VALUATION DISPUTES IN CORPORATE BANKRUPTCY

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Prior scholarship points to valuation disputes and judicial valuation error as key drivers of Chapter 11 outcomes. Avoiding valuation disputes and judicial errors is also the underlying driver of most proposed reforms, from Baird's auctions to Bebchuk's options. In this paper, we undertake a detailed examination of bankruptcy court opinions involving valuation disputes. Our paper has two goals. The first is to understand how parties and their expert witnesses justify their opposing views to judges, and how judges decide between them. The second is to provide practical guidance to judges in resolving valuation disputes. We document surprisingly pervasive (and often self-serving) errors in expert testimony. This is particularly true when valuation experts apply the discounted cash flow (DCF) method. With respect to key elements of that method, such as the discount rate, we observe stark inconsistency between expert testimony and finance theory and evidence. Judges are frequently unable to recognize these problems. We propose simple strategies based in finance theory that judges can employ (such as avoiding the use of company-specific risk premia in discount rates) to reduce the scope for valuation disagreements in Chapter 11. We also recommend that judges rely on the peer reviewed finance and economics literature to assess the scientific reliability of discount rates.

Introduction

Valuation disputes lie at the heart of the Chapter 11 reorganization process.[3] The premise of reorganization is that the firm may be worth more as a going-concern than liquidated. Markets may be sufficiently illiquid that this going-concern value cannot be realized through a sale of the entire firm. To avoid the illiquidity problem, the law allows a plan proponent to avoid a sale and instead distribute new claims (new debt and new equity) on the reorganized company to its old investors according to their entitlements.

Those entitlements hinge upon the value of the company. Junior creditors, for example, are entitled to new claims only if there is sufficient value to pay more senior creditors in full. Deciding what the company is worth is the job of the bankruptcy judge. In doing that job, the judge is placed in the difficult position of having to reach a valuation determination in the presence of competing arguments from expert witnesses. In theory, parties can settle their disputes in the shadow of a judicial valuation, but they often do not. The testimony required to resolve these disputes can delay resolution of a case by months, and costs imposed on the estate can be substantial. Experts typically base their valuation testimony on complicated techniques that require substantial discretion to implement. Evaluating the validity of the assumptions used in valuation modeling requires an understanding of finance theory, statistical methods, and industry-specific and company-specific conditions.

The academic literature on bankruptcy has long been aware of the judicial valuation problem generally, as early work by Blum illustrates.[4] More recently, Baird[5], Bebchuk[6], Adler[7] and other scholars[8] have proposed various mechanisms that avoid judicial valuations

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[3] Of course, valuation disputes loom large in many areas of law. One example is appraisal litigation in corporate law. *See, e.g.*, Albert H. Choi & Eric L. Talley, "Appraising the 'Merger Price' Appraisal Rule" 2 (Va. Law and Econ. Research Paper No. 2017-01) (laying out an optimal valuation measure for fair value in the mergers and acquisitions law context). The valuation controversies discussed in this paper are not unique to corporate reorganization, but we are unaware of literature—in bankruptcy or other areas—that studies the methods used by valuation experts and how courts react to them.

[4] *See* Walter J. Blum, *The Law and Language of Corporate Reorganization*, 17 U. CHI. L. REV. 565, 572 (1950) ("[Judicial value] can never be objectively ascertained or verified but always remains in the realm of opinion or belief.").

[5] *See* Douglas G. Baird, *The Uneasy Case for Corporate Reorganizations*, 15 J. LEGAL STUD. 127, 145 (1986) (advocating sale of the firm to the highest bidder).

[6] *See* Lucian Ayre Bebchuk, *A New Approach to Corporate Reorganizations*, 101 HARV. L. REV. 775, 777 (1988) (proposing an options-based reorganization mechanism).

[7] *See* Barry E. Adler, *Financial and Political Theories of American Corporate Bankruptcy*, 45 STAN. L. REV. 311, 312 (1993) (proposing a "Chameleon Equity" mechanism).

[8] *See, e.g.*, Barry E. Adler & Ian Ayres, *A Dilution Mechanism for Valuing Corporations in Bankruptcy*, 111 YALE L. J. 83, 86 (2001) (proposing a junior dilution mechanism); Anthony J. Casey & Edward R. Morrison, *Beyond Options*, in CORPORATE BANKRUPTCY HANDBOOK (Barry Adler ed., Forthcoming

entirely. Whatever the merits of these proposals, they do not reflect existing law. Since judicial valuation is unlikely to disappear from bankruptcy any time soon, we should understand more about how parties explain their opposing valuation positions to a judge, and how judges with varying degrees of financial expertise decide these disputes.

To do this, we study reported cases involving a Chapter 11 valuation dispute. Our sample begins in 1990 and includes 143 cases. Each case was coded by two research assistants and read by one of us. The most common settings in which these disputes appear are plan confirmation hearings and fraudulent transfer litigation, but they also arise in adequate protection hearings, preference actions, and other contexts.

Attempts at manipulating valuations to serve the self-interest of the litigants is common. In some cases, the manipulation is transparent, and the judge catches it. But in many cases, judges are persuaded to use assumptions that have no reliable basis in finance theory or evidence. The most prominent of these is the use of "company-specific" or "unsystematic" premiums when calculating the discount rate for future cash flows. These are nothing more than arbitrary add-ons that drive the company's reported value downward. We find cases in which experts recommend, and judges approve, company-specific risk premia as large as 10%. Although prominent practitioner publications admit the absence of reliable evidence for these add-ons, they recommend them anyway.[9]

More broadly, based on our reading of the opinions in our sample, we believe that the discounted cash flow (DCF) method is particularly susceptible to the kinds of manipulation that judges have difficulty evaluating. Because this method leans heavily on subjective assumptions that are difficult to test, if not entirely untestable, we believe this method is not well-suited for adversarial litigation in a bankruptcy case. It may be best used as a last resort when more transparent approaches (surrounding market evidence, comparable transactions, or comparable company multiples) are unreliable, and only when discount rates can be calculated using well-grounded approaches that have a basis in finance theory and evidence.

2019) (on file with author) (proposing an "automatic" bankruptcy procedure, that largely eliminates judicial valuation).

[9] As Shannon Pratt explained:

> [T]he unsystematic risk specific to the subject business or business interest, still remains largely a matter of the analyst's judgment, without a commonly accepted set of empirical support evidence. The analyst will base this judgment on factors . . . such as financial statement and comparative ratio analysis and the qualitative matters to be considered during the site visit and management interviews. However, after carefully analyzing these elements of investment-specific risk, there is no accepted model for quantifying their exact effect on the discount rate. The analyst must depend on experience and judgment in this final element of the discount rate development, but should explicitly describe the factors that affect this final element.

SHANNON P. PRATT, VALUING A BUSINESS: THE ANALYSIS AND APPRAISAL OF CLOSELY-HELD BUSINESSES 185 (5th ed. 2008).

Thus, we find opinions such as *Iridium*[10] and *Boston Generating*,[11] which place greater weight on contemporaneous evidence of offers (or lack of offers) by market participants, more convincing than post-hoc valuation estimates by self-interested litigants.

When DCF is used, assumptions used to calculate the discount rate should be justified using theory and evidence from the peer-reviewed finance literature, rather than valuation industry journals and guides. Assessing appropriate risk-factors, such as whether a risk premium is warranted for small firms, is a complicated judgment that requires finance theory and sophisticated statistical techniques. Because finance scholars have spent decades engaged in this debate, support from the peer-reviewed finance literature should be a necessary condition for admissibility of any method used to calculate a discount rate.

The judges in our sample of cases are better at screening out assumptions when they evaluate multiples-based valuations. In those cases, disputes between experts take many forms: Which income statement variable should be used to generate the multiple? Should the multiple be trailing or forward? Is the comparison group, which was chosen to generate the multiple, actually comparable? Expertise in finance theory is less essential to evaluate competing arguments about these inputs, so judges and adversarial litigants do a better job screening out assumptions that are intended to manipulate the valuation estimate.

