴² Although Judge Grewal agreed with Microsoft that there were significant concerns regarding both the structure of the survey and how it was conducted, he denied Microsoft’s motion, reasoning that “jurors are equipped to evaluate these defects themselves.”⁴³ Judge Grewal said that, “[u]nlike some of the more esoteric tools used in such cases, surveys are not exactly unusual or unfamiliar to the layperson” and that it is therefore proper for the jury to evaluate such evidence.⁴⁴ He found that, “as long as [surveys] are conducted according to accepted principles . . . survey evidence should ordinarily be found sufficiently reliable Unlike novel scientific theories, a jury should be able to determine whether asserted technical deficiencies undermine a survey’s probative value.”⁴⁵ In sum, Judge Grewal said that a jury is, in general, capable of assessing survey evidence in patent infringement cases.

In response to Microsoft’s first contention—that the survey questions that Sentius’s survey expert administered were overly broad and did not relate to any issue in the case—Judge Grewal said that, even though the expert could have tailored the survey questions more narrowly to isolate the accused aspects of Microsoft’s spelling and grammar features, the surveys would still help a finder of fact because they related to “specific aspects” of those features.⁴⁶ Second, Microsoft argued that the surveys disregarded the fact that products contained “thousands of features” when it focused on consumers’ preferences for the accused features.⁴⁷ Microsoft contended that the so-called “direct method” of survey design that Sentius had used was not a “generally accepted methodology.”⁴⁸ Judge Grewal disagreed because Microsoft had not cited any authority to support its claims that any other survey methodology would

⁴⁰ No. 5:13-cv-00825-PSG, 2015 WL 331939 (N.D. Cal. Jan. 23, 2015).

⁴¹ *Id.* at *1.

⁴² *Id.* at *1–2.

⁴³ *Id.* at *1.

⁴⁴ *Id.*

⁴⁵ *Id.* at *2 (quoting *Southland Sod Farms v. Stover Seed Co.*, 108 F.3d 1134, 1143 n.8 (9th Cir. 1997)).

⁴⁶ *Id.* at *4 (citing *Apple, Inc. v. Samsung Elecs. Co.*, No. 12-CV-00630-LHK, 2014 WL 794328, at *18 (Feb. 25, 2014)).

⁴⁷ *Id.* at *5.

⁴⁸ *Id.*

have been more appropriate.⁴⁹ Third, Judge Grewal said that, although the survey's open-ended questions presented a risk that the estimates of consumers' willingness to pay would be biased upward, Sentius's expert had properly used an adjustment factor to correct for that risk.⁵⁰ He said that Microsoft had again failed to cite to any authority establishing the presence of bias or that Sentius's method of adjustment was unreliable.⁵¹ In short, though acknowledging that the surveys suffered weaknesses, Judge Grewal concluded that the jury was capable of evaluating the proper weight to give the survey evidence.

A number of court decisions have also emphasized that courts must nonetheless scrutinize survey evidence to ensure that it meets the minimum standard for admissibility.⁵² In a trademark case, *Kraft Foods Group Brands LLC v. Cracker Barrel Old Country Store, Inc.*,⁵³ the Seventh Circuit, in an opinion by Judge Richard Posner, cautioned that survey results can be prone to bias.⁵⁴ The case concerned the sale of food products to grocery stores by Cracker Barrel Old Country Store ("CBOCS") under the name Cracker Barrel, which was a registered trademark of Kraft.⁵⁵ Kraft sold cheeses under the Cracker Barrel label, whereas CBOCS sold products excluding cheese, but including hams, under its logo.⁵⁶ CBOCS appealed a decision granting a preliminary injunction preventing its products from being shipped to grocery stores.⁵⁷ Kraft argued that an injunction was necessary because the CBOCS logo could mislead consumers into thinking that Kraft made the CBOCS products and, as a consequence, cause consumers to blame Kraft for any dissatisfaction with those products.⁵⁸ Analyzing the consumer survey that Kraft presented to support its claim of confusion, Judge Posner said:

There is *such* a wide choice of survey designs, none foolproof, involving such issues as sample selection and size, presentation of the allegedly confusing products to the consumers involved in the survey, and phrasing of questions in a way that is intended to elicit the surveyor's desired response—confusion or lack thereof—from the survey respondents.⁵⁹

⁴⁹ *Id.* at *5–6.

⁵⁰ *Id.* at *6.

⁵¹ *Id.*

⁵² See, e.g., *LaserDynamics, Inc. v. Quanta Comput., Inc.*, 694 F.3d 51, 80–81 (Fed. Cir. 2012); *Fractus, S.A. v. Samsung Co.*, No. 6:09-cv-203-LED-JDL, 2011 WL 7563820, at *1 (E.D. Tex. Apr. 29, 2011).

⁵³ 735 F.3d 735 (7th Cir. 2013).

⁵⁴ *Id.* at 741.

⁵⁵ *Id.* at 736.

⁵⁶ *Id.* at 736–37.

⁵⁷ *Id.* at 736.

⁵⁸ *Id.* at 738–39.

⁵⁹ *Id.* at 741.

Judge Posner expressed concern that, given the flexibility of survey design, an expert witness might cherry-pick survey results that support his testimony: “a survey that produces results contrary to the interests of the party that sponsored the survey may be suppressed and thus never become a part of the trial record.”⁶⁰ Judge Posner emphasized that, as a consequence, “caution is required in the screening of proposed experts on consumer surveys.”⁶¹ He doubted that CBOCS’s survey, which showed respondents an image of CBOCS ham and asked whether CBOCS also makes cheese, had any probative significance.⁶² Judge Posner considered the more relevant question to be whether the respondents thought that Kraft made the CBOCS ham.⁶³ Despite its skepticism of the survey’s probative value, the Seventh Circuit affirmed the district court’s grant of Kraft’s request for a preliminary injunction on the basis of other evidence.⁶⁴

Other decisions have also highlighted the district courts’ concerns regarding the potential for bias arising from the improper framing of survey questions and selection of respondents. In a breach-of-contract case, Chief Judge David Hamilton of the U.S. District Court for the Southern District of Indiana expressed concern over the potential for biased survey results when he cautioned that “closed-end questions” that do not have a “[d]on’t know/not sure” option “would push respondents” to read more into the stated questions than is actually there.⁶⁵ In *NetAirus Technologies, LLC v. Apple, Inc.*,⁶⁶ a patent infringement case, Judge John Kronstadt of the U.S. District Court for the Central District of California excluded a survey that suffered from sampling error.⁶⁷ “In a carefully executed survey,” he said, “each potential respondent is questioned or measured on the attributes that determine his or her eligibility to participate in the survey.”⁶⁸ Judge Kronstadt found that the survey in question suffered from sample bias because it had “not take[n]

⁶⁰ *Id.*

⁶¹ *Id.* at 742.

⁶² *Id.* at 742–43.

⁶³ *Id.*

⁶⁴ *Id.* at 743.

⁶⁵ *Hubbard v. Midland Credit Mgmt.*, Nos. 1:05-cv-00216-DFH-TAB, 1:05-cv-00218-DFH-TAB, 2009 WL 454989, at *3 (S.D. Ind. Feb. 23, 2009) (internal quotation marks omitted).

⁶⁶ Order Re Apple’s Motion to Exclude the Surveys, Expert Reports, and Opinions of Howard Marylander and James Berger and References Thereto by Joseph Gemini, No. 2:10-cv-03257-JAK (C.D. Cal. Oct. 23, 2013), ECF No. 524.

⁶⁷ *Id.* at 1.

⁶⁸ *Id.* at 5 (quoting FED. JUDICIAL CTR. & NAT’L RESEARCH COUNCIL OF THE NAT’L ACADS., REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 386 (3d ed. 2011)) (internal quotation marks omitted).

measures to adjust for response rates to balance the gender of respondents” and had asked “prospective purchasers many of the questions . . . that required present use” of the infringing devices.⁶⁹ He excluded the survey because it generated “answers from respondents who had no basis to provide them” and therefore violated the general principles of survey design.⁷⁰ Judge Kronstadt clarified that, “[a]lthough issues of ‘methodology, survey design, reliability, the experience and reputation of the expert, [and] critique of conclusions’ can go to the weight that a jury should accord to the survey, a court must first find that the survey is ‘relevant and conducted according to accepted principles.’”⁷¹

Similarly, in *LaserDynamics, Inc. v. Quanta Computer, Inc.*,⁷² the Federal Circuit, in an opinion by Judge Jimmie Reyna, found that the survey evidence that LaserDynamics’ damages expert presented was not admissible because it did not relate to the specific patented technology in the specific industry in question.⁷³ The expert had used a licensing survey as a check for an estimated royalty rate of six percent for the use of LaserDynamics’ optical disc drive (“ODD”) technology.⁷⁴ The Federal Circuit concluded that the survey was not limited to any particular industry and did not involve the patent in suit, or even ODD technology.⁷⁵ The Federal Circuit found that the district court had erroneously relied on the survey evidence, which was not sufficiently tied to the facts of the case and “served no purpose other than to . . . increase the reasonable-royalty rate above rates more clearly linked to the economic demand for the claimed technology.”⁷⁶ The Federal Circuit remanded the case to the district court.⁷⁷

In sum, although U.S. courts generally admit survey evidence to support a calculation of patent damages, leaving the consideration of deficiencies to the jury, it is clear that courts will first scrutinize those surveys to determine whether they comply with accepted statistical principles of survey design

⁶⁹ *Id.* at 5.

⁷⁰ *Id.* at 6 (citing FED. JUDICIAL CTR. & NAT’L RESEARCH COUNCIL OF THE NAT’L ACADS., REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 386 (3d ed. 2011)).

⁷¹ *Id.* at 5–6 (quoting *Clicks Billiards, Inc. v. Sixshooters, Inc.*, 251 F.3d 1252, 1263 (9th Cir. 2001)); *see also* Order on Defendant’s Motion to Exclude Testimony of Keith Party and Dr. Gareth Macartney; Plaintiff’s and Defendant’s Outstanding Motions in Limine, *Fujifilm Corp. v. Motorola Mobility LLC*, No. 12-cv-03587, 2015 WL 1737951, at *10 (N.D. Cal. Apr. 8, 2015).

⁷² 694 F.3d 51 (Fed. Cir. 2012).

⁷³ *Id.* at 81 (excluding the expert testimony of Emmett Murtha).

⁷⁴ *Id.*

⁷⁵ *Id.* at 60–61.

⁷⁶ *Id.* at 80 (internal quotation marks omitted) (quoting *ResQNet.com, Inc. v. Lansa, Inc.*, 549 F.3d 860, 872–73 (Fed. Cir. 2010)).

⁷⁷ *Id.* at 56.

and are sufficiently linked to the facts of the case to help the finder of fact. However, to increase the likelihood that survey evidence will meet the standard for admissibility, the survey designer should at a minimum identify an appropriate sample of respondents, and the survey should test consumers' valuations of the specific patented features or functionalities in the specific industry in question.

