

Florida is unambiguously a *Daubert* state. After many decades of *Frye*, the Florida Supreme court has handed down *In Re Amendments to the Florida Evidence Code 2019* where they adopted the *Daubert* Standard passed by the Florida Legislature, making it unambiguously the law in Florida. Effective immediately. Petition for rehearing denied. Following are excerpts from my chapter “*Daubert and Commercial Litigation Expert Testimony*” a chapter in the Florida Bar/Lexis publication “*Business Litigation in Florida*” You will be able to buy this from the Florida Bar in 2022, but because you are on my website, you can read it now for free. This is a comprehensive 2021 update of the chapter, incorporating the Supreme Court’s new holding. What follows is a prepublication excerpt from the forthcoming 10th edition of that book. This is the most complete excerpt of that chapter on this site and most of the other excerpts contain material that is also contained in this excerpt.

STEPHEN MAHLE*

***DAUBERT* IN FEDERAL AND FLORIDA STATE COURTS**

- I. INTRODUCTION AND SCOPE
- II. *DAUBERT* AND FEDERAL RULES OF EVIDENCE
 - A. [§13.4] In General
 - B. [§13.5] Rule 104: Preliminary Questions
 - C. [§13.6] Rule 402: Relevance
 - D. [§13.7] Rule 403: Prejudicial, Confusing, Or Misleading
 - E. Rule 702: Evidentiary Reliability And Doctrine Of Judge As Gatekeeper
 - 1. [§13.8] In General
 - 2. [§13.9] The Scientific Method
 - F. [§13.10] *Daubert*’s Five Factors For Assessing Evidentiary And Scientific Reliability
 - G. [§13.11] Rule 706: Help For Gatekeeper
- III. [§13.12] *DAUBERT* AND NONSCIENTIFIC EXPERT TESTIMONY
- IV. ADDITIONAL *DAUBERT* ISSUES
 - A. [§13.13] Standard Of Review Of *Daubert* Rulings: Abuse Of Discretion
 - B. [§13.14] Case-Dispositive Determination
 - C. [§13.15] No Expert Testimony Allowed On Issues Of Common Understanding
 - D. [§13.16] Expert Testimony To Legal Conclusions Not Admissible

*J.D., University of Virginia, 1995; Ph.D., Economics, The Ohio State University 1986. Dr. Mahle is a member of the Florida Bar and is a commercial litigator, specializing in *Daubert*, *Frye*, and expert testimony issues.

- V. SCIENCE-, STATISTICS-, AND REGRESSION-BASED EXPERT TESTIMONY
 - A. [§13.17] Introduction
 - B. [§13.18] Legal View Of Statistical And Regression Analysis
 - C. [§13.19] Lawyering And Regression Assumptions
 - D. Summary Of Regression Analysis
 - 1. [§13.20] Basic Regression Model
 - 2. [§13.21] Unbiased Estimates
 - 3. [§13.22] Standard Deviation And Best Estimates
 - 4. [§13.23] Some Regression Terminology
 - 5. [§13.24] Three Regression Problems Common In Case Law
 - E. Expert Testimony In Securities Litigation
 - 1. [§13.25] Introduction
 - 2. Event Studies
 - a. [§13.26] *In Re Oracle Securities Litigation*
 - b. [§13.27] Event Study Cases
 - c. [§13.28] Economics Of Event Studies
 - 3. Econometrics Of Event Studies: Applied Regression Analysis
 - a. [§13.29] In General
 - b. [§13.30] Abnormal Return
 - c. [§13.31] Hypothesis Tests And Statistical Significance Of Estimates
 - d. [§13.32] Summary
 - F. Regression-Based Antitrust Expert Testimony
 - 1. [§13.33] Introduction
 - 2. Case Study
 - a. [§13.34] *In Re Ampicillin Antitrust Litigation*
 - b. [§13.35] *Daubert* Analysis Of Ampicillin Example
 - 3. Post-*Daubert* Expert Testimony In Eleventh Circuit
 - a. [§13.36] Introduction
 - b. [§13.37] Prototype Antitrust *Daubert* Hearing
 - c. [§13.38] Another View Of *Daubert* And Economics Expert Testimony
 - d. [§13.39] Testing And Economics Expert Testimony: *City of Tuscaloosa v. Harcros Chemicals, Inc.*
 - e. [§13.40] *Allapattah Services, Inc. v. Exxon*
 - G. Examples Of Statistical Proof Of Employment Discrimination
 - 1. [§13.41] In General
 - 2. [§13.42] Model Specification Error And Inadmissibility Of Spurious Statistics: *Sheehan v. Daily Racing Form, Inc.*
 - 3. [§13.43] Model Specification Error And Admissibility Of Spurious Statistics: *Obrey v. Johnson*
 - H. Science-Based Expert Testimony In Products Liability Cases

1. [§13.44] In General
2. [§13.45] Feasibility Study Not “Scientific Testing”
3. [§13.46] Experts Must Test Whether Alternate Model Is “Just As Safe Or Safer”
4. [§13.47] Applying *Daubert*’s Other Criteria In Alternate Design Matters
5. [§13.48] Expert’s Failure To Eliminate Alternate Cause

VI. *DAUBERT* IN CLASS ACTION LITIGATION

- A. [§13.49] In General
- B. [§13.50] *Daubert*’s Enhanced Role In Class Action: *In Re Hydrogen Peroxide* And Kindred Opinions
- C. [§13.51] District Court Should Not Err In Favor Of Certifying Class
- D. [§13.52] *Über-Daubert*?
- E. [§13.53] *Wal-Mart Stores, Inc. v. Dukes*
- F. [§13.54] The Foundations Of *Hydrogen Peroxide*
- G. [§13.55] Summary Of *Daubert* In Class Action Litigation

VII. [§13.56] *DAUBERT* IN ELEVENTH CIRCUIT

VIII. ADMISSION OF EXPERT TESTIMONY IN FLORIDA STATE COURTS

- A. [§13.57] In General
- B. [§13.58] Florida’s *Frye* Standard
- C. The “Pure Opinion” Exception To The Florida *Frye* Standard
 1. [§13.59] In General
 2. [§13.60] *Frye* In Florida After *Daubert*
 3. [§13.61] *Marsh v. Valyou*
 4. [§13.62] How The Pure Opinion Exception To The *Frye* Standard Affects Outcomes Of Litigation
 5. [§13.63] *Hood v. Matrixx Initiatives, Inc.*
 6. [§13.64] *Ipse Dixit*
 7. [§13.65] The “Not New Or Novel Science” Exception
 8. [§13.66] Summary
- D. Florida’s First Post-2013 *Daubert* Legislation Decisions
 1. [§13.67] Supreme Court of Florida
 2. [§13.68] District Courts of Florida

IX. APPENDIX

- A. Scientific Method: A Look Behind *Daubert*’s Five Factors
 1. [§13.69] Hypothesis Testing
 2. [§13.70] Known Or Potential Error Rate
 3. [§13.71] Peer Review And Publication
 4. [§13.72] General Acceptance
- B. [§13.73] Calculating Securities Damages Using Event Study
- C. [§13.74] Calculating Abnormal Returns

DAUBERT IN FEDERAL AND FLORIDA STATE COURTS

I.

INTRODUCTION AND SCOPE

There is new Florida Law governing expert testimony. With *In re Amendments to Florida Evidence Code*, May 23 2019, (hereinafter *In re Amendments to Florida Evidence Code*, 2019), the Florida Supreme court reversed its 2017 rejection of the *Daubert* Standard for admissibility of expert testimony in Florida and adopted as Rules of Court chapter 2013-107, known as the Florida *Daubert* Amendments, which had been passed into law by the Florida Legislature in 2013 but rejected by the Florida Supreme Court in 2017.

The 5-2 2019 majority wrote that the Court

“adopts chapter 2013-107, sections 1 and 2, Laws of Florida (*Daubert* amendments), which amended sections 90.702 (Testimony by experts) and 90.704 (Basis of opinion testimony by experts), Florida Statutes, of the Florida Evidence Code to replace the *Frye*¹ standard for admitting certain expert testimony, with the *Daubert*² standard, the standard for expert testimony found in Federal Rule of Evidence 702.”

While this last part is not exactly right, by invoking FRE 702, the Court adopt into Florida law the Federal Rules of Evidence and its acres of precedent. This was the intent of the legislation and it is clarifying to see that language in the opinion.

In the overruled opinion *In re Amendments to Florida Evidence Code*, 210 So. 3d 1231, 1239 (Fla. 2017), hereinafter *In re Amendments to Florida Evidence Code*, 2017), the Court . . . declined to adopt the *Daubert* amendments, to the extent that they are procedural, solely “due to the constitutional concerns raised” by the Committee members and commenters who opposed the amendments.

In *In re Amendments to Florida Evidence Code*, 2019 “The Court . . . recedes from that position and in its place adopts the *Daubert* legislation as a rule of court. *In re Amendments to Florida Evidence Code*, 2019. This overturns *In re Amendments to Florida Evidence Code*, 2017 and puts Florida into the *Daubert* column. I had the privilege of arguing *Amendments to Florida Evidence Code* 2017 with two colleagues and we waited much of a year to hear that, at first we had lost, (but covered the spread); but then two years out we hear that we have won and Florida is a *Daubert* State.

The Court’s language is historic: “We now recede from the Court’s prior decision not to adopt the Legislature’s *Daubert* amendments to the Evidence Code. As Justice Polston has explained, the “grave constitutional concerns” raised by those who oppose the amendments to the Code appear unfounded:

[T]he United States Supreme Court decided *Daubert v. Merrell Dow Pharm. sacceticals, Inc.*, 509 U.S. 579 (1993), in 1993, and the standard has been routinely applied in federal courts ever since. The clear majority of state jurisdictions also adhere to the *Daubert* standard. ~~See 1 McCormick on Evidence § 13 (7th ed. June 2016 Supp.).~~ In fact, there are 36 states that have rejected *Frye* in favor of *Daubert* to some extent. ~~See Charles Alan Wright & Victor Gold, 29 Federal Practice and Procedure § 6267, at 308-09 n.15 (2016).~~ Has the entire federal court system for the last 23 years as well as 36 states denied parties’ rights to a jury trial and access to courts? Do only Florida and a few other states have a constitutionally sound standard for the admissibility of expert testimony? Of course not.

As a note to the federal rule of evidence explains, “[a] review of the caselaw after *Daubert* shows that the rejection of expert testimony is the exception rather than the rule.” Fed. R. Evid. 702 advisory committee’s note to 2000 amendment. “*Daubert* did not work a ‘seachange over federal evidence law,’ and ‘the trial court’s role as gatekeeper is not intended to serve as a replacement for the adversary system.’” ~~*Id.* (quoting *United States v. 14.38 Acres of Land*, 80 F.3d 1074, 1078 (5th Cir. 1996)).~~

Furthermore, I know of no reported decisions that have held that the *Daubert* standard violates the constitutional guarantees of a jury trial and access to courts. To the contrary, there is case law holding that the *Daubert* standard does not violate the constitution. *See, e.g., Junk v. Terminix Int’l Co.*, 628 F.3d 439, 450 (8th Cir. 2010) (rejecting legal merit of the constitutional claim “that the district court violated [appellant’s] Seventh Amendment right to a jury trial by improperly weighing evidence in the course of its *Daubert* rulings” and explaining that “Junk does not cite any case for the notion that a proper *Daubert* ruling violates a party’s right to a jury trial”); *E.I. du Pont de Nemours & Co. v. Robinson*, 923 S.W.2d 549, 558 (Tex. 1995) (rejecting claim “that allowing the trial judge to assess the reliability of expert testimony violates [the parties’] federal and state constitutional rights to a jury trial by infringing upon the jury’s inherent authority to assess the credibility of witnesses and the weight to be given their testimony”); *see also Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 142-43 (1997) (rejecting “argument that because the granting of summary judgment in this case was ‘outcome

determinative,' it should have been subjected to a more searching standard of review” and explaining that, while “disputed issues of fact are resolved against the moving party[,] . . . the question of admissibility of expert testimony is not such an issue of fact”).

Accordingly, the . . . “grave constitutional concerns” regarding the *Daubert* standard are unfounded.

In re Amends. to Fla. Evidence Code, 210 So. 3d 1231, 1242-43 (Polston, J., concurring in part and dissenting in part). We find Justice Polston’s observations instructive in deciding to now adopt the Legislature’s *Daubert* amendments but we do not decide. . . , the constitutional or other substantive concerns that have been raised about the amendments. Those issues must be left for a proper case or controversy.³” I wrote previously that Justice Polston’s dissent was more well thought out than the majority opinion in *Evidence 2017*, and now the new Court agrees. The 2019 Court continued with an explanation of the benefits of *Daubert* over *Frye*.

Additionally, as outlined in the Committee minority report, the *Daubert* amendments remedy deficiencies of the *Frye* standard. Whereas the *Frye* standard only applied to expert testimony based on new or novel scientific techniques and general acceptance, *Daubert* provides that “the trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable.” *Daubert*, 509 U.S. at 589 (holding that the Federal Rules of Evidence superseded *Frye*). Moreover, also as argued in the minority report, the *Daubert* amendments will create consistency between the state and federal courts with respect to the admissibility of expert testimony and will promote fairness and predictability in the legal system, as well as help lessen forum shopping.

Amendments 2019 at xx.

The Court concluded that:

Accordingly, in accordance with this Court’s exclusive rule-making authority⁴ and longstanding practice of adopting provisions of the Florida Evidence Code as they are enacted or amended by

the Legislature,⁵ we adopt the amendments to sections 90.702 and 90.704 of the Florida Evidence Code made by chapter 2013-107, sections 1 and 2. Effective immediately upon the release of this opinion, we adopt the amendments to section 90.702 as procedural rules of evidence and adopt the amendment to section 90.704 to the extent it is procedural.

It is so ordered.

CANADY, C.J., and POLSTON, LAWSON, LAGOA, and MUÑIZ, JJ., concur.

LAWSON, J., concurs and concurs specially with an opinion, in which CANADY, C.J., and LAGOA and MUÑIZ, JJ., concur.

LABARGA, J., dissents with an opinion.

LUCK, J., dissents with an opinion.

So Justice Paulson's well written dissent from *In Re 2017* is the basis of the Florida Supreme Court's reversal on *Daubert*. I wrote last year in this space that Justice Paulson's 2017 dissent was more perceptive than the majority opinion and it is nice that the Court has agreed and all order is restored in our little part of the force.

Florida is back, apparently permanently, to being a *Daubert* state – this time with the informed blessing of the Court. There was a special concurrence and two dissents for a 5-2 opinion.

Before I move on, I note Justice Lawson's special concurrence which will be important as this decision is challenged. The special concurrence addresses and seemingly puts to bed challenge, because, as the concurrence explains, all that happened in this case, as momentous as it is, is that the Florida Supreme Court adopted a Rule of Court which is unambiguously within their exclusive province. The concurrence says:

LAWSON, J., . . . concurring specially.

I fully concur in the majority opinion and write separately to emphasise that "All that this Court is doing now is reconsidering its earlier administrative (i.e., non-adjudicative) decision not to adopt the proposed *Daubert* amendments.

The concurrence is extensive and goes on for pages, but this is its core point – All the court did in *In Re 2019* was adopt a Rule of Court which is its exclusive province. It's hard to imagine a constitutional challenge to that,

So Florida adopts the *Daubert* Standard for admissibility of scientific expert testimony in a landmark reversal.

The chapter now articulates and discusses that *Daubert* Standard for admissibility of expert testimony.

THE DAUBERT STANDARD IN FLORIDA

The Florida Legislature amended sections 90.702 and 90.704 of the Florida Evidence Code (*F.S. Chapter 90*) to model them after Federal Rules of Evidence 702 and 704, and instructed Florida courts to apply Florida's new law in accordance with *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S.Ct. 2786, 125 L.Ed.2d 469 (1993) (referred to in the remainder of this chapter as *Daubert*), *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 119 S.Ct. 1167, 143 L.Ed.2d 238 (1999), and *General Electric Co. v. Joiner*, 522 U.S. 136, 148, 118 S.Ct. 512, 139 L.Ed.2d 508 (1997), 177 A.L.R.Fed. 667, known collectively as the *Daubert* trilogy.

Daubert in Florida starts with Chapter 2013-107, §1, Laws of Florida, which amended section 90.702, Florida Statutes, to read:

90.702 Testimony by experts. — If scientific, technical, or other specialized knowledge will assist the trier of fact in understanding the evidence or in determining a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education may testify about it in the form of an opinion or otherwise, if:

- (1) The testimony is based upon sufficient facts or data;
- (2) The testimony is the product of reliable principles and methods; and
- (3) The witness has applied the principles and methods reliably to the facts of the case.

With this amendment, *F.S. 90.702* is identical to Federal Rule of Evidence 702, apart from some grammatical differences.

The text of Chapter 2013-107, Laws of Florida, contains a series of "Whereas" clauses that constitute the preamble to the bill. These clauses state that the United States Supreme Court follows *Daubert* and its progeny; that Florida's Evidence Code is patterned after the Federal Rules of Evidence, and that the Federal Rules of Evidence were amended in 2000 to reflect the holdings of the *Daubert* trilogy; and that

courts of the state of Florida shall no longer apply the *Frye* standard or the pure opinion exception, but shall instead apply Florida's law in a manner consistent with the *Daubert* trilogy.

The Florida Supreme Court's adoption of *Daubert* is a dramatic change in Florida evidence law, bringing Florida into the modern era of expert witness testimony.

2. [§13.2] An Important relic of Florida Frye.

An important remaining relic of the Florida Frye era is the pronouncement by prior Supreme Courts that *Daubert* is a more liberal standard. As a result, expect to need to argue the relative liberality of *Daubert*.

Before the Florida Legislature's 2013 amendment to sections 90.702 and 90.704 of the Evidence Code, the Florida Supreme Court had considered *Daubert*, found it wanting, and reaffirmed Florida's reliance on the standard in *Frye*. In *Brim v. State*, 695 So.2d 268, 271–272 (Fla. 1997), the court enunciated Florida's stance: “[d]espite the federal adoption of a more lenient standard in *Daubert* . . ., we have maintained the higher standard of reliability as dictated by *Frye*.”

The remaining interesting thing about the *Brim* decision is that *Daubert* is not “a more lenient standard” for admissibility of expert testimony than *Frye*. See §§13.3, 13.68. If anything, there seems to be evidence that *Daubert*, in practice, sets a stricter standard than the *Frye* standard it displaced in many jurisdictions. *Northrup Grumman Systems Corp. v. Britt*, 241 So.3d 208 (Fla. 4th DCA 2018).

This remains an important issue, because proponents of expert testimony will surely argue that their testimony should come into evidence because *Daubert* is a more liberal standard than the *Frye* standard that it replaced. This is a faulty argument although that will not keep it from being argued in Florida Courts.

The Florida *Daubert* standard is a derivative of the federal standard. As a result, this chapter first considers the federal standard, then takes up the Florida *Daubert* standard as addressed by the Florida courts since 2013. There are several Florida *Daubert* cases that were decided under the *Daubert* standard by the DCAs and there is little reason to think that they have changed their views on *Daubert* matters, so those opinions are of interest.

B. [§13.3] *Daubert* And Federal Courts

The admissibility of expert testimony in federal court is governed by *Daubert* and *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 119 S.Ct. 1167, 143 L.Ed.2d 238 (1999), and their progeny. The initial *Daubert* opinion provides a set of science-based admissibility criteria for federal court expert testimony and installs the trial judge as a “gatekeeper,” charged with evaluating all proffered expert testimony and admitting only testimony that is found both relevant and reliable.