Although we are critical of many practices in our sample, we believe expert witnesses can and should continue to serve an important role in valuation disputes. Experts are necessary for understanding the subject company's unique circumstances, making inherently difficult judgments about discount rates and comparable companies, and conveying technical information effectively to non-expert judges. We believe this process will be more informative to judges if experts are required to make decisions based on a more confined and standardized toolkit than the wide-open space that currently exists. Shrinking the space of available arguments also has the potential to reduce disagreement between the parties as to how a court will value the asset in question.[12] Reducing this disagreement should promote settlement, increase speed, and reduce litigation costs that deplete the bankruptcy estate.

Our paper proceeds as follows. In Part I, we give a brief overview of valuation techniques, our classification scheme, and our hypotheses. Part II introduces the data and our findings. Part III provides some practical takeaways that judges can use to spot manipulation and separate the good arguments from the bad.

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[10] In re Iridium, 373 B.R. 283 (Bankr. S.D.N.Y. 2007).

[11] In re Boston Generating, 440 B.R. 302 (Bankr. S.D.N.Y. 2010).

[12] *See* Kenneth Ayotte, "Disagreement and Capital Structure Complexity" 1 (Working Paper, Mar. 2017) (showing how disagreements about collateral values can cause costly valuation litigation and inefficient liquidations).

I. Valuation in Law and Practice

A. *The Law of Valuation*

Key moments in a Chapter 11 reorganization hinge on valuation. The judge must value an asset or the entire firm when a creditor seeks compensation for depreciation in the value of collateral ("adequate protection"); when the judge determines the amount each creditor is owed, and whether the debt is secured or unsecured ("claims allowance"); when the debtor attempts to recover assets that were transferred improperly to creditors or others prior to the bankruptcy case ("preferential transfer" and "fraudulent conveyance" actions); and when the debtor proposes a plan of reorganization that is opposed by some stakeholders ("cramdown").

Sometimes the valuation is straightforward. During claims allowance, for example, the judge determines whether debt owed to a secured creditor exceeds the value of the underlying collateral. The creditor has a secured claim up to the value of the collateral and an unsecured (deficiency) claim to the extent that the debt exceeds the collateral's value, which "shall be determined in light of the purpose of the valuation and of the proposed disposition or use of such property."[13] This means, according to the Supreme Court, that we use "foreclosure value" if the debtor plans to sell or abandon the property, but use "replacement value" if the debtor plans to keep it.[14] Replacement value is "the cost the debtor would incur to obtain a like asset for the same 'proposed . . . use.'"[15] Neither "foreclosure value" nor "replacement value" are typically difficult to measure in practice.

Most of the time, however, the standards for valuation are vague and unhelpful. When a proposed plan of reorganization is disputed, the judge must determine (i) the firm's value and (ii) whether the plan distributes value in accordance with bankruptcy priorities, such as the "absolute priority rule." The Code says a lot about (ii), but almost nothing about (i).

The same legal vacuum can be felt in fraudulent conveyance actions. In the typical case, the debtor's estate can claw back assets transferred pre-petition to other parties if it can prove that (i) it received less than "reasonably equivalent value" in exchange for the assets (ii) at a time when the firm was insolvent or had "unreasonably small capital."[16] None of this is straightforward. A transfer is made for "reasonably equivalent value" if the "totality of the circumstances"[17] show that the debtor received "approximately equivalent" value,[18] or that

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[13] 11 U.S.C. § 506(a) (2012).

[14] Associates Commercial Corp. v. Rash, 520 U.S. 953, 965 (1997).

[15] *Id.*

[16] 11 USC § 548(a)(1)(B) (2012).

[17] In re R.M.L., Inc., 92 F.3d 139, 148-49 (3d Cir. 1996).

[18] BFP v. Resolution Trust Corp., 511 U.S. 531, 538 n.4 (1994).

the estate was not "unfairly diminished,"[19] or that the debtor's "realizable going concern value after the transaction is equal to or exceeds its going concern value before the transaction."[20] The standards for assessing whether a debtor was insolvent or had unreasonably small capital are just as vague. A debtor is insolvent under the Code if "the sum of [its] debts is greater than all of [its] property, at a fair valuation."[21] It has "unreasonably small capital" if it has "such meager assets that bankruptcy is a consequence both likely and foreseeable."[22]

B. Valuation in Practice

Valuation standards may be vague, but the tools of valuation are well-established. Though there are many names and variants, methods for valuing a company as a going-concern are typically classified into three groups:[23] discounted cash flow (DCF), comparable company multiples (CCM), and comparable transaction multiples (TM).[24] A fourth method that is often used in bankruptcy cases is what we will call *direct market evidence*, such as a stock price, or an offer to buy securities or assets on a given date.[25] Finally, if liquidation is being considered, book value or some other estimate of liquidation value may be used.

Here we provide a brief overview of these methods, with an emphasis on DCF, since we are most critical of valuation practice with respect to this method.

1. Discounted Cash Flow (DCF)

DCF begins with estimates of future cash flows and then discounts those flows to present value using a discount rate, thereby obtaining an estimate of an asset's value. The discount rate attempts to measure the *opportunity cost of the capital* from the point of view of the

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[19] HBE Leasing Corp. v. Frank, 48 F.3d 623, 635 (2d Cir. 1995).

[20] Mellon Bank, N.A. v. Metro Communications, Inc., 945 F.2d 635, 647 (3d Cir. 1991).

[21] 11 U.S.C. § 101(32)(A).

[22] Boyer v. Crown Stock Distribution, Inc., 587 F.3d 787, 794 (7th Cir. 2009).

[23] *See generally* Christopher S. Sontchi, *Valuation Methodologies: A Judge's View*, 20 AM. BANKR. INST. L. REV. 1 (2012).

[24] *See* PRATT *supra* note 9, at 358. Many valuation methods go by different names but are effectively one of these three methods or a hybrid of several of these. For example, in real estate valuations, methods go by names like *income capitalization* or *yield capitalization*. The essence of these methods involves calculating a normalized measure of income (from projecting and discounting future cash flows, as in DCF, or from a historical number on the income statement, as in the CCM or TM methods) and scaling them up by a capitalization rate (which can come from comparable transactions as in the TM method, or from adding a risk premium to a risk-free rate, as in the DCF method).

[25] *See generally* Michael W. Schwartz & David C. Bryan, Campbell, Iridium, *and the Future of Valuation Litigation*, 67 BUS. LAW. 939 (2012).

investor: that is, it measures the rate of return that an investor could expect to get elsewhere on investments with risk comparable to that of the asset being valued.[26]

The DCF method is correct in theory but challenging to implement in practice, because it requires a multitude of assumptions that are difficult to evaluate. Projecting future cash flows for an operating company may require detailed projections about future sales growth, future profit margins, capital expenditures, and working capital needs. These projections are contestable, but historical data can provide an adequate starting point for evaluating whether future projections are aggressive or conservative. For example, if a company has historically sold its products at gross margins of 30%, a model that forecasts future gross margins of 40% would require an explanation from the expert for why future circumstances are expected to change.

A particularly controversial and influential term in a DCF valuation is the discount rate.[27] When a business enterprise is being valued, a common method used to calculate the appropriate discount rate is the weighted average cost of capital (WACC) method.[28] This method determines the firm's overall discount rate (often called its "cost of capital") by separately calculating the rates of return required by the firm's creditors and its shareholders, respectively, and weighting these rates of return by the percentage of the firm's financing that the creditors and the shareholders provide.[29]

Computing a WACC requires calculating capital structure weights, an after-tax cost of debt, and a cost of equity. Under some conditions, the cost of debt can be derived from the

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[26] JONATHAN BERK & PETER DEMARZO, CORPORATE FINANCE 141 (1st ed. 2007).

[27] *See* Stan Bernstein et al., *Squaring Bankruptcy Valuation Practice with* Daubert *Demands*, 16 ABI L. R. 161, 190 (2008) ("Often the key determinant and cause of variance among experts in their valuation opinions is the selection of the appropriate discount rate.").