II. Conjoint Analysis in Theory and Practice

Conjoint analysis is a valuation technique that uses survey data to measure the tradeoffs that consumers make among the salient features of a product.⁷⁸ Because conjoint analysis enables one to isolate respondents' valuation of a single feature in a multicomponent product, expert economic witnesses have used the technique to calculate patent damages when the accused patented technology is incorporated into a multicomponent product.⁷⁹ Assuming that the sample chosen is representative of the desired population, those valuations will provide evidence of consumers' willingness to pay for the patented technology and therefore the incremental profits that the infringer earned (or expected to earn at the time of the hypothetical negotiation with the patent holder) from incorporating the patented technology into its products.⁸⁰ The infringer's incremental profits from the patented technology, in turn, inform the infringer's maximum willingness to pay for a license to the patented technology in a hypothetical negotiation—that is, the upper bound on the range of royalty rates over which the patent holder and implementer bargain.⁸¹

There are four main types of conjoint analysis: (1) the traditional method, also known as “full-profile” analysis,⁸² (2) choice-based conjoint analysis, (3) adaptive conjoint analysis, and (4) self-explicated conjoint analysis.⁸³ These types differ in their data collection process, use of prior constraints, and level of aggregation.⁸⁴ Choice-based conjoint analysis is the most relevant for reasonable-royalty calculations because it most closely approximates consumer

⁷⁸ See, e.g., *TV Interactive Data Corp. v. Sony Corp.*, 929 F. Supp. 2d 1006, 1020 (N.D. Cal. 2013); VITHALA R. RAO, *APPLIED CONJOINT ANALYSIS* 196 (Springer 2014).

⁷⁹ See *Apple, Inc. v. Samsung Elecs. Co.*, 909 F. Supp. 2d 1147, 1156 (N.D. Cal. 2012).

⁸⁰ See, e.g., *Order Granting in Part & Den. in Part Mots. to Exclude Certain Expert Ops.*, *Apple, Inc. v. Samsung Elecs. Co.*, No. 12-cv-00630-LHK at 24–28, 36 (N.D. Cal. Feb. 25, 2014), ECF No. 1325.

⁸¹ See Sidak, *The Proper Royalty Base for Patent Damages*, *supra* note 30, at 993.

⁸² See Paul E. Green & V. Srinivasan, *Conjoint Analysis in Consumer Research: Issues and Outlook*, 5 J. CONSUMER RESEARCH 103, 108 (1978).

⁸³ RAO, *supra* note 77, at 195–96.

⁸⁴ See generally *id.*

choice in the real world.⁸⁵ In a choice-based survey, respondents choose among hypothetical products that incorporate a range of features (as opposed to, for example, rating or ranking different product profiles, as in a self-explicated conjoint survey).⁸⁶ One advantage of choice-based conjoint analysis is that, unlike valuation techniques that directly ask for a respondent's valuation of a feature, which often result in the respondent's assigning an arbitrary dollar value to the feature, choice-based conjoint analysis indirectly reveals respondents' preferences by focusing their attention on tradeoffs between the features in one hypothetical product relative to those in other hypothetical products.⁸⁷ The technique is a less artificial way of estimating consumer preferences than asking a consumer to rank or compare features because the consumer is asked to choose between two or more comparable products, exactly as he would when making an actual purchasing decision.⁸⁸

However, all surveys are susceptible to error and weakness in methodology that can diminish their accuracy and render the survey inadmissible, as Judge Posner recognized in *Kraft Foods*.⁸⁹ A survey might suffer from sampling error, as Judge Kronstadt recognized in *NetAirus*,⁹⁰ which occurs when the sample of respondents does not represent the underlying population.⁹¹ Any pool of respondents that is not randomly chosen is liable to suffer from selection bias, whereby the sample excludes certain types of respondents.⁹² Selection bias might make the survey unrepresentative of the entire population.⁹³ A survey might also contain measurement error, which occurs when the survey responses do not capture consumers' real-world behavior.⁹⁴ Leading questions,

⁸⁵ See Stephen F. Ross & Wayne S. DeSarbo, *A Rapid Reaction to O'Bannon: The Need for Analytics in Applying the Sherman Act to Overly Restrictive Joint Venture Schemes*, 119 PENN ST. L. REV. PENN STATIM 43, 54 (2015).

⁸⁶ See, e.g., BRYAN K. ORME, *GETTING STARTED WITH CONJOINT ANALYSIS: STRATEGIES FOR PRODUCT DESIGN AND PRICING RESEARCH 2* (Research Publishers 2010).

⁸⁷ *Id.* at 20–22.

⁸⁸ *Id.*

⁸⁹ *Kraft Foods Grp. Brands LLC v. Cracker Barrel Old Country Store, Inc.*, 735 F.3d 735, 741 (7th Cir. 2013).

⁹⁰ See Order Re Apple's Motion to Exclude the Surveys, Expert Reports, and Opinions of Howard Marylander and James Berger and References Thereto by Joseph Gemini at 5–6, *NetAirus Techs., LLC v. Apple, Inc.*, No. 2:10-cv-03257-JAK-E, 2013 WL 9570686 (C.D. Cal. Oct. 23, 2013).

⁹¹ See, e.g., R. LYMAN OTT & MICHAEL LONGNECKER, *AN INTRODUCTION TO STATISTICAL METHODS AND DATA ANALYSIS* 178 (Cengage Learning 6th ed. 2010).

⁹² *Id.*

⁹³ *Id.*

⁹⁴ See, e.g., DUANE F. ALWIN, *MARGINS OF ERROR: A STUDY OF RELIABILITY IN SURVEY MEASUREMENT 3* (John Wiley & Sons 2007).

vague questions, limited options for responses, and respondents' inability to recall information or accurately estimate values are all problems that could introduce measurement error and therefore bias the survey results.⁹⁵

In a typical choice-based conjoint survey, the survey respondent is asked to choose from a menu of hypothetical products that contain bundles of features with varying characteristics, known as "levels."⁹⁶ For instance, to determine consumers' valuations of the most important features in a smartphone, the survey designer might incorporate into the survey the features and levels, examples of which Table 1 shows.

Table 1. Example of Features and Levels for Smartphones

Feature	Level
Brand	Apple
	Samsung
	HTC
	Motorola
Camera Resolution (Megapixels)	6
	8
	10
	12
Talk time (minutes per battery life)	300
	600
	900
	1200
Weight (grams)	100
	125
	150
	175
Color	Black
	White
	Grey
	Silver

Table 1 exemplifies how a survey designer might select the features in a conjoint survey to estimate a clear tradeoff between the tested features, such as weight versus talk time. Table 1 also shows how one can use conjoint surveys to establish the relative value of features where no clear tradeoff exists, such as with phone color and weight.

⁹⁵ See, e.g., OTT & LONGNECKER, *supra* note 91, at 28.

⁹⁶ ORME, *supra* note 86, at 51–56.

The academic literature indicates that conjoint analysis has the most predictive value when it tests six or fewer features.⁹⁷ With a greater number of tested features, the researcher runs the risk that respondents will employ heuristics to reduce their information overload, as well as the risk that the responses will be distorted.⁹⁸ Even in a typical survey with only a few features and levels, the total potential combinations of features and levels of a hypothetical product could become unworkably large. In the smartphone example in Table 1, there are 1,024 potential profiles.⁹⁹

To reduce the loss of predictive power that results from such a high number of combinations, the survey designer typically selects a subset of the total number of possible product combinations to design a set of hypothetical products. The survey designer could use respondents' answers to preliminary questions to select the product profiles, by combining choice-based conjoint survey questions with self-explicated conjoint survey questions. In the self-explicated portion of the survey, the survey designer would ask the respondents to rank their most preferred features to identify the most salient features, so as to inform the survey designer's inclusion of features in hypothetical product profiles included in the following portion of the survey.¹⁰⁰ The survey would then ask respondents to choose among those hypothetical product profiles and to assume that all product features, other than those listed, remain constant. For example, a conjoint survey that tests consumers' valuation of features in a smartphone might include the following hypothetical profiles, as shown in Figure 1 below.

After collecting the survey data, the survey designer can apply various analytical methods to the data to estimate consumers' underlying preferences for the tested features of the products. For example, an expert might use an ordinary least squares regression with dummy variables assigned to each level of the features to identify the utility that the consumer derives from a particular level, known as a "partworth" utility function.¹⁰¹ One could use that utility function to identify the tradeoffs that respondents make between two different features to maintain the same utility. For example, one could find that a fifty-minute increase in the talk-time of a smartphone would result in an increase in utility of x , which is the same increase in utility that results from improving the camera resolution by one megapixel.

⁹⁷ Paul E. Green & V. Srinivasan, *Conjoint Analysis in Marketing: New Developments with Implications for Research and Practice*, 54 J. MARKETING 3, 8 (1990).


⁹⁸ *Id.* at 6–7.

⁹⁹ With four possible levels and five features, there are 45 combinations, or 1024, potential profiles.

¹⁰⁰ *See, e.g.*, RAO, *supra* note 78, at 195–96.

¹⁰¹ *See id.* at 9–15.

Q: If you were in the market to purchase a smartphone today and these smartphones were your only alternatives, which would you choose?



Brand	Apple	Samsung	HTC	Motorola
Camera Resolution (Megapixels)	6	8	10	12
Talk Time (Minutes Per Battery Life)	300	600	900	1200
Weight (Grams)	100	125	150	175
Color	White	Black	Gold	Blue

Figure 1. Hypothetical Profiles in a Conjoint Survey for Valuation of Smartphone Features. Photographs from Apple iPhone 5s, T-Mobile, <http://www.t-mobile.com/cell-phones/apple-iphone-5s.html>; Samsung Galaxy S6 edge, phoneArena.com, http://www.phonearena.com/phones/Samsung-Galaxy-S6-edge_id9193; HTC One M9 Pictures and Specs Leak Out, The Verge, <http://www.theverge.com/2015/2/22/8084639/htc-one-m9-specs-pictures-leak>; Motorola Nexus 6- Midnight Blue, AT&T, <http://www.att.com/cellphones/motorola/nexus-6.html>.

The survey designer could then use the data to predict a consumer's preferences for any other hypothetical products containing combinations of the tested features.¹⁰² The researcher could "interpolate" the survey results within the tested range of an attribute by assuming that the utility function is linear between two attribute levels and that the interpolated utility is a point on that line.¹⁰³ The survey designer could also "extrapolate" the results beyond the tested range of an attribute by estimating the utility function beyond that range, but such an extrapolation should be done with caution, as it might yield misleading results.¹⁰⁴

In addition, conjoint analysis might be able to measure the value from complementarity effects between the components in a multicomponent

¹⁰² *Id.* The computation of partworth utilities would become more or less complex depending on the shapes of the underlying utility functions. *See id.* at 13.

¹⁰³ *Id.* at 15.