Because the testimony considered in *Daubert* was scientific, lower courts subsequently struggled with questions of what constitutes scientific expert testimony and whether, when, and how *Daubert* applies to nonscientific testimony. The United States Supreme Court addressed these questions in *Kumho Tire Co.*, extending *Daubert*'s general reliability holding to govern admissibility of all expert testimony proffered in federal courts. *Kumho Tire* is often miscited as extending *Daubert* to non-science when it actually extended it to all expert testimony. VERIFY last sentence.

One area of historical debate remaining relevant because it will be litigated is whether *Daubert* is a more liberal standard than the *Frye* standard it replaced. There seems to be little remaining support for the “liberal *Daubert*” hypothesis, but proponents of junk expert testimony in Florida, now that they have nothing else to work with, will surely attempt to baptize the *Daubert* standard as more liberal. Section 13.14

discusses the “exacting standards of reliability” that expert testimony must meet under the *Daubert* cases. *Weisgram v. Marley Co.*, 528 U.S. 440, 442, 120 S.Ct. 1011, 145 L.Ed.2d 958 (2000). There seems to be at least anecdotal evidence that courts are excluding much testimony that would have been admitted in the pre-*Daubert* world. While references to *Daubert* as a more liberal standard will continue to appear in briefs of hopeful proponents of all manner of expert testimony, the preponderance of the law rejects such a notion. This is important in business litigation because, when judges exclude expert testimony, they often remove the link between liability and the money damages that are the ultimate goal of the litigation. The Florida Supreme Court has now fully embraced the *Daubert* standard.

One large class of expert testimony that has received close and increasingly sophisticated judicial scrutiny is testimony based on a statistical technique known as multiple regression analysis. Several major business litigation practice areas, including antitrust and securities, use regression-based expert testimony extensively. Employment and discrimination law likewise have a long history of regression-based expert testimony.

As federal courts have repeatedly noted, judges tend not to be scientifically trained. *General Electric Co. v. Joiner*, 522 U.S. 136, 118 S.Ct. 512, 139 L.Ed.2d 508 (1997). As a result, some opinions contain scientific missteps that become important in the cases. See *City of Tuscaloosa v. Harcos Chemicals, Inc.*, 158 F.3d 548 (11th Cir. 1999), discussed in §§13.38–13.39.

Under Fed.R.Evid. 706, the court can appoint experts on its own initiative or at the suggestion of one of the parties. Although employing experts could substantially reduce the incidence of scientific missteps, it is unclear to what extent such experts are actually appointed. Yet, as courts assume the “gatekeeper” duties that the Federal Rules of Evidence impose and that were articulated by the Supreme Court in *Daubert*, judges must undertake probing analyses of complex scientific and statistical issues in deciding whether to admit expert testimony. Thus, it becomes increasingly important that they get the scientific questions right. See the discussion of *Brim v. State*, 695 So.2d 268 (Fla. 1997), in §13.58, for an example in the Florida state courts system, and the discussion of *Estate of Hill v. ConAgra Poultry Co.*, 1997 WL 538887 (N.D. Ga. 1997), in §13.37, for an example from a district court in the Eleventh Circuit.

Courts are paying close attention to the scientific foundations of proffered expert testimony and are regularly turning defendants who have lost on liability into de facto winners by excluding expert testimony that provides the necessary link between liability and monetary damages. See, e.g., *Black v. Food Lion, Inc.*, 171 F.3d 308 (5th Cir. 1999) (plaintiff’s disease not shown to have been caused by fall).

Because science informs the law so pervasively in this field, it is impossible to develop the law of expert testimony in a satisfactory manner without developing a few of the basic elements of science and what *Daubert* appropriately calls the “scientific method.” While this may seem a daunting task, much of basic scientific methodology can be developed in intuitive terms with only very minimal use of science, mathematics, and formal statistics. This chapter adopts such a strategy in discussing standards for admissibility of expert testimony. Most of the technical detail is confined to the Appendix (§§13.68–13.73). When the law is well settled, this chapter follows the format of the rest of this manual in simply reporting the law and advising on its use. When the law is not so well settled, the chapter extrapolates from the well-settled law and science. The chapter begins with the federal system and pays close attention to the *Daubert* Court’s use of scientific basics and the subsequent reliance on those principles by the circuit courts.

II. *DAUBERT*, THE FEDERAL RULES OF EVIDENCE AND THE FLORIDA RULES OF EVIDENCE

A. [§13.4] In General

Daubert held that “the *Frye* test was superseded by the adoption of the Federal Rules of Evidence” as the standard for admissibility of expert testimony in federal trials. *Daubert*, 509 U.S. at 587. While the focus is on Fed.R.Evid. 702, Rules 104, 402, 403, 703, and 706 are also implicated.

B. [§13.5] Rule 104: Preliminary Questions

Daubert, 509 U.S. at 593 n.10, notes that Fed.R.Evid. 104(a) provides that “[p]reliminary questions concerning the . . . admissibility of evidence shall be determined by the court, subject to the provisions of subdivision (b) [pertaining to conditional admissions]. In making its determination it is not bound by the rules of evidence except those with respect to privileges.” Although the Federal Rules of Evidence do not state what the standard of proof for determining such issues should be, the Supreme Court has “traditionally required that [Rule 104(a) preliminary questions of admissibility] be established by a preponderance of proof.” *Bourjaily v. United States*, 483 U.S. 171, 175, 107 S.Ct. 2775, 97 L.Ed.2d 144 (1987). Furthermore, the emphasis is “solely on principles and methodology, not on the conclusions that they generate.” *Daubert*, 509 U.S. at 595. Thus, the “proponent of the testimony does not have the burden of proving that it is scientifically correct, but that by a preponderance of the evidence, it is reliable.” *Allison v. McGhan Medical Corp.*, 184 F.3d 1300, 1312 (11th Cir. 1999).

It is Rule 104 that establishes the gatekeeper role of the trial court. *Daubert*, 509 U.S. at 592–593, states:

Faced with a proffer of expert scientific testimony, then, the trial judge must determine at the outset, pursuant to Rule 104(a), whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue. We are confident that federal judges possess the capacity to undertake this review. Many factors will bear on the inquiry, and we do not presume to set out a definitive checklist or test.

C. [§13.6] Rule 402: Relevance

Daubert, 509 U.S. at 587, cites to Fed.R.Evid. 402 as the “baseline” for admissibility of expert testimony, quoting from the rule that “[a]ll relevant evidence is admissible, except as otherwise provided by the Constitution of the United States, by Act of Congress, by these rules, or by other rules prescribed by the Supreme Court pursuant to statutory authority. Evidence which is not relevant is not admissible.” In elaborating on the rule, the Court noted that “[t]he Rule’s basic standard of relevance . . . is a liberal one” and is based on Rule 401’s definition of “relevant evidence” as “that which has ‘any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence.’” *Id.*

As noted in §§13.2–13.3, an important conflict exists about whether *Daubert* liberalizes the *Frye* standard or whether *Daubert* puts in place a new, stricter test for admissibility of expert testimony. Proponents of the former view cite to *Daubert* and its progeny for pronouncements of liberalization, while proponents of the latter view point to *Daubert*’s apparently strict scientific guidelines and the de facto exclusion of testimony under *Daubert* that would have been admitted under *Frye*.

D. [§13.7] Rule 403: Prejudicial, Confusing, Or Misleading

The *Daubert* Court noted that “Rule 403 permits the exclusion of relevant evidence ‘if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury.’” 509 U.S. at 595. The Court also stated that “[e]xpert evidence can be both powerful and quite misleading because of the difficulty in evaluating it. Because of this risk, the judge in weighing possible prejudice against probative force under Rule 403 . . . exercises more control over experts than over lay witnesses.” *Id.*, quoting Weinstein, *Rule 702 of the Federal Rules of Evidence is Sound; It Should Not be Amended*, 138 F.R.D. 631, 632 (1991).

E. Rule 702: Evidentiary Reliability And
Doctrine Of Judge As Gatekeeper

1. [§13.8] In General

Federal Rule of Evidence 702 provides as follows:

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;
- (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.

The cases interpreting the former version of Fed.R.Evid. 702, which was substantively the same as the amended rule, remain relevant to a current discussion of the law.

Daubert installs the trial judge as the evidentiary gatekeeper, charged with admitting into evidence only expert testimony that has been shown to be reliable from an evidentiary standpoint, and explains the criteria trial courts should use to screen “purportedly scientific evidence,” *id.* at 589, by parsing Rule 702, focusing on the meanings of “scientific” and “knowledge.” The Court explained that “[t]he adjective ‘scientific’ implies a grounding in the methods and procedures of science. Similarly, the word ‘knowledge’ connotes more than subjective belief or unsupported speculation.” *Daubert*, 509 U.S. at 590.

The *Daubert* Court further stated that “[t]he subject of an expert’s testimony must be ‘scientific . . . knowledge,’” because “the requirement that an expert’s testimony pertain to ‘scientific knowledge’ establishes a standard of evidentiary reliability.” *Id.* at 589–590. *Daubert* further requires that “to qualify as ‘scientific knowledge,’ an inference or assertion must be derived by the scientific method.” *Id.* at 590. These words foreshadow much of the rest of *Daubert*; the failure of some commentators and lower courts to fully comprehend them contributes much of the misinformation to the debate that surrounds the *Daubert* progeny.

2. [§13.9] The Scientific Method

The phrase “the scientific method” is a term of art within the scientific community and has a specific meaning within that community. *Daubert*’s discussion of the scientific method quotes from seminal works on scientific inquiry enough to make it clear that the Court is using the term in that manner. Indeed, much of the language relied on by the Court in its discussion of the scientific method is strikingly similar to the language used in several amicus briefs filed by or on behalf of scientists from industry and academia.

The Court stated:

Ordinarily, a key question to be answered in determining whether a theory or technique is scientific knowledge that will assist the trier of fact will be whether it can be (and has been) tested. “*Scientific methodology today is based on generating hypotheses and testing them to see if they can be falsified; indeed, this methodology is what distinguishes science from other fields of human inquiry.*” [Emphasis added]

Daubert, 509 U.S. at 593, quoting Green, *Expert Witnesses and Sufficiency of Evidence in Toxic Substances Litigation: The Legacy of Agent Orange and Bendectin Litigation*, 86 Nw.U.L.Rev. 643 (1992).

The “scientific methodology” that the emphasized language above requires is called “hypothesis testing” in the scientific community, and, as the Court’s quotations indicate, hypothesis testing is the essence of the scientific method. It is noteworthy that the *Daubert* Court required that experts follow this “scientific method” even before it turned to the five factors that commentators and lower courts have fixed on, because testimony that proceeds in accordance with the scientific method will tend to satisfy the Court’s first two criteria. The role of the scientific method is central to the Court’s analysis and in the analysis of the more sophisticated commentators and lower courts. The Appendix of this chapter, §§13.68–13.73, develops some of the fundamentals of the scientific method.

F. [§13.10] *Daubert’s* Five Factors For Assessing Evidentiary And Scientific Reliability

The five widely cited *Daubert* criteria for evaluating the admissibility of expert testimony are (1) whether the methods on which the testimony is based have been tested; (2) the known or potential rate of error associated with the testing; (3) whether the method has been subject to peer review; and (4) whether the method is generally accepted in the relevant scientific community and (5) whether there exist standards for the use of the techniques employed by the expert and whether the expert has followed these standards. The first two of these five criteria amount to asking whether the techniques on which the testimony is based are grounded in the scientific method. Virtually no scientific expert testimony will satisfy the last two factors unless it satisfies the first two. See 1 Faigman, Saks, Sanders & Cheng, MODERN SCIENTIFIC EVIDENCE: THE LAW AND SCIENCE OF EXPERT TESTIMONY §1:16 (Thomson/West 2017–2018), observing that “courts will find application of *Daubert* difficult if they treat testability as an optional factor. The other factors all presuppose testability; in science, a non-testable hypothesis cannot have an error rate and is exceedingly unlikely to be published in a peer-reviewed journal and achieve general acceptance.”

Daubert’s fifth criteria has been left off many commentators and courts lists but it can be among the most important of the *Daubert* criteria because it is not uncommon for an expert to employ a generally accepted technique, but misuse the technique.

Other courts have articulated additional sensible criteria for assessing the scientific reliability of expert opinions. Additional factors that trial judges should consider in evaluating the reliability of the proffered expert testimony are described in the Committee Note to the 2000 Amendments of Fed.R.Evid. 702:

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

(2) Whether the expert has unjustifiably extrapolated from an accepted premise to an unfounded conclusion. See *General Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997) (noting that in some cases a trial court “may conclude that there is simply too great an analytical gap between the data and the opinion proffered”).

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

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

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

G. [§13.11] Rule 706: Help For Gatekeeper

Concern for the ability of the trial judge to execute the required gatekeeper duties has been expressed from *Daubert*’s inception, but, as the *Daubert* Court pointed out, “Rule 706 allows the court at its discretion to procure the assistance of an expert of its own choosing.” *Daubert*, 509 U.S. at 595. This idea was echoed in Justice Breyer’s concurrence in *General Electric Co. v. Joiner*, 522 U.S. 136, 148, 118 S.Ct. 512, 139 L.Ed.2d 508 (1997), 177 A.L.R.Fed. 667, which notes that “judges are not scientists . . . [but] neither the difficulty of the task nor any comparative lack of expertise can excuse the judge from exercising the ‘gatekeeper’ duties that the Federal Rules of Evidence impose. . . . To the contrary, when law and science intersect, those duties often must be exercised with special care.” Justice Breyer quoted the amicus brief of the New England Journal of Medicine for the proposition that

a judge could better fulfill this gatekeeper function if he or she had help from scientists. Judges should be strongly encouraged to make greater use of their inherent authority . . . to appoint experts. . . . Reputable experts could be recommended to courts by established scientific organizations, such as the National Academy of Sciences or the American Association for the Advancement of Science. [Citations omitted.]

Id. at 149–150.

In *Allapattah Services, Inc. v. Exxon Corp.*, 61 F.Supp.2d 1335, 1342 n.12 (S.D. Fla. 1999), *aff’d*

333 F.3d 1248, discussed further in §13.40, the United States District Court for the Southern District of Florida observed:

In complicated cases such as this, a timely appointment of a court appointed expert to comment on the attacks and counter-attacks could help assist the district judge in understanding and analyzing the crucial differences between the experts, and the reasonableness of each expert's methodology, data and approach given the *Daubert* factors.

Using a court-appointed expert seems like a sound idea. Because “judges are not scientists,” *Joiner*, 522 U.S. at 148, and yet are called on to judge science that is often both complex and crucial to the outcomes of matters that come before them, it seems imperative that the court not be “out-experted” by the parties or misled by well-sounding advocacy proffered as expert testimony. Using a court-appointed expert should also save money throughout the system as specialists do the work and inform the courts.

III. [§13.12] *DAUBERT* AND NONSCIENTIFIC EXPERT TESTIMONY

One of the debates that surrounded the *Daubert* opinion from the outset was “whether, or how, *Daubert* applies” to nonscientific expert testimony. *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 146, 119 S.Ct. 1167, 143 L.Ed.2d 238 (1999). In *Kumho Tire Co.*, the Supreme Court, reversing the Eleventh Circuit, extended *Daubert* to govern all expert testimony proffered in federal courts. *Kumho Tire Co.* made clear that “*Daubert*’s general holding . . . applies not only to testimony based on ‘scientific’ knowledge, but also to testimony based on ‘technical’ and ‘other specialized’ knowledge.” *Kumho Tire Co.*, 526 U.S. at 141. Under *Kumho Tire Co.*, *Daubert*’s general principles are to be applied flexibly to the evaluation of all expert testimony proffered in federal courts, and the five *Daubert* criteria for admissibility of expert testimony may be applied as appropriate by the trial court to screen any type of expert testimony. Arguments that imply that *Kumho Tire Co.* requires trial courts to apply *Daubert*’s five factors to nonscientific expert testimony are not supported by the Court’s opinion, which is explicit that such application is *permitted* but not *required*.

The *Kumho Tire Co.* Court explained that *Daubert* was couched in terms of scientific testimony merely because the testimony then before the Court was of a scientific variety. The Court observed that “Federal Rules [of Evidence] 702 and 703 grant expert witnesses testimonial latitude unavailable to other witnesses on the ‘assumption that the expert’s opinion will have a reliable basis in the knowledge and experience of [the expert’s] discipline.’” *Kumho Tire Co.*, 526 U.S. at 148, quoting *Daubert*, 509 U.S. at 592.

Other than its announcement that the *Daubert* “gatekeeper judge” applies to all expert testimony, *Kumho Tire Co.*’s most cited pronouncement is that *Daubert* requires the trial court to assure itself that the expert “employs in the courtroom the same level of intellectual rigor that *characterizes the practice of an expert in the relevant field*” [emphasis added]. *Kumho Tire Co.*, 526 U.S. at 152. Revisiting *Daubert*’s reliability test, *Kumho Tire Co.* also singled out the words “scientific” and “knowledge” but put the focus squarely on the word “knowledge” rather than on the phrase “scientific knowledge,” because “it is the Rule’s word ‘knowledge,’ not the words (like ‘scientific’) that modify that word, that ‘establishes a standard of evidentiary reliability.’” *Id.* at 147, quoting *Daubert*, 509 U.S. at 589–590. The *Kumho Tire Co.* Court instructed trial judges not to be overly concerned with distinctions between the words “scientific,” “specialized,” and “other,” used in the rule, because those words are merely modifiers, not separate classes of testimony.

Indeed, the Court in *Kumho Tire Co.* expressed the view that it would be difficult for judges to

make “a distinction between ‘scientific’ knowledge and ‘technical’ or ‘other specialized’ knowledge, since there is no clear line dividing the one from the others.” *Id.* at 138. This is an interesting observation to be contained in an opinion that extends *Daubert*, because *Daubert* drew precisely such a line, stating “[s]cientific methodology today is based on generating hypotheses and testing them to see if they can be falsified; indeed, this methodology is what distinguishes science from other fields of human inquiry.” *Daubert*, 509 U.S. at 593, quoting Green, *Expert Witness and Sufficiency of Evidence in Toxic Substances Litigation: The Legacy of Agent Orange and Bendectin Litigation*, 86 Nw.U.L.Rev. 643, 645 (1992).

The conflict between *Daubert*’s clear articulation of a dividing line between scientific and nonscientific inquiry and *Kumho Tire Co.*’s declaration that no such distinction exists raises a tension between the opinions and provides an opportunity for careful lawyering. In that light, it can be important to rely on the fact that the older opinion’s view seems the more accepted among scientists. The heart of the matter is that, because nonscientific inquiry does not involve the performance of tests and specification of their error rates, nonscientific testimony is vulnerable to exclusion under a strict reading of *Kumho Tire Co.* This is because *Kumho Tire Co.* permits trial courts to apply all of *Daubert*’s criteria to all expert testimony, and all nonscientific testimony is likely to fail *Daubert*’s testing and error rate criteria.

A possible solution may lie in *Kumho Tire Co.*’s affirmation of *Daubert*’s admonition that the five factors be applied flexibly. If flexibility is defined as applying all five of *Daubert*’s factors to testimony proffered as scientific and applying only the peer review and general acceptance factors to testimony proffered as nonscientific, some “other” and “technical” testimony will pass the test. Of course, this seems to fly in the face of the notion of a flexible application of all factors.

