A Simple Theory of Complex Valuation
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The American legal system has a problem with complex valuations. These valuations cannot be done without expertise, yet competing experts provide so little accurate information to courts that judges routinely pick an arbitrary value that falls somewhere between the extreme values suggested by the parties. This creates costly uncertainty and undermines the legitimacy of the court. While this problem has been recognized, the proposed solutions have become increasingly complex and convoluted. As a result, no solution has been effectively adopted and the problem persists. This article suggests that the valuation dilemma can be solved more simply by recognizing a basic legal imperative that has been ignored in this context. Our theory of valuation rests on the simple idea that valuations are nothing more than enterprises in routine fact finding. Valuation is not an ethereal question with no right answer. Rather, valuation is a process of inferring a fact about the value that a relevant community places on an asset.

As simple as that point may be, it has been ignored in practice and received almost no attention in the academy. By reorienting the analysis of valuation around this foundational point, this Article reveals the potential for a shift in valuation practice that will both restore the legitimacy of the process and reduce the costs of uncertainty and biased testimony. We demonstrate that a return to traditional evidentiary rules, including attention to burdens of proof, will discourage courts from resorting to ad-lib spreadsheet calculations in favor of valuations arrived at through vetted methodologies that are shown to be reasonably accurate and supported by the record. We further show that this will lead to an improvement in the quality of information provided by expert witnesses.

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Courts are increasingly faced with the task of valuing complex assets, entitlements, and claims. While some valuations are straightforward and the court simply performs its traditional factual inquiry, a significant number of cases raise more difficult valuation questions. Where there is no easily discernible market value for an asset or claim, the court must infer value from what it knows about uncertain current, past, or future states of the world. This often requires complicated estimates of subjective values, risks, future contingencies, or the potential cash flows of risky assets or complicated financial instruments. The analysis and procedures courts and scholars apply to these valuations differ from the analysis they apply to simple valuations and traditional factual inquiries. This article suggests the different approaches are unjustified in theory and problematic in practice.

It is no secret that courts are ill-equipped to perform complex valuations – at least on their own. As a result, a massive industry of valuation experts has developed within the world of complex litigation – civil and criminal. This is true

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1 We thank Mathilde Cohen, Florian Ederer, James Kwak, Saul Levmore, Jennifer Mnookin, Anthony Niblett and workshop participants at Albany Law School for helpful comments and discussion. Sarah Nudelman and Thomas Malinowsky provided excellent research assistance.

2 See, e.g., John W. Hill et al., Increasing Complexity and Partisanship in Business Damages Expert Testimony: The Need for A Modified Trial Regime in Quantification of Damages, 11 U. Pa. J. Bus. L. 297, 336 (2009) (“Most often, judges are not experts in financial theory or valuation methodologies. This had led to frequent compromises in order to make decisions in a reasonably efficient manner.”); Stephen J. Leacock, The Anatomy of Valuing Stock in Closely Held Corporations: Pursuing the Phantom of Objectivity into the New Millennium, 2001 Colum. Bus. L. Rev. 161, 167-68 (2001) (“Very often, judges are not experts in financial theory and as a result, courts have very frequently struck a compromise... [with] no conceptual, theoretical or intellectually convincing basis”) (citation omitted).

across an expansive range of legal disputes. Courts routinely rely on experts to assist them in valuing corporations, financial assets, tax liability, tort and civil rights damages, or even the costs or benefits of entitlements such as public education. Because the valuation process is embedded in our traditional adversarial system, it most often requires the courts to assess the merits of competing experts who may function more as advocates than informative experts.

The involvement of experts introduces a set of legal and philosophical dilemmas that have – as Learned Hand famously pointed out – troubled courts, lawyers, and scholars for centuries. Complex valuations cases introduce an added dimension: they require mathematical models. Experts identify the best methodology for assessing value and the variables that must be determined for

We focus primarily on civil courts in this paper. The analysis carries over to the criminal context, with the caveat that the different burden of proof changes some of the practical outcomes discussed in Part II.

4 See, e.g., In re Chemtura Corp., No. 09-11233 (REG), (Bankr. S.D.N.Y. Oct. 21, 2010); In re Nat'l Student Mktg. Litig., 598 F. Supp. 575 (D.D.C. 1984) (using expert testimony to value entity involved in a merger); Albert Trostel & Sons Co. v. Notz, 679 F.3d 627 (7th Cir. 2012) (affirming district court’s decision to defer to plaintiff’s valuation in merger case).


the methodology to be successful, and then perform the ultimate mathematical analysis. But, despite the variability of expert quality and statistics themselves, courts regularly respond to complex valuation cases by assigning a value that falls at an often arbitrary point somewhere in between the experts' high and low values. The expert models set the outer limits and may be engaged to provide an ex post justification of the final judicial valuation. But they play little role as actual analytical tools to guide the court in reaching that value.

This state of affairs is concerning to courts, scholars and practitioners alike. Some have argued that it lacks legitimacy and fails the requirements of rule of law. Others have highlighted its practical consequences, suggesting it creates incentives for experts to increasingly exaggerate their value estimates and leads to an arms race, of sorts, among litigants. In the extreme scenario, expert testimony becomes an uninformative process that imposes a cost on litigants and the courts and creates no social value. One might expect this to result in an

11 See, e.g., Tarver Robertson, supra note 9, at 191 (arguing that splitting the difference does not resolve problem of offsetting expert biases); Douglas G. Baird, Donald S. Bernstein, Absolute Priority, Valuation Uncertainty, and the Reorganization Bargain, 115 Yale L.J. 1930, 1953 (2006) (“In the absence of a settlement, [judicial appraisal in bankruptcy] ‘splits the baby’ based on the judge’s determination of value, which may depart from what either the senior investor or the junior investor thinks the business is worth.”); Kenton K. Yee, Dueling Experts and Imperfect Verification, 28 Int’l Rev. L. & Econ. 246, 248 (2008) (describing a game theoretic model of expert valuation in which the judge is pre-committed to "splitting the baby").

12 The judge may not view the number as arbitrary, but to the extent that expertise beyond the court’s skills is required to conduct the valuation it is hard to see how a number chosen in this way will be anything but arbitrary unless it is simply an average of the two numbers. Hand, supra note 10; Sharfman, supra note 9.

13 See, e.g., Gross, supra note 9; Tarver Robertson, supra note 9 at 191 (describing problem of expert); Sharfman, supra note 9; see also In re Appraisal of Shell Oil Co., 1990 Del. Ch. LEXIS 199, at 14 (noting that it was no surprise in our system that the experts testimonies were flawed). And to be sure, the problem exists in other expert contexts as well. But the considerations may be different. See below at part III.

equilibrium where experts are abandoned. But the sticky procedural rules of our system require a party to put at least something into evidence to make its case. An admissible expert fills that evidentiary void. Thus, the parties will continue to choose the most extreme experts that a court will accept as qualified under Daubert. These bad incentives, of course, feed back into the legitimacy problem as experts – and the lawyers and courts that rely on them – are viewed even more skeptically.

Finally, there is the cost of uncertainty (or risk). If experts provide no useful information to courts on value and courts have no expertise themselves, judicial valuations will have no relation to actual value. This can make

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15 And often it is the only thing. There may be data and other evidence that when analyzed supports a valuation. But often the relevance and foundation of that evidence cannot be established without the expert testimony See, e.g., Bettinger v. Bettinger, 396 S.E.2d 709, 725 (W. Va. 1990) (“There is little doubt that in valuing interest in pension and profit sharing plans or the value of a business or property which have been found to be marital assets, expert witnesses are needed.”); See also Kent v. Flickinger, 453 F.2d 955, 958 (10th Cir. 1972) (finding “no expert testimony in the record from which a separate valuation…could possibly have been made”); Am. Nat. Bank & Trust Co. of Chicago, Ill. v. Bone, 333 F.2d 984, 988-89 (8th Cir. 1964) (finding that “substantial evidence [was] lacking to support the valuation finding made by the trial court” given that “[t]he trustee offered no expert testimony as to the value” of the business); Ripka v. Ripka, 908 N.Y.S.2d 510, 512 (2010) (approving of another case where “the court properly accepted defendant’s valuation of the vehicles, where plaintiff presented no expert testimony that would support a different valuation”) (citation omitted); In re IBM Credit Corp., 731 S.E.2d 444, 451 (N.C. Ct. App. 2012) (rejecting a “hybrid” valuation proposal because it was “actually not developed by any witness, expert or otherwise”); Brooks Res. Corp. v. Dept of Revenue, 595 P.2d 1358, 1360 (Or 1979) (rejecting a taxpayer’s assertion that a business was valueless because he “offered no expert testimony to support [his] position”); see, e.g., Kohler, 468 F.3d 1032 (2006).


17 Gross, supra note, 9 at 1135 (1991) (describing cycle of contempt for the expert witness system leading good experts to opt out and reinforcing the perception by all involved that experts are hired guns).

18 Here we talk of uncertainty to encompass both the concept of risk and uncertainty. We unpack the important distinction between the two below at ___
transactions and other relations more costly in three ways. First, uncertainty can be costly itself ex ante. This is not always true if the expected values remain constant. But under certain conditions uncertainty can be very costly.\textsuperscript{19} Second, once the parties have entered into a transaction, their subsequent behavior will be distorted by the uncertainty. Litigation that produces arbitrary numbers essentially gives an option to an out-of-the-money party to recoup value. Even if the option is wealth destroying and the parties desire the opposite outcome, it is difficult to contract around it ex ante.\textsuperscript{20} Parties may find solutions to get around this problem – such as binding arbitration under different rules – but they are unlikely to be cost free. Third, uncertainty skews the incentives of parties to use litigation as a dispute-resolution mechanism. If other more accurate mechanisms are available,\textsuperscript{21} the party with the better case will steer away from litigation while the party with the worse case will steer towards litigation. That may create socially costly distortions of the parties’ choice of mechanism\textsuperscript{22} and it will change the ex ante value of transactions for parties who expect to have stronger cases or expect to have less control over the mechanism.

On the other hand, some have embraced judicial averaging as a feasible solution to the problem of self-serving expert testimony.\textsuperscript{23} This could be viewed as a nod to judicial realism. Many judges follow the practice and many appeals courts are willing to uphold arbitrary judicial findings in this context despite

\textsuperscript{19} We discuss this below at __.

\textsuperscript{20} See below at __. Sharfman, \textit{supra} note 9.

\textsuperscript{21} Other mechanisms might include self help or arbitration. See below at ____.

\textsuperscript{22} To the extent litigation has social value as a dispute resolution mechanism we should be concerned with this distortion. See below at____. Especially where the alternative mechanism is self-help, there is good reason to think that litigation has social value. \textit{See} Adam B. Badawi, \textit{Self-Help and the Rules of Engagement}, (work in progress; draft on file with authors).

\textsuperscript{23} \textit{See}, \textit{e.g.}, Sharfman, \textit{supra} note 9, at 370 (proposing a valuation averaging process for arriving at a compromise value between those suggested by experts); Gross, \textit{supra} note 9; Tarver Robertson, \textit{supra} note 9.
significant doctrinal hurdles. Those who are more skeptical have proposed modifications to how expert testimony is presented. The court-appointed expert is among the most popular solution proposals. This suggestion – which fundamentally changes the role of the judge and the advocates in determining complex facts – has gone largely unheeded by judges themselves and court-appointed experts remain a novelty.

\[24\] See, e.g., United States v. 1,162.65 Acres of Land, 498 F.2d 1298, 1301 (8th Cir. 1974) (“where the totality of the evidence supports the award it will be upheld notwithstanding the fact it is outside the range of all the experts’ valuations”); Laird v. United States, 556 F.2d 1224, 1241 (5th Cir. 1977) (“a compromise figure roughly midway between the positions of the parties in no way diminishes the validity of that valuation”); Colonial Fabrics, Inc. v. C.I.R., 202 F.2d 105, 108 (2d Cir. 1953); Swope v. Siegel-Robert, Inc., 243 F.3d 486 (8th Cir. 2001) (where shareholders dissenting to merger sue over valuation, appeals court finds no clear error after district court chose value within range of expert valuations). One court went as far as to reverse a district court for not using its discretion to conduct its own judicial valuation. Tractebel Energy Marketing, Inc. v. AEP Power Marketing, Inc., 487 F.3d 89 (2nd Cir. 2007).

\[25\] This is proposed as a solution for the problem of self-serving experts more generally and not just in the valuation context See, e.g., Donna Tumminio, Breaking Down Business Valuation: The Use of Court-Appointed Business Appraisers in Divorce Actions, 44 Fam. Ct. Rev. 623 (2006) (describing how appointed appraisers are less costly, quicker, and lead to increased settlements and should be used when party witnesses would produce large disparities in valuation); Ellen E. Deason, Court-Appointed Expert Witnesses: Scientific Positivism Meets Bias and Deference, 77 Or. L. Rev. 59, 93 (1998) (suggesting that court-appointed experts are perhaps best able to “analyze the conflicts between the party experts”); Joe S. Cecil & Thomas E. Willging, Accepting Daubert’s Invitation: Defining A Role for Court-Appointed Experts in Assessing Scientific Validity, 43 Emory L.J. 995, 1009 (1994) (suggesting that court-appointed experts are useful both in leading to appropriate decisions on the merits and encouraging settlement); but see Sophia Cope, Ripe for Revision: A Critique of Federal Rule of Evidence 706 and the Use of Court-Appointed Experts, 39 Gonz. L. Rev. 163, 195 (2004) (stating that court-appointed experts are a second order solution and that their use “should decline as judges’ sophistication with scientific methods increases”).