¹⁰⁴ *Id.*

product. Suppose that a phone with three functions—calling, texting, and storing phone numbers—sells for \$100. A conjoint survey might find that consumers are willing to pay \$10 for a device that only sends and receives text messages, and that they are willing to pay an amount twice that (\$20) for a device that only stores phone numbers and are willing to pay an amount thrice that (\$30) for a device that only makes and receives calls. The sum of the consumers' willingness to pay for each component does not equal the price of the entire phone, because the price for the phone would also include the value from any complementarity effect between each component.¹⁰⁵ The difference between the price of the phone (\$100) and the sum of the consumers' willingness to pay for each component (that is, \$60 = \$10 + \$20 + \$30) is the benefit (\$40) from the complementarity effect among the three components.

A conjoint survey can also help determine the source of that complementarity effect. For example, a conjoint survey might find that consumers are willing to pay \$50 for a device that can send and receive texts and store phone numbers. That is, combining the texting component (which by itself has a value of \$10 to consumers) and the address-book component (which by itself has a value of \$20 to consumers) provides \$20 of additional value to consumers, as a result of complementarity effects between the two features. Similarly, if consumers are willing to pay \$70 for a device that can make and receive calls and can store phone numbers, one might conclude that combining the calling component (which by itself has a value of \$30 to consumers) and the address-book component (which by itself has a value of \$20 to consumers) also creates \$20 of value due to complementarity effects. Table 2 shows the consumers' valuation of each component and the complementarity effects between components in this example. To the extent that there is a "remainder" between the price of the device and the consumers' willingness to pay for the individual components, data from a conjoint survey can form the basis of an analysis to assign that remainder to the interaction between the complementary components.¹⁰⁶

Even though one could use conjoint analysis to disaggregate the consumers' willingness to pay for a multicomponent product, it bears emphasis that conjoint analysis itself does not provide any guidance on the proper method to apportion the value from complementarity.¹⁰⁷ That is, if the patent in suit relates

¹⁰⁵ The individual effect is sometimes referred to as the "main effect," and the complementarity effect is sometimes referred to as the "interaction effect." See, e.g., *id.* at 91.

¹⁰⁶ See Greg M. Allenby, et al., *Valuation of Patented Product Features*, 57 J.L. & ECON. 629, 638–40 (2014).

¹⁰⁷ The question of how one should allocate economic value to the individual components of a product or portfolio arises in many fields of economics. See, e.g., Stewart C. Myers & James A. Read, Jr., *Capital Allocation for Insurance Companies*, 68 J. RISK & INS. 545 (2001).

Table 2. Consumers' Valuation of Individual Components and Their Complementarity Effects

Component	Consumers' Willingness to Pay
Calling	\$30
Texting	\$10
Address Book	\$20
Complementarity Between Calling and Address Book	\$20
Complementarity Between Texting and Address Book	\$20
Total Price	\$100

only to the texting component of the phone, how should a damages expert account for the value of complementarity between the texting component and the address-book component (a non-infringing component) when calculating a reasonable royalty? In other words, what is the total value that the texting component contributes to the phone? The consumers' willingness to pay for the texting component alone is \$10. However, removing the texting component from the phone would reduce the consumers' willingness to pay for the phone by \$30 because the phone would also lose the value from complementarity between the texting component and the address-book component. One could split the value from complementarity evenly between the two complementary components, which would imply that the value that the texting component contributes to the phone is \$20. Although conjoint analysis can estimate the complementary value added from the interaction between two components in a multicomponent product, it does not provide a heuristic for how to apportion the value from the interaction between those two components to each individual component.¹⁰⁸

In a patent infringement case, a damages expert can include price, the patented feature, and additional "distraction" features in a hypothetical product to estimate consumers' average willingness to pay for a feature, which will support the calculation of reasonable-royalty damages. By comparing that average willingness to pay with consumers' average willingness to pay for the next-best non-infringing alternative, damages experts in past patent infringement cases have estimated the implementer's incremental profits from

An economic expert witness could use Shapley values to allocate the combined value of a multicomponent product among its features. See generally Yair Tauman, *The Aumann-Shapley Prices: A Survey*, in *THE SHAPLEY VALUE: ESSAYS IN HONOR OF LLOYD S. SHAPLEY* 279 (Alvin E. Roth ed., Cambridge Univ. Press 1988).

¹⁰⁸ Allenby et al., *supra* note 105, at 643–44.

a hypothetical license and therefore the upper bound of the bargaining range in a hypothetical negotiation.¹⁰⁹ Part III analyzes those cases.

To obtain information regarding a feature's effects on market outcomes, the survey designer could include additional questions in a conjoint survey. For example, by including questions about the respondents—such as whether they have used similar products or what they expect their volume of future use of the product in question will be—the survey designer could estimate the size of potential markets.¹¹⁰ Having identified those markets, the survey designer could estimate the distribution of respondents' average willingness to pay across markets. Within each identified market, the survey designer could then use the data from conjoint surveys, in combination with other information such as marginal costs, to estimate own-price and cross-price elasticities of demand and to simulate variations in historical prices and changes in market shares as a result of a given feature's incorporation into the multicomponent product.¹¹¹ Unlike average willingness to pay estimates, which one calculates assuming that prices are constant, by estimating prices at equilibrium—which effectively is the marginal buyer's willingness to pay—the survey designer would account for the market's reaction to the inclusion of a particular feature in the multicomponent product.¹¹² That methodology could enable an expert to estimate more directly the incremental profits that result from the implementer's inclusion of a patented feature in a multicomponent product.¹¹³

Damages experts have also used conjoint surveys to support the patent holder's claim for an injunction by showing that the patented feature drives demand for the end product.¹¹⁴ Part IV examines those cases.

¹⁰⁹ Oracle Am. Inc. v. Google Inc., 798 F. Supp. 2d 1111, 1114 (N.D. Cal. 2011).

¹¹⁰ Allenby et al., *supra* note 105, at 640.

¹¹¹ See RAO, *supra* note 78, at 292–97; see also Timothy J. Gilbride, Peter J. Lenk & Jeff D. Brazell, *Market Share Constraints and the Loss Function in Choice Based Conjoint Analysis*, 27 *MARKETING SCI.* 995, 995–96 (2008); ANDERS GUSTAFFSON, ANDREAS HERRMANN & FRANK HUBER, *CONJOINT MEASUREMENT: METHODS AND APPLICATIONS* 47–65 (Springer Sci. & Bus. Media 2007); Franziska Völckner & Henrik Sattler, *Separating Negative and Positive Effects of Price with Choice-Based Conjoint Analyses*, 1 *MARKETING: J. RES. & MGMT.* 5 (2005) (using a hierarchical Bayesian model to identify price elasticities of demand).

¹¹² Allenby et al., *supra* note 105, at 662.

¹¹³ See, e.g., Allenby et al., *supra* note 105, at 632–33. As explained in Part II, the damages expert must employ a methodology that will enable her to disaggregate the profit that is “properly and legally attributable to the patented feature” from the profit that is attributable to the non-infringing features of the multicomponent product. *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1227 (Fed. Cir. 2014) (quoting *LaserDynamics, Inc. v. Quanta Comput., Inc.*, 694 F.3d 51, 67 (Fed. Cir. 2012) (internal quotation marks omitted)).

¹¹⁴ *Apple, Inc. v. Samsung Elecs. Co.*, 678 F.3d 1314, 1324 (Fed. Cir. 2012).

III. When Is It Admissible to Use Conjoint Analysis to Estimate an Implementer's Willingness to Pay?

In four cases before U.S. district courts—*Apple Inc. v. Samsung Electronics Co. (Apple I)*,¹¹⁵ *Oracle America, Inc. v. Google Inc.*,¹¹⁶ *Microsoft Corp. v. Motorola, Inc.*,¹¹⁷ and *TV Interactive Data Corp. v. Sony Corp.*¹¹⁸—the plaintiff's expert witness presented findings of a conjoint survey as evidence of the implementer's willingness to pay for the patents in suit, and the defendant's counsel moved to strike those conjoint analysis findings under *Daubert*.¹¹⁹ In his ruling on Google's *Daubert* motion in *Oracle v. Google*, Judge William Alsup of the U.S. District Court for the Northern District of California analyzed whether conjoint analysis is inherently unreliable for calculating damages.¹²⁰ The four district courts also identified which factors might reduce the weight that a finder of fact should give to the findings of a conjoint survey.¹²¹ The following explains that the admissibility of conjoint analysis findings as evidence of an implementer's willingness to pay for the patents in suit depends on whether an implementer's willingness to pay at the time of the conjoint survey comports with its willingness to pay at the moment immediately before first infringement. Furthermore, even if a court finds a conjoint survey to be admissible evidence, the weight that a finder of fact should give that evidence depends on several factors.

A. Can Evidence from a Conjoint Survey Meet the Standards for Admissibility Established in Federal Rule of Evidence 702?

Federal Rule of Evidence 702 provides:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

(a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;

¹¹⁵ 735 F.3d 1352, 1366–68 (Fed. Cir. 2013).

¹¹⁶ 798 F. Supp. 2d 1111 (N.D. Cal. 2011).

¹¹⁷ 904 F. Supp. 2d 1109, 1119–20 (W.D. Wash. 2012), *aff'd*, 795 F.3d 1024 (9th Cir. 2015).

¹¹⁸ 929 F. Supp. 2d 1006 (N.D. Cal. 2013).

¹¹⁹ See *Apple*, 735 F.3d at 1366; *Oracle*, 798 F. Supp. 2d at 1119; *Microsoft*, 904 F. Supp. 2d at 1119; *TV Interactive*, 929 F. Supp. 2d at 1009–10.

¹²⁰ Order Granting in Part and Denying in Part Google's *Daubert* Motion to Exclude Dr. Cockburn's Third Report at 13, *Oracle Am., Inc. v. Google Inc.*, 798 F. Supp. 2d 1111 (N.D. Cal. 2011).

¹²¹ See *Apple*, 735 F.3d at 1368; *Oracle*, 798 F. Supp. 2d at 1120–21; *Microsoft*, 904 F. Supp. 2d at 1120; *TV Interactive*, 929 F. Supp. 2d at 1021–22.

- (b) the testimony is based on sufficient facts or data;
- (c) the testimony is the product of reliable principles and methods; and
- (d) the expert has reliably applied the principles and methods to the facts of the case.¹²²

Consequently, pursuant to Rule 702(a), for the findings of a conjoint survey to be admissible, those findings must help the trier of fact determine a fact in issue as it relates to determining damages for infringement of the patents in suit.¹²³

Under the hypothetical-negotiation framework for calculating reasonable-royalty damages for patent infringement, a reasonable royalty for the patents in suit is a royalty upon which the patent holder and the implementer would have agreed at the hypothetical negotiation between the parties immediately before first infringement.¹²⁴ Consequently, the relevant questions of fact in determining patent damages relate to the conditions and expectations of the parties and the market at the time of the hypothetical negotiation.¹²⁵ That is, the conditions and expectations of the parties and the market at the time of the damages calculation are relevant to determining damages only to the extent that they inform the conditions and expectations of the parties and the market immediately before first infringement.¹²⁶

An expert conducts a conjoint survey to estimate consumers' valuation of a patented technology, disaggregated from the value of the other components that comprise the product that includes the relevant patented technology, so as to estimate the implementer's willingness to pay for the patented technology at the time of the hypothetical negotiation.¹²⁷ However, a conjoint survey can directly measure consumers' valuation of the patented technology only at the moment when the expert conducts the survey.¹²⁸ That is, a conjoint survey

¹²² FED. R. EVID. 702.