Further complicating this matter is that, in discussing the application of *Daubert*, the *Kumho Tire Co.* Court stated that “we can neither rule out, nor rule in, . . . the factors mentioned in *Daubert* . . . for subsets of cases categorized by category of expert or by kind of evidence.” *Kumho Tire Co.*, 526 U.S. at 150. This apparently argues against such a dichotomization of testimony into scientific and nonscientific categories as well as against a rule applying only a subset of the factors to nonscientific testimony. Further developments by lower courts are anticipated in this area.

IV. ADDITIONAL DAUBERT ISSUES

A. [§13.13] Standard Of Review Of *Daubert* Rulings: Abuse Of Discretion

In *General Electric Co. v. Joiner*, 522 U.S. 136, 118 S.Ct. 512, 139 L.Ed.2d 508 (1997), 177 A.L.R.Fed. 667, an electrician who worked in proximity to PCBs developed lung cancer and brought a lawsuit. The district court applied *Daubert* and excluded the testimony of the plaintiff’s causation expert on an indispensable element of the case. Because the plaintiff presented no triable issue of fact in the absence of the expert testimony, the court granted the defendant’s motion for summary judgment. The Eleventh Circuit applied a “hard look” standard of review and reversed. *Joiner v. General Electric Co.*, 78 F.3d 524, 535 (11th Cir. 1996). The Supreme Court reversed the Eleventh Circuit court, holding that the proper standard of review is abuse of discretion, the standard ordinarily applicable to evidentiary rulings. The Court also noted that a court of appeals, applying an “abuse of discretion” standard, may not distinguish between rulings allowing expert testimony and rulings excluding it. The Florida rule has been very different. See §13.58.

B. [§13.14] Case-Dispositive Determination

Weisgram v. Marley Co., 528 U.S. 440, 120 S.Ct. 1011, 145 L.Ed.2d 958 (2000), appears to give

adverse *Daubert* rulings more finality. In *Weisgram*, the defendant, a heater manufacturer, received an unfavorable verdict at trial. On appeal, the Eighth Circuit excluded the plaintiff's expert testimony, which was the only link between the heater and a fire that caused the damage under litigation. Despite the plaintiff's request for a new trial, the case was remanded to the district court with instructions to enter a directed verdict for the defendant/manufacture. The United States Supreme Court upheld the decision of the court of appeals. Thus, the plaintiff had no opportunity to put on any new evidence that the heater caused the fire. This is an important development because, until *Weisgram*, when appellate courts excluded expert testimony that was an indispensable element of the matter at bar, the typical action was to reverse and remand for a new trial. *Weisgram* is significant because the Eighth Circuit effectively reversed, yet declined the plaintiff's request for a new trial. As a result, the ruling disposed of the case rather than return it to the district court for further consideration of the crucial expert testimony matter. The Supreme Court said that, since *Daubert*, "parties relying on expert evidence have had notice of the exacting standards of reliability such evidence must meet," and that "[i]t is implausible to suggest, post-*Daubert*, that parties will initially present less than their best expert evidence in the expectation of a second chance should their first try fail." *Weisgram*, 528 U.S. at 455.

This case-dispositive potential of a successful *Daubert* challenge to admissibility of expert testimony was addressed by the North Carolina Supreme Court in *Howerton v. Arai Helmet, Ltd.*, 597 S.E.2d 674 (N.C. 2004). The Court considered *Daubert* and rejected it because it believed that *Daubert* motions were too powerful as case-dispositive tools. The court stated:

As a consequence of [*Daubert's*] stringent threshold standards for admitting expert testimony, we are concerned with the case-dispositive nature of *Daubert* proceedings, whereby parties in civil actions may use pre-trial motions to exclude expert testimony under *Daubert* to bootstrap motions for summary judgment that otherwise would not likely succeed. . . . "[I]f the court bars the testimony of one party's expert witness or witnesses, that party is unable to present an essential element of his or her claim, or to proffer a defense. Accordingly, judges are aware that applying *Daubert* heavy-handedly has the effect of lightening one's caseload, as a party stripped of its expert often must dismiss the claims or settle the lawsuit."

Howerton, 597 S.E.2d at 691, quoting *Brasher v. Sandoz Pharmaceuticals Corp.*, 160 F.Supp.2d 1291, 1295 n.12 (N.D. Ala. 2001). Nonetheless, *Daubert* has been accepted by the majority of the states.

The message of *Daubert* and *Weisgram* for proponents of expert testimony is that it is critical to proffer testimony that will be defensible and to put that evidence forth in its most favorable light to maximize its chance of meeting the *Daubert* criteria. The message for opponents of expert testimony is that the cases increasingly demonstrate that the exclusion of expert testimony is frequently case dispositive, either by excluding a finding of liability or by cutting the link between the act for which the defendant is found liable and the money damages that are typically the ultimate goal of the litigation. The teaching of *Weisgram* is that such rulings have more final effect than before, making them more valuable.

Many types of expert testimony that are offered in commercial matters are highly susceptible to a *Daubert* challenge on a range of issues, many of which have already appeared in the cases and legal literature, and others that have not yet appeared but seem destined to, given the issues that *have* appeared. For example, legal issues discussed in this chapter — such as variable selection and controlling for extraneous factors in an expert's analysis — have econometric analogues that imply layers of scientific questions that courts have yet to address, perhaps only because the issues have not been argued by counsel in the reported cases.

All of this implies that, when preliminary investigation indicates a deficiency in the expert

testimony, early action to exclude the testimony can potentially dispose of the matter and save large litigation costs. Although the notion of an early *Daubert* challenge does not conform to some traditional litigation timetables, sophisticated commercial clients will see the strategy as a positive net-present-value project, especially when they balance the typically modest cost of the strategy against the expected value of its payoff.

C. [§13.15] No Expert Testimony Allowed On
 Issues Of Common Understanding

When the finder of fact can answer a question for themselves without having an expert answer it for them, expert testimony on such a question is not helpful to the trier of fact in determining the issue and should be excluded under Fed.R.Evid. 702. *Hibiscus Associates Ltd. v. Board of Trustees of Policemen & Firemen Retirement System of City of Detroit*, 50 F.3d 908, 917 (11th Cir. 1995) (“Expert testimony is properly excluded when it is not needed to clarify facts and issues of common understanding which jurors are able to comprehend for themselves.”). “[A]n expert . . . must testify to something more than what is ‘obvious to the layperson’ in order to be of any particular assistance to the jury.” *Ancho v. Pentek Corp.*, 157 F.3d 512, 519 (7th Cir. 1998). One commentary to the notes to the amendment to Rule 702 is more blunt: “[E]xpert testimony about obvious matters could constitute prejudicial error . . . where the expert does nothing more than bolster the credibility of a fact witness by merely restating that testimony in expert garb.” Saltzburg, Martin & Capra, 3 FEDERAL RULES OF EVIDENCE MANUAL §702.02[2] (Matthew Bender & Co. 8th ed. 2005). “[T]he improper admission of the expert testimony was reversible error, because it was used to bolster the testimony of . . . [a] fact-witness.” Saltzburg *et al.*, *supra*, citing *United States v. Cruz*, 981 F.2d 659 (2d Cir. 1992). In *Scott v. Sears, Roebuck & Co.*, 789 F.2d 1052, 1055 (4th Cir. 1986), the appellate court held that the trial court erred in admitting expert testimony on the reaction of women in high heels in avoiding sidewalk grates, stating that “the witness was simply repeating what is common knowledge and common sense.” In addition, “experts have sometimes relied on logical analysis to go from premise to conclusion. . . . If the process from premise to conclusion is not itself consistent with . . . well-accepted principles, then Courts have generally excluded the testimony as based on unreliable and improper extrapolation.” Saltzburg *et al.*, *supra* at §702.02[7], citing *Lust by & through Lust v. Merrell Dow Pharmaceuticals, Inc.*, 89 F.3d 594 (9th Cir. 1996).

D. [§13.16] Expert Testimony To Legal Conclusions
 Not Admissible

The expert may not testify to a legal conclusion, and a primary criterion of whether the expert’s testimony constitutes a legal conclusion is whether the expert uses the language of a statute or words or phrases that have specialized legal meanings in ways that accord with that specialized legal meaning. See, *e.g.*, *Good Shepherd Manor Foundation, Inc. v. City of Momence*, 323 F.3d 557 (7th Cir. 2003) (affirming district court’s exclusion of proffered expert testimony concerning legal conclusions); *United States v. Barile*, 286 F.3d 749, 760 (4th Cir. 2002) (distinguishing characteristics of when expert is testifying to “an improper legal conclusion” are whether expert’s statement “tracks the language of the legal principle” and “whether any terms employed have specialized legal meaning”); *EEOC v. Morgan Stanley & Co.*, 324 F.Supp.2d 451 (S.D. N.Y. 2004).

There are occasional exceptions to this rule. For example, some instances of expert testimony on foreign law have been admitted; however, that seems a kind of technicality, because it seems implicit in the rule that the rule refers to expert testimony on United States law.

V. SCIENCE-, STATISTICS-, AND REGRESSION-BASED EXPERT TESTIMONY

A. [§13.17] Introduction

Lawyers are required to deal with a range of statistical concepts in the courtroom. This portion of the chapter discusses statistical techniques used in litigation, focusing on how regression analysis is used as the basis of expert testimony in several business litigation practice areas. Regression analysis informs a range of legal questions in important ways because it can be used to detect relationships between variables and to distinguish true relationships from spurious ones. *Sobel v. Yeshiva University*, 839 F.2d 18 (2d Cir. 1988); *In re Polypropylene Carpet Antitrust Litigation*, 996 F.Supp. 18 (N.D. Ga. 1997) (citing Rubinfeld, *Econometrics in the Courtroom*, 85 Colum.L.Rev. 1048 (1985)).

Most standard nonregression hypothesis testing models used in commercial litigation are simplifications or generalizations of the regression model discussed in this section. As a result, the analysis of regression techniques that follows applies equally in simpler models and more complex ones. The plaintiff's expert that Judge Posner discusses in *Sheehan v. Daily Racing Form, Inc.*, 104 F.3d 940 (7th Cir. 1997), used one of these simplified models. See §13.42.

Regression can be used to show that a publicly traded company's stock fell in price as a result of the financial press revealing irregularities in the company's financial statement. It can also be used to show the absence of a stock price reaction to such a disclosure. Regression can be used to discern illegal relationships between age and termination rates or between gender and rate of pay. *Sheehan*; *Sobel*. It can also be used to sort out, for example, whether the variable correlated with the termination rate is actually age, or if termination patterns are being driven by lack of computer sophistication, a characteristic possibly present in older workers. *Id.* An example of a spurious correlation is if a company adopts a new computer-based method in its production and lays off its non-computer-literate employees, the terminations will tend to fall on older workers. If such terminated workers sue, they will likely be able to proffer evidence of a strong correlation between age and layoff rates, even if the layoff was done with no regard to age. Regression and certain other statistical tools can inform a decision whether that correlation/causation is real or spurious.

Like many powerful tools, regression must be used properly if it is to inform; it has great potential to mislead if used improperly, and such improper use regularly occurs in litigation settings. There are carefully articulated standards for the use of regression analysis, and courts are beginning to look at whether regression-based testimony comports with the established standards for use of the regression model. See, e.g., *Estate of Hill v. ConAgra Poultry Co.*, 1997 WL 538887 (N.D. Ga. 1997). The same is true of regression's less sophisticated statistical cousins. Courts are holding in limine *Daubert* hearings to determine whether proffered economics expert testimony is reliable, and they are applying increasingly sophisticated and detailed econometric analyses in making their reliability determinations. The court in *In re Polypropylene Carpet Antitrust Litigation*, 996 F.Supp. at 26, held an in limine hearing on the reliability of economics expert testimony and, while reserving judgment on the admissibility of the economist's testimony, agreed the economist's "multiple regression analysis is a scientific endeavor whose admissibility . . . must be determined using the test set forth in *Daubert*." There is, however, a contrasting view. See the discussion of *In re Executive Telecard, Ltd. Securities Litigation*, 979 F.Supp. 1021 (S.D. N.Y. 1997), in §13.27, and *City of Tuscaloosa v. Harcros Chemicals, Inc.*, 877 F.Supp. 1504 (N.D. Ala. 1995), *aff'd in part, rev'd in part, vacated in part* 158 F.3d 548, in §13.39. It should also be noted that *In re Polypropylene Carpet Antitrust Litigation* was pre-*Kumho Tire Co.* and therefore was written before the distinction between *Kumho Tire Co.* and *Daubert* (and the *Daubert* factors) existed. Finally, in virtually all instances, regression analysis, when carried out in nonlitigation settings, not only meets the *Daubert* criteria but, when evaluated by peer researchers, is evaluated using a set of criteria very similar to those in *Daubert*.

Opinions at every level make a point of noting that judges are not scientists. This can mean that there is a good chance a judge may not understand the science put before the court. This presents an opportunity for the scientifically informed lawyer, because a little scientific understanding may go a long way in influencing critical issues. Conversely, this can be unfortunate if it is opposing counsel who informs the court. The central point here is that precedent exists in the circuit courts that is based on misconceived readings of the science presented in *Daubert* hearings. Scientifically informed lawyering can help courts to give less weight to scientifically suspect precedent.

Although the practice of science and the scientific method use sophisticated mathematical tools, most of the scientific issues presented in the cases have almost completely nonmathematical, intuitive explanations. Even most of the statistics can be understood in a commonsense way that allows full discussion with only minimal mathematics. The discussion below concentrates on these commonsense notions.

B. [§13.18] Legal View Of Statistical And Regression Analysis

Properly executed regression studies apparently meet all of the *Daubert* criteria. Such studies perform tests and specify the error rates associated with those tests. They are published in the peer-reviewed scientific journals of a panoply of scientific disciplines, and properly executed regression is a generally accepted scientific research technique in dozens of disciplines.

Of course, the fact that properly executed regression studies apparently meet all of the *Daubert* criteria makes “properly executed” the battleground of admissibility. Most of the regression failures that courts are noting can be traced to the failure of the model or data to meet the assumptions of the regression model. See the discussion in §§13.20–13.24, especially of *Estate of Hill v. ConAgra Poultry Co.*, 1997 WL 538887 (N.D. Ga. 1997). Because regression analysis is vulnerable to attack and exclusion when the assumptions of the regression model can be shown to have been violated, some consideration of the assumptions is warranted.

C. [§13.19] Lawyering And Regression Assumptions

For lawyers, the central scientific point on regression in the post-*Daubert* era is that, if the regression model is properly executed, the regression estimators have a set of desirable properties that allow economists and other experts to do the testing and error-rate analysis that is required for admissibility as expert testimony in federal courts. If counsel can establish that the regression was improperly done (perhaps because the regression assumptions have been substantially violated), the scientific basis of the testimony is discredited, and it loses evidentiary reliability.

The assumptions that underlie the regression model mostly relate to requirements that the data and models that the scientist uses not be misleading. The assumptions are most easily and precisely expressed as requirements on what are called “regression residuals.” Economists use tests of residuals to diagnose the presence of problems and errors in regression in much the same way that physicians use blood tests to diagnose the presence of disease processes.

The term “residual” is given to the (typically small) errors made by the well-conceived regression model. These errors are assumed to average out to zero and are assumed to have a constant “standard deviation,” a term that is explained in §13.22. That these errors exist is not regarded as evidence of mistakes in method, although the presence of certain patterns in the errors is. The residuals are assumed to be uncorrelated with each other, and they are assumed to be normally distributed, which basically means that they have the familiar bell-curve shape normally associated with exam grades like those on the LSAT or

the Bar exam. The important expert testimony cases analyzed in the balance of this chapter address the results of the failure of these assumptions and the lawyering opportunities that they present.

D. Summary Of Regression Analysis

1. [§13.20] Basic Regression Model

The basic regression model is known as the ordinary least squares (OLS) model. When the assumptions of the OLS model are met, the estimates that the model generates have an important set of desirable properties that allow them to establish inferences that meet the *Daubert* criteria for admissibility of expert testimony. When these assumptions are met, OLS estimates are said to be “BLUE,” an acronym for “best, linear, unbiased estimate.” See Kmenta, *ELEMENTS OF ECONOMETRICS* 161 (McMillan Pub. Co. 1971). Strictly speaking, Kmenta discusses these as properties of estimators, not of estimates; however, BLUE estimators produce BLUE estimates, and the distinction is not important for purposes of this discussion.

This chapter considers only linear estimators because other classes of estimators are somewhat esoteric and rarely found in litigation. A BLUE estimator is desirable because it possesses the desirable characteristics of being “best” and “unbiased.” Kmenta, *supra*. Both of these have mathematical definitions that are discussed in Kmenta, *supra*, but discussion in this chapter concentrates on developing an overall understanding of these two characteristics. Analogies to throwing darts at a target are useful in developing this understanding.

2. [§13.21] Unbiased Estimates

An estimate is unbiased if, in repeated trials, it misses in one direction with the same propensity as it misses in the opposite direction. Its errors are analogous to those of darts thrown at a bull’s-eye target by a sighted, competent dart player. The throws are pretty well aimed at the right target. They group around the bull’s-eye, although they may only rarely actually hit the bull’s-eye. Unbiased estimates have error, but the errors are distributed around the right target.

The analogy does not follow through, however: a biased estimator is not like a poor dart player. The poor dart player still centers his throws around the target, although he may miss very badly on frequent attempts. Biased estimates are distributed around a different target. They are like the throws of a dart player who is looking through distorted glasses that make the target seem to be somewhere it is not. The resulting dart throws will now be centered around something that is not the bull’s-eye, perhaps the lamp next to the dart board. A biased estimator has errors that center on a target other than the target alleged. Such an estimator does not measure what it purports to measure; it measures something else.

3. [§13.22] Standard Deviation And Best Estimates

Scientists have a measure for the size of a typical error of an estimate, which is known as the “standard deviation.” Lawyers will rarely need to be concerned with the actual calculation of the standard deviation (which begins with the errors contained in a group of estimates, weights these errors in ways that take account of their size and frequency, and produces a number that represents the typical error made in the estimates). A hypothetical conveys the intuition of standard deviation: Consider a 200-pound man who goes into Wal-Mart and buys five different scales, all of the same model. The man weighs himself on each scale, and the five scales measure the man’s weight as 197, 199, 200, 201, and 203 pounds. Because the man weighs 200 pounds, the errors in these measurements are -3, -1, 0, 1, and 3. Assume that a statistician’s calculation of the standard deviation of these errors is 2. Comparing the actual deviations of 3, 3, 1, 1, and 0 pounds to the standard deviation of 2, a deviation of 2 seems representative or “typical” of the actual

deviations associated with the different scale's measurements of the man's weight. If five scales of a different model measured the man's weight as 190, 195, 200, 205, and 210, the standard deviation of those scales would be 7.1. Comparing this scale's standard deviation of 7.1 to its actual deviations (or errors) of 0, 5, 5, 10, and 10, a deviation of 7.1 appears to be a fairly typical deviation. These scales' respective deviations of 2 and 7.1 are "typical" deviations for the respective scales in the sense that the actual errors cluster around them.

The estimator with the smallest standard deviation of all possible estimators is called the "best" estimator. Such an estimator is also said to be "efficient." Kmenta, *ELEMENTS OF ECONOMETRICS* 159 (McMillan Pub. Co. 1971). (This use of the term efficient is unrelated to the use of "efficient" in the phrase "efficient markets.") The best estimator is like the best dart player in a group. A weak dart player, even when throwing at the right target, will miss often and badly. A good dart player will still miss the bull's-eye, but the throws will tend to be more closely clustered around the bull's-eye. The best estimator will produce estimates that are more tightly grouped around the true value of the variable that it is estimating than will any other estimator. Estimators with small standard deviations are desirable for a variety of reasons, one of which is that a small standard deviation makes for more powerful hypothesis tests (see §13.31).