\[26\] See In re Joint E. & S. Districts Asbestos Litig., 830 F. Supp. 686, 693 (E.D.N.Y. 1993) (“A recent survey of trial judges conducted through the Federal Judicial Center revealed that use of court-appointed experts under Rule 706 is relatively infrequent and that most judges ‘view the appointment of an expert as an extraordinary activity that is appropriate only in rare instances.’”) (citation omitted). Other proposed solutions include blind experts, outside intermediaries, and formulaic combinations of divergent expert valuations. Sharfman, supra note 9.
This Article suggests a more fundamental solution that moves in the opposite direction. Rather than further separating complex valuation from the traditional adversarial process, we propose that it be reunited with the legal principles and safeguards of basic fact finding. A preoccupation with the purportedly unscientific nature of valuations and the experts who conduct them has led courts, academics, and lawyers to construct a false distinction between two processes which are both at their heart nothing more than drawing factual inferences from evidence. There is no fundamental difference between inferring a “fact” from the competing testimony of various eyewitnesses or other evidence on the one hand, and inferring the market value of an asset from data and the competing testimony of financial experts on the other. Both require a judge\(^ {27}\) to measure the credibility of witnesses who are providing testimony about circumstances that are beyond the judge’s knowledge and expertise. And both require the judge to make factual inferences based upon those credibility determinations. And yet the process and standard of reviewing those inferences has diverged in practice.

The conventional view that differentiates these two processes both overcomplicates the judge’s role in the complex valuation and idealizes the “truth” finding role of the judge in the traditional cases.\(^ {28}\) Consider a car accident in Chicago: The factfinder has no more expertise about what happened at Adams Street and Michigan Avenue at 9:00 pm on a Tuesday than she does about the value of a clean-energy company at the time it filed for bankruptcy.\(^ {29}\) In the first

\(^{27}\) For simplicity and because most complex valuations occur before them, we focus on judges as factfinders throughout most of this article. See below at ___ for the distinctions involved when a jury is doing the fact finding.

\(^{28}\) On the interaction between truth and expert testimony see Hand, supra note 10, at 55.

\(^{29}\) In the bankruptcy of the energy company Calpine Corporation, for example, the parties asserted valuations ranging from $11.9 billion to $25.5 billion. The valuation dispute turned on expert models and the predictions about various inputs into those models. Ultimately, the case settled. See Anthony J. Casey, The Creditor’s Bargain and
case, the judge must assess the value of competing eyewitness testimony or circumstantial evidence. In the second, she must assess the value of competing expert models. Neither inference is more or less “factual” than the other. And neither answer is more or less entitled to the label “truth.”

We suggest the problem stems from a theoretic and doctrinal vacuum. With little more than an intuition that expert valuations are different, the system has embraced an artificial and unnecessary distinction. By filling that vacuum, we provide a reasoned and practical theory for complex valuation. We argue that complex valuation cases are similar to cases that involve more run-of-the-mill fact finding. Courts must hear testimony, look at documents, weigh credibility, and make findings of fact that are consistent with the record. Here, as in other areas, procedural mechanisms such as burdens of proof, limitations on admissible evidence, and the basic requirement that verdicts be supported by and not be against the weight of the evidence should protect the integrity of the judgment at least to the same degree as with other facts.

As a practical matter (and counterintuitively) treating valuation questions as traditional questions of fact places greater importance on and creates more reliability in experts and their models. The logical extension of conceiving of complex valuation as an enterprise in traditional fact finding is to limit courts to finding values that have been arrived at by applying a vetted methodology, not through a judge’s back of the envelope or excel spreadsheet calculation. Typically – though not always – this will mean that a judge must choose one of the valuation methodologies offered by the parties’ experts, or find that the party with the burden of proof has failed to meet that burden. This does not mean that judges have no role in valuations other than to choose one expert’s number or the other. Rather, judges must scrutinize the relevance of methodologies being

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*Option-Preservation Priority in Chapter 11, 78 U. Chi. L. Rev. 759, 801 n. 167 (2011) (discussing the details of the Calpine valuation dispute).*
applied and engage in fact finding on their credibility and the integrity of the variables going into the models being used.

Furthermore, by limiting themselves to valuations supported by the factual record (that is to say supported by the data, the experts, and their models) and invoking the burden of proof in cases in which they are unpersuaded by either expert, judges will improve the incentives of litigants and their experts. This outcome is akin to that achieved by final-offer arbitration mechanism such as “baseball arbitration.” At the risk of losing everything, the party with the burden of proof will put on an expert with better credentials and a more reasonable approach who is prepared to explain her methodology and justify her choice of variables. In response, the other side will have every incentive to present its own highly qualified, reasonable expert. Because the parties have better incentives to put forth reasonable experts, the range of outcomes will narrow around the accurate value. The ultimate valuation should become more accurate and uncertainty problems will be diminished. In turn, the court's ultimate decision will be easier to review and the valuation itself will have a legitimacy that is lacking under the current arbitrary regime.

This Article proceeds in three parts. Part I presents the problem and its costs. Part II sets forth our proposal to return complex valuation to the traditional fact-finding process and explores the theoretical grounding and the practical applications of the approach. Part III explores broader implications of this analysis beyond complex valuation as well as its limitations.


31 See Kohler, 468 F.3d 1032 (“[The IRS] could have justified a more modest estimate yet one well above $11.1 million, but clinging stubbornly to its untenable valuation it suggested no alternative to $19.5 million. It played all or nothing, lost all, so gets nothing.”)
I. Judicial Valuation Today

Our primary objective in this Article is to show that the judicial approach to complex valuation\(^{32}\) has strayed from first principles of fact finding. The resulting state of affairs is a theoretically unjustifiable process that undermines judicial legitimacy and creates costly uncertainty. For the most part, courts and scholars have (at least rhetorically) given lip service to the notion – which is central to our analysis – that complex valuation is a type of fact finding. The largely unspoken assumption is that in complex valuations as elsewhere "the legal system[] aspire[s] toward truth."\(^ {33}\) In keeping with this, contributors to the literature on reforming complex valuations have generally sought measures "that may help make our expert witnesses genuine contributors to the quest for truth."\(^ {34}\)

Relatedly, courts conducting valuations do not suffer from a lack of clarity about the ultimate fact they are trying to identify. Just as in the binary case where a court must determine whether the defendant stole the wallet, in complex valuation cases the ultimate fact being pursued is generally no mystery. As one bankruptcy judge described it, "in determining an asset's value the ultimate goal remains . . . to determine as accurately as possible what the sale price would

\(^{32}\) There is no theoretical distinction between simple and complex valuation. Instead, they are best conceived of as on a spectrum of complexity. The value of a collection of cash, for example, is one of the simplest cases. The court will need only the factual testimony about precisely how much cash was in the collection. On the other end of the spectrum, the going concern of a corporation in bankruptcy can often require highly technical determinations about financial and other questions that require the application of skills that are beyond the capacity of a court or traditional factual witness. See below at __. We focus primarily on the more complex cases in this article, but our ultimate proposal applies across the spectrum.

\(^{33}\) Tarver Robertson, supra note 9, at 184 and 181 (arguing that, although "the law may be wrong in its presupposition that there is an exogenous truth to be found," that assumption has instrumental value and should obtain in complex valuation cases).

The goal of valuation is similarly straightforward in tax cases, where the tax code typically requires that the court determine the fair market value of the asset being transferred. While the tax code provides simple formulae for determining that value in some circumstances, in other instances, valuation depends on the hypothetical "value the transferred interest in question would command had it been sold." There is no doubt about the final objective – to determine the value an asset would have if it were sold.

Even as valuations proceed on the assumption that courts will invoke the truth-seeking function of the judicial system in the service of identifying a particular value necessary to a legal proceeding, courts seem to disclaim the notion that accuracy in complex valuations is even possible. Chief among such disclaimers is one often repeated in the tax courts: "The determination of the fair market value of property is a matter of judgment, rather than of mathematics." In other words, the consensus assumption that valuation, like other fact finding is a truth-seeking enterprise aimed at identifying a specific value has meant little as courts have treated valuation (either explicitly or through some sleight of hand) as a unique type of inquiry that must be conducted outside the normal bounds of reasoned judicial fact finding.

We suggest that this overlooked disjunction between practice on the ground and the express and implied goals of valuation within the legal system is key to understanding and resolving the breakdown of our system of complex valuations. Indeed, this very tension surrounding the fact finding involved in

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37 We lay out our argument for holding to this assumption that valuation is a way to arrive at a value that corresponds not to a random number selected by an inexpert judge, but to the valuation produced by an expert applying an accepted valuation methodology in Part I.b.

complex valuations bubbled to the surface in a recent debate at the Supreme Court of the United States. In *Comcast Corp. v. Behrend*, Justice Scalia, writing for the majority, included this enigmatic language in a footnote:

The dissent is of the view that what an econometric model proves is a "question of fact"... [W]hile the data contained within an econometric model may well be "questions of fact" in the relevant sense, what those data prove is no more a question of fact than what our opinions hold.39

Unsurprisingly, given the lack of judicial or scholarly attention to this particular question, the language was not supported by citation to precedent. Nor did the majority explain whether the reasoning applied to valuation models outside of the class certification context.40 Other ambiguities abound. By its plain language, the footnote may be read to state that valuation models themselves are opinions on legal questions and can therefore be reviewed, overturned or manipulated by courts at any level under their authority as interpreters of the law. Under a more moderate reading, the footnote may suggest simply that what a valuation model is capable of proving is not a question of fact but is instead the type of legal conclusion that deserves no deference. Either way, it is problematic.

Justice Ginsburg’s dissent took issue with the majority’s characterization of what constitutes a fact when an expert generates a model and a resulting calculation:

The Court, however, concludes that “the model failed to measure damages resulting from the particular antitrust injury on which petitioners’ liability

39 133 S.Ct. 1426, 1434 n. 5 (U.S. 2013) (emphasis added).

40 It is possible that Justice Scalia was simply referring here to the *Daubert*-like inquiry that must be done before a model can be introduced for certification purposes. The ambiguity lies in the word “what.” To ask what the data prove is both to ask the general question of what the model is useful for (is it a legitimate damages model?) and to ask what output it provides (what specific damages number does it produce?). The dissent seems to reject the validity of all versions of interpreting this language.
in this action is premised.” To reach this conclusion the Court must consider fact-based matters, namely what this econometric multiple-regression model is about, what it proves, and how it does so. And it must overturn two lower courts’ related factual findings to the contrary.

Here, the District Court found McClave’s econometric model capable of measuring damages on a classwide basis, even after striking three of the injury theories. Contrary to the Court’s characterization this was not a legal conclusion about what the model proved; it was a factual finding about how the model worked. Under our typical practice, we should leave that finding alone.\footnote{Id. at 1439-40.}

This back-and-forth has thus far been paid little attention. Yet it is worth analysis precisely because (unwittingly or not) the Justices’ dialog begins to scrape away the veneer that has allowed the current system of valuation by judge to flourish. Both the strong and weak forms of Justices Scalia’s point are problematic for reasons we discuss throughout this Article. As we will show, while what a valuation model needs to show in order to satisfy a legal claim is a question of law, the operation of that model and whether from a technical standpoint it is capable of making that showing is clearly a question of fact that requires a factfinder to make a series of credibility judgments about everything from the expert’s demeanor to the expert’s methodology, her choice of variables, and the way in which she combines those variables.

Justice Scalia’s weaker claim is also problematic for reasons we discuss, most importantly because so many intermediate factual findings go into a decision that a particular valuation model will indeed offer relevant legal proof that they are inextricable from the ultimate legal conclusion. This means that credibility judgments about the expert testimony on the variables and the model

\footnote{Id. at 1439-40.}
itself cannot be separated, at least in the absence of a clear error, from the ultimate conclusion about whether the legally relevant fact can be obtained from the particular model.

We suggest here that while the majority’s rhetoric may be strikingly out of synch with the basic notion that fact finding based on facts introduced by experts is no different from any other, its view is in ways closer to current practice on the ground in cases involving complex valuations than the dissent’s. But that current practice is problematic. And to the extent the Court is articulating a doctrine that expands and ingrains the mindset that complex valuations are not factual inquiries, it is walking the judicial system further down the path that has mired these frequent disputes in what many have called the “theater of valuation.”