¹²³ FED. R. EVID. 702(a).

¹²⁴ *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *modified and aff'd*, 446 F.2d 295 (2d Cir. 1971), *cert. denied*, 404 U.S. 870 (1971).

¹²⁵ *Rite-Hite Corp. v. Kelley Co.*, 56 F.3d 1538, 1554 (Fed. Cir. 1995) (citing *Hanson v. Alpine Valley Ski Area, Inc.*, 718 F.2d 1075, 1078 (Fed. Cir. 1983)) ("The hypothetical negotiation requires the court to envision the terms of a licensing agreement reached as the result of a supposed meeting between the patentee and the infringer at the time infringement began."); *see also* *Hanson v. Alpine Valley Ski Area, Inc.*, 718 F.2d 1075, 1081 (Fed. Cir. 1983) ("The issue of the infringer's profit is to be determined not on the basis of a hindsight evaluation of what actually happened, but on the basis of what the parties to the hypothetical license negotiations would have considered at the time of the negotiations.").

¹²⁶ *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1333–34 (Fed. Cir. 2009).

¹²⁷ *See, e.g., TV Interactive Data Corp. v. Sony Corp.*, 929 F. Supp. 2d 1006, 1019 (N.D. Cal. 2013).

¹²⁸ *See Oracle Am., Inc. v. Google Inc.*, 798 F. Supp. 2d 1111, 1116 (N.D. Cal. 2011).

conducted after the moment of first infringement does not directly measure consumers' valuation of the patented technology immediately before first infringement, which is the question of fact ultimately relevant to determining patent damages.¹²⁹ Because it does not measure the consumers' valuation of the patented technology immediately before first infringement, the conjoint survey's findings do not, on their own, necessarily reveal the implementer's willingness to pay for the patented technology at the moment of the hypothetical negotiation.¹³⁰ Therefore, the findings of a conjoint survey conducted during litigation are relevant to the damages calculation, and helpful to the finder of fact, only if those findings—that is, consumers' current valuation of the patented technology—approximate consumers' valuation of the patented technology at the moment immediately before first infringement.

In *Oracle v. Google*, Judge Alsup implicitly recognized that methodological flaw in using conjoint analysis to “predict” how consumers and the implementer valued the patented technology in the past.¹³¹ Oracle's expert, Dr. Iain Cockburn, relied on Dr. Steven Shugan's conjoint analysis to calculate a reasonable royalty for Oracle's patents in suit and copyrights in suit.¹³² On the basis of Dr. Shugan's findings, Dr. Cockburn determined that Oracle's patents in suit were twice as valuable as Oracle's copyrights in suit, and he used that ratio as an input in his damages calculation.¹³³ Google moved to strike Dr. Cockburn's expert testimony and Dr. Shugan's conjoint analysis under *Daubert*.¹³⁴ Although Judge Alsup said that “[c]onsumer surveys are not inherently unreliable for damages calculation,” he also cited the Federal Circuit's decision in *Lucent Technologies, Inc. v. Gateway, Inc.*,¹³⁵ in which the Federal Circuit explained the conditions for using information that postdates the hypothetical negotiation to calculate damages that occurred at the moment

¹²⁹ See *Rite-Hite*, 56 F.3d at 1554.

¹³⁰ See *Oracle*, 798 F. Supp. 2d at 1116; J. Gregory Sidak, *How Relevant Is Justice Cardozo's Book of Wisdom to Patent Damages?*, 17 COLUM. SCI. & TECH. L. REV. 246 (2016), <https://www.criterioneconomics.com/justice-cardozos-book-of-wisdom-and-patent-damages.html>.

¹³¹ *Id.* at 1114–16.

¹³² Order Granting in Part and Denying in Part Google's *Daubert* Motion to Exclude Dr. Cockburn's Third Report at 13, *Oracle Am., Inc. v. Google Inc.*, 798 F. Supp. 2d 1111 (N.D. Cal. 2011).

¹³³ *Id.* at 16 (“Mathematically, Dr. Cockburn requires this ratio of 2:1 in order to allocate the adjusted starting point of \$598 million (now \$561 million) between the patents in suit, copyrights in suit, and patents not in suit using an algebraic formula with only one variable to solve.”).

¹³⁴ *Id.* at 2.

¹³⁵ 580 F.3d 1301 (Fed. Cir. 2009).

immediately before first infringement.¹³⁶ The Federal Circuit's decision in *Lucent* implies that information that postdates the hypothetical negotiation might be helpful to the finder of fact for calculating damages to the extent that such information helps a court understand the parties' expectations at the moment of the hypothetical negotiation—that is, as “inferential evidence” of those expectations.¹³⁷ Therefore, it is apparent that Judge Alsup qualified his characterization of conjoint analysis (as “not inherently unreliable”) with the condition that the findings of conjoint analysis reflect consumers' valuation of the patented technology and the implementer's willingness to pay for that technology at the moment immediately before first infringement.¹³⁸

However, a survey that attempts to “predict the past” by asking respondents to predict what they would have done in the past typically suffers from hindsight bias, which might render it unreliable.¹³⁹ That is, a survey respondent might in hindsight be inclined to believe that an unexpected event had been predictable, even in the absence of credible evidence that the respondent could have predicted the event before it occurred.¹⁴⁰ For example, suppose that an investor must choose between investing in the stock of Company *A* and investing in the stock of Company *B*. Suppose further that, on the basis of the information available to the investor at the moment of the investment decision, the investor expects investing in Company *A* to be as profitable as investing in Company *B*, and he elects to invest in Company *A*. However, if the investor later finds that investing in Company *B* would have yielded

¹³⁶ Order Granting in Part and Denying in Part Google's *Daubert* Motion to Exclude Dr. Cockburn's Third Report at 13, *Oracle Am., Inc. v. Google Inc.*, 798 F. Supp. 2d 1111 (N.D. Cal. 2011) (citing *Lucent*, 580 F.3d at 1333–34).

¹³⁷ See Martha K. Gooding, *Reasonable Royalty Patent Damages: A Proper Reading of the Book of Wisdom*, BUREAU NAT'L AFF. PAT. TRADEMARK & COPYRIGHT J., Apr. 18, 2014, at 1476, 1481. The Federal Circuit has consistently emphasized that a court should calculate reasonable-royalty damages using information that was available to the parties at the moment immediately before first infringement and use information that postdates the hypothetical negotiation only if it informs the court about the parties' expectations at the moment of the hypothetical negotiation. See *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1209–10 (Fed. Cir. 2010); *Trell v. Marlee Elecs. Corp.*, 912 F.2d 1443, 1446 (Fed. Cir. 1990); *Trans-World Mfg. Corp. v. Al Nyman & Sons, Inc.*, 750 F.2d 1552, 1568 (Fed. Cir. 1984); *Hanson v. Alpine Valley Ski Area, Inc.*, 718 F.2d 1075, 1079 (Fed. Cir. 1983); *Lucent*, 580 F.3d at 1333–34.

¹³⁸ Order Granting in Part and Denying in Part Google's *Daubert* Motion to Exclude Dr. Cockburn's Third Report at 13, *Oracle Am., Inc. v. Google Inc.*, 798 F. Supp. 2d 1111 (N.D. Cal. 2011).

¹³⁹ See Neal J. Roesse & Kathleen D. Vohs, *Hindsight Bias*, 7 *PERSP. ON PSYCHOL. SCI.* 411, 412 (2012).

¹⁴⁰ *Id.*

higher profits than his choice to invest in Company *A*, the investor would be inclined to believe *ex post* that he should have predicted, on the basis of the information available at the moment of the investment decision, that investing in Company *B* would be more profitable. Similarly, suppose that survey respondents had expected, at the moment immediately before first infringement, that the patented technology would become very valuable. Suppose further that later, when the expert conducts the conjoint survey, those respondents have discovered that the patented technology is less valuable than initially expected. In the latter scenario, the survey respondents will, due to hindsight bias, be more likely to attest that they knew that the patented technology would not be so valuable and would have acted accordingly.¹⁴¹ That is, the survey respondents' *ex post* expectations regarding the value of the patented technology might skew their responses to questions that require them to recall their *ex ante* expectations regarding the patented technology (at a moment when they necessarily possessed less information).¹⁴²

Consequently, if the expected value of the patented technology at the moment immediately before first infringement exceeds the actual value of the patented technology at the time of the survey, this hindsight bias would cause the survey results to underestimate the consumers' valuation of the patented technology (and thus to underestimate the implementer's willingness to pay for the patented technology) at the moment immediately before first infringement.¹⁴³ Conversely, if the actual value of the patented technology at the moment of the survey exceeds the expected value of the patented technology at the moment immediately before first infringement, the survey results would likely overestimate consumers' valuation of the patented technology (and thus would likely overestimate the implementer's willingness to pay for the patented technology) at the moment immediately before first infringement.¹⁴⁴ In either case, conjoint survey results would be a biased indicator of the consumers' valuation of the patented technology at the moment immediately before first infringement.

To the extent that a conjoint survey suffers from hindsight bias, analysis of the data resulting from such a survey would merely distort the facts of the case. In sum, hindsight bias, which is likely to arise when using conjoint analysis to estimate consumer behavior and the implementer's willingness to pay at the moment immediately before infringement, might cause conjoint analysis to fail the test for admissibility that Rule 702 establishes.

¹⁴¹ See, e.g., *id.* at 412, 417.