4. [§13.23] Some Regression Terminology

Often, one of the most daunting impediments to understanding the ideas of a foreign discipline is the terminology specific to that discipline. In the field of regression analysis, the "independent variable" is said to "explain" the "dependent variable." For example, age and computer skill (independent variables) might "explain" employment separation rates (the dependent variable). A mnemonic is that the dependent variable "depends" on the independent variables, while the independent variables are assumed to be independent of other variables in the model. Regression results are typically written in the form $Y=a+bX$, in which "a" is the value of Y when X is zero and "b" tells how much Y rises when X rises by one unit of measure. This number "b" is called the slope coefficient.

As mentioned in §13.21, an estimator is "unbiased" if it is correct on average, while a biased estimator produces estimates that differ systematically from the true value they are attempting to estimate. A notion related to "unbiasedness" is the notion of "consistency," which approximately means that, as more observations are added to the data used for calculations, the estimate becomes more accurate. Kmenta, *ELEMENTS OF ECONOMETRICS* 166 (McMillan Pub. Co. 1971). Estimators that meet the regression assumptions are also consistent, and consistency is perhaps the most important of the OLS "desirable characteristics." Consistency is absolutely not an empty technical concept. Rather, it plays a central and critical role not only in science, but also in the law, because if the estimates of the regression parameters are inconsistent, the hypothesis tests are scientifically invalid and invalid as evidence, as are the *Daubert* factor-two error rates associated with those tests.

5. [§13.24] Three Regression Problems Common In Case Law

There are three problems associated with regression analysis that appear to be common in case law. The first two problems are the statistical manifestations of well-known conceptual problems, and the presence of either of them could cause the exclusion of proffered expert testimony if they are too severe. The first is model misspecification. A model is said to be "misspecified" if the true relationship between the two variables of interest is given by one equation, but the researcher models the relationship as excluding some of the important variables. Kmenta, *ELEMENTS OF ECONOMETRICS* 442–455 (McMillan Pub. Co. 1971) (discussing model specification and econometric tests to determine if a model is misspecified). See also Judge, Hill, Griffiths, Lütkepohl & Lee, *INTRODUCTION TO THE THEORY AND PRACTICE OF*

ECONOMETRICS 405–441 (John Wiley & Sons 2d ed. 1988) (providing an overview of regression model specification tests). For example, an analyst has modeled termination rates as depending on age, when those termination rates could depend on computer skill. Regression estimates from such a misspecified model are considered scientifically unreliable. This is an important consideration in a range of courtroom situations and comes into play in the securities cases discussed in §§13.29–13.32, the antitrust cases discussed in §§13.33–13.40, and the employment discrimination cases discussed in §§13.41–13.43. See *Sheehan v. Daily Racing Form, Inc.*, 104 F.3d 940 (7th Cir. 1997) (discussion of specification error); *Estate of Hill v. ConAgra Poultry Co.*, 1997 WL 538887 (N.D. Ga. 1997) (discussion of regression specification error).

A second problem is called “errors in the variables.” This is the term that statisticians give to the problem of attempting to estimate a relationship using data that is measured with error. Kmenta, *supra*. If a variable is measured with error, the resulting estimators are inconsistent, and the hypothesis tests seem not to meet the *Daubert* standards because no error rate calculations can be carried out. Thus, the technique has not been peer reviewed with approval and is not generally accepted. When this type of error is present, there is technically still a test, but the test is known to be incorrect in its execution and likely incorrect in its conclusion. Lest this be dismissed as a statistical technicality, consider a simple example. A nurse takes the temperature of a patient immediately after the patient has consumed a cup of hot coffee. The thermometer registers 106 degrees. The nurse cannot correctly reject the hypothesis that the patient has a normal temperature, because the patient’s body temperature has been measured with error.

The final problem is “heteroskedasticity.” This is another failure of the regression assumptions — in particular, the failure of the residuals to have a constant variance through time. This is a problem that perhaps most often manifests in the event study method discussed in §§13.25–13.32. Heteroskedasticity does not cause inconsistency but does present its own set of problems that may keep heteroskedastic regression from meeting *Daubert*’s criteria for assessing the reliability of expert testimony. See *Estate of Hill* for a discussion of heteroskedasticity.

To the extent that the OLS estimates are best, linear, and unbiased (BLUE) and consistent, hypothesis tests done with them should meet the *Daubert* standards. Hypothesis tests done with parameters estimated by misspecified models or with inaccurately measured data seem to fail the *Daubert* standards, and, at a minimum, they seem to fail the testing, error rate, and general acceptance criteria. It cannot be overemphasized that hypothesis tests that fail the *Daubert* standard should be excluded from being introduced into evidence not simply because they fail to meet a technicality that the Supreme Court has imposed. Such hypothesis tests should be excluded from evidence because they are wrong.

The discussion below applies the concepts articulated in this chapter to an investigation of the admissibility of expert testimony techniques that scientists, economists, and statisticians use in a range of litigation settings. The first of these will be economics testimony as to damages suffered by a plaintiff in a 17 C.F.R. §240.10b-5 (Rule 10b-5) matter.

E. Expert Testimony In Securities Litigation

1. [§13.25] Introduction

The use of regression in securities litigation is most conspicuous in calculating damages done to stockholders by allegedly inappropriate corporate conduct. The law regarding damages in securities fraud requires that experts calculate damages by the use of a highly intuitive regression technique known as an “event study.” See Romano, *THE GENIUS OF AMERICAN CORPORATE LAW 17* (AEI Press 1993), in which the author explained that event study techniques

examine whether particular information events . . . significantly affect the firm's stock price (technically, they examine whether the average residuals of a regression of observed stock prices on predicted prices are statistically different from zero). If an information event . . . is considered beneficial for shareholders then stock prices will rise significantly above their expected value on the public announcement of the event. If the event is perceived as detrimental to shareholder wealth, then stock prices will significantly decline. Given the regression methodology, such stock price effects are referred to as average residuals or abnormal returns.

In short, event studies are used to measure the impact on a company's market value of the release into the market of some significant news about the company.

The statistical concepts developed here generalize immediately to areas of antitrust, employment discrimination, and an array of other practice areas that rely on statistical evidence and proof.

2. Event Studies

a. [§13.26] *In Re Oracle Securities Litigation*

In an opinion that came down six weeks after *Daubert* but does not cite it, the Northern District of California generally disparaged the proffer of a damage estimate that was calculated using a "value line" approach and opined that the "[u]se of an event study or similar analysis is necessary more accurately to isolate" damages. *In re Oracle Securities Litigation*, 829 F.Supp. 1176, 1181 (N.D. Cal. 1993). The court went on to state that, because of the expert's "failure to employ such a study," the expert's results could not be "evaluated by standard measures of statistical significance," thus making his results unreliable. *Id.*

Event studies are widely used by economists in nonlitigation settings to investigate the impact of the release of new information on the price of a stock that is actively traded in an efficient market. A properly executed event study apparently meets all of the *Daubert* criteria. Studies based on the technique have been peer reviewed and published hundreds of times, and the technique is generally accepted in the relevant scientific community. There are well-established standards that govern its use, and these standards point to proper hypothesis tests and the error rates of those tests as the proper instruments of investigation. Event studies use regression analysis, and because the reliability of regression analysis rests on several assumptions, when those assumptions can be shown to be violated, the admissibility of the event study is put into doubt. Because regression is susceptible to successful challenge, when confronted with the proffer of event study damages, the prudent attorney may wish to inquire whether the regression assumptions discussed in this chapter have been met.

Numerous examples exist of the use of an event study in a range of securities fraud matters whose fact patterns are strikingly similar to that of *In re Oracle Securities Litigation*. Many companies have experienced allegations of irregularities in their financial statements. The companies' stocks fell sharply following the release of this information, and ensuing lawsuits alleged that a class of each corporation's stockholders was damaged by purchasing stock the price of which was inflated by the alleged irregularities. As such litigation proceeds, economists will likely estimate the damages that were alleged to have been suffered by this class of stockholders and will probably use an event study for this purpose. This makes event study methods and cases worthy of careful consideration.

b. [§13.27] Event Study Cases

The court in *In re Executive Telecard, Ltd. Securities Litigation*, 979 F.Supp. 1021 (S.D. N.Y. 1997), cited the earlier case of *In re Oracle Securities Litigation*, 829 F.Supp. 1176 (N.D. Cal. 1993), for

the proposition that an event study is required to distinguish between fraud-related and non-fraud-related influences on the company's stock price; it also excluded expert testimony that failed to adequately account for non-fraud-related bad news. (The failure to account for non-fraud-related bad news is a form of the model specification problem discussed in §13.24.) *In re Executive Telecard, Ltd.* contains several interesting types of analysis that defy easy description. The court recounted *Daubert's* basics and stated that "valuation of damages in a securities class action such as this does not appear to be the sort of 'hard science' that requires application of the specific factors set forth in *Daubert*." *In re Executive Telecard, Ltd.*, 979 F.Supp. at 1024. The court instead required that "an expert's opinion should at least 'have a reliable basis in the knowledge and experience' of the particular 'discipline' involved." *Id.*, quoting *Daubert*, 509 U.S. at 592. The district court raised several interesting issues. First, *Daubert* proposed the specific factors as suggestions for proceeding with a flexible inquiry, so none of them have ever been "required," as is underscored by *Kumho Tire Co.* Second, it is notable that *Daubert* made no distinction between "hard" and "not-hard" sciences, relying instead on the scientific method to define science and the various disciplines to establish by the use (or nonuse) of the scientific method in their nonlitigation research whether they are scientific or nonscientific disciplines. Third, other courts have come to precisely the opposite conclusion expressed in *In re Executive Telecard, Ltd.* on whether regression-based expert testimony falls under *Daubert's* purview. In particular, see *In re Polypropylene Carpet Antitrust Litigation*, 996 F.Supp. 18, 26 (N.D. Ga. 1997) ("multiple regression analysis is a scientific endeavor whose admissibility . . . must be determined using the test set forth in *Daubert*"), and the prodding of the Eleventh Circuit in *City of Tuscaloosa v. Harcros Chemicals, Inc.*, 158 F.3d 548 (11th Cir. 1999), that the district court should have held a *Daubert* hearing to decide issues of admissibility of proffered expert testimony because it would have avoided subsequent problems. *City of Tuscaloosa* is a complex ruling that is discussed further in §13.39. In *Rebel Oil Co. v. Atlantic Richfield Co.*, 146 F.3d 1088 (9th Cir. 1998), 171 A.L.R.Fed. 783, the court discussed with approval the lower court's *Daubert*-based admissibility decision on expert economics testimony in a petroleum antitrust case.

When regression-based testimony is being evaluated and the discipline involved is economics, requiring that "an expert's opinion should at least 'have a reliable basis in the knowledge and experience' of the particular 'discipline' involved," it is tantamount to requiring precisely that the testimony be evaluated using *Daubert's* factors. *In re Executive Telecard, Ltd. Securities Litigations*, 979 F.Supp. at 1024, quoting *Daubert*. See §13.10. This is a theme repeated in §13.58 regarding expert testimony in Florida state courts.

RMED International, Inc. v. Sloan's Supermarkets, Inc., 2000 WL 310352 (S.D. N.Y. 2000), *aff'd* 2000 WL 420548, applied these notions in a telling way. The defense had challenged the plaintiff's damages expert, citing *In re Executive Telecard, Ltd.* and alleging that the expert's methodology was "unreliable because she did not employ formal statistical methods — and regression analysis in particular — to isolate and exclude from her damages calculation the portion of the inflation in Sloan's stock price attributable to company-specific factors unrelated to the alleged fraud." *RMED International, Inc.*, 2000 WL 310352 at *5. However, in that case, there was insufficient data for the expert to execute the standard statistical and regression analysis, and the court excused the expert from those requirements on that basis.

Here, the expert was presented with a number of legitimate limitations that hindered her ability to estimate plaintiffs' damages using statistical methods, and it appears that the methodologies she chose, taken together, were a reasonable and generally accepted alternative. Most significantly, Sloan's life as an operating company and the alleged fraud began at approximately the same time. . . . Accordingly, there did not exist a meaningful price history for Sloan's stock that Preston could designate as the control or "clean" period from which to estimate its true value using statistical analysis. In order to control for market and industry factors using a regression analysis, or to perform a statistical event study, Preston would have to have known the relationship of Sloan's stock price to the market

(the “company-market relation”) and to the industry (the “company-industry relation”) before the alleged fraud. . . . This would have required the availability of Sloan’s price history prior to the alleged fraud for a period of sufficient length to produce statistically significant estimates of Sloan’s company-market and company-industry relationships. Such data would have produced “betas” or coefficients which could be plugged into a mathematical formula and multiplied by the actual market and industry returns during the fraud period to calculate the portion of Sloan’s stock movement attributable to market and industry factors.

Id. at *7. The court admitted Preston’s testimony, reasoning:

Absent a control period, Preston was limited in her ability to perform a statistical event study, and thereby unable to isolate with mathematical certainty the effect of company-specific, market, or industry factors on Sloan’s stock price. Such limitations are contemplated by the academic sources cited by both plaintiffs and defendants, and require alternative methodologies such as the ones Preston employed.

Id.

That Preston’s damages estimate cannot be measured with mathematical precision because she did not employ statistical methods is an insufficient basis to exclude her proposed testimony, particularly in light of the absence of data from a control period.

Id. at *10.

Thus, while *Oracle* and *Executive Telecard* say the expert must do an event study, *RMED*, which involved another securities litigation issue for which an event study was appropriate but lacked sufficient data, allowed other, less formal techniques to substitute for the formal event study analysis, and the expert’s testimony was admitted. *RMED* will surely be cited for the proposition that an event study is not necessary to make a securities damages expert’s opinion admissible, but it seems to stand for the more narrowly drawn and well-reasoned notion that, when the data necessary to such an undertaking is absolutely unavailable, conceptual analogues to the event study can stand in its stead.

For example, citing *RMED*, the court in *In re Imperial Credit Industries, Inc. Securities Litigation*, 252 F.Supp.2d 1005, 1014, *aff’d* 145 F.App’x 218 (C.D. Cal. 2003), excluded plaintiff’s damages expert for failing to do an event study, reasoning that:

Plaintiffs’ expert report on damages, the Marek Report, is deficient for failure to provide an “event study” or similar analysis. An event study is a statistical regression analysis that examines the effect of an event on a dependent variable, such as a corporation’s stock price. *RMED International, Inc. v. Sloan’s Supermarkets, Inc.*, 2000 WL 310352, *6 (S.D.N.Y. 2000) (citing Koslow, *Estimating Aggregate Damages in Class Action Litigation under Rule 10B*, 59 Fordham L. Rev. 811, 822 & n. 50 (1991)). The event study method is “an accepted method for the evaluation of materiality damages to a class of stockholders in a defendant corporation.” *In re Gaming Lottery Sec. _____*, 2000 WL 193125, *1 (S.D. N.Y. 2000).

The court also stated:

Damages in a securities fraud case are measured by the difference between the price at which a stock sold and the price at which the stock would have sold absent the alleged misrepresentations or omissions. . . . A proper measure of damages in the securities context

thus requires elimination of that portion of the price decline or price difference which is unrelated to the alleged wrong.

Id. at 1014–1015. The court further observed:

Because of the need “to distinguish between the fraud-related and non-fraud related influences of the stock’s price behavior” . . . a number of courts have rejected or refused to admit into evidence damages reports or testimony by damages experts in securities cases which fail to include event studies or something similar. See, e.g., *In re Northern Telecom Ltd. Sec. Litig.*, 116 F.Supp.2d 446, 460 (S.D.N.Y. 2000) (“Torkelson’s testimony is fatally deficient in that he did not perform an event study or similar analysis to remove the effects on stock price of market and industry information and he did not challenge the event study performed by defendants’ expert.”); *Executive Telecard*, 979 F.Supp. at 1024-26 (finding an expert’s methodology not reliable because he failed to conduct an event study or regression analysis to detect whether stock price declines were the result of forces other than the alleged fraud; applying *Daubert* . . . to exclude the expert damages report); *Oracle*, 829 F.Supp. at 1181 (“Use of an event study or similar analysis is necessary more accurately to isolate the influences of information specific to Oracle which defendant[s] allegedly have distorted. . . . As a result of his failure to employ such a study, the results reached by [plaintiffs’ expert] cannot be evaluated by standard measures of statistical significance.”)

Id. at 1015. The bottom line for the court was that, “absent an event study or similar analysis, Plaintiffs cannot eliminate that portion of the price decline of ICII’s and/or SPFC’s stock which is unrelated to the alleged wrong.” *Id.* at 1016. The court excluded the plaintiff’s expert “pursuant to *Daubert* and Federal Rule of Evidence 702, on the ground that its methodology [was] flawed,” thus the court could not conclude that the expert’s report “rest[ed] on a ‘reliable basis in the knowledge and experience of [its] discipline.’” *Id.*, quoting *Daubert*, 509 U.S. at 592.

In *In re Cendant Corp. Securities Litigation*, 109 F.Supp.2d 235, *aff’d* 264 F.3d 201 (D. N.J. 2000), the court undertook an extended articulation of the legal and economic issues surrounding the calculation of damages in 10b-5 type securities litigation. This case is interesting for several reasons, one of which is the survey of the pertinent law and econometrics that its final quarter constitutes. This survey is interesting both because of the detail in which it is provided and because the case was lawyered by a who’s who of law firms, some of whose briefs are available to the industrious on PACER (Public Access to Court Electronic Records) at www.pacer.gov.

In *In re Cendant*, the defendants challenged the methodology of the plaintiffs’ expert. The plaintiffs responded that the event study methodology their expert

used to calculate shareholder damages during the class period “has been used by financial economists since 1969 as a tool to measure the effect on market prices from all types of new information relevant to a company’s equity valuation.” . . . It is so accepted, plaintiffs add, that courts now reject expert damage estimates which do not use event study methodology to evaluate the impact on the market of a company’s disclosures: “Use of an event study or similar analysis is necessary more accurately to isolate the influences of information specific to Oracle which defendants allegedly have distorted. [. . .]As a result of his failure to employ such a study, the results reached by [the expert] cannot be evaluated by standard measures of statistical significance.” *In re Oracle Securities Litig.*, 829 F.Supp. 1176, 1181 (N.D.Cal.1993).

In re Cendant, 109 F.Supp.2d at 253–254. The plaintiffs argued that a similar plan of allocation had been praised by Judge Walker in *In re California Micro Devices Securities Litigation*, 965 F.Supp. 1327, 1332 (N.D. Cal. 1997), as “by far the most thorough, sophisticated and well substantiated” plan he had seen in a securities class action. This plan is analogous to the analysis contained in §§13.25–13.26 and is an excellent example of its application. The *Cendant* court analyzed the damages calculation methodology carefully:

Plaintiffs’ expert . . . uses event study methodology to calculate the losses suffered by shareholders and allocate damages. This study attempts to calculate out-of-pocket damages suffered by shareholders due to Cendant’s fraudulent accounting practices. Out-of-pocket damages for shares bought during the class period and held until the end of the period are defined as “the price paid for a security minus the ‘true value’ of the security on the date of purchase—i.e., the value absent the [artificial] inflation caused by claimed misrepresentations or omissions.” . . . For shares bought during the class period and sold before its end, the damages “generally equal the artificial inflation at purchase minus the artificial inflation at sale.” . . . A summary of the methodology is as follows:

First, an event study is prepared. This measures the day-to-day changes of share price and isolates times when the disclosure of information is accompanied by a stock price return outside the stock’s normal volatility . . . (a “return” is a day-to-day change in share price illustrated as a percentage). This is done by estimating an appropriate market model to measure returns — here the S & P 500 Index was used. . . . Dorkey [plaintiff’s expert] then examined the stock’s volatility on the following dates in 1998: April 16–20th, to measure the impact of the April 15, 1998 disclosure; July 13–14th, for the preliminary announcement of the results of the WF & G/AA Report on July 14th; and August 27–31, for the release which detailed the report and stated that Cendant’s income was artificially increased by \$500 million. . . . Trading volume and price changes on these dates exceeded “normal” volume and returns under the market model. For the first event dates, the *statistically significant* total excess return is -33.65%; the second, -29.67%; and the last, -9.10%. [Emphasis added] Also considered were other news items disseminated to the market between April 15th and August 31st; other shifts in returns in this time span “were likely to have been caused by the highly volatile market prices of Cendant common stock . . . rather than fraud.”