The discount rate should not be confused with the interest rate (or "coupon rate"). The discount rate measures the rate of return investors would receive from a comparably risky investment. The interest rate (on debt) is a contractual term and may be higher or lower than the discount rate. If there is a risk of default, for example, the interest rate may be much higher than the discount rate. This is because the interest rate determines the cash flows paid to lenders when the firm *does not* default. Those cash flows must be high in order to offset the low (or no) cash flows paid to lenders in the event of default. The discount rate, by contrast, asks the following question: When we compute the cash flows that investors expect to receive *on average*, are those cash flows sufficient to offer a rate of return comparable to what the investors would receive from similarly risky investments? As we explain below, the "risk" that is relevant here is not the firm's own risk of default. It is instead the risk that the firm's cash flows are correlated with economy-wide factors ("market risk") that investors cannot avoid by holding a diversified portfolio of securities.

[28] BERK & DEMARZO, supra note 26, at 577.

[29] The formula for the WACC is $E/(D+E)*r_e+D/(D+E)*(1-t)*r_d$, where E is the market value of the firm's equity, D is the market value of the firm's debt, t is the corporate tax rate, and r_e and r_d are the investors' required rates of return on the company's equity and debt, respectively. *Id.* at 577.

interest rate charged on the debt. This makes life easy because the interest rate is readily observable (it's in the contract). The cost of equity is much more contestable. Unlike debt, an equity investment does not promise a particular rate of return in advance. A theory of future expected returns on the stock, given its risk, must be applied.

Among academic finance scholars, two approaches to calculating the required return on equity are most common and widely advocated: the capital asset pricing model (CAPM) and the Fama-French three-factor model.[30] The more popular of the two is the CAPM. This approach follows from a theoretical model and predicts that a stock's required risk premium is based only on its "beta," which measures the stock's exposure to overall market risk (the "market factor"). Beta is the relevant measure of risk because, in the CAPM theory, investors find it optimal to hold diversified market portfolios. As such, investors evaluate any individual stock based on the risk it would add to their diversified portfolios. Whereas the CAPM is based in theory, the Fama-French three-factor model is based on patterns observed in historical data. It is one of many empirically-based "factor methods" and calculates a stock's expected returns based on the stock's exposure to size and book-to-market factors, in addition to the market factor used in the CAPM. Fama and French, and many other scholars, have argued that these three factors (size, book-to-market, and the market factor) are good predictors of the rate of return that equity investors demand for holding a particular stock.[31]

Each method has its strengths and weaknesses, and scholars disagree about which is preferable. The virtue of the CAPM is that it is a well-articulated theory. It begins from assumptions about investor behavior and uses them to derive clear predictions about future expected rates of return. Empirically, though, tests of the CAPM provide only limited support for the theory. Although there is a historical relationship between betas and stock returns, other factors besides beta have been found to predict excess returns, which runs contrary to the theory.[32]

The Fama-French method and related models provide convincing evidence that historical rates of return have depended on the stock's exposure to size and book-to-market factors in addition to the market factor. But this approach lacks convincing theoretical foundations. It is unclear, for example, exactly why an investor should require higher returns for holding a stock of a company simply because the company is smaller, or because it has a higher book-to-market ratio.[33] As such, it is unclear whether the historical correlation between these factors and stock returns is sufficient to conclude that these factors are truly risk factors that investors require compensation for bearing. For example, the historical correlation might just

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[30] *See generally* Ivo Welch, *The Consensus Estimate for The Equity Premium by Academic Financial Economists in December 2007* (2009) (Working Paper, Jan. 2008).

[31] *See generally* Eugene F. Fama & Kenneth R. French, *Multifactor Explanations of Asset Pricing Anomalies*, 51 J. FIN. 55 (1996).

[32] BERK & DEMARZO, supra note 26.

[33] *Id.*

be the product of "data snooping bias": a researcher with enough data and time can always find some variables that are spuriously correlated with stock returns.[34] Consistent with this explanation, empirical evidence suggests that the small-firm premium may have disappeared following its discovery.[35]

We find a very different approach to discount rates when we turn to valuation industry publications and expert reports. A common approach there is to use what is called the "build-up method".[36] This method starts with a risk-free rate and adds a risk premium, as in the CAPM. But, unlike the CAPM, the build-up method gives the valuation analyst discretion to make further adjustments based on factors other than market risk, including firm size, industry, and company-specific risks.[37] The magnitude of the risk premia for size and industry are drawn from industry publications that lie outside the peer-reviewed academic finance literature.[38] The company-specific premium is left to the discretion of the analyst, based on her subjective perception of the company's general riskiness according to a multitude of factors.[39]

The justification given for using the build-up approach and company-specific risks, instead of the CAPM, is that the assumptions underlying the CAPM do not hold in the real world, particularly for small owner-managed companies whose owners are necessarily undiversified and thus exposed to company-specific risks. Though this argument has intuitive appeal, the build-up model does not present any viable alternative theory that can be used to determine how undiversified an owner must be before a premium might be warranted, and what the magnitude of this premium should be, if it exists at all.

Empirical finance research provides evidence against the existence of company-specific risk premia in the real world. Research reveals that public company stocks with greater

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[34] *Id.* at 404.

[35] *See generally* Mathijs A. van Dijk, *Is Size Dead? A Review of the Size Effect in Equity Returns*, 35 J. BANKING & FIN. 3263 (2011).

[36] *See* PRATT, *supra* note 9, at 198-200 (explaining that the "build-up model divides the risk premium into its three main subcomponents and estimates the cost of capital as the sum of the. . . risk-free rate" and "risk premium, including one or all of the following subcomponents," "[a]n equity risk premium. . . [a] size premium. . ." and "[a] company-specific risk premium").

[37] *Id.*

[38] *Id.* at 196 (citing Duff & Phelps *Risk Premium Report* for statistical evidence regarding the size premium), 201 (citing Ibbotson Associates SBBI Valuation Edition 2002 Yearbook for evidence regarding the industry risk premium).

[39] *See* PRATT, *supra* note 9, at 202-03 (listing 29 factors that the analyst may consider to determine the company-specific risk premium, including demographics, employee stability, internal and external culture, economic factors, IT systems, and location).

nonsystematic risk do not earn higher returns after adjusting for systematic risk.[40] To the contrary, it appears that stocks with greater idiosyncratic risk actually produce *lower* returns.[41] Moreover, even for small private companies where lack of diversification is a valid concern, evidence suggests that returns to the owners of small private companies are no larger than returns generated by their public-company counterparts.[42]

As a result, the standard CAPM model, despite its recognized flaws, remains the dominant method taught in MBA classrooms.[43] Moreover, survey evidence suggests that the CAPM is the dominant method used by investment banking advisors who advise companies on mergers and acquisitions[44] and by chief financial officers (CFOs) to evaluate their own firms' cost of capital.[45] CFOs of small firms do not report using higher costs of capital than large firms, so size premia are not commonly used in finance practice either.[46] The build-up method is popular, it seems, only among people working in the valuation industry.

2. Comparable company multiples (CCM) and comparable transaction multiples (TM)

The CCM and TM methods start by identifying a group of comparable companies (or projects) that have assets, operating risks, and growth opportunities comparable to those of the target company. The next step is to compute the enterprise value (or other value measure of interest) of these comparable companies. In the CCM method, enterprise value is measured using the market values of comparable publicly-traded companies. In the TM method, value is measured using the observed prices paid in acquisitions of comparable companies. In both

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[40] *See* Andrew Ang et al., *The Cross-Section of Volatility and Expected Returns*, 61 J. FIN. 259, 261 (2006) (finding "stocks with high idiosyncratic volatility have low average returns," contrary to predictions from some behavioral models).

[41] *Id.*

[42] *See* Tobias J. Moskowitz & Annette Vissing-Jorgensen, *The Returns to Entrepreneurial Investment: A Private Equity Premium Puzzle?*, 92 AM. ECON. REV. 745, 745 (2002) ("Private equity returns are on average no higher than the market return on all publicly traded equity.").