¹⁴² *Id.*

¹⁴³ *Id.*

¹⁴⁴ *Id.*

B. What Factors Affect the Admissibility and Weight of the Findings of a Conjoint Survey?

The Supreme Court said in *Daubert v. Merrell Dow Pharmaceuticals, Inc.* that the admissibility of expert testimony depends on whether the expert's methodology is reliable and whether the testimony is pertinent to the facts of the case.¹⁴⁵ The Court further clarified that “[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence,”¹⁴⁶ and that the question of admissibility “must be solely on principles on methodology, not on the conclusions that they generate.”¹⁴⁷ The courts have identified two factors that might affect the admissibility of, and weight to be given to, conjoint surveys: (1) failure to include in the survey the relevant features of a product that practices the patented technology and (2) issues in survey design and reliability of the survey results.¹⁴⁸

1. Failure to Include the Relevant Features in the Conjoint Survey

The courts in *Oracle v. Google* and *TV Interactive v. Sony* considered whether an expert failed to identify the product features that are relevant to determining the consumers' valuation of the patented technology.¹⁴⁹ One methodological weakness of conjoint analysis is that including more than six features in a conjoint survey reduces the predictive value of the survey.¹⁵⁰ Consequently, to estimate the consumers' valuation of a patented feature that is incorporated in a product that includes seven or more features, an expert needs to determine which features to include in the survey and which to exclude.¹⁵¹ Judge Alsup found in *Oracle v. Google* that Oracle's expert witness failed to include in his conjoint survey the features relevant to the task of disaggregating the value of the infringing feature from the value of other features in a multicomponent product.¹⁵² Judge Alsup, finding the expert's conjoint survey to be unreliable and

¹⁴⁵ 509 U.S. 579, 597 (1993).

¹⁴⁶ *Id.* at 596 (citing *Rock v. Arkansas*, 483 U.S. 44, 61 (1987)).

¹⁴⁷ *Id.* at 595; see also *Summit 6, LLC v. Samsung Elecs. Co.*, 802 F.3d 1283, 1294–96 (Fed. Cir. 2015).

¹⁴⁸ See *TV Interactive Data Corp. v. Sony Corp.*, 929 F. Supp. 2d 1006, 1022–26 (N.D. Cal. 2013); see also *Oracle Am., Inc. v. Google Inc.*, No. C10-03561, 2012 WL 850705, at *9–12 (N.D. Cal. 2012).

¹⁴⁹ *Id.*

¹⁵⁰ See *Green & Srinivasan*, *supra* note 97, at 8; see also *TV Interactive*, 929 F. Supp. 2d at 1025 (“[U]sing six or fewer variables leads to better predictive results because survey respondents are not overwhelmed by too much data.”).

¹⁵¹ See *TV Interactive*, 929 F. Supp. 2d at 1025.

¹⁵² Order Granting in Part and Denying in Part Google's *Daubert* Motion to Exclude Dr. Cockburn's Third Report at 14–15, *Oracle America, Inc. v. Google Inc.*, 798 F. Supp.

not sufficiently related to the facts of the case, excluded the expert's conjoint survey from evidence.¹⁵³ In contrast, in *TV Interactive v. Sony*, Judge Joseph Spero, also of the U.S. District Court for the Northern District of California, found that a conjoint survey's failure to include the relevant features does not render it unreliable and inadmissible.¹⁵⁴ However, he observed that such a failure might reduce the weight that the conjoint survey evidence receives in a specific case.¹⁵⁵

In *Oracle v. Google*, Google argued that Dr. Shugan's conjoint analysis included too few features because it included only seven in total, three of which related to Oracle's patents in suit, which "inappropriately focused consumers on artificially-selected features and did not reliably determine real-world behavior."¹⁵⁶ Judge Alsup observed that Dr. Shugan's research had identified thirty-nine features that consumers considered when purchasing an Android smartphone, the allegedly infringing product, but that Dr. Shugan selected the non-infringing features to include in his analysis without applying any "reasonable criteria."¹⁵⁷ In addition, Judge Alsup said that Dr. Shugan excluded from his analysis several important features unrelated to the patents in suit but included voice dialing, "an arguably unimportant feature."¹⁵⁸ Judge Alsup thus found that Dr. Shugan's conjoint analysis "force[d] participants to focus on the patented functionalities, warping what would have been their real-world considerations."¹⁵⁹ That is, Dr. Shugan's conjoint survey did not reflect the consumers' valuation of the individual features of an Android smartphone and therefore was not sufficiently tied to the facts of the case. Judge Alsup thus excluded the findings of Dr. Shugan's conjoint survey and Dr. Cockburn's damages calculation, which he predicated on Dr. Shugan's findings, because Dr. Shugan had failed to include a sufficient number of product features in his conjoint survey.¹⁶⁰ Judge Alsup's decision to exclude Dr. Shugan's analysis indicates that the expert must choose which features to include in his conjoint survey on the basis of "reasonable criteria," such that the survey reflects (rather than "warps") the real-world purchasing decisions of the consumers.

2d 1111 (N.D. Cal. 2011).

¹⁵³ *Id.* at 16.

¹⁵⁴ *TV Interactive*, 929 F. Supp. 2d at 1025–26.

¹⁵⁵ *Id.* at 1026–27.

¹⁵⁶ Order Granting in Part and Denying in Part Google's *Daubert* Motion to Exclude Dr. Cockburn's Third Report at 14, *Oracle America, Inc. v. Google Inc.*, 798 F. Supp. 2d 1111 (N.D. Cal. 2011).

¹⁵⁷ *Id.* at 14–15.

¹⁵⁸ *Id.* at 15.

¹⁵⁹ *Id.*

¹⁶⁰ *Id.* at 14–16.

Similarly, in *TV Interactive v. Sony*, Sony argued that Professor Seenu Srinivasan's conjoint survey was unreliable "because he had tested [only] a portion of all the attributes" of each infringing product—a Blu-ray player, a DVD player, and PlayStation 3 console.¹⁶¹ However, Judge Joseph Spero observed that Professor Srinivasan initially asked respondents to rank, in order of importance, up to twenty features of the infringing product, and that, on the basis of that initial survey, Professor Srinivasan selected the five features that he included in his conjoint survey.¹⁶² That is, Professor Srinivasan selected for inclusion in the conjoint survey features to which the consumers assigned a value similar to that of the infringing feature.¹⁶³ Sony's expert, Robert Klein, said that Professor Srinivasan's inclusion of only five features in his conjoint survey caused the survey to yield "absurd" results.¹⁶⁴ However, Judge Spero said that the dispute over whether Professor Srinivasan's conjoint survey included too few features was "a classic example of the 'battle of experts' for the jury to decide."¹⁶⁵ That is, Judge Spero found that, despite including only five product features, Professor Srinivasan's survey satisfied Rule 702,¹⁶⁶ and that the jury should decide what weight to give Professor Srinivasan's conjoint survey. In contrast with Dr. Shugan's conjoint analysis in *Oracle v. Google*, Dr. Srinivasan's conjoint survey included product features selected on the basis of a preliminary survey to identify the features of a Blu-ray player, a DVD player, or a PlayStation 3 console that the consumers found approximately as valuable as the infringing feature.¹⁶⁷

¹⁶¹ *TV Interactive Data Corp. v. Sony Corp.*, 929 F. Supp. 2d 1006, 1020, 1025 (N.D. Cal. 2013).

¹⁶² *Id.*

¹⁶³ *Id.*

¹⁶⁴ *Id.*

¹⁶⁵ *Id.* at 1026.

¹⁶⁶ *Id.*

¹⁶⁷ In *Apple v. Samsung (Apple II)*, Samsung moved to exclude under *Daubert* the conjoint survey that Apple's expert, Dr. John Hauser, conducted. Order Granting in Part and Denying in Part Motions to Exclude Certain Expert Opinions at 24, *Apple, Inc. v. Samsung Elecs. Co.*, No. 12-CV-630 (N.D. Cal. Feb. 25, 2014), ECF No. 1325. Samsung argued that, because Dr. Hauser's survey included only six features of the allegedly infringing products—Samsung smartphones and tablets—the survey results were not reliable. *Id.* at 6. Unlike the conjoint surveys in *Oracle* and *TV Interactive*, Dr. Hauser's conjoint survey sought to estimate the change in consumer demand for allegedly infringing products on the basis of whether those products incorporated the infringing features. *Id.* at 25. Judge Lucy Koh of the U.S. District Court for the Northern District of California ruled that "[w]hether [the expert] chose the correct . . . features, or whether he should have instead relied on other . . . features, goes to weight, not admissibility." *Id.* at 30 n.10.

In sum, the *Daubert* decisions in *Oracle v. Google* and *TV Interactive v. Sony* show that the admissibility and weight of a conjoint survey that estimates the implementer's willingness to pay for a patented technology depends on whether the survey includes a sufficient number of features. Failing to include a sufficient number of features might render the survey results inadmissible or lower the weight that the finder of fact gives the survey results.

2. Issues of Survey Design and Reliability of Results

In two cases, *Apple I* and *Microsoft v. Motorola*, the court considered whether problems with the design of the conjoint survey and the potential unreliability of the survey results affect the weight or admissibility of the expert's testimony.¹⁶⁸ In *Apple I*, Apple's expert, Dr. John Hauser, conducted a conjoint survey to estimate "what price premium, if any, Samsung consumers are willing to pay" for the features that incorporated Apple's patents in suit.¹⁶⁹ Samsung moved to exclude Dr. Hauser's testimony under *Daubert* in part because (1) he "surveyed recent Samsung purchasers, rather than the proper universe of potential Samsung purchasers," and (2) his description of the features in his conjoint survey did not match the testimony of Apple's other experts.¹⁷⁰ Judge Lucy Koh of the U.S. District Court for the Northern District of California denied Samsung's motion.¹⁷¹ She found that, even if the sample of respondents that Dr. Hauser used—that is, recent purchasers of Samsung's allegedly infringing products—were less inclusive than it should have been, such "underinclusiveness . . . goes to weight, not admissibility" of the survey results.¹⁷² Judge Koh also found that any discrepancy between Dr. Hauser's descriptions of the patented features in his conjoint survey and the

¹⁶⁸ *Apple, Inc. v. Samsung Elecs. Co.*, No. 11-CV-01846-LHK, 2012 WL 2571332, at *9 (N.D. Cal. June 30, 2012) (*Apple I*); *Microsoft Corp. v. Motorola, Inc.*, 904 F. Supp. 2d 1109, 1119–20 (W.D. Wash. 2012).

¹⁶⁹ Order Granting-in-Part and Denying-in-Part Motions to Exclude Expert Testimony, *Apple, Inc. v. Samsung Elecs. Co.*, No. 11-cv-01846, 2012 WL 2571332, at *9 (N.D. Cal. June 30, 2012), ECF No. 1157.

¹⁷⁰ *Id.*

¹⁷¹ *Id.* at 10.