Second, a value line is constructed which represents the “true value” of Cendant stock (price absent fraud). Two basic steps are involved: (1) estimate the maximum artificial inflation in the market price of CUC or Cendant common stock, expressed as a percentage of closing market price as of April 15, 1998; and (2) apportion that maximum inflation among the twelve reporting periods between May 31, 1995 and April 15, 1998 when inflated earnings were released Dorkey states that he used the method found in Bradford Cornell & R. Gregory Morgan, *Using Finance Theory to Measure Damages in Fraud on the Market Cases*, 37 U.C.L.A. L.Rev. 883 (1990) (hereinafter “Cornell & Morgan”) to set the value line. This method assumes that “the [trading] price and [true] value of the security move in tandem except on days when fraud-related information is disclosed.” *Id.* at 886. Here, there are 8 days where the movement of the security cannot be correlated to actual trading results.

Following Cornell & Morgan, Dorkey “constructed returns” to chart the day-to-day changes of Cendant’s price; constructed returns equal actual returns except for the eight days targeted by the event study. For these 8 days, returns are predicted under the market model. Cornell & Morgan at 899.

The series of constructed returns are then used to create the value line. The end of the class period is assumed as the point at which, if plotted on a graph, the market price and the true value of the stock converge — there is no more artificial inflation. On August 31, 1998, Cendant closed at \$11.63. Working backward, the artificial inflation rates are then calculated for the period covered by the correcting disclosures. The true value for August 28th is determined by dividing the value on August 31st (\$11.63) by [1 + the predicted return on August 31st (under the market model, -6.8%)]. This yields a true value of \$12.47. *See* Cornell & Morgan at 899 (the predicted return under the market model is used for this date because it is one of the 8 days altered by disclosure of fraud). This calculation is repeated for each trading day to determine the true value line through April 15, 1998, the date of the first disclosure of fraud. On that date, the true value of Cendant stock is calculated to be \$14.92, 58.1% of the actual closing price on that date. This date, April 15, 1998, yields the *maximum percentage of artificial inflation*.

Third, the maximum artificial inflation is allocated over the class period. Dorkey relies on the premise that the maximum level of inflation did not remain constant over the class period but gradually increased in the three years over which fraudulent earnings statements were released. Dorkey explains that throughout the class period, the fraudulent releases generally met market earnings expectations, creating a stock price that gradually appreciated with the market model. . . . The rate of artificial increase over the class period links the percentage of artificial inflation over the class period (increasing to the maximum percentage of 58.1%) to the actual amount by which each earnings release was overstated over the three year period. This is called the “Ross” approach, developed by David L. Ross of Lexecon, Inc. . . . (“The Ross approach is generally characterized as allocating the maximum artificial inflation in direct proportion to the total cumulative amount of earnings overstatement”); *see also In re California Micro Devices Securities Litig.*, 965 F.Supp. 1327, 1332–33 (N.D.Cal. 1997) (approving settlement with Plan of Allocation developed by Ross).

To illustrate, for the quarter ending April 30, 1995, the percentage of the maximum inflation allocated is equal to a fraction of: the amount of earnings per share disclosed as overstated for that quarter, or \$.04 per share, over the total overstatement of earnings per share of \$.61. For the second quarter of 1995, the fraction is expressed as \$.08 (the cumulative amount of overstatement for the first and second quarters) over \$.61.

* * *

Fourth, aggregate damages for the class are calculated. To arrive at the total damages, artificial inflation is “applied” to all shares acquired during the class period that were held until at least April 15, 1998, the date of the first corrective disclosure. . . . Dorkey did not allocate *any* damage to those who sold before this date because the shares were still artificially inflated at sale, in fact more so than at purchase under Dorkey’s methodology. It is impossible to determine the date on which each and every share was purchased or sold, thus Dorkey used a trading model to simulate actual trading. . . . (citing Dean Furbush & Jeffrey Smith, *Estimating the Number of Damaged Shares in Securities Fraud Litigation: An Introduction to Stock Trading Models*, Bus. Lawyer (Feb.1994)). The model identifies the fraction of each day’s volume that represents shares likely purchased and held through April 15th. The model assumes that each share purchased during the class period is more likely to have been traded than the other outstanding shares (the float). . . . Using his model, Dorkey estimated that 488.5 million shares were purchased and held beyond the class period

and 617.9 million were purchased but sold before the end of the class period. Based on Dorkey's calculation of the total amount of shares traded in the class period, he finds aggregate damage of \$8.8 billion.

In re Cendant, 109 F.Supp.2d at 264–266. The court rejected the defendant's *Daubert* motion and admitted the testimony of the plaintiff's expert. This is analogous to the analysis contained in §§13.25–13.26 of this chapter. The entire final quarter of *In re Cendant* is worth careful analysis by anyone with an interest in this type of litigation.

Daubert played a key role in litigation issuing from the WorldCom financial restatement fraud scandals. A series of opinions styled *In re WorldCom, Inc. Securities Litigation* relate to the dimensions of the expert testimony. In *In re WorldCom, Inc. Securities Litigation*, 2005 WL 375313 and 2005 WL 375314 (S.D. N.Y. 2005), the court rejected the defendant's motion to preclude evidence of aggregate damages and to require that damages for each class member be determined on an individual basis through a post-trial claims process. In particular, in *In re WorldCom, Inc. Securities Litigation*, 2005 WL 375313, *4, the defendant moved to preclude evidence of aggregate damages, challenging, inter alia, plaintiff's expert's "use of a 'proportional trading' model to calculate shareholder damages." The court denied the motion, noting that this "model has survived repeated *Daubert* challenges in other cases." *Id.*

One additional issue raised in *WorldCom* has to do with a proponent's strategy of disguising an expert witness as a fact witness to escape the rigorous demands of the *Daubert* progeny. Fed.R.Evid. 701, which concerns the admissibility of lay testimony, read as follows at the time of the *Worldcom* decision (and still reads substantially the same):

If the witness is not testifying as an expert, the witness' testimony in the form of opinions or inferences is limited to those opinions or inferences which are (a) rationally based on the perception of the witness, (b) helpful to a clear understanding of the witness' testimony or the determination of a fact in issue, and (c) not based on scientific, technical, or other specialized knowledge within the scope of Rule 702.

The *WorldCom* court cited the notes of the Advisory Committee on Rule 701 for the proposition that the 2000 amendments were

aimed at two goals: "eliminating the risk that the reliability requirements set forth in Rule 702 will be evaded through the simple expedient of proffering an expert in lay witness clothing" and "ensur[ing] that a party will not evade the expert witness disclosure requirements set forth in Fed.R.Civ.P. 26 . . . by simply calling an expert witness in the guise of a layperson." . . . According to the Advisory Committee, what separates expert and lay testimony is that "lay testimony results from a process of reasoning familiar in everyday life," whereas "expert testimony results from a process of reasoning which can be mastered only by specialists in the field."

In re WorldCom, Inc. Securities Litigation, 2005 WL 675601, *2 (S.D. N.Y. 2005).

c. [§13.28] Economics Of Event Studies

Event study logic flows from economists' belief that the current value of a security is equal to the present value of all of the payments that the security is expected to make to its owners throughout its life. An immediate implication of this is the belief that the value of the security changes when new information is released into the market that changes the market's assessment of the future payments that the security will make to its holders. When information comes into the market that is hypothesized to affect the value

of a particular stock, economists test that hypothesis by comparing how that particular stock performed right after the release of the information to how the stock would have been expected to perform in the absence of the release of the new information.

To see how information changes securities prices, one should start with a day when no information is released into the marketplace that alters the market's perception of the value of any stock: no Federal Reserve announcements made of actual or potential interest rate movements; no big contracts awarded; no lawsuits filed, won, or lost; no new inventions or patents introduced. On such a day, every publicly traded stock would close essentially where it had opened. Now, one should imagine a similar day when only one piece of new information is released into the market and that this information affects the value of only one stock. If the news is good, the price of that one stock will rise, but, assuming that the information has no secondary effects on any other stock and that the stock is not part of the Dow Jones Industrial average, the Dow will not move. It is then possible to calculate the impact of the newly released information on the value of a share of the stock. If the stock opens at \$100 and closes at \$103 while no other stock moves, economists would say that the information raised the value of the stock by three dollars.

Of course, such no-news days do not exist, so estimating the impact of the release of new information on the value of a stock is a little more complicated. But it still involves comparing the return on the particular stock with the return to an index of stocks that have not been affected by the information. For example, if the day's news, including some news about Stock A, caused the market to rise by 4%, while causing Stock A to rise by 3%, the economist would conclude that the news about Stock A was not good, because, on that news, the value of Stock A fell by 1% relative to the market.

The event study technique ascribes this change in the stock's value to the event that the information disclosed. In the case of the corporations mentioned in §13.26, this information is the release of allegations that reported sales figures were inflated. Because the event study is the financial economist's standard technique for determining the impact of mergers, dividend and earnings announcements, management changes, and a host of other phenomena on the value of the subject firm's stock, it has well-established nonlitigation uses. The heart of the technique is a test of the null hypothesis (see §13.31) that the information had no impact on the price of the stock. The economist will reject this null hypothesis if and only if the hypothesis test yields both an estimate of the change in the stock's value that is nonzero and an error rate of the test that convinces the economist that sampling error has not caused the nonzero estimate of the change in the stock's value. This technique meets all of the *Daubert* criteria: it poses and tests a hypothesis, reports the pertinent error rates, and is based on peer-reviewed and published techniques that are so pervasively used within the relevant scientific community that they are the generally accepted tool for evaluating the impact of the release of new information on the value of a publicly traded security.

3. Econometrics Of Event Studies: Applied Regression Analysis

a. [§13.29] In General

To determine how much a security's price moves as new information about an event that affects the security enters the market, one need only compare the return on the security over the time that the market receives the news, called the observed return, to the return on the security that would be expected during that time period in the absence of any news, called the expected return. See, *e.g.*, Brown & Warner, *Measuring Security Price Performance*, 8 J.Fin.Econ. 205 (Sept. 1980) (developing event study technique); see also Brown & Warner, *Using Daily Stock Returns: The Case of Event Studies*, 14 J.Fin.Econ. 3 (March 1985) (continuing development of event study technique).

The period during which the news is thought to affect the security's return is called the "event

window.” Researchers typically use an event window that begins just before the news is publicly announced to capture the price effects that are associated with pre-announcement information leakage. An event window of one day before the announcement to one day after the announcement is a very popular choice among financial economists, but the event window specified tends to vary. See Black, *Bidder Overpayment in Takeovers*, 41 Stan.L.Rev. 597, 602 (1989) (collecting event study results for “narrow (one to four day) ‘window’ periods”). For example, if a security is thinly traded, it may take longer for information to be fully incorporated, requiring a longer event window. The longer the event window, the more certain is the analyst that the full effect of the announcement has been measured. However, the longer the event window, the more likely it is that other value-affecting information will enter the market during the event window, with the undesirable result that the analyst’s estimates of the impact of the news of the event under consideration will actually reflect the impact of more than one event on the security. Thus, one choice of the expert witnesses that can immediately be seen as suspect is that of extending the event window to cover the entire class period. See Beaver & Malernee, ESTIMATING DAMAGES IN SECURITIES FRAUD CASES (Cornerstone Research 1990) (detailing procedure like event study but not in event study terminology). See also Alexander, *The Value of Bad News in Securities Class Actions*, 41 U.C.L.A.L.Rev. 1421 (1994) (providing example of rough version of such approach). This technique attributes all new information released on the security over the entire class period to the “news” that has come into the market. In a securities fraud matter, the “news” in the event study will be news of the fraud, and the entire movement of the security’s price during the event window will be attributed to the fraud. This is an especially attractive technique for plaintiffs’ experts in cases in which the value of the security has fallen dramatically during the class period for reasons unrelated to the fraud, because such decrements to value increase the resulting damage estimates. This can be made to sound reasonable, even benign. It is not.

b. [§13.30] Abnormal Return

The abnormal return for a day is the actual return for that day minus the return predicted for that day. Once the size of the abnormal return has been estimated for each day in the event window, the daily abnormal returns can be summed to find the cumulative abnormal return, or CAR, which is a measure of the impact of the event on the security’s return. Hypothesis testing is used to test the statistical significance of the CAR to determine the probability that a CAR of that particular size had occurred due to random chance rather than in response to the incorporation of new information.

c. [§13.31] Hypothesis Tests And Statistical Significance Of Estimates

Hypothesis testing is the process of deriving a proposition (or hypothesis) about an observable group of events from accepted scientific principles, then investigating whether, on observation of data regarding that group of events, the hypothesis seems true. It is hypothesis testing that distinguishes the scientific method of inquiry from nonscientific methods, and the scientific method of inquiry is required for the resulting inferences to be the basis of admissible expert testimony.

In the basic model of hypothesis testing, scientists pose hypotheses in pairs. The hypothesis that is actually tested is called the “null hypothesis,” and it alleges that there is “no difference” between populations or “no effect” of some treatment or event. A null hypothesis might say that there is no difference among the probabilities of a certain number coming up on a die or that there is no effect of a merger announcement on the value of a firm’s common stock. The “alternate hypothesis” is that there is a difference in the die-face probabilities or that the announcement of a merger does affect the price of the acquired firm’s stock. One tests the null hypothesis (often called just “the null”) and either rejects it at a certain level of confidence or fails to reject it. Although there is no scientific means for accepting a null or alternate hypothesis, if one tests the null and fails to reject it, one says that there is no effect or, speaking more carefully, that the attempt to reject the null failed. If one rejects the null hypothesis, one is left only with the alternate hypothesis, and, again, while

no mechanism exists for accepting either hypothesis, a rejection of the null constitutes strong evidence that the alternate hypothesis is true. See Kmenta, *ELEMENTS OF ECONOMETRICS* 110–114 (McMillan Pub. Co. 1971).

As a simple example of hypothesis testing, looking at a single six-sided die might lead one to the proposition (or hypothesis) that each of the six numbers is equally likely to be rolled on each roll of the die. This hypothesis is tested scientifically by proposing the “null hypothesis” that each number is equally likely to land face up, and then rolling the die, *e.g.*, 600 times, and recording the number of times that each number is actually found face up. If an appropriate statistical test is used, and if each number occurred about 100 times, the statistical test will be unable to reject the null hypothesis of equal probabilities, and the scientist will be left with the likelihood that the die is fair. However, if the number ‘3’ occurs a disproportionate number of times, say 200 times out of 600 rolls, the statistical test will be likely to reject the null hypothesis of equal probabilities and the scientist will interpret this as evidence that the die is loaded, thus rejecting the null hypothesis.

In actual research, the null hypothesis is denoted “ H_0 ”, so named because it hypothesizes no effect, and an alternative hypothesis is denoted “ H_1 ”. This pair of hypotheses is written by economists and other scientists as:

$$H_0: \text{CAR} = 0$$

$$H_1: \text{CAR} \neq 0.$$

This two-line expression is read as “the null hypothesis is that the cumulative abnormal return of the subject security during the event window is zero, so the event did not affect the return on the security. The alternate hypothesis is that the cumulative abnormal return on the subject security during the event window differs from zero, so the event did affect the return on the security.”

Economists say that the null hypothesis is rejected “at the 5% level” if the absolute value of the CAR is more than about double its standard deviation. The use of 5% is intended to mean that only 1/20 of the time would a CAR that large be observed if it were being measured over an event window that did not include an event that had truly affected the security’s return.

Conducting the hypothesis test that the Supreme Court describes in *Daubert* is mathematically equivalent to constructing the confidence intervals that other courts have used. See *Berry v. CSX Transportation, Inc.*, 709 So.2d 552 (Fla. 1st DCA 1998); *Turpin v. Merrell Dow Pharmaceuticals, Inc.*, 959 F.2d 1349 (6th Cir. 1992). The use of a confidence interval often makes the discussion of the statistical significance of an event more intuitive than the hypothesis testing technique can. The “5% confidence interval” is written as:

$$[\text{CAR} - (2 \times \text{standard deviation}), \text{CAR} + (2 \times \text{standard deviation})].$$

If the estimated CAR is 0.02 and the standard deviation is 0.007, the confidence interval is

$$[0.02 - (2 \times 0.007), 0.02 + (2 \times 0.007)], \text{ which is } [0.006, 0.0314].$$

In other words, for the data that generated this CAR and standard deviation, the scientist is 95% certain that the CAR is above 0.006 and below 0.0314. So in this case, the scientist is 95% confident that the CAR of 0.02 is statistically significant, which means that the scientist is 95% sure that the true abnormal return was not zero, and 95% sure that, in this case, the event contained in the event window increased the price of the security. On the other hand, if one considers the same example, but changes the assumed standard deviation

from 0.007 to 0.011, the 5% confidence interval would be [-0.002, 0.042]. This says that one is 95% confident that the true CAR is between -0.002 and 0.042. Because this interval contains zero, one can no longer say that the event contained in the event window increased the price of the security and be sure that he or she is right 95% of the time. Many scientists believe that the 95% confidence level is the “correct” confidence level to use and stop there. Others feel that there is nothing sacred about 95% confidence and would proceed to calculate the 90% confidence interval, which is:

[0.02 - 1.64 x 0.011, 0.02 + 1.64 x 0.011], or [0.00196, 0.03804],

which does not contain zero. So in this case the null hypothesis can be rejected at the 90% level, even though the null cannot be rejected at the 95% level.

d. [§13.32] Summary

Daubert, 509 U.S. at 593, articulates five criteria for the admissibility of scientific expert testimony but points out that “[m]any factors will bear on the inquiry [of what is scientific knowledge], and we do not presume to set out a definitive checklist or test.” Science does presume, however, and science’s checklist has so informed *Daubert* that it is difficult to imagine much flexibility in applying *Daubert*’s factors to scientific testimony that would not offend science. This has not, however, kept the courts from misapplying *Daubert* or the scientific principles that it articulates.

The important role of *Daubert* in securities class actions is discussed in §§13.49–13.55.

F. Regression-Based Antitrust Expert Testimony

1. [§13.33] Introduction

There is a long and well-established history of regression-based expert testimony in antitrust cases. Regression and hypothesis testing are applied to determine whether an antitrust violation has taken place and to calculate antitrust damages when a violation has been established. This analysis is often based on comparing actual prices to the “but for” price that would have existed in the absence of a violation. See §§13.31, 13.35. Regression is used to calculate damages (1) from antitrust violations alleged to have caused a plaintiff to overpay for a product, such as *In re Chicken Antitrust Litigation*, 560 F.Supp. 963 (N.D. Ga. 1980); (2) from exclusionary practices, such as *Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, 472 U.S. 585, 105 S.Ct. 2847, 86 L.Ed.2d 467 (1985); and (3) from Robinson-Patman violations, *Alan’s of Atlanta, Inc. v. Minolta Corp.*, 903 F.2d 1414 (11th Cir. 1990). See PROVING ANTITRUST DAMAGES: LEGAL AND ECONOMIC ISSUES (ABA Section of Antitrust Law 1996). The important role of *Daubert* in antitrust class actions is discussed in §§13.49–13.55.