[43] *See* Welch, *supra* note 30, at 3 (reporting that 75% of finance professors recommend using CAPM for corporate capital budgeting purposes, 10% recommend the Fama-French model).

[44] Robert F. Bruner et al., *Best Practices in Estimating the Cost of Capital: Survey and Synthesis* 8 FIN. PRAC. & EDUC. 13, 17 (1998) (reporting that 80% of advisers surveyed use CAPM to calculate the cost of equity).

[45] *See* John R. Graham & Campbell R. Harvey, *The Theory and Practice of Corporate Finance: Evidence from the Field*, 60 J. FIN. ECON. 187, 201 (2001) (73.5% of respondents in a survey of CFOs always or almost always use the CAPM).

[46] *See* John R. Graham & Campbell R. Harvey, "The Equity Risk Premium in 2015" 8 (Working Paper, Oct. 1, 2015) (finding no "size effect in our survey: the average WACC for firms with less than $25 million in revenue is 10.6% and the WACC for the largest firms with annual revenue greater than $10 billion is 10.5%.")

methods, the enterprise value of each comparable company is divided by an easily calculable measure of the company's scale or profitability, such as revenues or EBITDA. The ratio of enterprise value to company scale (or profitability) is called a multiple. This multiple is then applied to the target company's data to get the target's estimated enterprise value.[47]

Although CCM and TM are generally easier to understand and apply than DCF, these methods also rest on assumptions about the expected cash flows from operations, leverage, and cost of capital of both the target and the comparable companies. These assumptions are made explicitly in the DCF method but made implicitly through the choice of comparable companies in the CCM and TM methods.[48] Disputes over the validity of a CCM or TM estimate will typically be about the comparability of the comparison group used to generate the multiples. Experts also disagree about the appropriate denominator in the multiple. For instance, they might debate whether a multiple of sales or EBITDA should be used to estimate enterprise value, or whether the data from the comparables should be trailing (historical) values or forward (estimated future) values.[49] Finally, some experts advocate ex-post adjustments to correct for differences between the target company and the comparables, or to adjust for the value of control.[50]

Given the layering of assumption upon assumption in these methods, it is probably unsurprising that valuation via these methods becomes a battle of the experts, as we document next.

II.   Data

Our goal is to describe the types of arguments that experts make and how judges respond. We therefore focus on published opinions reported in Westlaw from 1990 to the present. We searched for any case that mentions "Chapter 11", "valuation", and at least one recognized technique used in company valuation settings, including "discounted cash flow",

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[47] *See* BERK & DEMARZO, *supra* note 26, at 261.

[48] As a court explained in *Peltz v. Hatten*:

> Simply put, when it comes to valuation issues, reasonable minds can and often do disagree. This is because the output of financial valuation models are driven by their inputs, many of which are subjective in nature . . . . The DCF method involves projections of future cash flows (which are largely dependent on judgments and assumptions about a company's growth rate) and judgments about liquidity and the cost of capital. Similarly, the comparable sales method involves making subjective judgments as to what transactions are 'comparable' to the property being valued.

Peltz v. Hatten, 279 B.R. 710, 737-38 (D. Del. 2002).

[49] *See, e.g.*, Jing Liu et al., *Equity Valuation Using Multiples*, 40 J. ACCT. RES. 135, 136 (2002) (documenting the "extent to which different value drivers serve as a summary statistic for the stream of expected [profits].").

[50] *See, e.g.*, In re Global Technovations, 431 Bankr. 739, 768 (Bankr. E.D. Mich. 2010) (noting an expert applied an ex-post multiple to calculate an enterprise's value).

"comparables", "multiples", and variants of these terms. This search yielded 226 cases, as *Table 1* shows, but only 143 of them provided sufficient detail about the valuation dispute and methodologies employed.[51] These 143 "relevant observations" are the focus of the rest of our paper. Most were decided in the jurisdictions most commonly chosen for corporate bankruptcy filings—the District of Delaware and the Southern District of New York.[52] *Figure 1* plots the distribution of cases by year, showing peaks after the 1990 recession and 2008 financial crisis.[53]

One research assistant coded the cases, and a second verified the work of the first. We then read all the cases ourselves to identify qualitative patterns.

Table 2 sets out the legal issues raised in these valuation cases. Because we are dealing with a small sample, we show both the percentage of cases raising each issue (column 1) as well as the number of cases in each category (column 2).[54] The number of cases in column 2 exceeds the total number of relevant cases (143) because some cases raise more than one legal issue. Table 2 shows that a third of the cases arise from valuation disputes in the context of plan confirmation. The rest are roughly evenly split between litigation seeking the return of preferential and fraudulent transfers, motions filed by secured creditors to protect collateral, and "other" disputes, which include valuation of claims (claims allowance), case dismissal (solvent firms often have their cases dismissed), and sale or auctions of assets (363 sales).

III.   Findings: Patterns in Valuation Disputes

We can now examine the data in more detail to understand how valuation disputes vary across different types of cases, and across the different valuation methods advocated by the experts. Because our sample size is small, our inferences will necessarily be tentative.

Valuation disputes are very different in preferential or fraudulent transfer cases ("ClawBack") than in other kinds of valuation cases ("Other"). The key valuation issue in claw-back cases is whether the firm was insolvent when it made pre-petition asset transfers. Because the defendants' experts will argue for positive equity valuations (solvency), while the plaintiff's will argue for negative (insolvency), we see huge variation in asset valuations. This can be seen in *Figure 2*,[55] which computes the percentage difference between the high and low valuations in each case. The percentage is relative to the high valuation. Thus, if the difference is 20%, the low valuation is equal to 20% of the high, and if the difference is 80%, the low is 80% of the high. Although this approach to computing the percentage difference is

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[51] *See infra* Table 1.

[52] The third-ranked jurisdiction is the Northern District of Illinois, which had 13 relevant observations.

[53] *See infra* Figure 1.

[54] *See infra* Table 2.

[55] *See infra* Figure 2.

somewhat unusual, we use it here because a number of our low valuations are equal to zero, making it impossible to compute the percent by which the high exceeds the low.

Table 3 identifies the valuation methodologies used in our cases.[56] We split the sample two ways. First, we separate cases in which the experts used DCF (Panel 1) from those where they used CCM or TM multiples (Panel 2) because the inputs are very different for these valuation methods and we want to see whether experts are more likely to disagree with respect to some inputs than others. We also separate cases by broad legal issue, namely fraudulent or preferential transfer cases ("Clawback Cases") and other cases ("Other"). In Clawback Cases, the parties are debating today whether the firm was insolvent in the past. Often, the court must decide whether the firm was insolvent two, three, or more years before it actually filed for bankruptcy. Problems of hindsight bias loom large here and, for that reason, we expect substantial disagreement among experts. In Other Cases, the valuation is forward-looking and the goal is to identify a particular dollar value (the present value of future cash flows from the firm). For each legal issue, we report the total number of cases raising that issue (e.g., we have 141 cases in total and 33 Clawback Cases). For each valuation method, we report the number of cases using that method (e.g., among the 141 cases in total, 121 use DCF). Within each valuation method, we report the percent and number of cases in which a particular input was disputed (e.g., WACC was disputed in 56 cases, which represent 46% of the 121 cases in which DCF was used by the experts).

Focusing first on the entire sample (Column 1), the first notable pattern is the high level of disagreement in cases where experts propose valuations based on DCF. In 46% of all cases, the experts fight over the discount rate (WACC) and in 74% they dispute the projected cash flows. Although we see comparable disagreement over key inputs to CCM and TM valuations, especially over the choice of comparable, the overall rate of disagreement is somewhat higher when experts use DCF: At least one input is disputed in 84% of cases in which DCF is used; in cases involving comparables, at least one input is disputed 76% of the time.

Recall that we split our sample between Clawback and Other Cases because the potential for disagreement seems much larger for the former cases, due in part to risk of hindsight bias. Columns (2) and (3) of *Table 3* tend to confirm this hypothesis: Disputes over most inputs are more common in Clawback Cases. The increase is particularly striking when experts use CCM and TM: at least one input is disputed in 95% of Clawback Cases, but only 71% of Other Cases, when experts apply these methodologies.