¹⁷² *Id.* at 10 (citing *Icon Enter. Int'l, Inc. v. Am. Prods. Co.*, No. 04-cv-01240, 2004 WL 5644805, at *25 (C.D. Cal. Oct. 7, 2004)). From the perspective of statistical analysis, a sample that is not representative of the population would bias the results, regardless of whether the sample is underinclusive or overinclusive. How the bias from an underinclusive sample compares with the bias from an overinclusive sample differs from case to case. That is, there is no reason why the courts' treatment of bias from an underinclusive sample should differ from its treatment of bias from an overinclusive sample. *See, e.g.*, DAVID FREEDMAN, ROBERT PISANI & ROGER PURVES, *STATISTICS* 333–49 (W. W. Norton & Co. 3d ed. 1998).

descriptions that Apple's other experts provided might affect the weight, but not the admissibility, of Dr. Hauser's conjoint survey.¹⁷³

In *Microsoft v. Motorola*, Motorola's expert witness, Dr. R. Sukumar, conducted a conjoint survey to value certain features of the allegedly infringing product, Microsoft's Xbox 360 console.¹⁷⁴ Microsoft moved to exclude Dr. Sukumar's survey under *Daubert* on the grounds that the survey (1) used "incomprehensible terminology" that rendered it unreliable and (2) used a "non-representative sample of the relevant universe, that is, Xbox owners, users, or individuals likely to purchase an Xbox."¹⁷⁵ Judge James Robart denied Microsoft's motion to exclude Dr. Sukumar's testimony, finding that issues of survey design and reliability of the survey results might decrease the weight that the survey results receive, but not render them inadmissible.¹⁷⁶ Similarly, responding to Microsoft's objection that the sample of respondents that Dr. Sukumar's conjoint survey used was less inclusive than it should have been, Judge Robart said that "any argument as to underinclusiveness of the survey goes to weight, as opposed to admissibility."¹⁷⁷ In sum, Judge Robart emphasized that potential problems in an expert's survey design might reduce the weight of testimony predicated on that survey, but they do not render that testimony inadmissible under *Daubert*.

In addition to reducing the weight to be given testimony predicated on survey evidence, it is conceivable that issues in survey design might cause a conjoint survey to be insufficiently tied to the facts of the case, so as to render its results inadmissible under Rule 702.¹⁷⁸ For example, suppose that an expert's task is to estimate U.S. consumers' valuation of the infringing feature within a multicomponent product. Suppose further that, instead of surveying a representative sample of the U.S. population, the expert surveys a sample of consumers from Des Moines, Iowa. To the extent that the expert's sample of consumers from Des Moines is not representative of U.S. consumers as a whole—that is, the relevant population in question—one could argue that the expert did not apply his methodology to the facts of the case, which required him to estimate U.S. consumers' valuation of the infringing feature.¹⁷⁹ Consequently, Judge Robart's conclusion in *Microsoft v. Motorola* that issues

¹⁷³ Order Granting-in-Part and Denying-in-Part Motions to Exclude Expert Testimony at 10, *Apple, Inc. v. Samsung Elecs. Co.*, No. 11-cv-01846, 2012 WL 2571332 (N.D. Cal. June 30, 2012) (ECF No. 1157).

¹⁷⁴ *Microsoft Corp. v. Motorola, Inc.*, 904 F. Supp. 2d 1109, 1119 (W.D. Wash. 2012).

¹⁷⁵ *Id.* at 1120.

¹⁷⁶ *Id.* (citing *Fortune Dynamic v. Victoria's Secret Stores Brand Mgmt., Inc.*, 618 F.3d 1025, 1038 (9th Cir. 2010)).

¹⁷⁷ *Id.* (citing *Fortune Dynamic*, 618 F.3d at 1038).

¹⁷⁸ See *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 591, 591–92 (1993).

¹⁷⁹ *Id.*

in survey design pertain only to the weight of the evidence and not to its admissibility appears to create an overly simplistic rule. A problem with survey design might indicate that the expert has not applied his methodology to the facts of the case, which would render his testimony inadmissible.¹⁸⁰ That is, a deficiency in survey design might reduce the weight that the testimony receives from the finder of fact (as Judge Robart reasoned), but only if that deficiency in survey design has not already rendered the testimony insufficiently tied to the facts of the case, so as to be inadmissible

IV. Using Conjoint Analysis to Determine Whether an Infringing Feature Drives Demand for the Entire Product

The legal tests for obtaining an injunction and for identifying an end product as the royalty base require evidence that the patented feature drives consumer demand for a downstream product.¹⁸¹ In a patent infringement case, to demonstrate that an injunction against an infringer is warranted or that the price of the downstream product is the proper royalty base, economic experts have used conjoint analysis to assess how consumers' willingness to pay for the patented feature relates to their willingness to pay for the downstream product.¹⁸² In other words, conjoint analysis must show that the demand for the patented feature significantly increases the desirability, or the price, of the downstream product and therefore drives its demand.¹⁸³

¹⁸⁰ Judge Koh made a similar observation in another patent case between Apple and Samsung. *See* Order Granting in Part and Denying in Part Motions to Exclude Certain Expert Opinions at 33, *Apple, Inc. v. Samsung Elecs. Co.*, No. 12-cv-00630 (N.D. Cal. Feb. 25, 2014), ECF No. 1325:

The Court continues to recognize that the framing of questions for purposes of surveys is generally an issue of weight, not admissibility. Nevertheless, the Court also recognizes that there must be outer limits to this principle. At some point, a description of a patent in a survey may vary so much from what is claimed that the survey no longer "relate[s] to any issue in the case" and is "not relevant and, ergo, non-helpful." Such survey evidence would not "help the trier of fact" and therefore must be excluded under Rule 702(a).

(quoting *Daubert*, 509 U.S. at 591) (citing *Fortune Dynamic*, 618 F.3d at 1039).

¹⁸¹ *See, e.g.*, *LaserDynamics, Inc. v. Quanta Comput., Inc.*, 694 F.3d 51, 67 (Fed. Cir. 2012); *Apple, Inc. v. Samsung Elecs. Co.*, 877 F. Supp. 2d 838, 905 (N.D. Cal. 2012).

¹⁸² *See* *Apple Inc. v. Samsung Elecs. Co.*, 809 F.3d 633, 644 (Fed. Cir. 2015).

¹⁸³ Order Denying Apple's Renewed Motion for Permanent Injunction at *6, *Apple, Inc. v. Samsung Elecs. Co.*, No. 12-cv-01846-LHK (N.D. Cal. Mar. 6, 2014).

A. Using Conjoint Analysis to Support a Prayer for an Injunction

The Federal Circuit has established that, to obtain an injunction against an infringer, a patent holder must prove a “causal nexus” between the infringement and some irreparable harm that the patent holder has suffered.¹⁸⁴ However, a series of related disputes between Apple and Samsung over Samsung’s alleged infringement of several Apple patents has revealed confusion over the role of conjoint analysis in supporting a prayer for an injunction, as well as confusion over what constitutes evidence of a “causal nexus” between the patent infringement and the allegedly irreparable harm.¹⁸⁵

1. *The Initial Injunction Ruling and Appeal*

In February 2012, Apple sued Samsung in the U.S. District Court for the Northern District of California, alleging that Samsung’s Galaxy Nexus smartphone, released in December 2011, infringed certain Apple implementation patents, including patents covering search features, the “autocorrect” feature, and the “slide to unlock” feature.¹⁸⁶ Apple asked the district court to grant a preliminary injunction against Samsung’s sale of the Galaxy Nexus.¹⁸⁷ In considering Apple’s request for a preliminary injunction, Judge Lucy Koh followed the guidance of the Federal Circuit in a separate dispute between Apple and Samsung and considered, among other questions, (1) whether Apple would suffer “irreparable harm” absent injunctive relief, and (2) whether there existed “some causal nexus” between Samsung’s infringement and the allegedly irreparable harm.¹⁸⁸ Regarding irreparable harm, Judge Koh found that Apple had adequately demonstrated that, in the absence of an injunction, it would likely suffer irreparable harm by losing substantial market share in the market for mobile phones.¹⁸⁹ To analyze causal nexus, Judge Koh, citing the Federal Circuit’s opinion in a separate dispute between Apple and Samsung, observed that “Apple cannot enjoin the Galaxy Nexus unless it is able to show that the features claimed by the [patents in suit] ‘drive the demand for the [Galaxy Nexus].’”¹⁹⁰ After noting that the Federal Circuit had not clarified what would constitute evidence that a patented feature “drives demand” for a downstream product, Judge Koh determined that Apple could demonstrate the causal nexus between its irreparable harm and Samsung’s

¹⁸⁴ *Apple, Inc. v. Samsung Elecs. Co.*, 678 F.3d 1314, 1324 (Fed. Cir. 2012).

¹⁸⁵ *See Apple*, 809 F.3d at 639–40.

¹⁸⁶ *See Apple, Inc. v. Samsung Elecs. Co.*, 877 F. Supp. 2d 838, 855 (N.D. Cal. 2012).

¹⁸⁷ *Id.* at 854–55.

¹⁸⁸ *Id.* at 897 (quoting *Apple*, 678 F.3d at 1325).

¹⁸⁹ *Id.* at 904.

¹⁹⁰ *Id.* at 905 (quoting *Apple*, 678 F.3d at 1324–25) (first alteration added, second alteration in original).

infringement “by showing either that the patented feature is an affirmative driver of consumer demand, or that the patented feature’s absence would suppress consumer demand.”¹⁹¹ She determined that one of the four patents in suit, which claimed the “unified search” feature, was essential to Siri, a feature of Apple’s iPhone 4s model.¹⁹² Apple’s survey evidence showed that Siri drove demand for the iPhone 4s.¹⁹³ Because the “unified search” patent was essential to a feature that drove demand for the iPhone 4s, Judge Koh found that Apple had satisfied the Federal Circuit’s causal-nexus requirement.¹⁹⁴ Consequently, Judge Koh granted Apple’s motion to enjoin Samsung’s Galaxy Nexus.¹⁹⁵

Samsung appealed Judge Koh’s decision to the Federal Circuit.¹⁹⁶ Judge Sharon Prost, reversed Judge Koh’s decision on the grounds that she abused her discretion in determining that the “unified search” patent drove demand for the Galaxy Nexus.¹⁹⁷ Judge Prost explained that “[t]he causal nexus requirement is not satisfied simply because removing an allegedly infringing component would leave a particular feature, application, or device less valued or inoperable.”¹⁹⁸ Consequently, Judge Prost determined that Apple’s evidence that Siri was a popular feature of the iPhone 4s in part because it included the “unified search” feature did not constitute evidence that the “unified search” patent drove the demand for the Galaxy Nexus.¹⁹⁹ In fact, Apple’s survey evidence showed that the “unified search” feature was not one of the top five reasons that consumers bought the Galaxy Nexus or any other Android smartphone.²⁰⁰ Consequently, finding that Apple had not satisfied the causal-nexus requirement and that the district court had wrongly enjoined sales of the Galaxy Nexus, Judge Prost reversed the district court’s decision and remanded the case.²⁰¹

2. The Second Injunction Ruling and Appeal

Following the Federal Circuit’s decision, on remand, a jury returned a verdict finding that twenty-six Samsung products infringed Apple’s patents or diluted Apple’s trade dress.²⁰² Consequently, Apple requested that the district

¹⁹¹ *Id.* at 906.

¹⁹² *See id.* at 907–08.

¹⁹³ *See id.*

¹⁹⁴ *Id.* at 909.

¹⁹⁵ *Id.* at 918.

¹⁹⁶ *Apple Inc. v. Samsung Elecs. Co.*, 695 F.3d 1370, 1373 (Fed. Cir. 2012).