In this Part, we explore the current practice of courts and litigants in complex valuation cases. While others have described the problem of expert bias and exposed the degree to which judges routinely mediate between the extreme values presented by experts, we focus on the justifications for valuation by judge. We show how the notion that valuations are fiction or opinion rather than fact has created an environment where judges routinely engage in unprincipled and unpredictable intervention in the task of valuation. We then explore the social costs imposed by this state of affairs.

42 The exact import of Justice Scalia’s Comcast language will only be revealed with time. The language is ambiguous and subject to multiple interpretations. Which interpretation prevails is beyond the scope of this Article as it will depend on idiosyncratic judicial behavior. While there is an extensive literature on that, see, e.g., Anthony Niblett, Tracking Inconsistent Judicial Behavior, 34 In. Rev. L. & Econ., 9 (2013) (reviewing and testing theories of judicial behavior), that is not the focus of this inquiry. While the language may be ignored by courts below, or rejected as dicta by the Court itself, there can be no doubt that lawyers will invoke it when it is to their advantage. If taken wholesale, the reasoning may have implications beyond those discussed in this Article. As it is, courts treat complex valuations as sui generis hybrid problems. They treat them differently from other facts at the trial level but the appellate review is still deferential. To follow the Comcast reasoning to its extreme, the validity, utility, and accuracy of a valuation model may become pure legal conclusions that are reviewed de novo. It is not certain how the trial court’s assessment of the credibility of the expert witness would fit into that analysis.
A. The Current Practice

[S]ince valuation is necessarily an approximation, it is not required that the value we determine be one as to which there is specific evidence, provided it is within the range of figures that properly can be deduced from the record.

- Silverman v. Commissioner, 538 F.2d 927, 933 (2d Cir.1976)

Assigning value is a task the legal system confronts daily. Courts set the worth of complex financial assets, entire corporations, and individual licenses in bankruptcy and tax proceedings. They judge how much limbs and lost years of work are worth in tort. And they determine the costs associated with constitutional entitlements, such as an adequate education or the funding necessary to meet the eighth amendment floor for prison conditions. Yet, despite the frequency with which such cases are litigated and the gravity inherent in allocating large sums of money in these contexts, the legal proceedings associated with determining value are widely conceived of today as "the theater of valuation."44

Why the theater? Judges and commentators view complex valuation as its own species of judicial determination, distinct from situations in which courts determine an independently verifiable fact, such as who stole a wallet. This view appears to be founded on a false distinction.45 In the case of the wallet, the court's task is viewed as uncovering a fact that already exists. And no matter how

43 For examples of the varied cases where courts confront complex valuation, see supra notes 3-8.


45 The search for a distinction between lay and expert testimony is firmly ingrained in our legal system. Learned Hand set out the premise of a distinction clearly – though, we suggest, erroneously – in 1901. Learned Hand, Historical and Practical Considerations Regarding Expert Testimony, 15 Harv. L. Rev. 40, 44-45 (1901) (distinguishing between expert opinion and lay testimony about fact).
carefully the court approaches its task, it is theoretically always possible that a subsequent revelation would show the court’s decision to be incorrect. Valuation of complex assets or entitlements, by contrast is not viewed as a quest for that kind of yes or no answer. This has led to the widespread view that while "the issues are largely if not wholly factual," conducting a valuation is "an extraordinarily open-ended process." In the words of one bankruptcy court, "valuation is a malleable concept, tough to measure and tougher to pin down without a host of explanations, sensitivities and qualifiers."

Further contributing to the perception that valuing complex assets involves theater is the fact that in such cases courts are invariably presented with experts for each side who differ about everything from the assumptions that should be made to the methodology that should be used. And those choices matter. As economists have noted, "[a]n inescapable feature of economic or financial testimony is that even slight changes of a few peripheral assumptions lead to substantial differences in valuation estimates." Yet, rather than focusing attention on the substantive assumptions being made, the presence of dueling experts in every complex valuation case contributes to a perception that valuation is simply an exercise in relativism. In a recent bankruptcy case, for example, the court described the task of valuation as "highly dependent on the perspectives and biases of those doing the measuring."

\[\text{References}\]


48 Kenton K. Yee, supra note 11.

49 Tarver Robertson, supra note 9, at 178 ("If every serious legal dispute devolves into a battle of hired-gun experts, the public may come to believe that 'there is no objectively correct scientific truth.'").

50 In re Charter slip op 17; see also Sieg Co. v. Kelly, 512 N.W.2d 275, 278 (Iowa 1994) (“What we have here is the usual stand off inherent in stock valuation cases. Both parties believe their expert's stock valuation calculations are the 'correct' ones.”); Cavalier Oil Corp. v. Harnett, 564 A.2d 1137 (Del. 1989) (one party's expert valued
Courts have responded to the perception that complex valuation is a relative enterprise akin to theatrical production with an often cynical embrace of their own discretion. In one frequently cited example from bankruptcy, a judge handed down his decision to value a company at the precise mathematical average of the values proposed by each side while at the same time pointing out that it "is a total absurdity that anybody could fix a value with that degree of precision." Other bankruptcy courts have referred to the "art of valuing a business," explaining their decisions to deviate from formulae proposed by the experts with the observation that such valuations require "the exercise of well-informed judgment." Corporate governance cases are no different. The case law is filled with cases of courts applying ad hoc methods to value assets, corporations, junk bonds, and the like. Tax courts similarly assert their broad discretion in complex valuation cases, offering a boilerplate justification for their freedom to deviate from expert findings in favor of their own judgment.

shares at $44.45 each while the other party's expert valued the same shares at $676.80 each).

51 See, e.g. Estate of Gallagher v. C.I.R., 101 T.C.M. (CCH) (T.C. 2011) (electing to use a conservative estimate after "neither expert convinced us as to the accuracy of his analysis."); Fed. Nat. Mortgage Ass'n v. Bruckner, 489 B.R. 93, 102 (E.D. Wis. 2012) (court selecting its own compromise value after it decided that "neither expert's opinion was entitled to more weight than the other's").

52 Citibank, N.A. v. Baer, 651 F.2d 1341, 1347 (10th Cir. 1980) (quoting district court opinion) quoted in, for example, Sharfman, supra note 9, at 359; Chaim J. Fortgang & Thomas Moers Mayer, Valuation in Bankruptcy, 32 UCLA L. Rev. 1061, 1132 (1985)

53 In re Charter slip op. 16.

54 Cede, 2003 WL 23700218, at *2 ("Experience in the adversarial, battle of the experts' appraisal process under Delaware law teaches one lesson very clearly: valuation decisions are impossible to make with anything approaching complete confidence... This effort should, therefore, not be understood, as a matter of intellectual honesty, as resulting in the fair value of a corporation on a given date.")

55 Buckley v. C.I.R., 68 T.C.M. (CCH) 754 at *6 (1994) (We "are not bound by the formulae and opinions proffered by an expert, especially when they are contrary to our judgment. Instead, we may reach a decision based on our own analysis of all the evidence in the record.").
treatise on federal taxation, Boris Bittker wrote with understatement that "[j]udges sometimes relish the role of expert pro hac vice."\(^{56}\)

Another recent bankruptcy proceeding illustrates the extent to which current valuation practice resembles a situation where judges act as both factfinder and expert in order to justify, ex post, decisions that essentially mediate between the two poles presented by the parties (depicted in stylized form in Figure 1). The case involved valuing a 252-unit residential real estate development in Kentucky known as Colts Run that was owned by a bankrupt corporation. The bank and the corporation were disputing its value. The bank argued that the property was worth not less than $17 million while the debtor argued that the property was worth $25 million.\(^{57}\) In that case, the bankruptcy judge held a hearing at which she gathered the attorneys around her laptop in order to walk them through her valuation decision. She explained that in making her decision, she had "read all of the appraisals carefully," looked at "all of the assumptions" made by the experts, and come up with her own value. In doing so, the judge consulted an article describing property valuation techniques and concluded that "there really are no accepted principles, there are different approaches."\(^{58}\) From her reading, the judge apparently felt at liberty to choose her own values for the various factors, such as effective gross income, other income, operating expenses and cap rate, that went into the valuation, and "plug[] them into the [Microsoft Excel] spreadsheets."\(^{59}\) What formula the Microsoft Excel spreadsheets were implementing is never explained.

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\(^{56}\) Bittker, *Federal Taxation of Income, Estates and Gifts*, § 135.5.1 Role of Experts (Thomson 2012).


\(^{58}\) *In re Colts Run, L.L.C.* (Bankruptcy N.D. Ill. 2011) transcript at 5.

\(^{59}\) *Colts Run* at 3, 4.
Despite acknowledging the maxim that "the income developed by one [valuation] method [must be] used with a cap rate derived by that same method," the judge admitted that in doing her own calculation, "I just could not delve into this and look at whether these definitions were consistent or not." Instead, the judge explained her own valuation methodology. She gave "half credit" to certain estimates of real estate taxes because, at least in one instance, she did not know what the part of the property being taxed, in this case a garage, was like. She also "went in the middle" between the two expert calculations of "effective gross income." She then looked at operating income and again found herself "sort of in the middle between the bank and the debtor." Finally, with some of the irony that is a common feature of opinions dealing with complex valuations, the judge told the parties, "amazingly enough, I selected the cap rate [exactly halfway between the two competing appraisals]."
This account is concerning. Judges do not routinely acknowledge that they are ignoring basic mathematical principles and making random assumptions in the absence of information. In fact, when they do so, whether openly or not, it should be grounds for reversal. Our justice system has mechanisms to deal with limited or absent information. Picking a number out of a hat is not one of them. Yet in this bankruptcy case, the judge was well within the norm when she decided to do just that. The judge could, and did, take "heart on the [precedent] . . . that said I could go through there and pick and choose in terms of different assumptions that were made and what have you." In the end, after halving her variables without regard to their correlational integrity, the judge summarized her methodology: she input the variables and "went down that column and whatever the number came out to be, the number came out to be." In this case, that number told her that the Colts Run apartment complex was worth $23,940,914.29. Remarkably, if anything is out of the ordinary about this decision, it is that the judge took the time to explain her arbitrary reasoning in such detail.

The judge in the Colts Run case would likely have had her judgment upheld whether or not she had explained her reasoning. Reviewing courts have consistently approved the idea that trial courts have near total discretion when it


67 See, e.g., Estate of Todisco v. C.I.R., 757 F.2d 1, 3 (1st Cir. 1985) (reversing tax court finding because Commissioner's method for calculating gross profit percentage was "spurious" and based on an unsupported factual assumption); Baba v. Holder, 569 F.3d 79, 84 (2d Cir. 2009) (reversing IJ determination because IJ's "gratuitous assumption" about a particular country were "rank unsupported speculation").

68 Burdens of production, discovery requests and conferences, or if those fail, burdens of proof that punish the failure to produce information are some elementary ways that the system addresses informational vacuums.

69 Colts Run at 4-5.

70 Colts Run at 5.
comes to complex valuations.\footnote{Comcast Corp. v. Behrend notwithstanding; see above at __.} They have created a regime where the lower courts are free to cherry-pick among the assumptions and methodologies offered by experts or even to use none at all. For example, in reviewing a tax court valuation of a gift of closely held stock, the Second Circuit dismissed an argument by appellants that "the Tax Court's use of a method of valuation different from that proposed by either their own or Commissioner's experts deprived them of due process of law.\footnote{Silverman v. C.I.R., 538 F. 2d 927, 933 (1976).} In explaining why the tax court was free to adopt its own valuation methodology rather than that offered by either side's expert, the Second Circuit reiterated the surprising conclusion that a value arrived at by the tax court does not need to be "a figure as to which there is specific testimony, if it is within the range of figures that may properly be deduced from the record."\footnote{Silverman \textit{v} CIR, 538 F.2\textsuperscript{d} at 933.}

What counts as a proper deduction from the record, in turn, is almost anything that is not obviously contravened by an actual document or, in rarer cases, by precedent establishing that a particular methodology should be used. The leading tax treatise on valuation states that "decisions of the trier of fact on [valuations] are so rarely overturned on appeal that they are, for practical purposes, conclusive."\footnote{Bittker, \textit{Federal Taxation of Income, Estates and Gifts}, § 135.5.2 Role of Experts (Thomson 2012).}

The main rationale for all of this latitude on the part of trial courts is the perception that what is really going on in valuations is "at best a process of weighing evidence of expert guesswork."\footnote{Silverman \textit{v} CIR, 538 F.2\textsuperscript{d} at 933; see also sources cited \textit{supra} note 24.} As early 1964, an article in the Tax Law Review described "the impression among the legal profession, accountants, estate managers, and others that valuation is essentially a process of 'horse-trading' in which each party takes an extreme position in the hope that the final compromise
will be to his advantage."\textsuperscript{76} In the courts, judicial guesswork has long been accepted as an antidote to advocate experts who slant their results in one direction or another. In response to what many judges conceive of as disingenuous and "overzealous effort[s] to infuse a talismanic precision" into expert valuations, many courts throw up their hands.\textsuperscript{77} Some have famously accused the parties of playing charades in their courts with their valuation evidence and threatened them with choosing one side or the other's valuation in toto unless they agree to settle.\textsuperscript{78} Others have given up on the experts and conducted their own haphazard valuations. One bankruptcy judge adjusted the value of a license upward by 25%, while explaining, illogically, that "obviously it's not within [my] capacity . . . to properly create an independent valuation, but I am impressed that there has to be some adjustment made to the valuation that [the plaintiff's expert] suggested."\textsuperscript{79} In short, the idea that complex valuation is a fuzzy and most likely impossible enterprise has allowed courts to conceive of their role in the process as simply to mediate between the values presented by the parties in an attempt to resolve the dispute rather than to achieve a procedurally legitimate, accurate, and predictable outcome.