Figure 2 presents additional evidence that the range of disagreement among experts varies by legal dispute and valuation methodology. As discussed above, we are plotting the distribution of disagreement by computing the percentage by which the low valuation differs from the high. Thus, the higher the percentage, the greater the disagreement. *Figure 2* shows that Clawback Cases (almost all of which are Fraudulent Transfer cases) generate more

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[56] *See infra* Table 3.

extreme disagreement than Other Cases. While disagreement in Clawback Cases ranges from 20% to 100%, it ranges from 0% to 100% in Other Cases. More importantly, the distribution of disagreement in Clawback Cases has substantially more mass over the range from 60% to 100%, indicating that cases with such high levels of disagreement account for a larger share of Clawback than Other Cases.

Finally, *Table 4* presents evidence that disagreement among experts extends beyond inputs to the valuation methods. Experts commonly report valuations based on multiple methods.[57] Sometimes experts will propose a final valuation equal to a weighted average of the valuations based on the multiple methods. Our data give us information about thirty-two experts who proposed such a weighted average. Twenty-four of these experts (75%) advocated a weighted average that placed greater weight on some valuations (e.g., the DCF-based valuation) than others (e.g., the multiples-based valuations). For half of these experts (twelve), the court tells us which valuations received the most weight. Table 4 shows that seven of the twelve put greatest weight on the valuation most favorable to the client who hired the expert. Although our sample is very small, it provides suggestive evidence that there is a tendency among experts to weight their testimony in favor of their clients.

IV. Discussion

The foregoing statistics, combined with our own reading of the cases, suggest the following inferences.

A. Experts and courts routinely incorporate firm-specific risk premia in discount rates. They appear to do this in order to adjust for biases in cash flow projections.

Firm-specific risk is diversifiable. Systematic risk is not. As long as investors can diversify at low cost, discount rates do not depend on firm-specific risk. This is fundamental corporate finance theory, and recent evidence confirms that firm-specific risk is not relevant to

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[57] *See, e.g.*, Kerry O'Rourke, note, *Valuation Uncertainty in Chapter 11 Reorganizations*, 2005 COLUM. BUS. L. REV. 403, 423-24 (2005) ("[V]aluation is an inexact science . . . The underlying assumptions will inevitably vary from one valuation attempt to another based on the judgment, experience, situation-specific knowledge, and expectations of the individual performing the valuation."). *See also infra* notes 90-92.

valuation.[58] Yet experts adjust discount rates (both upwards[59] and downwards[60]) to account for firm-specific risks.[61] Courts approve these adjustments even when an expert opposes them.[62] These adjustments might be justified on grounds that shareholders cannot diversify (as in a small owner-managed company), but experts and courts rarely (if ever) explore whether these grounds exist for the company in question.

The classic example of a firm-specific risk, often used by corporate finance instructors, is the risk that a regulator will not approve a new product. Although academic literature teaches that this risk is generally irrelevant in calculating a discount rate, it is cited by courts as a reason to adjust discount rates upward.[63] Another classic example is risk of default, but

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[58] *See* R. Brian Calvert & David C. Smith, "Company-Specific Risk Premiums: Update on the Scholarly Evidence" 3 (Working Paper, 2011) (finding "company-specific risk does not explain variation in cross-sectional stock returns and that holders of risky securities do not appear to receive compensation for bearing company-specific risk.").

[59] *See, e.g.*, In re Pine Tree Mall Associates Ltd. Partnership, 2010 WL 844592, at *5 (Bankr. S.D.N.Y. March 10, 2010) (approving expert's calculations that increased the capitalization rate to account for firm-specific risk).

[60] *See, e.g.*, In re 203 N. LaSalle Street, 190 B.R. 567, 575 (Bankr. N.D. Ill. 1995) ("The bank's appraiser took the point of view, in light of the high quality of the building (and perhaps the conservative estimation of cash flows), that the rates should be at the lower end of the spectrum.").

[61] *See* In re Whitney Lane Holdings, 2009 WL 2045700, at *6 (Bankr. E.D.N.Y. July 6, 2009) ("Ryan applied the discount rate of 10.50%, which was consistent with [data in a publication], due to the location of the property, the nature of the local economy, the age and condition of the property, and the occupancy and rent levels."); In re Doctors Hospital of Hyde Park, 360 B.R. 787, 861 (Bankr. N.D. Ill. 2007) (noting that the parties' experts disagreed "on the percentage of the company specific risk premium used in reaching the WACC").

[62] *See, e.g.*, In re Allegheny International, 118 B.R. 282, 306 (Bankr. W.D. Pa. 1990) (concluding that the expert erred when using "a discount rate for present value of only 13.4%" because the expert "did not fully consider the possibility that the debtor would fail to meet its forecasts. Further, they made no provision for the market attaching a speculative quality to the debtor's ability to achieve its projections.").

[63] A decision from the District of Delaware illustrates:

> We agree with the conclusion of PJSC that the discount rate for Zenith is more appropriately 25% than 17%. Zenith, although an established company in the consumer electronics industry, has clearly not been a leader in recent years. It is no Microsoft and no source of capital would view it as such. In fact, its inability to raise capital, at any rate, is one of the reasons it is in chapter 11 today. Further, the technology being assessed is new and untried in the market. There are significant risks inherent in its future: the risk that the FCC may change its decision on the standard for terrestrial broadcast, the risk that consumers may not embrace the new technology, the certainty that revenues will not be significant until digital is being broadcast and the products incorporating that technology are readily available and cheaper. We

that too has been used as a reason to adjust the discount rate.[64] Because these premia are purely subjective, courts decide on the appropriate magnitude based on rough intuition or by picking a value in between the experts' recommendations.[65]

There are, to be sure, exceptions to the rule. Some experts are careful to exclude firm-specific risk when they calculate a discount rate. When courts follow these experts, they don't do so because they are persuaded that firm-specific adjustments are inappropriate. Rather, courts follow these experts when they believe the experts are the most credible based on their experience, credentials, and adherence to industry norms,[66] or where cross-examination revealed lack of foundation for the firm-specific discount rates.[67]

Indeed, courts seem to prefer firm-specific adjustments, which function as a way to counteract cash flow projections that are overly optimistic. In one case, for example, the court explicitly permitted an upward adjustment to the discount rate, in addition to a downward adjustment in cash flows, in order to account for firm-specific risks in the cash flows.[68] This

conclude that PJSC properly assessed the risk inherent in this technology by comparing it to hedge funds and biotech companies.

In re Zenith Electronics Corp., 241 B.R. 92, 104 (Bankr. D. Del. 1999) (internal citations omitted).

[64] *See, e.g.*, In re Adelphia Communications Corp., 512 B.R. 447, 463 (Bankr. S.D.N.Y. 2014) (reporting the expert "applied a discount rate of 15.08%, which he estimated to be Adelphia's WACC. To arrive at that WACC, [the expert] assumed that 'both lenders and shareholders require a higher rate of return on their investment in a fraud- plagued company than in a company that is law abiding.' [The expert] quantified the risk premium he thought investors would apply by consulting industry reports and academic research regarding the increased cost of capital for firms that had lower credit ratings or that had experienced fraud.") (internal quotations omitted).

[65] *See, e.g.*, In re CNB International, 393 B.R. 306, 321-22 (Bankr. W.D.N.Y. 2008) ("[T]he plaintiffs' expert has suggested an additional risk premium of 5 percent. This, however, would represent more than one-third of the entire discount rate that the defendant's expert has proposed . . . . [T]he court believes instead that the unsystematic risk factor should fall within a range of 3 to 4 percent.")