¹⁹⁷ *Id.* at 1376, 1380.

¹⁹⁸ *Id.* at 1376.

¹⁹⁹ *Id.* at 1375–76.

²⁰⁰ *Id.* at 1376.

²⁰¹ *Id.* at 1380.

²⁰² *Apple, Inc. v. Samsung Elecs. Co.*, 909 F. Supp. 2d 1147, 1149 (N.D. Cal. 2012).

court issue a permanent injunction against those products.²⁰³ In support of the injunction, Apple’s expert, Dr. John Hauser, presented evidence from conjoint analysis surveys.²⁰⁴ His conjoint surveys “purport[ed] to establish the prices that Samsung consumers would pay for particular patented features.”²⁰⁵ Samsung disputed the validity of the conjoint analysis, maintaining that Dr. Hauser’s survey methodology did not distinguish willingness to pay for a particular feature from consumer demand for a complete product, and consequently his methodology could not show that the patented features drove the demand for Samsung products.²⁰⁶

In assessing Apple’s request for a permanent injunction, Judge Koh found that, even though Apple had suffered “some irreparable harm in the form of loss of downstream sales,”²⁰⁷ Apple had failed to demonstrate a causal nexus between Samsung’s patent infringement and the irreparable harm that Apple suffered.²⁰⁸ With respect to Dr. Hauser’s conjoint surveys, Judge Koh emphasized that estimates of the consumers’ willingness to pay—“evidence of ‘the price premium over the base price Samsung consumers are willing to pay for the patented features’”—is not the same as evidence that consumers will buy a Samsung phone instead of an Apple phone simply because it contains those features.²⁰⁹ Apple argued that the “demand for a *product* is often defined as consumers’ willingness to pay for that product, and thus the concepts of willingness to pay and demand are interchangeable.”²¹⁰ However, Judge Koh observed that Dr. Hauser’s conjoint survey did “not measure willingness to pay for *products*; it measure[d] willingness to pay for *features* within a particular product.”²¹¹ She found that the conjoint survey did “not address the relationship between demand for a feature and demand for a complex product incorporating that feature and many other features.”²¹² Judge Koh added that, “[t]o establish a causal nexus, Apple would need to show not just that there is demand for the patented features, but that the patented features are important drivers of consumer demand for the infringing products.”²¹³ However, she found that the survey failed to prove that link between willingness to pay for

²⁰³ *Id.*

²⁰⁴ *Id.* at 1156.

²⁰⁵ *Id.*

²⁰⁶ *Id.*

²⁰⁷ *Id.* at 1152.

²⁰⁸ *Id.* at 1156–57.

²⁰⁹ *Id.* at 1156 (citation omitted).

²¹⁰ *Id.*

²¹¹ *Id.*

²¹² *Id.*

²¹³ *Id.*

Apple's patented features and demand for Samsung's infringing products.²¹⁴ Consequently, Judge Koh denied Apple's request for a permanent injunction.²¹⁵

Apple appealed Judge Koh's decision to the Federal Circuit.²¹⁶ In December 2013, the Federal Circuit again found that the district court had erred in its analysis, this time because it had imposed a "level of proof" that was too high.²¹⁷ Writing for the Federal Circuit, Judge Prost agreed with the district court that evidence of nominal willingness to pay for a feature will not by itself necessarily show that a feature drives demand for a product.²¹⁸ For example, she explained that "consumers' willingness to pay an additional \$10 for an infringing cup holder in a \$20,000 car does not demonstrate that the cup holder drives demand for the car."²¹⁹ However, Judge Prost said that the district court had erred when it required Apple to show "that a patented feature is *the sole reason* for consumers' purchases."²²⁰ Instead, Apple needed only to show "*some connection* between the patented feature and demand for Samsung's products."²²¹ Judge Prost emphasized that a variety of ways might exist to demonstrate that required connection.²²² For example, Apple could have proven that connection "with evidence that a patented feature is one of several features that cause consumers to make their purchasing decisions" or "with evidence that the absence of a patented feature would make a product significantly less desirable."²²³ Judge Prost said that another way to show that a patented feature drives demand is to show that it significantly increases the price of a product or otherwise makes it more desirable,²²⁴ but she did not explain what constitutes a "significant" increase in price or desirability.²²⁵ Judge Prost found that "the district court had never reached that inquiry because it viewed Dr. Hauser's survey evidence as irrelevant."²²⁶ Consequently, the Federal Circuit vacated the district court's denial of Apple's request for an injunction with respect to certain patents and again remanded the case to Judge Koh.²²⁷

²¹⁴ *Id.*

²¹⁵ *Id.* at 1164.

²¹⁶ *See* Apple, Inc. v. Samsung Elecs. Co., 735 F.3d 1352, 1356 (Fed. Cir. 2013).

²¹⁷ *Id.* at 1367.

²¹⁸ *Id.*

²¹⁹ *Id.* at 1368.

²²⁰ *Id.* at 1364.

²²¹ *Id.* (emphasis added).

²²² *Id.*

²²³ *Id.*

²²⁴ *See id.* at 1368.

²²⁵ *Id.*

²²⁶ *Id.*

²²⁷ *Id.* at 1375.

3. The Third Injunction Ruling and Appeal

On remand, in March 2014, Judge Koh again found Dr. Hauser’s analysis insufficient to prove the causal nexus of Apple’s alleged harm and Samsung’s infringement for three reasons.²²⁸ First, Judge Koh found that “Dr. Hauser’s survey measures the market demand for the patented features in a vacuum, without relation to the actual price . . . of the devices.”²²⁹ She emphasized that Dr. Hauser had not considered competitors’ products or other indicators of market supply, which would have significantly affected prices.²³⁰ She clarified that “[t]he serious market competition in the smartphone and tablet industry works to depress prices, whereas Dr. Hauser’s survey did not account at all for competitor products or other supply at all.”²³¹

Judge Koh observed that, when summed, the price premiums for the features that Dr. Hauser tested exceeded the price of the products—even though those products also included many other features that Dr. Hauser did not test.²³² She found that Dr. Hauser’s failure to account for *actual* market prices explained why the combined price premiums for the six tested features significantly exceeded the prices of the products.²³³ Judge Koh said that the combined price premiums for the six tested features would likely not have exceeded the prices of the products “[i]f Dr. Hauser’s willingness to pay estimates related to actual smartphone and tablet prices.”²³⁴ Referring to the Federal Circuit’s cup holder example, Judge Koh found that Dr. Hauser’s survey provided no way to determine the cup holder’s impact on the price of the car.²³⁵ She found that “[t]his lack of information about how the patented features compare to the overall price of the infringing device is a significant hurdle for Dr. Hauser’s survey evidence.”²³⁶ Judge Koh emphasized that, although evidence that consumers have a high willingness to pay for patented features supports the conclusion that those features drive the demand for the infringing product, “absent some baseline device price for comparison, the survey results cannot demonstrate that the patented features significantly increase the *price* of a product.”²³⁷ In other words, Dr. Hauser’s survey evidence

²²⁸ Apple, Inc. v. Samsung Elecs. Co., No. 11-cv-01846-LHK, 2014 WL 976898, at *11–16 (N.D. Cal. Mar. 6, 2014).

²²⁹ *Id.* at *11.

²³⁰ *Id.*

²³¹ *Id.*

²³² *Id.* at *12.

²³³ *Id.*

²³⁴ *Id.*

²³⁵ *Id.*

²³⁶ *Id.*

²³⁷ *Id.*

provided no connection between the price consumers are willing to pay for a specific feature and the price consumers are willing to pay for a product that includes that feature.

Second, Judge Koh found that Dr. Hauser's survey evidence provided limited information to determine whether the inclusion of the patented technology would support a measurably *significant* increase in the price of the infringing product.²³⁸ She observed that substantial portions of Dr. Hauser's estimated price premiums for the infringing features were attributed to the distraction features that he included in his surveys.²³⁹ Further, Judge Koh observed that "numerous features that were not tested—such as battery life, MP3 player functionality, operating system, text messaging options, GPS, and processor speed—are highly important to consumers."²⁴⁰ Judge Koh said that, if Dr. Hauser's survey had included those features, it is possible that "the patented features would account for an even smaller percentage of the price premiums."²⁴¹ She emphasized that, "because Dr. Hauser's survey instead created a market in which consumers could choose only among four hypothetical devices at a time with six features of varying levels, any price premium that consumers are willing to pay for the patented features in the survey is devoid of sufficient context."²⁴² In other words, Judge Koh found that there was no way to attribute the estimated price premiums to the infringing features. Consequently, Judge Koh concluded that it was not clear that the "price premiums for the patented features" showed "that consumers are willing to pay *significantly* more for a product with the patented features or that the patented features [made] the infringing product *significantly* more desirable."²⁴³

Third, Judge Koh found that the survey evidence was unpersuasive because Dr. Hauser's survey inflated the value of the patented features by inadequately describing the non-infringing alternatives.²⁴⁴ Judge Koh found that, by using abbreviated descriptions of the patented features of a hypothetical phone and by describing the absence of the patented features in a vague way, Dr. Hauser "may have misled respondents into believing that the profile lacked any features of those types, rather than that the profile merely lacked the particular implementation of those features as patented by Apple."²⁴⁵ Judge

²³⁸ *Id.*

²³⁹ *Id.*

²⁴⁰ *Id.*

²⁴¹ *Id.*

²⁴² *Id.*

²⁴³ *Id.* (quoting *Apple Inc. v. Samsung Elecs. Co.*, 735 F.3d 1352, 1364 (Fed. Cir. 2013) (internal quotation marks omitted))

²⁴⁴ *Id.* at *14.

²⁴⁵ *Id.*

Koh also found that, by using graphics that placed undue emphasis on the patented features and by providing respondents with more information on the features than consumers in the marketplace have, the survey questions had inflated the relative value of Apple's patented features.²⁴⁶ She found that, as a result, "the survey results likely overstate[d] the consumers' relative willingness to pay for the patented features."²⁴⁷

Judge Koh concluded that, although evidence from conjoint analysis surveys was admissible, it did not suffice to show "the degree of connection necessary to establish that the patented features drive consumer demand for the infringing products, either directly or circumstantially."²⁴⁸ She concluded that the evidence merely provided an indicator of demand for the patented feature, but was not an "indicator of the degree of demand necessary to show that the patented features [drove] consumer demand for the accused product[]." ²⁴⁹

Following Judge Koh's decision, Apple again appealed.²⁵⁰ Judge Moore concluded that Judge Koh had again erred, and that Apple had, in fact, satisfied the causal nexus requirement.²⁵¹ The Federal Circuit determined that Judge Koh "erred when [she] required Apple to prove that the infringing features were the exclusive or predominant reason why consumers bought Samsung's products."²⁵² Instead, to satisfy the causal nexus requirement, Apple needed only to "show that the patented features impact consumers' decisions to purchase the accused devices."²⁵³ The Federal Circuit said that evidence that Apple had presented to the district court—which implied that (1) consumers valued the patented features, (2) Samsung tried to imitate the patented features, and (3) consumers found Samsung's alternatives undesirable—established a causal nexus.²⁵⁴ The Federal Circuit also criticized Judge Koh's apparent "disregard" for Dr. Hauser's conjoint survey evidence, noting that that evidence established that consumers valued the patented features and would not have purchased a Samsung phone that lacked those features.²⁵⁵ Thus, because Apple showed that the patented features "were related to infringement and were important to [consumers]," the Federal Circuit determined that Apple had satisfied the

²⁴⁶ *Id.*

²⁴⁷ *Id.* at *16.