\textbf{B. The Costs}

As the preceding discussion suggests, there are significant theoretical problems with the courts' approach to valuation. But more fundamentally the approach creates significant costs that could otherwise be avoided. They can be

\textsuperscript{76} Chelcie C. Bosland, \textit{Tax Valuation by Compromise}, 19 Tax L. Rev. 77, 78 (1963-64).

\textsuperscript{77} \textit{Buffalo Tool & Die Manufacturing Co. v. C.I.R.}, 74 T.C. 441, 452 (1980).

\textsuperscript{78} \textit{Buffalo Tool}, 74 T.C. at 451 ("As the Court repeatedly admonished counsel at trial, the issue is more properly suited for the give and take of the settlement process than adjudication.").

\textsuperscript{79} \textit{In re Airadigm Communications}, transcript at 8.
roughly divided into two categories: 1) legitimacy and law and 2) uncertainty and the cost of contracting.

i. Legitimacy

We discuss throughout the illegitimate or unprincipled nature of the decisions that result from ad hoc judicial valuations. Those are loaded words that need to be unpacked. From a market transaction perspective, a judicial process that was known to produce highly variable outcomes but with a certain expected value may be wasteful (as discussed below) but not necessarily illegitimate. In no sense would the valuation produced come anywhere close to estimating true or actual value, but if that was priced into the transaction there might be little for the parties to complain of in the sense of fairness or legitimacy.

But the valuation of complex assets has been wrapped full fold into our adversarial justice system, creating additional legitimacy concerns. That system has as its popularly accepted goal the attempt to reach an accurate, or “truthful,” outcome. Many believe that the failure or success of this goal can have significant impact on the public’s buy-in to our justice system. This conviction

80 Tarver Robertson, supra note 9, at 182 ("It goes without saying that outcome accuracy is an important concept in litigation. Some suppose that the truth has intrinsic value for the legal system, just as it does in the sciences. A reasonable degree of accuracy is also arguably necessary to make adjudication morally binding and legitimate. Aside from any such intrinsic value, however, the legal system’s truth-seeking function clearly has instrumental value. The substantive law exists to serve deterrence, compensation, and sometimes punishment; and the achievement of these purposes demands accuracy.")

81 Tom Tyler, Procedural Justice, Legitimacy, and the Effective Rule of Law, 30 CRIME & JUSTICE 283 (2003). Much has been written on the importance of procedural justice to perceptions of fairness and legitimacy in the system. See, e.g., Tom Tyler, WHY PEOPLE OBEY THE LAW (Princeton, NJ: Princeton University Press, 2006) (seminal work finding people believe in legitimacy of authority when procedures used are perceived as fair more so than if the outcomes are perceived as just); Raymond Paternoster, Robert Brame, Ronet Bachman, and Lawrence W. Sherman, Do Fair Procedures Matter? The Effect of Procedural Justice on Spouse Assault, 31 LAW & SOC’Y REV. 163, 170 (1997) (surveying studies and concluding that "perceptions of procedural fairness affect perceptions of satisfaction with and legitimacy of legal authorities"); Stephen J.
has deep roots in rule-of-law theories that hold that “reactions to legal authority are based to a striking degree on the assessments of the fairness of the processes by which legal authorities make decisions.”

This suggests two potential problems with arbitrary judicial valuations embedded in our larger adversarial system. The first is fundamental and systemic. The formal message sent by the systemic use of experts in complex valuation cases is that these experts are providing valuable information. At the rates they charge, the public would be expected to assume as much. In some cases, testimony can go on for days using up enormous private and public resources. A judge or jury is then charged with determining the facts based on the expert information. Yet lawyers and scholars complain that the process is an arbitrary theater. Experts are hired-guns and courts are incompetent referees.

That state of affairs is not invisible to the public as a whole. And it contradicts the formal message that experts are indispensible to complex valuations because those valuations strive for accuracy. All else equal, this will reduce faith that the system is fair and directed to achieving its goal. By many accounts that loss of faith will lead to more negative reactions to legal authority and less buy-in to our system generally. That will, in turn, destabilize and reduce the value of legal authority and institutions. The extent of this problem, if any, is


See, e.g., Tom Tyler, *supra* note 81.
an empirical question to which we don't have the answer. But, at a minimum, it is consistent with the existing evidence that random procedural mechanisms have a negative effect on legal authority.\textsuperscript{83}

Another systemic problem, and perhaps a greater one from an individual actor's perspective, centers around the outcomes offered by judicial valuations. By locating valuation in a system which serves as a cornerstone of legitimate justice, the message to parties in transactions and other relevant interactions is that accuracy is also a goal of judicial valuation. If randomness was an intended part of the contract in every transaction, the market would be expected to embrace an explicitly random mechanism for dispute resolution. Because that has not happened, a party at the outset receives the message that the process is designed to achieve a non-random, accurate outcome. Sophisticated repeat players (or those advised by lawyers who are sophisticated repeat players) will know better. In theory, those sophisticated players can take advantage of their asymmetric knowledge and capture value from unsophisticated counter parties. More likely, though, the public will become skeptical of all transactions involving complex valuation. That will stifle valuable economic activity. In essence the subjective view of unfairness in valuations within the legal system will reduce the buy-in to vast sectors of the market economy just as a view of unfairness elsewhere reduces the buy-in for the justice system generally.

A final problem with arbitrary valuation that relates to legitimacy is its effect on individual behavior. Much has been written about the way individuals view rules, norms, and unenforceable contract provisions. Parties often adhere to contracts for non-monetary behavioral reasons. Their word is worth something. A contract that has no enforceable penalty may still be followed simply because the party views it as the right thing to do.\textsuperscript{84} As the remedy for breach becomes

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\textsuperscript{83} Id.

\textsuperscript{84} In re Ancestry.com, Inc. Shareholder Ligations, 7988-CS Transcript at 27 (Dec. 17, 2012) ("I think treating people with dignity and respect assumes there is a class of
completely arbitrary and the parties view this as a baked-in default rule, they may view it as nothing more than an agreement to roll the dice. Knowing that the other party has the option to use random valuation to her benefit, the one is less likely to feel a moral obligation to perform. This reduces the value of moral obligation in enforcing contracts and makes contracting more expensive.\(^85\)

ii. Uncertainty, Risk, and the Cost of Contracting

The cost of uncertainty or risk is difficult to predict. And it is worth distinguishing between risk and uncertainty (or ambiguity) when trying to do so. To oversimplify, although both involve variability of unknown outcomes, risk is understood to capture the idea of outcomes drawn from a known distribution while uncertainty characterizes situations in which outcomes are drawn from an unknown distribution.\(^86\) Putting aside claims that all risk is really uncertainty, it is useful to know which category one is dealing with. It is not obvious whether the variability in judicial valuation is closer to risk or uncertainty.\(^87\) In the aggregate it may be that the values produced by judges fall along a nearly predictable buyer out there that actually takes legal obligations seriously, that is not willing to play the Chicago School efficient breach theory games just for fun."; Douglas G. Baird and M. Todd Henderson, Other People’s Money, 60 Stan. L. Rev. 1309, 1323 (2008) ("[M]any directors want to do what they are supposed to do.").

\(^85\) Oliver Hart and John Moore, Contracts as Reference Points, 123 Q. J. Econ. 1 (2008); Ernst Fehr and Simon Gachter, Fairness and retaliation: The Economics of Reciprocity, 14 J. Econ. Perso. Journal of Economic Perspectives, 159 (2000).

\(^86\) See F. Knight, Risk, Uncertainty and Profit 12 (1921); See also Eric L. Talley, On Uncertainty, Ambiguity, and Contractual Conditions, 34 Del. J. Corp. L. 755, 759 (2009)("'Risk' refers to randomness whose probabilistic nature is extremely familiar and can be characterized with objective probabilities (such as the outcome odds that attend the roll of a fair die). 'Uncertainty,' in contrast, refers to randomness whose probabilistic behavior is extremely unfamiliar, unknown, or even unknowable.").

outcome distribution. But it may be that they are more random and arbitrary than that.\textsuperscript{88} We analyze the costs of judicial valuation under both scenarios.

It may be that risk has no cost at all. As long as the courts arrive at the correct outcome on average, neutral parties only care about the mean of the outcome distribution not the characteristics and variability of the distribution itself. Even if the outcome is not right on average, the expected deviation from the “right” outcome can be priced into the ex ante transaction and no one is worse off.

Uncertainty may have the same result. There may be no reason to think that the courts arrive at correct outcomes on average or that there is any way to predict the probability of any given outcome. With no information, the parties have as much reason to expect to benefit from the arbitrary result as to be harmed by it. This may be equivalent to a 50% risk. On the other hand, evidence suggests that parties react differently to uncertainty for reasons such as ambiguity aversion\textsuperscript{89} and so costs may be higher if the valuation is uncertain.

In any event, under certain conditions risk or uncertainty can introduce welfare loss. Most obviously, a Pareto inefficiency exists if risk-averse parties are pushed out of the market by uncertainty or risk.\textsuperscript{90} A risk-averse party who for some reason cannot insure against the risk will not undertake a transaction that – if risk were reduced – would be value creating. Insurance markets can solve this in many cases with low information costs, but as those costs increase ...

\textsuperscript{88} The outcome distribution surely is not at either pure extreme. It is not entirely random or entirely predictable. The question is which extreme captures the variability most usefully for those who must make decision in the face of variable outcomes.


\textsuperscript{90} Again, they may be more averse to uncertainty than to risk, but the basic point remains the same.
insurance becomes a less viable solution. Uncertainty can also make insurance more costly than risk because insurance relies on being able to quantify the known probabilities associated with uncertain outcomes.

Second, uncertainty and risk make it costly for parties to bind themselves to some value-creating transactions and that makes contracting more expensive. Where the parties know the true value of an asset and know that the court will have high variability in estimating that value, an option may be created for an out-of-the-money party.

For example consider the recent high-profile Delaware case *Americas Mining Corporation v. Theriault*. The allegation in that case was that Americas Mining Corporation (AMC), a controlling shareholder of Southern Peru, caused Southern Peru to buy an affiliate of AMC at an inflated price. Southern Peru paid $3.7 billion for the affiliate. The minority shareholders of Southern Peru sued.\(^\text{91}\) Ultimately, the court found that the affiliate was only worth $2.4 billion and awarded damages accordingly. To see how the option operates in a world of risk, assume at the time of the investment the parties correctly estimated a 50% chance of being on the winning side of a judicial valuation for the aggregate of disputes that might arise.\(^\text{92}\) Also assume that in expectation the value of winning is equal to the value of losing.

In the second period, an actual dispute arises. The parties learn about the dispute and the specific probabilities associated with it. Here they learn that the affiliate is actually worth $2.4 billion. But they also know that the court would value the company at anywhere from $2.0 billion to $4.0 billion with equal probability. The probability of success or loss for the parties is no longer 50%.

\(^{\text{91}}\) The suit was brought derivatively, but that is not important for our purposes.

\(^{\text{92}}\) That is, for some disputes they will have a better or worse chance of winning. But taking all possible disputes into account, the probability of being on the winning side is 50%.
Realistically it would not be. After the original ex ante expectations are set, the parties will learn information that changes their expectations and behavior.

Now that a specific dispute has been identified and the parties know the new outcome distribution, they have different incentives. Because the expected valuation is $3.0 billion, the defendant has every incentive to litigate rather than settle at the actual value of $2.4 billion. Ex ante – that is before the dispute arose – the parties might view the risk as costless because they are equally likely to be on the winning side of the uncertain outcome. In some cases, AMC will get the benefit of inaccuracy, in some cases the minority shareholders will. But once the dispute arises, and the skewed average is known, the parties’ choice of litigation is affected.

The option is even more problematic when litigation is one sided. For example, in bankruptcy, when a junior creditor pushes for a judicial valuation, it receives all of the upside of a high valuation and none of the downside. This means that the more uncertainty or risk there is in outcomes the more the junior creditor wins and the senior creditor loses. The same would be true in the AMC case if the value was actually $3.7 billion. Plaintiffs would lose nothing if the court valued the transaction at anything above $3.7 billion, but gain every dollar for a value less than $3.7 billion. The same outcome, though perhaps more extreme, will result under uncertainty.

This option can be welfare destroying. First, it introduces large transactions costs in the form of haggling and ex post litigation. Second, it creates ex post hold up that will affect the parties’ incentives to invest in the relationship. To see this, imagine two parties (P1 and P2) to a contract involving projects A and B.