Antitrust presents an interesting scenario for analyzing the admissibility of expert testimony. Because so many of the cases are pre-*Daubert*, the opinions on the governing law are of limited interest. The testimony is, however, of great interest because there is a wealth of pre-*Daubert* expert testimony that was done in accordance with the standards that economists apply to their nonlitigation work. This testimony typically meets the *Daubert* criteria because the *Daubert* criteria are based on scientific principles that had governed economics research for decades when they first informed the law through their incorporation into *Daubert*. More important, there is information available about some of the pre-*Daubert* cases that illuminates *Daubert* in important ways. The insight provided in some of the older cases is important in understanding the current cases discussed in §§13.34–13.35.

2. Case Study

a. [§13.34] *In Re Ampicillin Antitrust Litigation*

Two of the testifying experts in *In re Ampicillin Antitrust Litigation*, 81 F.R.D. 395 (D. D.C. 1978), published an article that provides a much deeper look into regression-based expert testimony than that provided in the opinions. See Rubinfeld & Steiner, *Quantitative Methods in Antitrust Litigation*, 46 Law & Contemp. Probs. 69 (1983). Although it predates *Daubert* by 10 years, Rubinfeld & Steiner sounds like it is echoing *Daubert* on testing and error rates. This is because *Daubert* was informed by scientific writings, and Rubinfeld & Steiner reflects its authors' scientific training.

In *In re Ampicillin Litigation*, the plaintiffs alleged that Ampicillin prices had been propped up by illegal antitrust activity. Ampicillin prices had declined during the alleged antitrust activity, but the plaintiffs alleged that a quicker and sharper market price decline would have occurred absent the antitrust violation. This allegation implies a testable hypothesis. As Rubinfeld & Steiner state at 105:

[S]uch an issue is typical of many antitrust issues in that it poses a set of competing hypotheses to be evaluated. The plaintiffs' hypothesis was that the presence of generic houses in the market resulted in a lower price; the defendant's hypothesis was that the presence of generic houses had no effect on price. The two hypotheses are clearly mutually exclusive. . . . The choice between these hypotheses is one that can be handled in the context of classical statistics and econometrics. The null or initial hypothesis is set to be the well-defined hypothesis of no effect. This hypothesis is then tested against the alternative hypothesis that there is some effect. A null hypothesis of this type can be tested directly using a t-test within a multiple regression framework. If the null hypothesis is rejected at the appropriate level of significance, such as 1%, 5%, or 10%, the conclusion is that the data support the plaintiffs' hypothesis. However, a failure to reject the null hypothesis supports the defense.

This hypothesis test begins the *Daubert* analysis. The testing is operationalized by specifying a model, including dependent and explanatory (or independent) variables and using data to estimate the parameters (the regression coefficients and standard deviations) of the resulting model. These resulting parameters are used to test the desired hypothesis. See Rubinfeld & Steiner.

Specifying the form of the model requires setting out what variables are believed to affect the price of Ampicillin. For example, for purposes of this discussion, one can assume that the price of a bottle of Ampicillin is determined by four variables:

- Cost (COST), which represents an index of the cost of production of Ampicillin.
- Measure of Nongeneric Competition (N-COMP), which equals the number of nongeneric firms that bid on contracts.
- Time (TIME), which represents a Dummy Time Variable.
- Measure of Generic Competition (G-COMP), which equals the number of generic houses that bid on the same contracts.

An economist might then write a model that explains the determination of the price of Ampicillin as:

$$P = a + bG\text{-COMP} + c\text{COST} + dN\text{-COMP} + f\text{TIME} + e$$

where P is the price of Ampicillin; a, b, c, d, and f represent constants to be estimated by the regression; and e represents the error term. See Rubinfeld & Steiner for an explanation of the slightly more complex model actually used in the case. See also §§13.19 *et seq.* for discussion of regression residuals which are, in a non-rigorous sense, akin to estimates of the error term.

It is important to include all the variables that are likely to affect P, but the object of the exercise is to determine whether G-COMP has an impact on P, because this supports the plaintiff's contention. The impact of G-COMP on P is determined by a hypothesis test of $b=0$. See Rubinfeld & Steiner.

This is the prototype of the testing requirement articulated in *Daubert*. As in §13.69, associated with this test will be the rate of error of the test, known as the level of statistical significance.

Testing the hypothesis requires gathering relevant data, estimating the regression equation, and analyzing the resulting parameter estimates. The regression analysis will generate, for each variable, two parameter estimates. The first is called the coefficient estimate, which is the regression's estimates of the constants a, b, c, d, and f. The second will be a standard deviation for each coefficient estimate. Taken together, the coefficient estimate and the standard deviation of the coefficient estimate generate the hypothesis test discussed in *Daubert*. It is typical for economists to report such results in a table similar to TABLE 1, which is an abbreviated version of a similar table that appears in Rubinfeld & Steiner at 107.

TABLE 1				
	Table 1A		Table 1B	
Variable	Coefficient	t-Statistic	Coefficient	t-Statistic
N	0.06	0.67	0.01	0.12
C	3.45	14.03	-2.76	-2.67
C2			0.54	6.05

This table summarizes the results of hypothesis tests on all of the explanatory variables. Recall that a t-statistic of 2.0 is the rule-of-thumb cutoff for the hypothesis test to support the hypothesis that G-COMP affects P. An economist would say that Table 1A shows that the coefficient on G-COMP is not statistically significant because its t-statistic is 0.67, or that the coefficient is not differentiable from zero. In a *Daubert* hearing, the same information would be asserted as “the hypothesis test on [G-COMP] fails to show that it affected the price of Ampicillin when tested with a 5% rate of error.” On the other hand, the hypothesis that C does not affect the price of Ampicillin is rejected at an error rate of 5% because its t-statistic is above 2.0.

The other interesting thing to note about Table 1 is that it is divided into two parts. Table 1B exists because there is concern that costs may influence the price of Ampicillin in a more complicated way than is captured by the regression specification used to generate the results found in Table 1A. In particular, the concern is that production cost increases may affect price more when cost is already fairly high. As a result, the proper specification may include the square of cost as an explanatory variable. Table 1B shows results for a regression equation that includes this variable. This is an example of the model specification problem discussed in §13.24. Although the coefficients in the table change, the coefficient on N is very small and

continues to be statistically insignificant (and fails the *Daubert* factor-one test at any rate of error that is used for such tests). In this case, both specifications present evidence that the number of generic houses has no statistically significant impact on the price of Ampicillin.

b. [§13.35] *Daubert* Analysis Of Ampicillin Example

Will the Ampicillin example developed above be admissible under *Daubert*? The summary of the investigation into the impact of the presence of generic houses on the price of Ampicillin shows that the testimony has been *Daubert* tested, and the test prescribed by factor one of *Daubert* evinces that, in the relevant range and at the levels of error that economists apply to their nonlitigation work, the number of generic houses bidding on Ampicillin contracts does not affect the price at which Ampicillin is sold. So far, the testimony seems admissible.

There are two important things to note about the preceding description. The first is that this is a typical application of regression in expert testimony, and the discussion is typical of how economists review their results. Therefore, this is not just an antitrust example; it is an example of how regression analysis is applied in the scientific community and of how regression is required to be applied forensically.

The second is that the basis of economists' work is the hypothesis testing that some commentators believe cannot be widely done in the economic analysis that underlies expert testimony in antitrust litigation. Indeed, the most important point to be made about this table of coefficient estimates and t-statistics is that its purpose is to report on the testing of hypotheses of the sort that the *Daubert* court discusses and that scientifically unsophisticated commentators have dubbed as being impossible in most economics expert testimony work. See §§13.3, 13.17. Such a table of hypothesis tests is present in almost all credibly published empirical economics research, and usually the point of such a table is to show the results of the hypothesis tests that are the core of the economist's work. Hypothesis testing, far from being impossible in most situations involving economic analysis, is indeed required in most such analysis. Suggestions to the contrary are almost always ill-informed.

Antitrust price-fixing damages are measured by the difference between the prices actually paid by the plaintiff and the market price that would have obtained in the absence of the defendants' alleged conspiracy. Much of the application of regression analysis to antitrust is solving the data and econometric problems associated with estimating these but-for prices. See Finkelstein & Levenbach, *Regression Estimates of Damages in Price-Fixing Cases*, 46 Law & Contemp. Probs. 145 (1983) (illustrating this proposition in discussing regression estimation in cases including *In re Corrugated Container Antitrust Litigation*, 441 F.Supp. 921 (Jud.Pan.Mult.Lit. 1977), *In re Chicken Antitrust Litigation*, 560 F.Supp. 963 (N.D. Ga. 1980), and *Ohio Valley Electric Corp. v. General Electric Co.*, 244 F.Supp. 914 (S.D. N.Y. 1965)). Finkelstein & Levenbach is almost a companion piece to Rubinfeld & Steiner, *Quantitative Methods in Antitrust Litigation*, 46 Law & Contemp. Probs. 69 (1983), and continues its sophisticated analysis.

The analogue to what could be called "but for" returns is the event study technique of §§13.25–13.32, in which regression techniques are used to estimate what the return on a security would have been "but for" the release of fraudulent information. Although there are surely very large differences in actual practice detail, the conceptual problem is the same: to estimate the market price of the security or the product in the absence of the fraud or the antitrust activity.

3. Post-*Daubert* Expert Testimony In Eleventh Circuit

a. [§13.36] Introduction

Because virtually all credible economics so routinely utilize the kind of scientific analysis that the *Daubert* Court articulated, there is little room to argue against requiring that economics-based expert testimony be tested for reliability and admissibility by the *Daubert* factors. This is evident in the two cases described in §13.37. Both cases were decided by the same Eleventh Circuit trial judge in the same month, and they are somewhat complementary. These opinions look carefully at econometric issues such as model selection, heteroskedasticity, and other regression model assumptions that inform the trial court's reliability investigation required by *Daubert*. There is, however, a contrasting view that manifests itself in the case discussed in §13.38.

b. [§13.37] Prototype Antitrust *Daubert* Hearing

The court in *In re Polypropylene Carpet Antitrust Litigation*, 996 F.Supp. 18, 26 (N.D. Ga. 1997), held a hearing to determine whether an expert's proposed methodology would "comport with the basic principles of econometric theory," and agreed that the economist's "multiple regression analysis is a scientific endeavor whose admissibility in court proceedings must be determined using the test set forth in *Daubert*." The court analyzed the econometric model selection, including some of the possible different independent variables that could be included, then analyzed the hidden perils of trying a large number of variables in a regression and excluding the ones that do not seem to fit.

In *Estate of Hill v. ConAgra Poultry Co.*, 1997 WL 538887 (N.D. Ga. 1997), the court articulated some of the particular shortcomings that can cause regression to fail a *Daubert* test. In this case, the defendants challenged the reliability of the plaintiff's expert's testimony on the ground that it failed to satisfy the regression assumptions, which the court calls "principles." In particular, the defendants alleged that the plaintiff had failed to test whether the error term of the regression formula was independent of the included explanatory variables. This is the specification error problem of §13.24. The court investigated and determined that the defendants failed to show that the regression violated the independence assumption "to the point that the analysis fails to follow standard, acceptable econometric practices." *Estate of Hill* at *5. The court reasoned that the evidence cited by the defendants did not demonstrate the failure to test for the independence assumption but rather the failure to satisfy the constant variance assumption (what economists call the heteroskedasticity problem), which the defendants neither defined nor established must be fulfilled to perform a valid regression analysis.

A subsequent section of the court's analysis is interesting for the depth of its probing into the violation of the regression assumptions. It is somewhat lengthy, but it is this author's belief that it reflects where sophisticated courts are in their application of *Daubert* to regression-based damages:

[T]he Court believes sufficient evidence exists to support a reasonable inference that Dr. Jackson properly tested the assumptions specified in Defendants' argument . . . Dr. Jackson agrees that his model indeed contains heteroscedastic disturbances, and that he did not correct these disturbances before reaching the conclusions in his report. (Jackson Aff. ¶ 18-19.) Dr. Jackson cites two reasons for this course of action. First, Dr. Jackson states that, to compute t-statistics for formulas that are based on very large sample sizes (as is the case here), a regression analysis may use an estimate of the standard errors for its coefficients in lieu of the classic least squares estimates for these coefficients. FN9 (*Id.* at ¶ 15.) This procedure, according to Dr. Jackson, eliminates the need to correct for heteroscedasticity. (*Id.*) Second, Dr. Jackson states that, because the disturbance creating the heteroscedasticity varies systematically, the presence of the heteroscedasticity alone can

be interpreted as further support for a conclusion that Defendants manipulated the tare weights. (*Id.* ¶ 19.) In other words, the *systematic* nature of the variation suggests deliberate manipulation of the tare weights, according to Dr. Jackson. (*Id.*)

Defendants point to no evidence that contradicts Dr. Jackson's assertions. Moreover, the Court is aware of several studies that have been admitted into evidence or published in journals in spite of the presence of heteroscedasticity in regression formulas. Cf. *Denny v. Westfield State College*, 669 F.Supp. 1146, 1149 (D.Mass.1987) (although expert admitted that heteroscedasticity was present in regression study to some degree, court concluded that "presence of heteroscedasticity itself [does not] detract from the validity" of the expert's study); Roy F. Gilbert, *Estimates of Earnings Growth Rates Based on Earnings Profiles*, 4-Sum J. Legal Econ. 1, 14 n. 4 (1994) ("The results in this paper ignore the possibility of heteroscedasticity of the errors. . . . Even in the presence of the heteroscedasticity, however, least squares estimators are still consistent and unbiased.")

For these reasons, the Court concludes Defendants' evidence is insufficient to show that Dr. Jackson failed to test properly the assumptions underlying his regression analysis.

Estate of Hill, 1997 WL 538887 at *5–*6. Having dispatched the defendants' allegation that the plaintiff's regression residuals were heteroskedastic, the court turned its attention to the defendants' allegation that the plaintiff's regression did not include certain significant variables. The court cited *Bazemore v. Friday*, 478 U.S. 385, 400, 106 S.Ct. 3000, 92 L.Ed.2d 315 (1986), a pre-*Daubert* Supreme Court opinion, for the following proposition:

While the omission of variables from a regression analysis may render the analysis less probative than it otherwise might be, it can hardly be said, absent some other infirmity, that an analysis which accounts for the major factors "must be considered unacceptable as evidence." . . . Normally, failure to include variables will affect the analysis' probativeness, not its admissibility.

As the econometric discussion of §§13.17–13.24 demonstrates, when variables are improperly omitted from a regression study, the resulting estimators lose the desirable properties that make them scientifically reliable; lost with this scientific reliability is the estimate's evidentiary reliability. Although econometrics is a powerful tool, when it is used other than in accord with the assumptive structure on which it is built, the answers that it produces are really answers to questions other than the ones that were thought to have been asked of it. A misspecified model must fail a *Daubert* examination because its tests are invalid, the error rates of those tests are unknowable, and, given these problems, the model itself is not generally accepted for peer-reviewed publication. *Bazemore* may accommodate model misspecification. *Daubert* does not.

Judge Posner provides an accessible but sophisticated discussion of specification error in *Sheehan v. Daily Racing Form, Inc.*, 104 F.3d 940 (7th Cir. 1997), an employment discrimination case discussed in §13.42.

c. [§13.38] Another View Of *Daubert* And
Economics Expert Testimony

One commentator has observed that "[i]t is doubtful that much economic testimony would survive a strict and literal application of the *Daubert* factors. . . . [F]ew economic techniques of the ilk utilized in antitrust litigation could be 'tested' in the sense contemplated by *Daubert*, i.e., falsified." Gavil, *After Daubert: Discerning the Increasingly Fine Line Between the Admissibility and Sufficiency of Expert*

Testimony in Antitrust Litigation, 65 Antitrust L. J. 663, 673–674 (1997). The cases cited in §13.37 seem to refute this assertion, and it is interesting to contrast it with the views of the scientifically sophisticated commentators cited elsewhere in this chapter. See Rubinfeld & Steiner, *Quantitative Methods in Antitrust Litigation*, 46 Law & Contemp. Probs. 69, 70 (1983) (noting that “hypothesis testing is particularly useful for dealing with questions of whether an antitrust violation has occurred”); Rubinfeld, *Econometrics in the Courtroom*, 85 Colum.L.Rev. 1048, 1049 (1985) (noting that “the most prominent application of econometric methods” is “the use of significance levels for hypothesis testing” (or to use the less descriptive term employed in *Daubert*, falsification)); PROVING ANTITRUST DAMAGES: LEGAL AND ECONOMIC ISSUES 145 (ABA Section of Antitrust Law 1996) (beginning a full chapter discussion of the use of econometrics and statistical analysis in antitrust by stating that “[r]egression analysis is a statistical technique that . . . can assist an antitrust plaintiff in proving both the fact and the amount of its injury,” before going on to develop the notions of hypothesis testing and falsifiability for application to antitrust damage calculations). This list of *contra* citations could continue almost without end.

Gavil himself notes that his “exposition of ‘falsifiability’ and ‘rate of error’ is somewhat simplistic,” Gavil, *supra*, at 675 n.48, and the resulting observations may have given way to the preponderant evidence on the role of testing in economics and econometrics, except that these “simplistic” arguments were made in the commentator’s discussion of the trial court’s analysis of expert testimony in *City of Tuscaloosa v. Harcros Chemicals, Inc.*, 877 F.Supp. 1504 (N.D. Ala. 1995), *aff’d in part, rev’d in part, vacated in part* 158 F.3d 548. When *City of Tuscaloosa* went up to the Eleventh Circuit on appeal, an amicus brief that echoes these misconceptions was filed in support of the City of Tuscaloosa, and the court cited to the brief with approval in a footnote that has since been cited by another Eleventh Circuit trial court. *Allapattah Services, Inc. v. Exxon Corp.*, 61 F.Supp.2d 1335 (S.D. Fla. 1999), *aff’d* 333 F.3d 1248. The connection may just be coincidence because the amici did not cite to Gavil, but, regardless, this commentary is apparently adopted in the Eleventh Circuit.

- d. [§13.39] Testing And Economics Expert
Testimony: *City of Tuscaloosa*
v. Harcros Chemicals, Inc.

In *City of Tuscaloosa v. Harcros Chemicals, Inc.*, 158 F.3d 548, 565 n.21 (11th Cir. 1999), the Eleventh Circuit generally reversed the district court’s exclusion of proffered antitrust expert testimony and stated that many of the problems in the district court’s opinion “might have been avoided had the district court simply held a *Daubert* hearing to allow the parties to clarify their positions, as well as the law, regarding the admissibility of these experts’ testimony.” With respect to admissibility of the experts’ testimony, the court of appeals affirmed that

[e]xpert testimony may be admitted into evidence if: (1) the expert is qualified to testify competently regarding the matters he intends to address; (2) the methodology by which the expert reaches his conclusions is sufficiently reliable as determined by the sort of inquiry mandated in *Daubert*; and (3) the testimony assists the trier of fact, through the application of scientific, technical, or specialized expertise, to understand the evidence or to determine a fact in issue.