²⁴⁸ *Id.*

²⁴⁹ *Id.* (quoting *Apple Inc. v. Samsung Elecs. Co.*, 735 F.3d 1352, 1364 (Fed. Cir. 2013)).

²⁵⁰ *See Apple Inc. v. Samsung Elecs. Co.*, 809 F.3d 633, 638 (Fed. Cir. 2015).

²⁵¹ *Id.* at 647.

²⁵² *Id.* at 642 (citing *Apple Inc. v. Samsung Elecs. Co.*, 735 F.3d 1352, 1364 (Fed. Cir. 2013)).

²⁵³ *Id.* (citing *Apple*, 735 F.3d at 1364).

²⁵⁴ *Id.* at 643.

²⁵⁵ *Id.* at 644.

causal nexus requirement²⁵⁶ and consequently vacated and remanded Judge Koh's decision.²⁵⁷

4. *Summation*

To demonstrate the existence of a causal nexus between the implementer's patent infringement and the patent holder's irreparable harm, conjoint analysis needs to show that the patented feature drives demand for the downstream product.²⁵⁸ However, it is not yet wholly clear what constitutes evidence that a feature drives demand for a downstream product. Evidence that the patented feature adds value to the downstream product does not suffice to show that it drives demand for the downstream product.²⁵⁹ However, it is not necessary to show that the patented feature is the *only* reason that consumers purchase the downstream product.²⁶⁰ The Federal Circuit has clarified that conjoint analysis must show that there is *some* connection between the patented feature and demand for the downstream product.²⁶¹ However, the *Apple v. Samsung* decisions of the U.S. District Court for the Northern District of California and the Federal Circuit show that confusion remains over the proper interpretation of "causal nexus" and what constitutes evidence that a patented feature "drives demand" for a downstream product. Furthermore, although the Federal Circuit has said that a patent holder can prove that a patented feature drives demand for the downstream product by showing that that feature "significantly" increases the price or desirability of the product,²⁶² it has not explained how to determine whether the increase in price attributable to a patented feature is "significant." Thus, the Federal Circuit has not yet provided clear guidance on how to determine whether a patented feature drives demand for a downstream product. Consequently, it is not clear what evidence a patent holder may use to prove a causal nexus between the patent infringement and the irreparable harm.

²⁵⁶ *Id.*

²⁵⁷ *Id.* at 647.

²⁵⁸ *Id.* at 644.

²⁵⁹ *Apple Inc. v. Samsung Elecs. Co.*, 809 F.3d 633, 641 (Fed. Cir. 2015).

²⁶⁰ *See id.* at 641–42.

²⁶¹ In 2015, the Federal Circuit granted Samsung's petition for rehearing for the express purpose of modifying its opinion to clarify that Apple needed to show that its patented feature was one of several features that cause consumers to make their purchasing decisions, rather than showing that its patented feature was the *only* feature that drove consumer demand. *See Order on Petition for Rehearing En Banc, Apple Inc. v. Samsung Elecs. Co.*, 808 F.3d 517, 518 (Fed. Cir. 2015) (per curiam).

²⁶² *Apple Inc. v. Samsung Elecs. Co.*, 809 F.3d 633, 658 (Fed. Cir. 2015).

B. Using Conjoint Analysis to Identify the Proper Royalty Base

Whether a patented feature drives demand for a downstream product is also the legal test for determining whether the price of that product is an appropriate royalty base.²⁶³ Consequently, the *Apple v. Samsung* cases analyzed in Part IV.A indicate that a damages expert could use conjoint analysis in a damages calculation to determine whether the price of a downstream product is an appropriate royalty base.²⁶⁴ However, the confusion over the “causal nexus” and what constitutes evidence that a patented feature drives demand for a downstream product could also complicate the identification of the proper royalty base.

In general, the Federal Circuit imposes a high evidentiary burden on parties that attempt to use a downstream product as a royalty base. For example, in 2009, the Federal Circuit in *Lucent Technologies, Inc. v. Gateway, Inc.* interpreted the Supreme Court’s apportionment requirement to mean that the price of a downstream product may constitute the royalty base only if there is “evidence demonstrating the patented method . . . as the basis—or even a substantial basis—of the consumer demand.”²⁶⁵ Similarly, in 2012, in *LaserDynamics, Inc. v. Quanta Computer, Inc.*, the Federal Circuit said that, when the technology is a small component of a complex product, using the price of the entire product as a royalty base requires that there be evidence “showing that the demand for the entire product is attributable to the patented feature.”²⁶⁶ That evidentiary principle for using the price of a downstream product as the royalty base is known as the “entire market value rule” (“EMVR”).²⁶⁷ Whether a patented feature drives demand for a downstream product is a question of fact.²⁶⁸ However, in *Ericsson, Inc. v. D-Link Systems, Inc.*,²⁶⁹ the Federal Circuit in December 2014 clarified that a damages calculation does not violate the

²⁶³ See Sidak, *The Property Royalty Base for Patent Damages*, *supra* note 30, at 1012.

²⁶⁴ See *supra* Part IV.A.3–4.

²⁶⁵ *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1337 (Fed. Cir. 2009).

²⁶⁶ See *Lucent*, 580 F.3d at 1336; *Tekmax, Inc. v. Exide Corp.*, Nos. 97-1386-97-1787, 1999 WL 435755, at *7 (Fed. Cir. Jan. 27, 1999); *Fonar Corp. v. Gen. Elec. Co.*, 107 F.3d 1543, 1552 (Fed. Cir. 1997); *IP Innovation, LLC v. Red Hat, Inc.*, 705 F. Supp. 2d 687, 689 (E.D. Tex. 2010).

²⁶⁷ See *Fonar*, 107 F.3d at 1552–53; *Tekmax*, 1999 WL 435755, at *7; *IP Innovation*, 705 F. Supp. 2d at 689–90; *Lucent*, 580 F.3d at 1336–37.

²⁶⁸ See, e.g., Order Denying Everlight’s *Daubert* Motion to Preclude the Expert Testimony of Nichia’s Technical and Damages Expert [# 312], and Granting in Part and Denying in Part Nichia’s Motion to Exclude the Testimony of Everlight’s Technical and Damages Experts, *Everlight Elec. Co. v. Nichia Corp.*, No. 12-cv-11758, 2014 WL 4707053, at *12 (E.D. Mich. Sept. 22, 2014).

²⁶⁹ 773 F.3d 1201 (Fed. Cir. 2014).

EMVR if one performs that calculation on the basis of comparable licenses.²⁷⁰ In other words, it is appropriate to use the value of the downstream product as the royalty base if it is common industry practice to do so.²⁷¹

However, absent an established practice of licensing patents using the downstream product as the royalty base, a damages expert must show that the patented feature drives demand for the product to use the value of that product as the royalty base.²⁷² The Federal Circuit has provided guidelines for how a damages expert can meet that legal requirement. In *LaserDynamics*, the Federal Circuit outlined the types of evidence that do not suffice to show that the patented feature drives demand for the downstream product.²⁷³ The Federal Circuit said that it is not “enough to merely show that the . . . [patented technology] is viewed as valuable, important, or even essential to the use” of a downstream product.²⁷⁴ It is also not “enough to show that a . . . [product] without [the patented feature] . . . would be commercially unviable.”²⁷⁵ Discussing the example of a laptop, the Federal Circuit said:

Were this sufficient, a plethora of features of a laptop computer could be deemed to drive demand for the entire product. To name a few, a high resolution screen, responsive keyboard, fast wireless network receiver, and extended life battery are all in a sense important or essential features to a laptop computer; take away one of these features and consumers are unlikely to select such a laptop computer in the marketplace. But proof that consumers would not want a laptop computer without such features is not tantamount to proof that any one of those features alone drives the market for laptop computers.²⁷⁶

Therefore, the Federal Circuit’s decisions regarding the EMVR indicate that it is not enough to show that a feature is necessary for a product to function. Only evidence that a patented feature motivates consumers to purchase the product at issue will suffice to show that the patented feature drives demand for that downstream product.

Conclusion

Since economic experts began to use conjoint analysis to calculate damages in patent infringement suits, case law on the admissibility and reliability of

²⁷⁰ *Id.* at 1225–26; see also J. Gregory Sidak, *Apportionment, FRAND Royalties, and Comparable Licenses After Ericsson v. D-Link*, 2016 U. ILL. L. REV. (forthcoming), <https://www.criterioneconomics.com/apportionment-frand-royalties-comparable-licenses-ericsson-dlink.html>.

²⁷¹ See Sidak, *The Proper Royalty Base for Patent Damages*, *supra* note 30, at 996–97.

²⁷² See, e.g., *LaserDynamics, Inc. v. Quanta Comput., Inc.*, 694 F.3d 51, 68 (Fed. Cir. 2012).

²⁷³ *Id.*

²⁷⁴ *Id.*

²⁷⁵ *Id.*

²⁷⁶ *Id.*

evidence from conjoint surveys grew to provide guidelines as to what an admissible and reliable conjoint survey must entail. This Article explains that conjoint analysis is inherently susceptible to hindsight bias because it attempts to “predict the past.” That is, a conjoint survey, conducted after the product that includes the patented feature has been marketed, might not be able to estimate reliably the consumers’ willingness to pay for the patented feature at the moment immediately before first infringement. To the extent that the consumers’ willingness to pay for the patented feature at the time of the conjoint survey deviates from the consumers’ willingness to pay for the patented feature at the moment immediately before first infringement, a conjoint survey might inherently be unable to meet the standards for admissibility in Federal Rule of Evidence 702. In addition, for an economic expert’s testimony based on conjoint analysis to be admissible, she must select the features being tested in the conjoint survey according to an intellectually rigorous methodology. Courts have said that other issues in survey design, such as using a sample that is not representative of the population of interest, generally should diminish the reliability of the survey evidence but not its admissibility. However, to the extent that such issues in survey design cause the survey results not to be sufficiently tied to the facts of the case, the survey results cannot satisfy the standards for admissibility established in Rule 702. With respect to using conjoint surveys to show that a patented feature drives demand for the downstream product (to show that the court should grant an injunction against the infringer or that the price of the downstream product is the proper royalty base for calculating damages), the Federal Circuit has not yet provided enough guidance on what constitutes a “significant” price increase or a “significant” increase in the product’s desirability.