93 See Baird and Bernstein, supra note 11.
94 This is a form of the classic corporate finance "risk-shifting" problem. See Benjamin C. Esty, "A Case Study of Organizational Form and Risk Shifting in Savings and Loan Industry." 44 J. Fin. Econ. 57 (1997).
95 If ex post bargaining is cheap, the parties will just settle at the expected value of the option. Therefore, this first cost of the option assumes that bargaining is costly.
Project B will be undertaken one year after the contract is entered if but only if project A is worth a certain amount \(x\). Assume that project B requires advance project-specific investments from \(P_1\) (preparing a work site, training workers, etc.). Because the investments are project specific they are useless in other projects. \(P_2\)'s investments are all generic and just as valuable in other uses. The parties both know that project A is and will actually be worth \(x\). In a world of certainty they will enter the contract, make the investments and prepare for project B. But now assume that the value of project A is likely to be litigated. While the parties know the value of A, they also know that a court will value A anywhere from \(x-100\) to \(x+100\). Knowing this, \(P_2\) can threaten litigation to hold \(P_1\) up. Once litigation is initiated, there is only a 50% chance that project B will go forward as planned. The litigation itself could derail project B if settlement does not occur. But even with costless bargaining, \(P_2\) will demand a bribe not to litigate. If that payment is expected to be sufficiently high, it will deter the original agreement. Anticipating the litigation and hold-up, \(P_1\) will not find it worthwhile to undertake the advance project-specific investments in project B. This is the classic problem of incomplete contracting and hold up that hinders relationship-specific investment.

With these costs, the deal would be more valuable if both parties could commit not to play out their option. That agreement costs neither party in expected value and reduces the expected costs for everyone. But that requires opting out of the default of litigation and designing an alternative valuation

\[\text{\textsuperscript{96}}\text{For example, there might be a financing arrangement that is secured by the value of Project A.}\]

\[\text{\textsuperscript{97}}\text{The example uses risk. The planning-cost problem would be more significant with uncertainty where the parties have no idea about the range or probabilities of the potential judicial outcomes.}\]

\[\text{\textsuperscript{98}}\text{Oliver Hart and John Moore, Incomplete Contracts and Renegotiation, 56 Econometrica, 755 (1988).}\]

\[\text{\textsuperscript{99}}\text{Even in the one-sided option case, that would have been priced into the original transaction in the first place.}\]
mechanism. In some cases, it may not be possible (or cost effective) to write such a contract. For example, in the bankruptcy context it is usually assumed to be almost impossible to bind all future creditors to a dispute resolution mechanism. A debtor may have thousands of potential current and future creditors. Some will be sophisticated banks; others will be employees or small vendors; others will be involuntary tort creditors. Bankruptcy law assumes an inability to bring all of these creditors to the bargaining table and therefore imposes mandatory rules defining the relationship between the parties.\textsuperscript{100} The same would not be true of a bilateral deal between two large businesses. But even with these parties, varying rules on the enforceability of arbitration and forum selection clauses will come into play.

Relatedly, uncertainty and risk skew the incentives of parties to use litigation as a dispute-resolution mechanism. In the examples above, if there is a choice of mediation, arbitration, self-help, or some other resolution on the one hand and litigation on the other, the choice of mechanism will be affected by the expected accuracy of the mechanisms. Parties with strong cases will prefer accurate mechanisms, while parties with weak cases will prefer inaccurate mechanisms. If the affiliate in the AMC case was actually worth $3.7 billion, the plaintiffs would never choose a mechanism with perfect accuracy. The defendants would always choose that mechanism (if they could). This has two potential costs. First, it will distort the use of dispute mechanisms based on which parties control the choice and the merits of their case. To the extent we think there is value in litigation, the inaccuracy is moving cases away from it and reducing that value. Moreover, the cases being moved toward litigation are being moved precisely to take advantage of the inaccuracy of that system. Second, this will change the ex ante value of transactions for parties who expect to have stronger cases or expect to have less control over the mechanism. A party that knows it is unlikely to

\textsuperscript{100} Thomas H. Jackson, \textit{The Logic and Limits of Bankruptcy Law} (1986).
control the choice of dispute mechanism is going to require a higher price or demand alternative binding dispute provisions be added. A party that expects to adhere to the contract and have a stronger case will also seek to raise the price or require alternative dispute resolution provisions. These attempts to contract around the problem will affect the cost of the transaction.

II. A New (Old) Theory of Valuation

Doubtless many would attempt to strike some compromise somewhere in the middle. But a figure thus arrived at would itself be unreal, one never seen anywhere in the record.

- Colonial Fabrics, Inc. v. C.I.R., 202 F.2d 105, 108 (2d Cir. 1953)

The costs inherent in our existing valuation regime have not gone unrecognized in the courts or in the academy. There is a wide-ranging consensus among scholars and judges that the current approach to complex valuations is troubled. Evidence scholars have proposed solutions ranging from employing

101 See, e.g., Charter Comm. at 16 (describing the complexity of valuation proceedings in a large corporate bankruptcy and the subjective nature of valuation); In re Airadigm Communications, Inc. at 4 ("Valuation is always an inexact science."); Chelcie C. Bosland, Tax Valuation By Compromise, 19 Tax L. Rev. 77 (1963-64) (observing that "[o]ne of the most difficult problems in federal tax administration is the determination of the value of ownership interests where there is no ascertainable market quotation" and noting "an apparent lack of any consistently applicable standards" for conducting valuations); Jay A. Soled, Transfer Tax Valuation Issues, The Game Theory, and Final Offer Arbitration: A Modest Proposal for Reform, 39 Ariz. L. Rev. 283, 283-84 (1997) (noting a lack of guidance on how tax courts should conduct valuations that results in "Solomon-like pronouncements, as judges tend to split warring parties' valuation differences"); Kenton K. Yee, Combining Value Estimates to Increase Accuracy, 60 Financial Analysts Journal 23 (2004) (arguing that a plethora of valuation procedures yielding different valuations creates problems for courts and businesses in complex valuations); Yee, supra note 11 (noting egregious problems with valuations such as "highly credentialed experts" testifying outside their core area of expertise and exploitation of grey areas in valuation by experts); Keith Sharfman, Judicial valuation Behavior: Some Evidence From Bankruptcy, 32 Fla. St. U. L. Rev. 387, 288 (2005) (arguing that one of the results of the "inherently imprecise, discretionary" nature of valuation in bankruptcy is the enactment of a pro-debtor bias on the part of bankruptcy
court-appointed experts,\textsuperscript{102} to using accredited intermediaries or blind experts,\textsuperscript{103} to imposing restrictions that would require courts to assign values based on a formulaic approach to multiple expert valuations.\textsuperscript{104} The solution need not be as complicated as these proposals suggest.

By unnecessarily overcomplicating the judicial approach to complex valuation, the courts and academics have introduced frictions that make judicial fact finding more artificial and less efficient. The view that valuation is unlike other fact finding, that it is art rather than science has led courts astray from the central task: finding of facts. By returning to first principles which are already assumed to govern in this area, we arrive at a straightforward and more effective solution that not only simplifies the judge’s role but also serves to better align the incentives of litigants and harness the benefits of the adversarial system to arrive at more accurate outcomes, which creates significant social value.

In this part, we first address the foundation (theoretical and practical) for returning valuation to the process of traditional fact finding. We then discuss how the implementation would play out in practice.

**A. Foundation**

We have suggested that courts and many commentators have accepted judicial averaging in the valuation cases because they lack a principled theory of

\begin{itemize}
  \item Andrew MacGregor Smith, \textit{Note, Using Impartial Experts in Valuations: A forum-specific Approach}, 35 Wm. & Mary L. Rev. 1241 (1994) (describing "shortfalls of the current [valuation] system" such as experts shopping, expert corruption, and the lack of expertise of judges); Michael R. Devitt, \textit{A Dip in the Hot Tub: Concurrent Evidence Techniques for Expert Witnesses in Tax Court Cases}, 117 J. Tax. 213 (2012) (arguing that "enduring concerns of trustworthiness, partiality, and litigation lethargy" suggest that it is time to "tinker" with the process of complex valuation in tax);
  \item Sharfman, \textit{supra} note 9, at 361 (arguing for a new averaging method to "improve the accuracy and predictability of valuation litigation.");
  \item Tarver Robertson, \textit{supra} note 9 (arguing that "the litigation system has not yet found a way to provide factfinders with reliable and unbiased expert signals" while still leaving discretion to develop their cases in the hands of litigants).
\end{itemize}

\textsuperscript{102} Smith, \textit{supra} note 101.

\textsuperscript{103} Tarver Robertson, \textit{supra} note 9.

\textsuperscript{104} Keith Sharfman, \textit{supra} note 9, at 361.
complex valuation and they are unwilling to recognize that the simple theories we apply to traditional fact finding apply with equal force in the valuation context. Commentators liken conducting valuations to an art not a science and courts repeat the caveat that, "when it comes to valuation, there is no revealed, objectively verifiable truth." This, of course, suggests that there is a revealed and objectively verifiable truth about other factual determinations. The car accident happened at exactly 8:00 pm. That is truth and science. The company is worth $1 billion dollars. That is art and subjective opinion. That distinction is false and misunderstands the concept of valuation (or perhaps “truth”). If a camera is “known” with certainty not to have been tampered with and to have a perfectly calibrated time display, then eyewitness testimony about the time of the accident can be verified. In the same way, if an asset is being traded on a perfectly liquid market with no market failures, its value can be verified. Yet those cases rarely exist; and if they did they would undoubtedly result in private settlements or plea bargains.

In the real world, valuation is essentially an exercise in determining what the relevant community, whether it is made of financial investors or art lovers,


107 On the distinction between opinion and fact, see Learned Hand, *Historical and Practical Considerations Regarding Expert Testimony*, 15 Harv. L. Rev. 40, 50 (1901) (noting that “[t]he expert is in effect not telling of facts at all” and dismissing as “frivolous” attempts to question the distinction in most practical cases).

108 In a perfect market with no liquidity constraints or transaction costs the market price will define the assets value. *See* Jay W. Eisenhofer & John L. Reed, *Valuation Litigation*, 22 Del. J. Corp. L. 37, 122 (1997) (“If a market for an asset exists, the value is equal to the market price of the asset”).
collectively thinks an asset or claim is worth. What view is held by that community is a fact that can be developed just like any other fact. Evidence will be gathered and presented from which the community’s view can be inferred. The relevant evidence, however, is farther from everyday experience and includes testimony about the existence and application of best practices that are often known only to those within the community – just as the events at Adams and Michigan are known only to those who were there at the time of the accident.

While the methodology used and the community best situated to determine the value of a particular complex asset will vary (and often be the subject of controversy), the same is true of traditional facts. The factual questions in complex valuation cases require weighing the merits of the methodology for valuing this type of asset and the variables necessary to calculate value using the best methodology. An expert model is like an eyewitness on the southeast corner. The other model is a witness on the northeast corner. The factfinder hears evidence about the merits of the model just as she hears evidence about whether the sun was in the eyes of the eyewitnesses. As Chief Judge Kaye of the New York Court of Appeals explained in a school finance case, "[w]hen courts undertake to resolve a controversy that others have brought before them, they appropriately resort to the tools of the judicial trade—testimony, evidence and fact finding."109 All of this is to say there is no theoretical difference between traditional facts and complex valuation; and we suggest there are several practical benefits to treating them the same.

One might object that the eyewitness cannot actually testify that the accident happened at 8:00 pm, while the expert, by virtue of Rule 702, testifies that the company is worth $1 billion. That distinction is semantic and can be easily dismissed. The eyewitness testifies that she saw the cars collide at 8:00

The factfinder infers from that that it happened at 8:00 pm. But in exactly the same manner the expert is obviously not testifying that the company is worth $1 billion. Rather the testimony is that her model suggests that the company is worth $1 billion. Again the factfinder infers from that that it is actually worth $1 billion. The question we confront is whether a judge or jury can, based on either of these respective statements with nothing else, conclude that the accident happened at 9:30 pm and the company is worth $600 million. There is no justification for tolerating the latter but not the former.

The American legal system is premised on the idea that procedural protections should at a minimum produce principled outcomes. To arrive at those outcomes efficiently and accurately, procedural and evidentiary rules require that judges hear testimony, look at documents and other physical evidence properly in the record, weigh credibility and make findings of fact to which they apply relevant legal principles. Under the rules, parties can introduce qualified experts to assist the factfinder in cases where expertise is essential to understanding the controversy. In the ultimate analysis, courts may not stray beyond the parameters of what is supported by the record. If they do, their decisions will be reversed and/or remanded on appeal. In addition, if a party

One might imagine a hyper-technical judge that would only allow the witness to testify that her watch said 8:00 pm. But even that raises questions about the validity and foundation of the information provided by the watch. Most likely the testimony will be allowed and any questions about the foundation of the witness statement of time and the accuracy of her watch will be left for cross examination.