Id. at 562. The court quoted *Daubert* regarding the flexibility of Fed.R.Evid. 702 and the variety of factors that may be relevant to the reliability of testimony. To the four *Daubert* factors, the court added a fifth: the “existence and maintenance of standards controlling [its] operation” (referring to the operation of the expert’s methods). *City of Tuscaloosa*, 158 F.3d at 563 n.16.

The court applied a novel version of flexibility and decided against applying the testing factor at all, citing amici, who “helpfully point out that, although ‘an important aspect of assessing scientific validity

(and therefore evidentiary reliability) is the ability of other scientists to test or retest a proponent's theory,' not every scientific or technical methodology applied by expert witnesses is susceptible to such an analysis." *Id.* at 566 n.25. The court reasoned that "[e]conomic or statistical analysis of markets alleged to be collusive, for instance, cannot readily be repeatedly tested, because each such case is widely different from other such cases and because such cases cannot be made the subject of repeated experiments." *Id.* The court also stated that

[t]he proper inquiry regarding the reliability of the methodologies implemented by economic and statistical experts in this context is not whether other experts, faced with substantially similar facts, have repeatedly reached the same conclusions (because there will be few or no cases that have presented substantially similar facts). Instead, the proper inquiry is whether the techniques utilized by the experts are reliable in light of the factors (other than testability) identified in *Daubert* and in light of other factors bearing on the reliability of the methodologies.

Id. This is difficult to square with the analysis of sophisticated commentators who propose that testing is the essence of *Daubert*. See 1 Faigman, Saks, Sanders & Cheng, MODERN SCIENTIFIC EVIDENCE: THE LAW AND SCIENCE OF EXPERT TESTIMONY §11:6 (Thomson/West 2007–2008 ed.) ("courts will find application of *Daubert* difficult if they treat testability as an optional factor. The other three factors all presuppose testability; in science, a non-testable hypothesis cannot have an error rate and is exceedingly unlikely to be published in a peer-reviewed journal and achieve general acceptance."). The field of economics generally uses a scientific methodology, *Confronting the New Challenges of Scientific Evidence*, 108 Harv.L.Rev. 1481 (1995), and regression, the economist's primary tool of analysis, is prototypical of scientific methodology, *In re Polypropylene Carpet Antitrust Litigation*, 996 F.Supp. 18, 26 (N.D. Ga. 1997) (citing to highly informed sources and observing that "multiple regression analysis is a scientific endeavor").

The court of appeals reversed the district court's exclusion of the expert's testimony, writing that his "testimony is entirely within his competence as a statistician" and that his data compilations and "testimony regarding estimated damages, are the products of simple arithmetic and algebra and of multiple regression analysis, a methodology that is well-established as reliable." *City of Tuscaloosa*, 158 F.3d at 565–566. The court did exclude some nonstatistical testimony from the statistician.

Perhaps the court's observation about testing will be limited to "arithmetic and algebra," which surely are admissible without a testing requirement, although, at least in the former case, there is a question of how the expert testimony will assist any but the most innumerate trier of fact. However, to apply such statements to an economist's regression analysis would fly in the face of the overwhelming preponderance of the informed literature, which generally accepts hypothesis testing as the sine qua non of regression analysis.

Finally, as discussed above, the court added to the *Daubert* factors a fifth factor, the existence and maintenance of standards controlling the use of the expert's methods. The basic standards for the use of regression (see §§13.17–13.24) virtually all relate to ensuring that the hypothesis tests based on the regression are competent. Thus, this criterion alone, if applied to the expert's regression analysis, seems to mandate hypothesis testing because it mandates that hypothesis tests be done competently. It is somewhat unclear why the court would articulate such a criterion and then pronounce its intention to disregard it.

Testing is of such critical concern because it is very easy for an expert to weave jargon together into a compelling and convincing story that has no basis in fact. Hypothesis testing can reveal such errors. Section 13.42 considers an example of a superficially compelling expert's story that can be debunked by proper controls on the testing of hypotheses.

e. [§13.40] *Allapattah Services, Inc. v. Exxon*

The court in *Allapattah Services, Inc. v. Exxon*, 61 F.Supp.2d 1335 (S.D. Fla. 1999), *aff'd* 333 F.3d 1248, held several days of *Daubert* hearings, citing to *Daubert* for the Eleventh Circuit's five factors for admissibility of expert testimony ~~(*Daubert's four plus the "existence of standards" factor discussed in §13.39*)~~. The court then cited to *City of Tuscaloosa v. Harcros Chemicals, Inc.*, 158 F.3d 548 (11th Cir. 1999), for the Eleventh Circuit's opinion on the proper way to apply those factors to an economist's testimony. The court wrote that "the Eleventh Circuit, in a pre-*Kumho* [*Tire Co.*] case, discussed, in a footnote, the proper inquiry regarding the reliability of the methodologies implemented by economic and statistical experts in the *Daubert* context." *Allapattah Services, Inc.*, 61 F.Supp.2d at 1339 n.7. The referenced footnote, set out in full in *Allapattah Services, Inc.*, is *City of Tuscaloosa*, 158 F.3d at 566 n.25, which "explains," wrongly, why testing is not applicable to an economist's expert testimony.

The proffered expert testimony in *Allapattah Services* did include regression testimony, and the court made multiple references to hypothesis testing in admitting the testimony of both experts. This seems like a standard *Daubert* hearing, admitting testimony that seems reasonable, with some attention paid to the expert's hypothesis tests. It remains to be seen how courts in the Eleventh Circuit apply footnote 25 of *City of Tuscaloosa*, which directs attention away from *Daubert's* testing factor.

Yellow is new *Daubert* has become pervasive and other parts of the website address *Daubert* in other states and in a range of practice areas. Topics include *Daubert* in securities litigation, antitrust, employment, engineering, medical malpractice and medical device, lost profit damages, and forensic accounting and finance.

...

VII. [§13.56] *DAUBERT* IN ELEVENTH CIRCUIT

Of the three cases constituting the widely cited *Daubert* trilogy (*Daubert*, *Joiner*, and *Kumho Tire Co.*), two are the result of the Supreme Court overturning the Eleventh Circuit on expert testimony issues. The Eleventh Circuit discussed this in rejecting the plaintiff's proposal for a "soft" *Daubert* standard in *Allison v. McGhan Medical Corp.*, 184 F.3d 1300, 1312 (11th Cir. 1999):

While Allison argues that the thrust of the Rules and of the Eleventh Circuit has been for liberal admissibility of evidence, she fails to appreciate . . . that this Circuit has been twice overruled on *Daubert* decisions in precedent setting Supreme Court decisions in *Joiner* and *Kumho Tire*, both of which imposed stricter admissibility standards than the Eleventh Circuit had deemed appropriate.

This statement has practical implications because nearly every *Daubert* response brief filed in federal court argues that *Daubert* is a softer, more liberal standard than previously applied. That argument does not withstand careful scrutiny in almost any forum and, according to *Allison*, does not withstand even casual review in the Eleventh Circuit.

United States v. Frazier, 387 F.3d 1244 (11th Cir. 2004), is the most complete articulation of *Daubert* principles by the Eleventh Circuit since *Kumho Tire Co.* It seems carefully considered and echoes

themes of the *Daubert* cases as they are discussed in this chapter. *Frazier* is a criminal case and not a commercial matter, but it incorporates into Eleventh Circuit case law a range of *Daubert* propositions widely cited in commercial litigation cases. It begins by recounting that the district court must “perform the critical ‘gatekeeping’ function concerning the admissibility of expert *scientific* [and nonscientific] evidence. . . . This function ‘inherently require[s] the trial court to conduct an exacting analysis’ of the *foundations* of expert opinions to ensure they meet the standards for admissibility under [Fed.R.Evid.] 702.” *Frazier*, 387 F.3d at 1260. The core of the opinion is:

[t]he importance of *Daubert*’s gatekeeping requirement cannot be overstated. As the Supreme Court framed it in *Kumho Tire* [526 U.S. at 152]: “[T]he objective of that requirement is to ensure the reliability and relevancy of expert testimony. It is to make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field.” . . . The district court’s role is especially significant since the expert’s opinion “can be both powerful and quite misleading because of the difficulty in evaluating it.”

Id. The court adopted the standard Rule 702 three-part inquiry, requiring that the expert be qualified, the expert’s methodology be reliable, and the expert’s testimony assist the trier of fact in determining a fact in issue. The proponent of the expert testimony has the burden of proof on each of these three parts. The “meat” of these three requirements is the reliability determination. As the court in *Frazier* stated:

[T]he gatekeeping role requires a district court to make a reliability inquiry, and . . . “the expert’s bald assurance of validity is not enough.” . . . If admissibility could be established merely by the *ipse dixit* of an admittedly qualified expert, the reliability prong would be, for all practical purposes, subsumed by the qualification prong.

Id. at 1261, quoting *Daubert v. Merrell Dow Pharmaceuticals, Inc.* (on remand), 43 F.3d 1311, 1316 (9th Cir. 1995).

The reliability determination is based on, “to the extent practicable,” the five *Daubert* factors; however, “[t]hese factors are illustrative, not exhaustive; not all of them will apply in every case, and in some cases other factors will be equally important in evaluating the reliability of proffered expert opinion.” *Frazier*, 387 F.3d at 1262. In elaborating on the factors, *Frazier* cites to *Daubert*’s proposition that, “to qualify as ‘scientific knowledge,’ an inference or assertion must be derived by the scientific method.” *Id.* at 1261 n.14. The court in *Frazier* also stated that “[s]cientific evidence encompasses so-called hard sciences (such as physics, chemistry, mathematics and biology) as well as soft sciences (such as economics, psychology, and sociology),” apparently correcting the unfortunate language of *City of Tuscaloosa v. Harcross Chemicals, Inc.*, 158 F.3d 548 (11th Cir. 1999), discussed in §13.39. *Frazier*, 387 F.3d at 1262 n.14, quoting Schwarzer & Cecil, “Management of Expert Evidence,” REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 39, 42 (Federal Judicial Center 2d ed. 2000) (available at www.fjc.gov/sites/default/files/2012/sciman00.pdf).

An expert cannot escape rigorous challenge by eschewing “reliance on any rigorous methodology and instead purport[ing] to base his opinion merely on ‘experience’ or ‘training.’” *Frazier*, 387 F.3d at 1262. This dodge is similar to attempts to get expert testimony admitted as Rule 701 lay testimony, discussed in connection with the WorldCom litigation in §13.27.

The expert’s testimony must assist the trier of fact, which it can do only if it “concerns matters that are beyond the understanding of the average lay person.” *Frazier*, 387 F.3d at 1262. Alternately, “[p]roffered expert testimony generally will not help the trier of fact when it offers nothing more than what lawyers for

the parties can argue in closing arguments.” *Id.* at 1262–1263.

Finally, “[b]ecause of the powerful and potentially misleading effect of expert evidence, . . . sometimes expert opinions that otherwise meet the admissibility requirements may still be excluded by applying Rule 403.” *Id.* at 1263. This is appropriate when the probative value “is substantially outweighed by its potential to confuse or mislead the jury, . . . or if the expert testimony is cumulative or needlessly time consuming.” *Id.* Judges exercise “more control over experts than over lay witnesses” in Rule 403 issues, because “[s]imply put, expert testimony may be assigned talismanic significance in the eyes of lay jurors, and, therefore, the district courts must take care to weigh the value of such evidence against its potential to mislead or confuse.” *Frazier*, 387 F.3d at 1263, quoting 138 F.R.D. 631,632.

VIII. ADMISSION OF EXPERT TESTIMONY IN FLORIDA STATE COURTS

A. [§13.57] In General

The *Daubert* legislation is effective for cases filed after July 1, 2013, but the Florida Supreme Court’s new opinion, *In Re Evidence 2019* adopting *Daubert* is under appeal so this chapter retains the discussion of the Florida *Frye* standard below.

B [Section B & C? dealing with the Florida Frye Standard have been deleted here](#)

D. Florida’s Post-2013 *Daubert* Legislation Decisions

Crane v. DeLisle, 206 So.3d 94 (4th DCA 2016), *quashed by* SC16-2182, held:

- proffered expert’s opinion that gaskets were substantial cause of plaintiff’s mesothelioma was inadmissible;
- proffered expert’s findings regarding release of asbestos fibers from cigarette filters were admissible;
- proffered expert’s opinion that cigarettes were substantial contributing factor to plaintiff’s mesothelioma was inadmissible;
- proffered expert’s opinion that plaintiff’s mesothelioma risk was increased by low-level of exposure to crocidolite asbestos was admissible;
- proffered expert’s opinion that asbestos-containing cigarettes constituted significant exposure to crocidolite asbestos was inadmissible; and
- hourly rate paid for experts was improper basis for damages award.

In *Crane*, the Fourth District applied *Daubert*, reversed the trial court’s improper admission of expert testimony and ordered a new trial. One of the key expert opinions was that “every exposure” to asbestos would be considered a substantial contributing factor to DeLisle’s mesothelioma. The opinion

that every asbestos exposure level above background level is a substantial contributing factor has been rejected repeatedly by courts as insufficiently supported by data or testing to satisfy *Daubert*.

The DCA notes that one of the other experts effectively told the trial court to take his word for it, that his testimony was sound.

The court reiterated sound *Daubert* principles:

Since 2013, Florida has applied “the standards for expert testimony in the courts of this state as provided in *Daubert* [], [] *Joiner*, and *Kumho Tire Co., Ltd.*[].” 2013 Fla. Sess. Law Serv. Ch. 2013–107 (H.B.7015) (WEST). Section 90.702 codifies the standard:

If scientific, technical, or other specialized knowledge will assist the trier of fact in understanding the evidence or in determining a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education may testify about it in the form of an opinion or otherwise, if:

- (1) The testimony is based upon sufficient facts or data;
- (2) The testimony is the product of reliable principles and methods; and
- (3) The witness has applied the principles and methods reliably to the facts of the case.

§ 90.702, Fla. Stat. (2015).

Under section 90.702 and *Daubert*, [], the trial courts must “act as gatekeepers, excluding evidence unless it is reliable and relevant.” *Hughes v. Kia Motors Corp.*, 766 F.3d 1317, 1328 (11th Cir. 2014). The trial courts “are charged with this gatekeeping function ‘to ensure that speculative, unreliable expert testimony does not reach the jury’ under the mantle of reliability that accompanies the appellation ‘expert testimony.’ ” *Id.* at 1328–29 (quoting *Rink v. Cheminova, Inc.*, 400 F.3d 1286, 1291 (11th Cir.2005)). “Whether an expert’s testimony is reliable depends on ‘the particular facts and circumstances of the particular case.’ ” *Id.* at 1329 (quoting *Kumho Tire*, 526 U.S. at 158, 119 S.Ct. 1167).

To properly perform its gatekeeping function, the court must first determine that the expert is “qualified on the matter about which he [or she] intends to testify”; second, that the expert is employing “reliable methodology”; and third, that the expert’s testimony can “assist the trier of fact through the application of expertise to understand the evidence or fact in issue.” *Id.* In assessing whether an expert’s methodology is reliable, the court should consider the following factors: (1) whether the theory “can be (and has been) tested”; (2) whether it “has been subjected to peer review and publication”; (3) “the known or potential rate of error” for “a particular scientific technique”; and (4) whether the “theory or technique has been generally accepted by the relevant scientific community.” *Daubert*, 509 U.S. at 593–94, 113 S.Ct. 2786.

However, “[t]he court’s gatekeeping function requires[t] more than simply ‘taking the expert’s word for it.’ ” *United States v. Frazier*, 387 F.3d 1244, 1265 (11th Cir.2004) (en banc) (quoting

Fed.R.Evid. 702 advisory committee's note (2000 amends.)). "[S]omething doesn't become scientific knowledge just because it's uttered by a scientist; nor can an expert's self-serving assertion that his conclusions were derived by the scientific method be deemed conclusive." *Hughes*, 766 F.3d at 1331 (quoting *McDowell v. Brown*, 392 F.3d 1283, 1299 (11th Cir.2004)) (alteration in original). As the Supreme Court explained in *Joiner*,

[t]rained experts commonly extrapolate from existing data. But nothing in either **Daubert** or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the ipse dixit of the expert. A court may conclude that there is simply too great an analytical gap between the data and the opinion proffered.

Joiner, 522 U.S. at 146, 118 S.Ct. 512. Thus, "an expert opinion is inadmissible when the only connection between the conclusion and the existing data is the expert's own assertions[.]" *McDowell*, 392 F.3d at 1300. Additionally, where an expert relies solely or primarily on their experience, the proponent of the testimony has the burden "to explain how that experience led to the conclusion [the expert] reached, why that experience was a sufficient basis for the opinion, and just how that experience was reliably applied to the facts of the case." *Frazier*, 387 F.3d at 1265.

* * *

In sum, the trial court's gatekeeping role is not a passive role. The court should affirmatively prevent imprecise, untested scientific opinion from being admitted. The expert must explain his or her methodology and how it is applied to the data relevant to the case. Further, when relying on other studies, the expert must identify those studies and explain how they support the application of the methodology used. We evaluate the various challenged experts and the trial court's rulings on the admissibility of their opinions with the foregoing principle in mind.

Crane v. DeLisle, 206 So.3d at 101-03.

While *Crane* was quashed and has no apparent lasting impact, it is a good assessment of the views of the 4th DCA on *Daubert*,

In *Conley v. State*, 129 So.3d 1120 (Fla. 1st DCA 2013), in which the District Court of Appeal, First District, held that the trial court "erred in excluding evidence of a penile plethysmograph (PPG) test" and should have admitted it under the then-existing *Frye* standard. The court, however, noted that while the appeal was pending, Florida adopted the federal *Daubert* standard governing the admissibility of scientific evidence, and it therefore remanded the case "for a new trial after the trial court has determined the admissibility of the PPG evidence under the *Daubert* standard codified by section 90.702." *Id.* at 1121.

In *Perez v. Bell South Telecommunications, Inc.*, 138 So.3d 492, 494 (Fla. 3d DCA 2014), the trial court had stricken the only medical expert testimony linking the premature birth of the Perez baby, his resulting surgeries, and his developmental deficits, to workplace stress suffered by Mrs. Perez. The trial court found the testimony to be inadmissible under *Frye*, and entered summary judgment for the defendant employer. The appellate court noted that the Florida Legislature had adopted the *Daubert*

standard for the admissibility of expert testimony in the place of *Frye*, and determined that the expert's testimony was inadmissible under *Daubert*. In pertinent part, the court noted that in enacting the new legislation adopting *Daubert* as Florida's standard, the legislature expressed its intent to "prohibit in the courts of this state pure opinion testimony as provided in *Marsh v. Valyou*, 977 So.2d 543 (Fla. 2007)." *Id.*, quoting Ch. 2013-107, § 1, Laws of Florida.

The court further wrote that

[a]lthough there has been a healthy debate among courts and commentators over whether the *Daubert* standard for admissibility of expert testimony is more lenient or more strict than the *Frye* standard which it displaced two decades ago in the federal courts and in some state courts thereafter, the Florida Legislature has settled that debate for the trial and appellate courts of this state. . . . The legislative purpose of the new law is clear: to tighten the rules for admissibility of expert testimony in the courts of this state.

Id. at 497.

This is an important observation from the court because of Florida's history of supporting the notion of *Daubert* as a more lenient standard. As previously noted, it seems clear that *Daubert* is not a more lenient standard. This author has published for decades, both in this chapter and elsewhere, that *Daubert* is not a more lenient standard irrespective of the pronouncements of the Florida Supreme Court. That opinion has always seemed somewhat of a secondary issue. However, this is no longer a secondary issue since the Florida Supreme Court has recently relied upon the mischaracterization to support the upholding of a murder conviction. *Anderson v. State*, 220 So.3d 1133 (2018).