[66] *See, e.g.*, In re American Classic Voyages, 367 B.R. 500, 514 (Bankr. D. Del. 2007) ("While each expert presents valid arguments, I am persuaded, in part, by Calvert's extensive experience in performing valuations, and whose methods more closely followed generally accepted procedures."); *id.* at 514 n. 20 (explaining that an expert was persuasive because he "explained why he used a small cap premium in his cost of equity analysis instead of the Ibbotson Size Premium; why using an un-systematic risk premium in the discount rate was inappropriate and why he disagreed with using weekly observed beta because it introduced statistical 'noise' into the calculation") (internal citations omitted).

[67] For an example of a court's reliance on trial testimony in its choice to use one expert's proposed risk premium over the other's, see In re Veluchamy, 524 B.R. 277, 314 (Bankr. N.D. Ill. 2014) ("At trial, [the expert] admitted that he was aware of no source that provides any method for determining a company-specific risk premium.").

[68] *See, e.g.*, In re Cellular Information Systems, 171 B.R. 926, 935 (Bankr. S.D.N.Y. 1994) ("Accounting for risk in more than one element of a financial valuation model . . . is not improper per se. If

may help explain why courts are attracted to firm-specific adjustments even when experts argue against them.

As intuitive as this adjustment may seem to courts, it is not only inconsistent with the peer-reviewed literature, but it can have enormous effects on firm value, especially for firms that are expected to grow in the future. To take a simple example, suppose a company's cash flow is expected to grow at 5% per year and the discount rate is 10%. Raising the discount rate by adding a company-specific premium of just 1% (from 10% to 11%) reduces the company's projected value by 16.7%. A 5% premium (from 10% to 15%) reduces the company's value by 50%, and a 10% premium (from 10% to 20%) reduces the company's value by 66.7%.[69]

B. *Courts disagree on the reliability of DCF, but are reluctant to consider techniques that they have not seen before.*

When evaluating competing expert witnesses, courts reach varying decisions about the methods they consider more and less reliable. Many courts express frustration with the DCF method due to the various subjective assumptions that are required and the potential to manipulate the end result.[70] Indeed, a number of courts favor comparables (such as CC and TM) because, in their view, DCF involves "far more numerous and complex assumptions," and, therefore, "has greater potential for error."[71] Some courts seem unsure how to evaluate conflicting expert testimony on the inputs to DCF, such as the discount rate.[72] Yet, other

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circumstances warrant, the risk component in a valuation analysis may be allocated between the cash flow projections and discount rate."). *See also* In re CNB International, 393 B.R. 306, 320 (Bankr. W.D.N.Y. 2008) ("Theoretically, in a discounted cash flow analysis, the appraiser should balance the reasonableness of his projections with an appropriate consideration of risk.").

[69] These numbers are calculated by applying the formula for valuing a perpetuity with a constant growth rate: a stream of cash flows with a first-period value of C that grows at a constant rate g with per-period discount rate r is worth $C/(r\text{-}g)$.

[70] *See, e.g.*, In re Bachrach Clothing Inc., 480 B.R. 820, 866 (Bankr. N.D. Ill. 2012) ("[T]he disparity in [the parties'] valuations is striking given that they relied on the same data as their starting point. It lends credibility to the concept that the DCF method is subject to manipulation and should be validated by other approaches.").

[71] In re Vallambrosa Holdings, 411 B.R. 899, 908 (Bankr. S.D. Ga. 2009); *see also* In re Genco Shipping & Trading, 513 B.R. 233, 254 (Bankr. S.D.N.Y. 2014) ("Although DCF is a traditional methodology used in valuation exercises, courts have recognized its limitations, particularly when the assumptions are unreliable or difficult to ascertain."). As Judge Gerber observed: "DCF works best (and, arguably, only) when a company has accurate projections of future cash flows." In re Adelphia Communication Corp., 512 B.R. 447, 471 (Bankr. S.D.N.Y. 2014).

[72] *See, e.g.*, In re Global Technovation, 431 B.R. 739, 767 (Bankr. E.D. Mich. 2010) ("And while each side's expert explained at some length how he calculated the WACC that he used, and criticized the other's calculated WACC the Court concludes that neither expert's explanation and support for his chosen WACC was persuasive.") (internal citations omitted).

courts consider DCF to be the most reliable method for assessing value. Indeed, one court found the absence of a DCF valuation sufficient grounds for barring expert witness testimony.[73]

Although courts have divergent views on the reliability of DCF, they tend to reject techniques that might improve the DCF analysis. As discussed above, the Fama-French model for determining the cost of equity is one of the two commonly used approaches (along with the CAPM) for determining a discount rate.[74] A substantial number of scholars believe that the model is superior to the CAPM.[75] Nevertheless, one court rejected it merely because it is new, or at least not used by "valuation firms."[76]

Here is another example: DCF analysis can be applied to total cash flows or just to cash flows that remain after servicing debt. The latter is often known as "levered DCF" and, at least in 2006, it has been called "one of Wall Street's most popular valuation models."[77] As popular as it is, however, levered DCF seems rarely used in bankruptcy cases. This is probably because the method is used to value equity, which typically has no value in a reorganization. There are situations, however, where the method could be used in bankruptcy. For example, when a court confirms a plan of reorganization, it must determine whether the plan is "feasible" in the sense that the reorganized firm will be able to serve its debts in the future. For that inquiry, it can be important to know the expected value of the reorganized firm's equity. A levered DCF approach seems well-suited to this question. Nonetheless, the approach was rejected by the Southern District of New York in 2010 because it

> fail[ed] to meet any of the *Daubert* factors: it is not a method that has been tested or relied upon by other experts, it had never been subjected to peer review or discussed in any publication, the potential rate of error is unknown, and there is no evidence that this method was ever employed, discussed, and certainly not generally accepted in any academic or professional community.[78]

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[73] *See* In re Med Diversified, 334 B.R. 89, 99 (Bankr. E.D.N.Y. 2005) ("For essentially the same reason, [an expert's] failure to use the DCF method amounts to a material flaw in his methodology sufficient to bar his testimony as an expert witness because his conclusions lack 'good grounds.'") (quoting Amorgianos v. National R.R. Passenger Corp., 303 F.3d 256, 266 (2d Cir.2002)).

[74] *See supra* Part II.

[75] *See supra* note 31.

[76] *See, e.g.*, ASARCO LLC v. Americas Mining Corp., 396 B.R. 278, 361 (S.D. Tex. 2008) ("By [the expert's] own admission, the Fama–French method is used primarily by academics and was not used by the *valuation industry* at the time of the transfer. Even today, Fama–French has not gained wide-spread acceptance by *valuation firms*.") (emphasis added).

[77] Scott Hoover, Stock Valuation: An Essential Guide to Wall Street's Most Popular Valuation Models 332 (2006).

[78] In re Young Broadcasting, Inc., 430 B.R. 99, 127 (Bankr. S.D.N.Y. 2010).

Thus, courts disagree about the reliability of DCF and, at the same time, resist variations on the method. This may reflect an aversion to uncertainty. The complexity and subjectiveness of the DCF method render it an opaque approach that judges have difficulty evaluating. That difficulty seems to lead at least some judges to prefer the valuation method that yields the lowest disagreement among experts, even if that method is potentially less accurate. Thus, if two experts present DCF-based valuations that diverge substantially, but comparables-based valuations that are much closer, a court may ignore the DCF.[79]

C. *Courts are often aware that many experts are designing their testimony strategically to provide maximal support for their client. Some, but not all, courts catch these attempts.*

It's not uncommon for a court to find that an expert chose a particular, unsuitable comparable "as his only comparable in order to reach a desirable valuation,"[80] or for a court to be "left with the distinct impression that [the expert's] work was carried out with litigation bias and for the express purpose of showing that [debtor corporation] was insolvent."[81] But not all courts seem aware of common, invalid valuation strategies, such as "proving" that an estimate of future cash flows, prepared in the past, was reasonable by comparing these estimates to the realized cash flows. This is classic hindsight bias.[82]

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[79] *See, e.g.*, In re DBSD North America, Inc., 419 B.R. 179, 199 (Bankr. S.D.N.Y. 2009) ("[T]he experts' Trading Comparables Analyses resulted in similar valuation ranges, which suggests that this methodology is the most reliable.").