WRIGHT & MILLER, 21B FED. PRAC. & PROC. EVID. § 5102.1 (2d ed.) (describing “the principle of the exclusivity of the record,” which holds that “cases must be decided solely on the basis of evidence produced in open court and subject to all of the procedural protections that make up the adversary system”).

See, e.g., Postal Tel. Cable Co. v. City of Newport, Ky., 247 U.S. 464, 473, 38 S. Ct. 566, 570, 62 L. Ed. 1215 (1918) (noting principle that when there is no support in the
has the burden of proof and fails to introduce enough evidence to meet that burden, that party will not prevail.\textsuperscript{115}

Theoretically, there is no reason those basic safeguards should not apply in complex valuation cases. They guarantee, at a minimum, that the courts conduct valuations in a principled manner and that the ultimate valuation be clearly based on evidence in the record. Yet, courts approaching complex valuation as an art rather than a science misperceive the nature of the evidence in complex valuation cases. If courts are seeking the "true" value of a company, or in other words, the best possible valuation for a company or asset that can be provided at a particular moment in time, then a complex valuation cannot be produced without a coherent understanding of which variables are relevant and how to combine those variables into one value. That understanding usually appears in the form of a mathematical model introduced by an expert. Courts themselves lack the expertise to produce such models. Entire textbooks exist to explain valuation techniques to financial analysts with degrees in accounting, finance or economics.\textsuperscript{116} Decisions about which models to apply are also the result of expertise. Financial analysts typically apply multiple techniques in any given valuation and may "run through more than one methodology when asked to value a company."\textsuperscript{117}

This does not mean that the judge has no role. Instead, the judge is tasked with, in addition to excluding unqualifed experts, evaluating the credibility of the witnesses and the soundness of the facts or assumptions upon which they are

\footnotesize

\textsuperscript{115} Kohler v. United States, 468 F.3d 1032 (2006) (Posner, J.) (holding that where both parties put forward manifestly erroneous valuations, the IRS lost because it had the burden of production).

\textsuperscript{116} Yee, Combining Value Estimates to Increase Accuracy, 60 Financial Analysts Journal 23 (2004).

\textsuperscript{117} Id. at 23.
basing their valuations. The judge must insist that experts persuade them that theirs is the state-of-the-art methodology and be meticulous in questioning the pieces that make up that methodology. The judge may even make intermediate fact findings that may alter the final valuation. For example, if the judge is persuaded that a particular variable, such as depreciation, has been inflated or deflated by one or both experts, the judge may adopt a different number so long as it is supported by the record.

Yet, when it comes to deriving meaning from a set of factual variables, the judge is not free to create a new valuation model. The judge must, instead, rely on a model that appears in the record. Changing a valuation model is akin to changing a fact. Such models are internally coherent wholes created by experts. They do not exist on a spectrum but are instead extremely individualized. While multiple different approaches may apply to a particular valuation, those approaches each require their own formula from which meaning will be derived from a set of variables.

To give an analogy, a case in which two valuation models are introduced is like a case in which two witnesses testify, one of whom says that the robbery happened on Seventh Avenue in Manhattan and the other of whom says it happened on Fifth Avenue. In such a case, the judge should, and almost certainly will, get reversed if she decides that the robbery happened on Sixth Avenue. That is an incoherent and illogical response to the two witnesses' competing accounts. Instead, the judge has to make a credibility determination to decide whether the robbery happened on Fifth Avenue or Seventh Avenue – or perhaps neither, if both witnesses lack credibility.

Similarly, valuation models are facts of the take it or leave it variety.¹¹⁸ Either the judge believes in a particular model or she doesn't. Complex valuation models do not consist of easily interchangeable parts, but instead rely on a fine

¹¹⁸ Sharfman, supra note 9.
degree of coherence in the way that the variables that go into them are calculated.\(^\text{119}\) While an expert might be able to create a different model from pieces of two others, doing so would be to create an entirely new fact, to offer a new account of the valuation. For a judge to conduct his or her own valuation using a formula never before seen in the record is thus both beyond his or her competence and outside the scope of the judge's prerogative as fact finder, not fact generator. If a judge credits none of the valuation models on offer (and the parties have the ability to make cases against models through their own experts or through cross examination) then it is likely the party with the burden has failed to make her case. Judge Posner pointed this out in *Kohler v. United States*, “How to choose between adversaries' valuations when both are manifestly erroneous? The conventional response would be that the party with the burden of proof (in the sense of the burden of persuasion) would lose.”\(^\text{120}\) As the Supreme Court wrote in *Daubert*, "[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence."\(^\text{121}\)

Part of the confusion that arises in complex valuation cases comes from the complicated role of experts in litigation. Under Federal Rule of Evidence 702, expert testimony is admissible "if and because it will assist the trier of fact to understand evidence that will determine a fact in issue."\(^\text{122}\) The current rule makes clear that a qualified expert may testify "in the form of an opinion," in

\(^{119}\) For example, several methods exist for calculating net operating income for the purpose of valuing real estate. One article describing these methods advises appraisers that they "can ensure that appraisal values are meaningful by," among other things, "be[ing] certain that the [capitalization] rate employed to capitalize a given NOI [net operating income] was derived in a method consistent with the development of that NOI. John M. Francis, *The Elusive Definitions of NOI and OAR*, Appraisal Journal, 56, 60 (Jan. 1, 1998).

\(^{120}\) 468 F.3d 1032 (2006).

\(^{121}\) *Daubert v. Merrell Dow*, 508 U.S. at 595.

order to "suggest[] the inference which should be drawn from applying the [expert's] specialized knowledge to the facts."\textsuperscript{123} Courts routinely cite to Rule 702 as they mislabel any information introduced by experts as mere "opinion." That label, in turn, is one justification courts offer for disregarding the testimony "of any expert witness when that opinion is contrary to [the court's] judgment."\textsuperscript{124} Yet, in complex valuation cases, expert witnesses are doing more than offering their opinions about facts. They are also introducing facts themselves in the form of valuation models and often compilations of the data that goes into them.\textsuperscript{125} An expert's testimony that the model is the right one to use in a particular scenario and the expert's assertion about the ultimate inference that can be drawn from the model must be assessed for credibility and coherence by judges in complex valuation cases. The model itself, however, is not an opinion. For a judge to justify doing his or her own haphazard math by declaring that the expert's model is an "opinion" subject to the court's judgment is the same as a judge deciding that the robbery happened on Sixth Avenue when the witnesses say Fifth and Seventh; it is changing a fact to a wholly new fact rather than drawing a supportable inference from a given set of information. While the courts repeatedly note their imperative to issue judgments based only on the facts in the record, they erroneously exclude the mathematical models used to transform raw data into valuations from the "fact" category purely because those models are

\textsuperscript{123} F.R.E. 702, Advisory Committee's Note to Rule 702.

\textsuperscript{124} Parker v. C.I.R., 86 T.C. 547, 561(1986).

\textsuperscript{125} Typically the data and facts in a complex valuation case are admissible into evidence. But Rule 703 provides, with certain caveats, that an expert may disclose facts or data he or she uses in forming her conclusions even "if the facts or data an expert relies on would otherwise be inadmissible." Fed. R. Evid. 703. The emphasis on distinguishing between fact testimony and opinion testimony is today something of a historical anachronism. Compare, e.g., Charles T. McCormick, \textit{Some Observations Upon the Opinion Rule and Expert Testimony}, 23 Tex. L. Rev. 109 (1945) with Federal Rule of Evidence 701. Rule 701 now provides that lay witnesses may also testify "in the form of an opinion" if that opinion is "rationally based on the witness's perception;" non technical, and helpful to understanding the testimony or to determining a fact in issue.
created by experts. Once they have labeled the models and other information introduced by experts "opinion," courts assert that they are free to "be selective in the use of any portion of such an opinion."\textsuperscript{126}

This leads to a particularly troubling outcome in complex valuation cases. If the methodology used to value an asset is exclusively a matter of opinion, then courts are free to introduce their own opinions about how to value the asset. This means that, as in the bankruptcy case described in Part I, they can average or otherwise combine numbers that appear in the record in any way they see fit. By extension, reviewing courts find that the "facts" in the record support judge-made valuations because without the constraint of a particular methodology or model, the "facts" in the record can be combined in manifold ways to support any valuation. Thus, as outlined in Part I, courts routinely combine their own conclusions about intermediate variables that go into a valuation calculation – the so-called "facts" – in virtually unidentifiable ways to produce a final valuation. That valuation is then upheld by a reviewing court which finds that the final valuation is supported by "facts" in the record.

\textbf{B. Implementation}

If, as we have argued, the goal in complex valuations is for the judge's valuation to correspond to the valuation that the relevant community believes to be accurate, then the basic tenets of American civil procedure and evidence require a shift in the way they are conducted. Judges are not free to assign their own values in complex valuation cases based on dubious Microsoft Excel spreadsheets or simple averaging. Valuations in these cases must be generated by the techniques used in the relevant community, which in these cases means some kind of valuation model.

Those valuation models will inevitably be introduced by experts. Experts are typically the only people in the case with the experience and often specialized


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education required to perform appraisals, interpret financial statements, find and interpret the kind of market data that goes into a valuation, and create a valuation model that will derive meaning from all of the variables. Courts recognize this truism when they unfailingly permit experts to testify in complex valuation cases. Once the experts have testified, courts must and typically do scrutinize the individual judgments made by experts with a combination of deference to their expertise and skepticism born of the conviction that "many subjective judgments [are] made in arriving at . . . opinions of value."127 Conscientious courts must continue to look to "the reasons underlying an expert's subjective judgments"128 in order to assess each facet of a valuation. In other words, what judges are required and competent to do, in addition to excluding unqualified experts, is to question the assumptions that are being made by the experts, to insist that experts persuade them that theirs is the state-of-the-art methodology and to be meticulous in questioning the pieces that make up that methodology. In other words, in complex valuation cases, the judge should evaluate an expert's credibility and his or her methodology (based on direct and cross examination or the even the judge's own examination) rather than intervene and adopt the role of the expert herself.129 She must then make clear findings of fact based on her assessments.

Once judges have done that fact finding, however, they must allow the expert(s) to apply the methodology to the numbers. Only in that way can they produce relevant meaning. A judge may accept or reject the number produced by

\[\text{127 Buckley v. C.I.R., 68 T.C.M. 754 at *8 (1994)}\]

\[\text{128 Id.}\]

\[\text{129 The distinction between these two roles can be seen in In re Chemtura Corp., No. 09-11233 (REG), 3 (Bankr. S.D.N.Y. Oct. 21, 2010). There the judge went through a lengthy and thorough credibility inquiry, only to conclude that the experts' lack of credibility counseled him to "be more proactive in making my own value judgment, rather than accept either of the proffered ones." Id. at 40. The first half of that analysis (on credibility) is the proper role of the judge, the second have (proactively making an independent valuation) is not.}\]
the chosen methodology.\textsuperscript{130} By definition, however, only an expert can apply a given methodology in a complex valuation case with the rigor necessary to produce meaning from a set of inputs and a formula.\textsuperscript{131}

When a judge presides over a complex valuation, therefore, he or she is usually bound to choose a number generated by a model introduced by one of the parties. This may mean that the judge must choose the valuation offered by one side or another. It may also mean that a judge rejects all valuations and applies procedural rules, like the burden of proof, to determine the outcome of the valuation proceeding.\textsuperscript{132}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure2.png}
\caption{Proposed Static Approach to Judicial Valuation}
\end{figure}


Figure 2 assumes that all input variables (A,B,C and X,Y,Z) are endogenous to and inextricably linked to the respective model. For many variables this will be

\textsuperscript{130} Although our motivation is different, our proposal is similar to final offer arbitration. That literature provides insight into the incentive effects of requiring that a judge or arbitrator take or leave a party's proposed valuation. See note __.

\textsuperscript{131} Learned Hand, \textit{Historical and Practical Considerations Regarding Expert Testimony}, 15 Harv. L. Rev. 40, 54 (1901) (noting that the expertise is “confessedly foreign” to the factfinder’s experience).

\textsuperscript{132} Kohler, 468 F.3d 1032 (2006).
the case. For others it won’t. In a dynamic context, depicted in Figure 3, it may be that the judge, after carefully scrutinizing the expert testimony, finds a certain model to be credible, makes factual findings related to variables that go into that model, and orders that the expert who has produced the chosen model use the variables and the model to generate a final valuation. Note that the link between variables and the model is itself a factual question. Some models will by design require certain input variables to be correlated with each other or with assumptions in the model. Other variables will be entirely exogenous. For the former, the inputs will live and die with the model. For the latter, more discrete variables, the judge may make separate factual findings on which inputs to use. Thus, in Figure 3, the Judge determines that Model f is the best valuation methodology and then makes factual findings about the value of the variables that go into the model. The variables must be consistent with the model, hence they are related to Expert 1's variables (A, B, C). At the same time, they won't necessarily mirror those put forth by the expert. This may require expert testimony on various things: 1) the proper model; 2) which variables are exogenous; and 3) where input variables are exogenous which values to use. Experts may disagree on one or all of these points. The key remains that the judge’s ruling must be supported by evidence in the record. If plaintiff’s expert testifies that her model is the correct one and can only provide a proper result with input variable X, the defendant has two options: 1) put on an expert for a different model; or 2) put on an expert testifying that plaintiff’s model is more accurate if variable X is replaced with variable A. Of course, the defendant may try to make these arguments in the alternative as well.