In *Gaiimo v. Florida Autosport, Inc.*, 154 So.3d 385, 387 (Fla. 3d DCA 2015), workers compensation plaintiff Gaiimo

objected to the apportionment testimony of Dr. Lee as being "pure opinion" unsupported by a foundation of sufficient facts and data and lacking a basis in reliable medical principles and methods as required by section 90.702, Florida Statutes. The [employer/carrier] countered that Dr. Lee, as Gaiimo's authorized treating physician, was in the best position to address apportionment.

The appellate court noted:

In rejecting Gaiimo's argument that Dr. Lee's testimony was pure opinion testimony, the [Judge of Compensation Claims (JCC)] explained that Dr. Lee's "opinion was based on his experience and treatment of the claimant and thorough review of the medical and treatment records of Dr. Rodrigo Agbunag, M.D., who treated the claimant's injuries sustained in the 2009 non-work related car accident."

Id. at 388.

In reversing the JCC's admission of the expert's testimony, the appellate court stated:

This basis for Dr. Lee's opinion, however, is precisely what makes it pure opinion testimony under *Marsh*, 977 So.2d at 548-49. Testimony of this type, though previously acceptable as pure opinion under *Marsh*, no longer suffices under section 90.702. The 2013 Legislature has made clear that the admissibility of expert opinions requires that the requirements of *Daubert* be met. Because no basis in the record exists to support that Dr.

Lee's testimony was "the product of reliable principles and methods" and that Dr. Lee applied such principles, the JCC's conclusion that Dr. Lee's testimony met Florida's newly-adopted *Daubert* standard is erroneous.

Id. at 388–389. Under *Daubert*, as discussed in *Giaino*, there must exist a basis in the record that supports the reliability of the expert's method in order for the testimony to be admissible.

In *Bunin v. Matrixx Initiatives, Inc.*, 197 So.3d 1109 (Fla. 4th DCA 2016), the District Court of Appeal, Fourth District, stated that the *Daubert* standard was procedural and, therefore, applied retroactively to *Bunin*, which had been filed before the 2013 *Daubert* legislation took effect. The court stated:

Having carefully reviewed the record, we conclude that the trial court did not abuse its discretion in excluding the plaintiff's expert's causation opinion under *Daubert*, even though the expert's opinion would have been admissible under the "pure opinion" rule of *Marsh v. Valyou*, 977 So.2d 543, 548-50 (Fla. 2007). Because the plaintiff's case depended upon her expert's excluded causation testimony, the summary judgment in favor of the defendants must stand.

Id. at 1110.

This is an important statement because of Florida's history of admitting highly questionable expert testimony in this *Matrixx* line of cases under the pure opinion exception as discussed in §13.63. Compare *Bunin v. Matrixx Initiatives, Inc.* to *Hood v. Matrixx Initiatives, Inc.*, 50 So.3d 1166 (Fla. 4th DCA 2011), both decided by the same court and both presenting essentially the same "expert" testimony. Under Florida *Frye* and its pure opinion exception, the Fourth DCA admitted the expert testimony that it excluded in *Bunin* under *Daubert*. This provides a stark contrast for Florida courts to compare the admissibility of widely discredited expert testimony that is admissible under the pure opinion exception to the Florida *Frye* standard but, in the hands of the same court, is inadmissible under *Daubert*. Interestingly, the Fourth DCA, ruling under *Frye*, seemed reluctant to admit the widely discredited expert testimony, writing: "While we recognize the federal courts' uniform refusal to admit [the expert's] testimony, we are compelled to find that [the expert's] opinion is admissible in Florida under *Marsh*." *Hood*, 50 So.3d at 1175.

If there is a common thread in these opinions, it is that "junk" or unsupported expert testimony that could be admitted as the expert's "pure opinion" under *Frye* does not suffice when the expert's testimony is held up to the light of *Daubert* and scientific knowledge.

In *Kemp v. State*, 2017 WL 6371164 (Fla. 4th DCA 2017), the defendant challenged the testimony of an accident reconstructionist and appealed his conviction of five counts of vehicular manslaughter. The District Court of Appeal, Fourth District, affirmed and held that the trial court properly applied the **Daubert** standards in admitting expert testimony from the accident reconstruction expert and articulated the standards that Florida courts should apply in making admissibility decisions.

Kemp argued that "the trial court erred by admitting [the accident reconstructionist]'s braking opinion, because it did not meet the requirements of section 90.702, Florida Statutes (2015), and **Daubert**." *Id.* At *2. The parties had relied on **Daubert** at trial and neither party challenged the validity or constitutionality of the **Daubert** Amendment. The court undertook a substantial recounting of the *Daubert* criteria, beginning with the gatekeeper role of the court:

Daubert assigned the trial judge as gatekeeper to “ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable.” 509 U.S. at 589, 113 S.Ct. 2786. That obligation applies not only to “scientific” testimony, but “to all expert testimony.” *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 147, 119 S.Ct. 1167, 143 L.Ed.2d 238 (1999).

The Court articulated factors bearing on the reliability inquiry:

- (1) whether the theory can be or has been tested;
- (2) whether the theory or technique has been subjected to peer review and publication;
- (3) the known or potential rate of error of a particular scientific technique, as well as the existence of standards controlling the technique’s operation; and
- (4) general acceptance in the scientific community.

Kemp, 2017 WL at *2-*3.

Notice that the *Kemp* court correctly applies an important issue that many courts and most commentators do not: *Daubert* articulated *five* criteria for admissibility of expert testimony and the *Kemp* court got the fifth, the existence of standards controlling the technique’s operation. This is too important an issue to have forgotten because it goes to whether the expert had used the technique correctly, in conformity to the standards that the expert’s discipline sets of the use of the technique by the expert. Compare *DeLisle*.

The court recalled that Section 90.702, Florida Statutes, provides that expert testimony is admissible if:

- (1) The testimony is based upon sufficient facts or data;
- (2) The testimony is the product of reliable principles and methods; and
- (3) The witness has applied the principles and methods reliably to the facts of the case.

Kemp, 2017 WL at *3.

The court cited to *Kumho Tire* and its pronouncement that the gatekeeper function applies to all expert testimony and that the trial court must insure that proffered expert testimony must be reliable and relevant “whether the testimony reflects scientific, technical, or other specialized knowledge.” *Kumho Tire*, 526 U.S. at 148–49, 119 S.Ct. 1167 (citations omitted).

With that background the court explained that the expert was qualified as an expert.

Here, there can be no doubt that Corporal Dooley was an expert in accident reconstruction. He testified that he had been employed with the Florida Highway Patrol for thirteen years, and had been a homicide investigator for more than five years. His training was extensive. He testified extensively [about his training].

Id.

After substantial voir dire the trial court admitted the expert's opinion in its role as gatekeeper. Notably, the court specifically mentioned pure opinion testimony and wrote that "I do find that it's not a pure opinion of the corporal but it's instead based on training, experience, he's got the expertise. And I do find as a gatekeeper that it is sufficiently reliable and sufficiently factually based to allow this opinion into the—into evidence in this trial."

Id. at *5. The court let the expert opinion stand.

An insightful dissent questions that decision. The appellate judge wrote that the expert witness's opinion about braking "amounted to little more than a subjective and unverifiable opinion and represents precisely the sort of junk science that should never be countenanced in a court of law." *Id.* at *6. "The majority opinion emphasizes [the expert]'s experience and quotes long portions of his testimony, but fails to undertake any analysis of how the braking opinion relates to the **Daubert** factors." *Id.* Simply, the appellate judge would have excluded the testimony because it does not pass *Daubert*. Recently, the appellate court opinions have not raised the question of whether Florida is a *Daubert* state, they just apply it.

Satisfying *Daubert* qualification criteria can never stand as a proxy for the reliability of the testimony. They are two different questions—is the expert qualified and separately, has the expert applied the tools of the trade reliably.

Under **Daubert**, a trial judge has a gatekeeping role . . . [and] is charged "with this gatekeeping function 'to ensure that speculative, unreliable expert testimony does not reach the jury' under the mantle of reliability that accompanies the appellation 'expert testimony.'" *Crane*, 206 So.3d at 101 (quoting *Hughes v. Kia Motors Corp.*, 766 F.3d 1317, 1328–29 (11th Cir. 2014)).

Id. at *7.

The dissent's caution against unreliable testimony reaching the jury "under the mantle of reliability that accompanies the appellation 'expert testimony' is an important one. The gatekeeper must never be so impressed with the qualifications of an expert that it forgets to make "'a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue.'" *Id.*, quoting *Daubert*.

In briefest summary, the gatekeeper must ensure both that the expert is qualified and that the expert's reasoning is scientifically valid. The scientific validity of the expert's opinions is assessed with reference to the five *Daubert* criteria articulated in *Kemp*.

The science of the expert's braking opinion is from physics and the expert applied no physics to his core result, just "eyeballing." The dissent says:

[The expert]’s braking opinion was inadmissible under *Daubert*. The record does not show that [the expert]’s technique—eyeballing the shape of the crash damage on a vehicle to determine if the vehicle that made the impact was braking—has been tested, has been subjected to peer review or publication, has a quantifiable rate of error, or is generally accepted in the field of accident reconstruction. *[The expert]’s repeated invocation of the magic words “training and experience” was insufficient, without more, to establish the reliability of his opinion under Daubert.* [Emphasis added.] As we explained in *Crane*, “where an expert relies solely or primarily on their experience, the proponent of the testimony has the burden ‘to explain how that experience led to the conclusion [the expert] reached, why that experience was a sufficient basis for the opinion, and just how that experience was reliably applied to the facts of the case.’ ” 206 So.3d at 102 (quoting *United States v. Frazier*, 387 F.3d 1244, 1265 (11th Cir. 2004) (en banc)).

Simply put, [the expert] opined that because the damage to the Lexus went downward in an “arc-type fashion,” appellant’s car must have been dipping at the time of the collision, which indicated that appellant was braking. [The expert]’s opinion can therefore be broken down into two distinct components: (1) applying the brakes causes the front of the driver’s vehicle to dip downward; and (2) [the expert] was able to look at the shape of the damage to the Lexus to infer that appellant’s vehicle was dipping, and therefore braking, at the time of the collision. The first component of [the expert]’s opinion was supported by the laws of physics and momentum. But the second component of [the expert]’s opinion—which I will refer to as the “braking opinion”—was never shown to be reliable.

Id. at *8.

Thus, while the laws of physics and momentum provided a reliable basis for the expert’s testimony that the front of a vehicle dips downward while braking, there was no showing that simply looking at the shape of crash damage on a vehicle is a generally accepted methodology in the field of accident reconstruction for determining whether the vehicle that made the impact was dipping (and therefore braking) before the collision.

The second of *Daubert*’s five factors is whether the expert has taken an accepted technique and applied it outside its proper realm. The scientific premise of the front end of a car dipping upon braking due to the physics does not cover the opinion that the damage to the plaintiff’s car can be read like tea leaves to determine whether defendant’s car was dipped down due to braking at the time of the collision.

In short, the expert’s braking opinion was insufficient to satisfy *Daubert*. None of the *Daubert* factors supported the admissibility of the opinion. The expert did not rely on anything much in formulating this braking opinion, other than his subjective visual impression of what the damage to the Lexus “look[ed] like to [him].” There was simply too great an analytical gap between the expert’s observations and the braking opinion proffered.

The improper admission of Dooley’s testimony was not harmless. *See State v. DiGuilio*, 491 So.2d 1129, 1135 (Fla. 1986). The dispute over whether appellant was braking at the

time of the collision went to the heart of appellant's defense that he had lost consciousness immediately before the accident. I would reverse and remand for a new trial.

Id. at *9-10.

In *Northrup Grumman Systems Corp. v. Britt*, 241 So.3d 208 (Fla. 3d DCA 2017), the trial court awarded \$9 million in a mesothelioma matter and the District Court of Appeal, Third District, held that the trial court did not abuse discretion under *Daubert* or *Frye* in admitting the expert's testimony and opinion regarding worker's aggregate exposure.

The court wrote that

Applying the more rigorous standard, *Daubert* and its codification in sections 90.702 and 90.704, the trial court in the present case discharged its duty as "gatekeeper" for proffered expert testimony. [The expert]'s testimony established his background and experience as a physician and epidemiologist for the Ontario Department of Labor for 30 years, studying the health of workers ("particularly asbestos workers in the province"). His doctorate in experimental physics included studies of asbestos, other crystals, and asbestos fibers.

[The expert] conducted and published studies of workers exposed to asbestos, and he had published 50 to 60 peer-reviewed research papers dealing with asbestos disease.

Id. at 214.

[The expert]'s expertise, his application of reliable methodology and peer-reviewed, published studies, and the general acceptance by the scientific community of the relationship between the inhalation of asbestos fibers and mesothelioma, distinguish the present case from the rejection, based on *Daubert*, of proffered "every exposure" testimony by a medical toxicologist in *Crane Co. v. DeLisle*, 206 So.3d 94, 103–106 (Fla. 4th DCA 2016), *review granted*, Case No. SC16–2182, 2017 WL 3484484 (Fla. July 11, 2017). The Northrop DCA wrote that the trial court did not abuse its discretion in admitting [the expert]'s testimony and opinions.

Id. at 215.

V111. SUMMARY

Florida has turned a corner and replaced the dated and hopelessly porous *Frye* Standard with *Daubert v. Merrill Dow*. *Daubert* has governed admissibility of expert testimony in US federal courts for 25 years and in a majority of states for almost as long. Florida is the latest state to adopt the *Daubert* Standard which stops forum shopping and junk-science based outcomes.

IX. APPENDIX

A. The Scientific Method: A Look Behind *Daubert*'s Five Factors

1. [§13.69] Hypothesis Testing

The scientific method is used in all science and is based on empirical verification of scientific propositions. It proceeds by posing a hypothesis, gathering data relevant to the hypothesis, and testing to see whether real-world data confirm the scientist's conceptual reasoning.

Examples of hypothesis testing and, therefore, the scientific method alluded to by the Court in *Daubert*, are plentiful in all of the most highly regarded professional journals that publish empirical research. See, *e.g.*, THE JOURNAL OF FINANCE, THE JOURNAL OF FINANCIAL ECONOMICS, THE AMERICAN ECONOMIC REVIEW, and similar periodicals.

Hypothesis testing is discussed more fully in §13.31.

2. [§13.70] Known Or Potential Error Rate

The second factor that *Daubert* suggests trial judges use in evaluating the scientific validity and, therefore, evidentiary reliability of "purported scientific testimony" is the "known or potential rate of error" associated with using the particular scientific technique. In plain language, this is the likelihood of being wrong that the scientist associates with the assertion that an alleged cause has a particular effect. Most scientists routinely require that this error rate be very small, usually between 1% and 5%.

There are two types of error rates in testing hypotheses, denoted as "Type I error" and "Type II error." Type I error is the propensity of the test for false positives, while Type II error is the propensity of the test for false negatives. For example, if a drug test for a substance comes back positive, but the tested individual has not actually used the drug, a layperson would call that a "false positive," while a scientist would call it a Type I error. If the drug test comes back negative and the tested individual has used the drug, that is a "false negative" or, among scientists, a Type II error. The Type I error is the most commonly cited component of the "error rate" in hypothesis testing. This error rate is also known both as the "level of confidence" of the hypothesis test and as the level of statistical significance of the test's result. Determining this error rate is actually part of conducting a hypothesis test. Kmenta, ELEMENTS OF ECONOMETRICS 119 n.16 (McMillan Pub. Co. 1971). A common assertion in scientific research is that "the null hypothesis is rejected at the 1% level," or equivalently "the result is statistically significant at the 1% level," which means that the statistical technique used to test the hypothesis, if applied to data when the null hypothesis is true, would reject the null hypothesis only 1% of the time. If such a statement were made about the example of the single die in §13.31, it would mean that, if the die were not loaded and the experiment of rolling it 600 times and testing the null hypothesis that the die was fair were done 100 times, 99 of those tests would correctly show the die to be fair, while one of those tests would incorrectly show the die to be loaded.

The relationship between the *Daubert* Court's first two criteria — the hypothesis test and the error rate — is so close that it is virtually unheard of for a scientist to report that a hypothesis was rejected without stating the level of confidence at which it was rejected. Indeed, such a report would be completely meaningless. The Type II error is more subtle and not nearly so commonly reported in scientific studies.

3. [§13.71] Peer Review And Publication

The third criterion that the Supreme Court suggested for use by trial courts in determining whether

expert testimony reaches the trier of fact is “whether the theory or technique has been subjected to peer review and publication.” *Daubert*, 509 U.S. at 593. Publication is typically the purpose for which research is offered up for peer review, and passing peer review is required for publication. “Peer review and publication” of a scientist’s work is largely a term of art that means that the scientist’s peers have sanctioned the work as credible and accepted it for publication. Publication then exposes the work to further review by other scientists, whose responses to the research indicate their agreement or disagreement with the methods and results of the work. A scientist’s peers often express agreement with the work of that particular scientist by citing the work with approval or as authority or by extending the work. Properly executed hypothesis tests, with their attendant error rates, are the essence of scientific method and are very nearly necessary conditions for peer review to result in publication.

4. [§13.72] General Acceptance

Like the Court’s third criterion, “general acceptance” is a summary measure of the extent to which the expert’s methods produce information that qualifies as scientific knowledge. Scientific methods begin the process of becoming generally accepted in the scientific community by bringing appropriate hypothesis testing techniques to bear on questions (or hypotheses) of interest to the scientific community in a fashion that results in the peer approval required for publication. They move toward general acceptance by then withstanding the scrutiny of the broader scientific community to which publication exposes the methods.

Of course, there are numerous odd propositions for which there exists some collection of individuals who will assert that they comprise a relevant scientific community and that the proposition is generally accepted within their community. The *Daubert* Court discussed briefly the characteristics of a “relevant scientific community,” citing the analysis of *United States v. Downing*, 753 F.2d 1224, 1239 (3d Cir. 1985), which states that the inquiry should focus on “the non-judicial uses to which the scientific technique[s] are put.” The *Downing* court’s elaboration of that point noted that the absence of nonlitigation uses for a scientific technique is taken as evidence of a lack of reliability, while the existence of nonlitigation uses for a technique is taken as evidence of the reliability of the technique. The nonjudicial uses to which the scientific techniques are put may also constitute circumstantial evidence of the reliability of the technique. See *In re Paoli Railroad Yard PCB Litigation*, 1992 WL 321226 (E.D. Pa. 1992), *aff’d in part, rev’d in part* 35 F.3d 717. The inescapable conclusion is that the relevant scientific community within which the technique finds acceptance must be the community of real-world scientists who pursue science for nonlitigation purposes, and that finding general acceptance within the community of forensic scientists does not constitute general acceptance in the relevant scientific community. This must be the rule, for were it otherwise, defendants’ hired experts could generally accept one sham technique that serves their purposes, while plaintiffs’ hired experts could generally accept another sham technique that serves their purposes, and both would be supported for admissibility by the general acceptance criteria despite the fact that they were both sham techniques.

5. Existence of Standards and Meeting those Standards

This criteria goes to whether there exist standards for the use of the expert’s technique and whether the expert met them. To cite the example of regression analysis discussed on this site, there are volumes of textbooks and scholarly journals that discuss the criteria for use of regression and addressing whether an expert met the standards can be critical. I have a cool war story about this if we meet I will share it.