[80] In re YL West 87th Holdings, 423 B.R. 421, 435 (Bankr. S.D.N.Y. 2010). *See also* In re Savannah Gardens-Oaktree, 146 B.R. 306, 311 (Bankr. S.D. Ga. 1992) (calling the expert's approach "defective" for failing to pick an appropriate comparable).

[81] In re Iridium Operating LLC, 373 B.R. 283, 342 (Bankr. S.D.N.Y. 2007).

[82] *In re Yellowstone* provides an example of a court potentially exhibiting such hindsight bias:

> In the offering memorandum, Credit Suisse projected cash EBITDA for the Debtors of $83,500,000 in 2005, $97.6 million in 2006, $135 million in 2007 and $269 million in 2008. Reducing the above numbers for interest expense, Mordy testified that Credit Suisse's true cash EBITDA projections were $60 million in 2005, $72 to $73 million in 2006 and $113 million in 2007, yet Debtors' actual cash EBITDA in such years was woefully short of Credit Suisse's projections. The Debtors missed the Credit Suisse projections by $42,660,000 in 2005 because Debtors in fact had only $17 million with which to repay debt in that year. In 2006, Debtors missed the mark by $46 million because cash EBITDA was only $25 million. Similarly, in 2007, Debtors missed the mark by $90 million because cash EBITDA was $23 million rather than $113 million. Mordy characterized Credit Suisse's projections as a 'leap of faith.'. . . . To test the reliability of the projections, [another expert] Reilly chose to compare projected gross revenues to actual gross revenues, as opposed to projected cash flows to actual cash flows as was done by Mordy and attempted to be done by Sheridan.

436 B.R. 598, 622, 647-48 (Bankr. D. Mont. 2010).

D. *Overall, courts seem more adept at applying multiples, based on CC or TM, than DCF.*

Valuation based on multiples, such as CC and TM, is simpler because it relies less on finance theory and more on arguments about the comparability between companies. It is not only simpler than DCF, but it's also easier for a judge to evaluate the inputs to the final valuation. Courts can fairly readily determine whether an expert is biased because he or she is being paid (or receiving a job) if his client wins[83] or rejecting a method that he or she previously advocated in other, similar cases.[84] Courts have also identified sources of bias in identifying comparable firms, such as using foreclosure sales as proxies for market value,[85] or selecting transactions that occurred prior to an industry-wide recession that preceded the bankruptcy filing.[86] Courts also do a good job identifying cases where the expert generated the multiple using an accounting variable that was selected strategically to favor a client's position,[87] cases where experts make ad-hoc adjustments based on personal, subjective judgment when objective methods are available,[88] and cases where multiples are applied incorrectly by applying a trailing multiple to forward-looking data.[89]

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[83] *See, e.g.*, In re Granite Broadcasting Corp., 369 B.R. 120, 142 (Bankr. S.D.N.Y. 2007) (calling an expert's submission "seriously undermined by the fact that his compensation . . . is contingent on the total consideration to be received").

[84] *See, e.g.*, In re Chemtura Corp., 439 B.R. 561, 583 (Bankr. S.D.N.Y. 2010) (noting that, "in [an expert's] valuations of several other chapter 11 debtors" similar to this one, the expert "used the final year's cash flows in its computation of Terminal Value, and did not use the normalization technique it used here. One may legitimately wonder, then, why the normalization technique was appropriate here but was not appropriate there—or vice versa.").

[85] *See* In re Savannah Gardens-Oaktree, 146 B.R. 306, 311 (Bankr. S.D. Ga. 1992) ("[The expert] admitted, under cross-examination, that a foreclosure sale did not meet the criterion of a sale for 'market value.'").

[86] *See* In re Continental Airlines, Inc., 146 B.R. 536, 542 (Bankr. D. Del. 1992) (finding an expert's "conclusion unrealistic" because world events rendered the "transaction unreliable as a comparable.").

[87] *See* In re Med Diversified, 334 B.R. 89, 101 (Bankr. E.D.N.Y. 2005) (noting that "the variable [an expert] chose to use, net cash flow from operations, actually had an inverse relationship with the financial well-being of the company.").

[88] *See* In re Hotel Associates, 340 B.R. 554, 562 (Bankr. D. S.C. 2006) (finding an expert's "method of making an adjustment" to be "more subjective" and "not as persuasive" as that of a separate expert that relied on a "more objective adjustment.").

[89] *See* In re The Majestic Star Casino, 457 B.R. 327, 353 (Bankr. D. Del. 2011) (finding an expert's concluding value off by "approximately $86 million" because she "selected an EBITDA range that was based on trailing twelve month EBITDA and then applied that to the Debtors' *year one* EBITDA.").

E. *Judges are also increasingly looking to market measures*
instead of expert valuations.

By market measures, we mean evidence from transactions conducted in a market setting. This would include the price offered at an auction, including an auction conducted in bankruptcy (which would be relevant to firm valuation for purposes of plan confirmation). Market measures could also include pre-bankruptcy valuations done by independent experts in a non-litigation context, such as in connection with a business transaction (which would be relevant to the insolvency inquiry in Clawback cases). And it would also include evidence regarding the terms of financing offered to a debtor prior to its bankruptcy (again relevant to the insolvency inquiry). At least by 2010, courts were looking to these measures as supportive or determinative evidence in valuation disputes.[90]

It wasn't always this way. In 2003, for example, the Delaware bankruptcy court rejected expert testimony that aimed "to bring value calculations in line with current market value."[91] This was inappropriate, the court said, because "the 'taint' of bankruptcy will cause the market to undervalue the securities and future earning capacity of the Debtor."[92]

V. Implications: Rules of Thumb for Judges

Based on our qualitative readings of the valuation opinions in our sample, and in light of the finance theory and evidence provided above, we provide some practical advice for bankruptcy judges:

A. *Reject arbitrary add-ons to the discount rate. Use the peer-reviewed*
finance literature for credible approaches on discount rates.

Finance theory is clear that investors will evaluate the risk of an asset, and the return they require for holding it, based on the asset's contribution to their overall portfolio risk, not on a stand-alone basis. This is the fundamental insight underlying the CAPM theory. When investors can diversify cheaply and easily, they do not require compensation through higher returns for bearing idiosyncratic (or diversifiable) risks. Other empirically-based methods for determining discount rates, such as the Fama-French method, are based on the same

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[90] Courts found the measures determinative in cases like *Boston Generating*, *Campbell*, and *Iridium*. They were relied on to further support a court's conclusions in, for example, In re Chemtura Corp. 439 B.R. 561, 586-87 (Bankr. S.D.N.Y. 2010) ("[T]he lack of buyers or investors for the Debtors at higher values or values within the Equity Committee's range—a species of 'market' information that informs, though it does not solely support, my conclusion that the Debtors have met their burden as to value here.").

[91] In re Exide Technologies, 303 B.R. 48, 66 (Bankr. D. Del. 2003).

[92] *Id.* For a discussion of the longstanding antipathy for market measures in corporate reorganization, see Blum, *supra* note 4.

principles, although they measure non-diversifiable risk using multiple factors instead of only a market factor.

Valuation industry methods that allow for "company-specific" premia are particularly suspect. Moreover, we believe that these methods fail the *Daubert* standard of reliability:[93] They are not accepted by the scientific community, no empirical evidence supports making the adjustments, and the ad hoc nature of the adjustments render them fundamentally untestable.[94]

The discount rate is also not the proper place to correct biased cash flow projections. A discount rate is an opportunity cost: It is a rate of return that an investor expects on her money given the riskiness of the investment. Although it is conceivable that a higher denominator (discount rate) could act as a "fudge factor" to counteract a biased numerator (cash flow projection), there is simply no way a judge can evaluate the appropriate magnitude of this adjustment. If the cash flow projections are suspect, it is better to get them right than to tinker with the discount rate. Indeed, when courts allow experts to tinker with the discount rate, they are rendering the DCF process even more opaque and subjective. The discount rate becomes the site of multiple, contestable, untestable assumptions.