Figure 3. Proposed Dynamic Approach to Judicial Valuation

<table>
<thead>
<tr>
<th>Expert 1</th>
<th>Judge</th>
<th>Expert 2</th>
</tr>
</thead>
</table>

44
In this dynamic context, the new system depicted in Figure 3 has the judge making fact findings both on the variables inputs (A', B'' and C), and on the appropriate model to determine the final valuation (Model f). In addition to ensuring that valuations are based on facts properly in the record, this system would preempt the kind of mathematical incoherence that was so pronounced in the valuation of the Colts Run housing development. Rather than ignoring the requirement that "the income developed by one [valuation] method [be] used with a cap rate derived by that same method" because her final valuation really had little to do with any of the actual variables in the case and everything to do with mediating between the bank and the debtor, the judge would be required to consider the methods for assessing income and cap rates and choose one. The judge would also need to choose from the models offered by the experts – if they differ - for finding the ultimate value being sought. The judge's fact finding would contribute to the ultimate valuation, which would be conducted by the expert, or experts if both valuation models were the same and only the variables differed.

The evaluative process may result in the lay judge being dissatisfied with pieces of each expert's presentation. The response in such a case, we argue, should be for the judge to highlight the areas where the experts lack credibility.

\[^{333}\text{Colts Run at 7.}\]
and to require that the parties address those areas. Rather than inserting the
tax calculation from one model into a model that relies on incompatible
assumptions about depreciation, for example, the judge should require that the
parties' experts themselves put the evidence in the record and make the necessary
adjustments. Judges as factfinders are not tasked with adjusting complicated
formulae that rely on interdependent assumptions. If a party cannot produce a
credible expert or sufficient evidence to persuade the judge, the result should not
be that the judge does the party's work, thereby doing damage to the concept of
the factual record in the case. Instead, as in any case in which a party with the
burden of proof provides insufficient evidence, a party that brings in an
exaggerated valuation that lacks credibility will not prevail even if the other party
is equally lacking in credibility.

Above we discussed the costs of uncertainty. Returning complex valuation
to the traditional fact finding process will reduce that uncertainty and it will do so
in a manner that facilitates accuracy. The uncertainty is reduced, first, because
the court is expected to adopt the most reasonable model proposed by the parties.
This narrows the range of possibilities of numbers that the court will adopt. By

\[\text{...}\]

134 Other structural changes to the presentation of evidence would enhance judges’
ability to focus in on crucial areas of disagreement between experts. One excellent
proposal in the tax context calls for a "concurrent evidence" approach in which tax court
judges would hear testimony from and question simultaneously sworn experts rather
than allowing the experts to be called sequentially and to testify under the direction of
the attorneys in the case. Michael R. Devitt, A Dip in the Hot Tub: Concurrent Evidence
Techniques for Expert Witnesses in Tax Court Cases, 117 J. Tax. 213 (2012). This method
has already seen limited use in the tax court and has been adopted in other common law
systems. See id. at 218 (citing Rovakat, LLC, TCM 2011-225).

135 Judge Posner applied this standard in Kohler v. United States, 468 F.3d 1032
(2006) (holding that where both parties put forward manifestly erroneous valuations,
the IRS lost because it had the burden of production). As Judge Posner noted the exact
location of the burdens of production and persuasion can be complicated in tax cases.
But once those burdens are established, applying them to valuation is straightforward.
Id. As we have suggested throughout, many courts go in the other direction, embracing
valuation-as-an-art theories to justify ignoring burdens of proof. See, e.g., Tractebel
grounding the value in a reasonable model, market participants can predict a more narrow range of outcomes. Courts may err in their determination of reasonable models, but we suggest that those errors will be smaller than the errors inherent in judicial valuation.

Moreover, the models proposed to the judge will be more reasonable and accurate. In the current system the court is presented extreme valuation models and then pieces together a valuation. In the system advocated here, the judge will be faced with less extreme models to choose from. This improvement in the models presented stems from a change in the incentives of the parties. The point is simple and has long been recognized in the context of final offer or baseball arbitration.136

Knowing that the judge will choose the most reasonable approach, the parties each have an incentive to be more reasonable than the other side. Experts, in turn, will have every incentive to present the most effective, current and defensible valuation scheme available. Particularly when the burden of proof clearly rests on a party, that party will go to great lengths to make sure that it persuades the factfinder that its model is complete and efficacious. The other party can either attack that model or present evidence that other models are more likely to achieve the correct value. That party might even take the approach of presenting several models in the alternative, giving the court a broader view of the spectrum of what might be credible. If a judge is troubled by a part of the model in the course of litigation, parties will also be incentivized to make the necessary adjustments to their models or risk an adverse judgment. And finally,

judges themselves will focus on interrogating the methodology of the experts instead of relying on their own ex post adjustments to determine what the relevant community thinks a particular asset is worth.\textsuperscript{137} This causes the range of models to narrow and, in turn, provides more predictability and makes it less costly for the factfinder to assess the models. This also provides an incentive to the experts in the industry to market themselves on the ability to defend their models as reasonable rather than their willingness to take extreme positions.

\section*{III. Broader Implications and Limitations}
Valuation disputes are at the heart of many varied fields of litigation today. Yet the variability and legitimacy problems that plague them have caused scholars and courts to advocate shutting the courtroom doors on those seeking to resolve valuation disputes. For example, in corporate bankruptcy the arbitrary discretion courts possess in declaring the value of an asset or claim has led to a near consensus that the courts’ role in the process should be diminished. Article after article has proposed procedural and incentive mechanisms to avoid judicial valuation altogether.\textsuperscript{138} Lawyers have drawn on these proposals to come up with

\textsuperscript{137} If a judge lacks the time or ability to comb through the valuation itself, the court may appoint a special master to carefully review the expert methodology and inputs before coming to a conclusion. The NJ Supreme Court’s approach to recent school funding litigation provides a good example of how this works in practice. When the State requested that the Court approve its new, complex funding scheme as constitutional, the court appointed a lower court judge to sit as a special master. The judge heard testimony from the state’s experts as well as from the other party to the litigation over the course of several months before writing a lengthy opinion describing the state’s cost out study and the resulting funding scheme and recommending that the Court find it constitutional. \textit{Abbott ex rel. Abbott v. Burke}, 971 A.2d 989 (2009).

novel auction mechanisms to force parties to value assets without the intervention of the court.\footnote{See, e.g., Skadden, Arps, Slate, Meagher & Flom Newsletter, Central European Distribution Corporation’s Chapter 11 Plan Incorporates Dutch Auction (August 5, 2013) available at \url{http://www.skadden.com/newsletters/Novel_Chapter_11_Plan_Incorporates_Dutch_Auction.pdf} .}

Courts have bought into the idea that they should strive to avoid involving dueling experts in their valuations. Judges at all levels have raised “market” valuations (no matter how flawed) to a hallowed status. When markets appear to be available, however remotely, the courts will use them at virtually any cost to avoid asking the judge to value the assets based on expert testimony. In the so-called Vlasic Pickle bankruptcy, for example, the Third Circuit announced that "[a]bsent some reason to distrust it, the market price is 'a more reliable measure of the stock's value than the subjective estimates of one or two expert witnesses.'"\footnote{VFB LLC v. Campbell Soup Co., 482 F.3d 624, 633 (3d Cir. 2007).} There were specific reasons to distrust the market in the Vlasic case and of course there is mounting evidence that markets are not as reliable measures of value as courts would like them to be.\footnote{VFB LLC v. Campbell Soup Co., 482 F.3d 624, 633 (3d Cir. 2007) (discounting creditor argument that the public equity market was an improper reflection of value due to failures of disclosure by Campbell Soup). See also, e.g., Douglas G. Baird, The Bankruptcy Exchange, 4 BROOK. J. CORP. FIN. & COM. L. 23, 27 (2009) (arguing that "[i]f
The Supreme Court has legitimized the dependence on market values, no matter how flawed. It has read the bankruptcy code whenever possible to avoid any reliance on judicial valuation.\textsuperscript{142} The most obvious example is the seminal new value case \textit{203 North Lasalle}.\textsuperscript{143} The court was faced with the question whether junior stakeholders had made a new contribution to the firm that was valuable enough to justify the share they were receiving in the reorganized business. The court suggested that value of the contribution could not be determined by a bankruptcy judge relying on expert testimony. Rather, the contribution could only be considered if it was market tested. The state of corporate governance law in Delaware is similar.\textsuperscript{144} Courts are increasingly deferential to markets and market based decisions which allow them to avoid any role in valuation.

Our analysis suggests that the solution to valuation problems need not be so drastic. Attempts to correct fundamental errors in the mechanism of judicial valuation should precede attempts to shunt litigants into private channels in order to resolve their disputes. If judicial valuation could be improved considerably it would become a viable dispute resolution mechanism and the distrust that pervades bankruptcy and corporate law could be reduced. In the


bankruptcy context, the impact of this change would be enormous. It would reduce the severity of the central problem of bankruptcy law today.

In other areas of law, particularly areas where no market exists for providing an escape hatch to valuation, courts have been more flexible. For example, in *Abbott v. Burke*, a long-running suit alleging, among other things, that New Jersey’s state funding for its educational system did not meet a constitutionally-mandated floor for providing an education to the state's children, the New Jersey Supreme Court has repeatedly been faced with competing expert testimony about the amount of money necessary to meet the constitutional minimum. In a recent iteration of that case, the court again did what it had in the past: it appointed a special master to hear testimony from the experts and make detailed findings and recommendations to the court. The special master, a New Jersey trial judge, spent a full month hearing from both plaintiff’s experts, who alleged the State’s proposed funding scheme was unconstitutional, and experts at a company the State had hired to perform a "costing-out study," which seeks to quantify the cost of providing an adequate education by interviewing teachers and education experts about the inputs necessary for such an education and creating a formula that accounts for the money needed for those inputs given the number of low income and special needs children in a district, among other things. The special master’s hearings resulted in a detailed report explaining why the he recommended that the court find the State’s funding scheme constitutional. Upon conducting its own review

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146 Abbott XX at 996.

147 Abbott XX at 1010 (Appendix, Report of Special Master, Hon. Peter Doyne).

148 Abbott XX at 992.
of the evidence in the case and the special master's report, the New Jersey Supreme Court agreed, issuing a lengthy opinion detailing its findings.\textsuperscript{149}

Of course, many factors make cases about the value of entitlements different from those seeking to value assets.\textsuperscript{150} Yet, this Article suggests a fundamental similarity, which is that in both instances, courts must hear testimony from competing experts about the value of something that it would be impossible for a lay person, acting alone, to value. In both instances, it is clear what value is sought and in both, a court is tasked with using the full power of the law to arrive at a conclusion based soundly on the evidence in the record.

Courts like the New Jersey Supreme Court have been tempted to intervene to mediate between the sides in entitlement valuation cases in ways reminiscent of asset valuation cases. In earlier rulings in the \textit{Abbott v. Burke} case, for example, the New Jersey Supreme Court itself, faced with state inaction and what it characterized as untenable demands from plaintiffs, devised its own novel solution to the school finance problem.\textsuperscript{151} Even as it did so, the court called on the state to provide "needed comprehensive relief," tacitly acknowledging that its own attempt at a remedy would likely fall short.\textsuperscript{152} In other education finance cases, state courts have ignored the findings of their own special masters and bowed to pressure to minimize the impact on state budgets that these education

\textsuperscript{149} \textit{Abbott XX}.

\textsuperscript{150} Among other things, concerns having to do with separation of powers, the priority and important of constitutional rights enforcement and political pressures unique to entitlements debates all distinguish those cases from the average tax or bankruptcy valuation. \textit{See, e.g.}, Julia A. Simon-Kerr, Robynn K. Sturm, \textit{Justiciability and the Role of Courts in Adequacy Litigation: Preserving the Constitutional Right to Education}, 6 STAN. J. CIV. RTS. & CIV. LIBERTIES 83, 108 (2010) (describing separation of powers concerns making courts reluctant to find for plaintiffs in education finance cases emphasizing costing-out studies).

\textsuperscript{151} \textit{Abbott v. Burke}, 693 A.2d 417, 445 (1997) ("Presented with no alternative remedy by either the plaintiffs or the State . . . the Court must resort to judicial relief.").

finance cases can impose.153 Both responses are politically expedient, yet when viewed as valuation cases, it becomes apparent that both are as fundamentally opposed to the requirement that judgments be based on evidence properly in the record as the decision by the bankruptcy judge who pulls a number out of a hat in order to rationalize two wildly inflated expert valuations.

There are, however, limitations to the panacea of returning to first principles in dealing with the legal system's problems with experts. While an approach that takes seriously the burden of proof and the necessity to respect mathematical models will benefit most interactions with experts, it cannot, for example, solve many of the well-documented problems with scientific expert testimony in areas from toxic torts to medical malpractice to forensics.154 We have argued that the valuation problem will be ameliorated by a return to the application of traditional theories of evidence because the prevailing view that valuation is art rather than science and the status quo of judicial intervention have released valuations from all connection to reality. By contrast, the primary problem with scientific evidence as it has been articulated by scholars in the field is not that the courts have thrown up their hands and begun doing their own


154 For a general introduction to problems with experts in these areas, see, e.g., Gross, supra note 9 (describing problems with expert credibility and judicial response in general); Jennifer L. Mnookin, Expert Evidence, Partisanship, and Epistemic Competence, 73 BROOK. L. REV. 1009, 1022 (2008) (discussing difficulty in assessing expert evidence in toxic tort cases given a scarcity of established science on question of causation); Erin Murphy, The New Forensics: Criminal Justice, False Certainty, and the Second Generation of Scientific Evidence, 95 CAL. L. REV. 721, 773 (2007) (describing difficulties with expert evidence in so-called "second generation" forensics cases, such as those involving DNA); Jennifer L. Mnookin, The Courts, the Nas, and the Future of Forensic Science, 75 BROOK. L. REV. 1209 (2010) (describing scientific flaws in fingerprinting evidence and judicial response)
Instead, to oversimplify, it has to do with the quality of the data being introduced into court and the ability of the factfinders and often also of the attorneys involved to understand the science well enough to be able to discredit tenuous claims. There is no rampant inattention to expert presentations present in the birth defect case in which a judge makes a blatantly unscientific finding or the fingerprint case in which the jury credits testimony from a fingerprint examiner who represents as scientific certainty a tenuous fingerprint match. Instead, those problems involve the interplay of bad lawyering, corrupt or inept experts, and factfinders who lack the tools – either through disinterest or because it requires too much specialized knowledge – to probe behind a veneer of credibility.

Far from losing sight of their basic procedure, courts in cases involving scientific testimony of a forensic or medical nature have been criticized for hewing too closely to a rules-based understanding of the evidence before them. For example, they have been faulted for "approach[ing] methodological questions as questions of law and case-specific applications of these methods as questions of fact" because this leads them to admit faulty laboratory data in particular cases and allow the factfinder to make the credibility determination rather than screening it out before it gets to the fact-finder. Erin Murphy, The New Forensics: Criminal Justice, False Certainty, and the Second Generation of Scientific Evidence, 95 CAL. L. REV. 721, 757 (2007).

See, e.g., Gross, supra note 9, at 1114 (identifying problems with expert witnesses including buying whatever opinion a side needs, the specialization of experts to plaintiff or defense side, the phenomenon of the professional expert witness, the ability of experts to become expert performers in court, the extensive preparation of experts by attorneys, lawyers who are ill-equipped to conduct effective cross-examination, juries who are awed by expert credentials).

Gross, supra note 9, at 1114 (describing failures of judges to see through incorrect scientific testimony).

Jennifer L. Mnookin, The Courts, the Nas, and the Future of Forensic Science, 75 BROOK. L. REV. 1209, 1226 (2010) (discussing how "in court, until quite recently, experts frequently testified that their technique had a 'zero error rate,'" a scientific impossibility).

See Gross, supra note 9, at 1182 (describing problems with expert corruption and lawyer inadequacy as well as "the essential paradox in the use of expert evidence," that experts testify about matters "beyond the ordinary understanding of lay people" yet "we ask lay judges and jurors to judge their testimony").
Thus, while problems exist in many other areas involving experts, the phenomenon of widespread judicial disregard for experts in favor of judicial pseudo-science is relatively unique to valuations. Our proposal seeks to return legitimacy and accuracy to this area by re-imposing basic procedural safeguards which have not broken down in a similar way in other areas that frequently involve dueling experts. This begs the question whether making valuations more like other areas involving experts is really a good idea. As we have described, there is a considerable body of scholarship dedicated to enumerating problems with expert bias and the susceptibility of factfinders to facially persuasive yet factually deficient experts.160

These concerns are valid and will not wholly resolve under our proposal. Yet, valuations cases have characteristics that make them less susceptible to false credibility findings even as they may be more prone to the type of exaggeration that has resulted in a system of judicial averaging. First, many of the judges in complex valuation cases have some expertise in the area (bankruptcy and tax judges, for example).161 Even those judges without expertise should, at a minimum, be able to understand the basic contours of different valuation approaches and to assess evidence, such as journal articles and books, that


161 Bankruptcy judges are largely appointed from the bankruptcy bar and remain highly responsive to it. The courts of appeals run the appointment process, and they have tended to appoint bankruptcy practitioners through a merit selection system that depends heavily on the input of the bankruptcy bar. See Troy A. McKenzie, Judicial Independence, Autonomy, and the Bankruptcy Courts, 62 STAN. L. REV. 747, 793 (2010) ("Bankruptcy judges are selected from the bankruptcy bar on their professional merits."). See also, Danshera Cords, Tax Court Appointments and Reappointments: Improving the Process, 46 U. RICH. L. REV. 501, 531 (2012) (arguing in favor of the traditional appointment and reappointment process for Tax Court judges because it "has resulted in a very qualified and specialized Tax Court bench").
suggest how best to value a particular type of asset. Valuation of complex assets can be quite challenging, but even in complex cases it remains more accessible than the biological sciences, for example, in which it is extremely difficult for someone without training to probe behind the surface of an expert's assertion. Valuation is also not an area where there is judicial resistance to science, as in fingerprinting where judges have clung to fingerprinting as a tried and true methodology even though a National Academy of Sciences Report found both the science behind fingerprint analysis and the way it is generally conducted in this country to be deeply flawed. Finally, complex valuation cases typically do not involve the kind of resource imbalances that leave vacuums of expertise on the defense side in criminal cases. One side is unlikely to be without the resources to secure a good expert in a high-stakes valuation case. Thus, these are cases in

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162 As one popular finance blog explained as part of a series designed to educate investors on various methods for valuing corporations, all a reader would need to follow the posts is "math most 10-year-olds have learned upon graduating fifth grade." Tim Beyers, Learning Mathanese: How to Calculate Market Cap and Enterprise Value, Daily Finance, available at http://www.dailyfinance.com/2011/09/23/learning-mathanese-how-to-calculate-market-cap-and-enterprise-v/.

163 See, e.g., The Breast Implant Controversy: A Prism for Reform, 12 RISK: ISSUES HEALTH & SAFETY 121, 131 (2001) ("Years of training are required to fully understand the implications and limitations of even a simple epidemiological study; a lay juror cannot make an informed judgment when the results of such studies are briefly presented to him.").


165 Resource disparities have received much attention in the context of criminal trials. See, e.g., Ronald F. Wright, Parity of Resources for Defense Counsel and the Reach of Public Choice Theory, 90 IOWA L. REV. 219, 231 n.48 (2004) (collecting evidence of spending differentials between the government and defendants). In contexts in which large amounts of money are involved, such as the mass tort arena, however, there has been a shift towards cooperation between plaintiffs' lawyers that has leveled
which our system's reliance on the lay, bankruptcy or tax judge should be rewarded with probing scrutiny of experts such that the experts become more rational rather than more polished. For example, whereas to seem more credible in a fingerprinting case, an expert might be inclined to inflate his or her certainty of a match,\textsuperscript{166} in a valuation case, experts seem more credible if their estimates are less inflated and closer to those offered by the other side. Furthermore, a valuation expert who cannot defend his or her choices may find that the judge simply chooses the valuation produced by the other side. Even if the judge does not fully adopt the other side's position, she is likely to make fact findings adverse to the expert's client that will negatively impact the final valuation. In turn the experts' incentives will shift, reducing the levels of bias. As a final bonus, this will encourage more experts to participate in litigation, improving the quality of expert testimony in general.\textsuperscript{167} Thus, experts will be more reliable sources of information.

See Peter H. Schuck, \textit{Mass Torts: An Institutional Evolutionist Perspective}, 80 Cornell L. Rev. 941, 956 (1995) (explaining that "plaintiffs' lawyers have established clearinghouses that help coordinate the exchange of legal briefs, depositions, information on expert witnesses, and other types of costly litigation resources -- cooperation that partly reflects the interdependence of mass tort claims values").

\textsuperscript{166} See, e.g., Margaret A. Berger & Lawrence M. Solan, \textit{The Uneasy Relationship Between Science and Law: An Essay and Introduction}, 73 BROOK. L. REV. 847, 850-51 (2008) (arguing that "much of contemporary science involves researchers hypothesizing about natural phenomena and offering tentative explanations that become the subject of further research, which results in both refinements and broad challenges"); Frank C. Keil, \textit{Getting to the Truth: Grounding Incomplete Knowledge}, 73 BROOK. L. REV. 1035, 1042 (2008) (describing the confidence-inflating effect found in a study when students were shown a set of evidence accompanied by fMRI data, they found it much more difficult to tell the good from the bad explanations when they also contained the fMRI results, even though the fMRI results were completely noninformative).

\textsuperscript{167} Samuel R. Gross, \textit{Expert Evidence}, 1991 WIS. L. REV. 1113, 1135 (1991) (arguing that a result of perceptions of expert bias is "some of the best experts in many fields have a contempt for legal proceedings that goes beyond the low regard for law and lawyers that is common in our society" and refuse to participate in litigation).
The strongest objection to refocusing around expert opinion in valuation cases may be that judges in those cases will make the kind of credibility mistakes that seem to occur so often in cases involving scientific testimony.168 It is true that factfinders will get credibility determinations wrong in some cases, blinded by a suave demeanor or a fancy spreadsheet. While they are a necessary byproduct of any system that relies on witnesses, these credibility mistakes will not have the same costs as arbitrary judicial valuations. First, for the reasons described above, they will be less likely to occur in valuations cases than in cases involving more complex scientific testimony. In addition, the current regime creates an incentive for witnesses to put forward the most extreme valuation that will be tolerated. By contrast, mistakes in credibility, if they are unpredictable and relatively infrequent, do not create incentives for the parties to move to the extremes. At most they give parties with weak claims an incentive to litigate if they think there is a high enough chance of a mistake. But those litigants hoping for a mistake still have the incentive to appear as credible as possible, which when faced with a judge with some ability to probe behind the numbers (or at least to spot a red flag when the experts present wildly deviating numbers), will require them to hire an expert who is more than a pretty face. Furthermore, unless the errors are exaggerated by fraud, incompetence, or institutional flaws, they are unlikely to undermine legitimacy in the same way as arbitrary judgments.

Finally, we have throughout this article discussed the role of judge as factfinder. We have done so both for simplicity and because most complex valuation cases do not involve juries. Torts cases provide the most frequent exception to that rule. Our argument applies with equal force to juries. There is no difference in theory between how a judge as opposed to a jury should conduct

168 See, e.g., Gross, Expert Evidence, at 1232 n. 39 (1991) (describing extensive, yet incorrect, credibility findings by district court in process of explaining his belief in plaintiffs' expert in birth defect suit whose outcome was later criticized as scientifically groundless).
fact finding in a valuation case, although the degree to which it is possible to know how a jury has reached its conclusion is obviously less. In practice there may be other factors to consider. The biases of jurors and judges may differ. And the dynamic of jury deliberations where some jurors disagree on which expert is credible may require further consideration as well as adjustments such as more extensive jury instructions and additional bifurcation of trials (some of which happens already in complex tort cases). We leave the elaboration of those mechanisms to future work.

**Conclusion**

Through inattention to basic legal principles and the false conviction that valuation is art not science, the judicial system has embraced a singular approach to complex valuations. Scholars and courts have focused extensively on two questions: (1) whether an advocate expert testimony should be part of the system at all; and (2) how to screen experts for qualifications to testify if they are part of the system. But little real attention has been paid to the question of what to do with the expert testimony when experts do take the stand. Litigants and courts have intuited a fundamental difference between experts and lay witnesses – especially in the valuation context – and have followed an experts-are-different approach in practice. This intuition is wrong. It has no grounding in doctrine and little theoretic reasoning to commend it.

By focusing on the simple idea that valuations are enterprises in fact finding and that the values being sought are not ethereal but correspond to best practices for valuation by experts in the field, this Article offers a new understanding of the valuation problem. Rather than a failure created by dueling experts that must be cured through blinding the experts, using experts appointed by the court, or instructing judges to apply a specific mathematical formula to expert testimony in every case, what we are witnessing is, in an important sense, a simple procedural breakdown. Because valuation is not just a process of mediation but instead invokes the truth-seeking function of the judicial process
in order to identify clearly-established values, procedural and evidentiary mechanisms that require that the facts that ground a judgment appear in the record and that structure how those facts appear, must be enforced. We contend that those rules are being ignored and that adhering to them would produce principled outcomes, legitimacy, and valuable certainty.