We recommend that courts consistently apply the CAPM. We recognize the flaws in this method (e.g., there is no universally accepted theory of risk premia), but all methods are subject to criticism and the CAPM method is the most widely used and recommended method in finance theory and practice.[95] If courts were to demand that experts use the CAPM, disputes would move away from the discount rate and toward cash flow projections, which is where the disputes should (we think) be focused. Our understanding is that experts and courts tend to defer to projections prepared by the debtor's managers, who tend to be in the best position to project the firm's future. Instead of challenging those projections, the parties fight to make arbitrary, subjective adjustments to the discount rate. We think this is a mistake and that valuation disputes should center on the source of the controversy—the cash flow projections. An environment where CAPM is used as the standard approach would be better

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[93] *See* Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993) (laying out the standard for expert witnesses).

[94] This is not to say that idiosyncratic negative shocks (like the possibility of losing a key contract, or the entry of a new competitor) are irrelevant to a firm's value. They can and should be reflected in a DCF in the cash flow projections. Future cash flow projections should be expected values that incorporate both negative and positive future scenarios, weighted by their probabilities. To be sure, estimating the impact and probability of future negative events is difficult, but judges deal with these disputes competently when the opposing sides are forced to be transparent about their assumptions about these probabilities and to defend them with evidence. For an example, see In re 203 N. LaSalle Street P'ship, 190 B.R. 567, 575 (Bankr. N.D. Ill. 1995) (evaluating the reversionary value of a building where "the primary basis for the difference in estimated cash flows" concerned the probability that one of the two major tenants renews its lease).

[95] *See* text accompanying footnotes *supra* 43-45.

than the status quo, which allows maximum flexibility to the expert to justify any value she wants by adjusting the discount rate.

B. *Weighting schemes are sources of manipulation, both across methods and within methods.*

It is common for parties (and courts) to calculate values using multiple methods and then combine these methods into an overall "average" value using a weighting scheme that places more weight on some values than others. In theory, it may be justifiable to place greater weight on one method if it conveys more information about the true value than other methods. In practice, however, the use of weights is often self-serving. Experts tend to advocate greater weights for the methods that most favor their clients' positions.[96] When using DCF, an advocate for a higher discount rate (and a correspondingly lower asset value) will often recommend a higher weight on the equity in the capital structure, since equity rates of return are higher than debt rates of return. Similarly, multiples-based methods require identifying a comparison group, and experts often choose weighting schemes to give more weight to some comparable companies over others.[97] Clever justifications for these weighting schemes can always be given after the fact. In our view, if a method is sufficiently suitable to be used in the first place, it should receive the same weight as other methods. Any other approach is vulnerable to abuse. Put differently, equal weighting should be a strong default rule—an approach that some courts have already adopted.[98]

C. *Markets beat experts.*

Often the debtor corporation will propose to sell itself or particular assets through an auction. The auction, however, may yield prices substantially below experts' estimates of firm value. Should this worry courts? No. Markets beat experts. As Judge Easterbrook put it: "Astute investors survive in competition; those who do not understand the value of assets are pushed aside. There is no similar process of natural selection among expert witnesses and

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[96] *See, e.g.*, In re Med Diversified, Inc., 346 B.R. 621, 633 (Bank. E.D.N.Y. 2006) ("It has not escaped the Court's attention . . . that the values derived from applying the other two methods were higher than that from the DCF method. By reducing the weights of the results from the other methods, once again [the expert] shoved the data to a lower value.").

[97] *See, e.g.*, In re Payless Cashways, Inc., 290 B.R. 689, 701 (Bank. W.D. Mo. 2003) (noting that two experts "performed similar calculation[s] using different comparable companies" and "[n]ot surprisingly" arrived at two very different equity values).

[98] *See, e.g.*, In re Med Diversified, Inc., 346 B.R. at 632 ("[The expert] offers no adequate explanation why this Court should not require equal weights to the results obtained by each of the three standardized methods.").

bankruptcy judges."[99] As blunt as this proposition is, New York courts increasingly rely upon it.[100]

Market evidence may be particularly useful in fraudulent transfer cases, where the range of expert disagreement tends to be highest. In this setting, a court may be able to *rule out* the possibility that the firm was insolvent by asking whether well-informed market actors—especially unsecured creditors and equity holders—treated the firm as if it were solvent at the time of the potentially voidable transfer. If a debtor can access credit markets on terms comparable to those offered by solvent borrowers, and there has been no fraud on the market, the debtor is highly unlikely to be insolvent. This is particularly true if the debtor can raise capital from unsecured creditors, which are highly exposed to the risk of insolvency. A secured lender might offer credit to a failing firm, perhaps even on terms that don't differ markedly from terms offered to solvent borrowers, if the loan is over-collateralized. The terms of unsecured credit, however, will be much more sensitive to the debtor's financial condition. Equity markets will be similarly sensitive. If investors are well-informed, an insolvent or undercapitalized firm will be unable to raise meaningful equity financing.[101]

Even if a debtor does not access capital markets after the allegedly fraudulent transfer, data from those markets may rebut allegations of insolvency or inadequate capitalization. For example, if a debtor's bonds trade at par after the transfer (and if there is no evidence of fraud on the market), it is unlikely that the market perceives insolvency or inadequate capitalization.[102]

What we are proposing here is a *sufficient condition* for finding solvency and adequate capitalization. Elements of this approach can be seen in the case law (and recent commentary).[103] Courts have frequently held that a firm's access to capital markets on

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[99] In re Central Ice Cream Co., 836 F.2d 1068, 1072 n. 3 (7th Cir. 1987).

[100] *See, e.g.*, In re Boston Generating, LLC, 440 B.R. 302, 327 n. 22 (Bankr. S.D.N.Y. 2010) (quoting Judge Easterbrook axiom); In re Granite Broadcasting Corp., 369 B.R. 120, 140-141 (Bankr. S.D.N.Y. 2007) (same).

[101] For an example of a court employing such an approach, see In re Iridium LLC, 373 B.R. 283, 349 (Bankr. S.D.N.Y. 2007) ("The fact that Iridium closed on three syndicated bank loans and raised over $2 billion in the capital markets between 1996 and 1999 is an indication of both solvency and capital adequacy.").

[102] *See id.* at 332-33 ("From 1995 through January 1999, Iridium's bonds generally traded at a price at or near par value and this indicated that the bond market believed that Iridium would be able to repay the debt owing on the bonds.").

[103] *See* Schwartz & Bryan, *supra* note 25, at 951-52 (2012) (arguing courts should consider expert testimony on valuation issues only when contemporaneous market evidence, such as actions of creditors or counterparties, is unavailable or insufficient).

ordinary terms is consistent with solvency or adequate capitalization.[104] In *VFB LLC v. Campbell Soup Co.,* for example, the debtor brought a fraudulent transfer action against the seller from whom it purchased its assets (the debtor was created via a spinoff from the seller.)[105] The bankruptcy court identified many facts that were inconsistent with the debtor's insolvency at or after the asset sale. One of them was the debtor's continued access to capital markets; in particular, the debtor renegotiated a credit facility.[106] The lending banks were well-informed (after due diligence), agreed to an amended agreement, and assigned a BB credit rating to the debt. The court noted that this rating "was still equal to or greater than that of 60% of the consumer packaged goods companies in the United States."[107] Subsequently, the debtor sold $200 million in unsecured bonds, which were also assigned a BB rating by investors who had been given "full disclosure of all facts and circumstances of the Spin-off, VFI's performance thereafter, the status of the bank financing to which the bonds were subordinated, and the numerous risk factors attendant to the bondholders' unsecured position."[108] Assuming the terms of the bonds were comparable to the terms offered to solvent firms in the same industry, these facts establish a sufficient condition for the debtor's solvency at and after the asset sale.

Cases like *VFB* do not stand for the proposition that the mere ability to access capital markets is sufficient to prove solvency. Capital markets are open even to a firm that is defaulting on covenants and looking for financing to cover losses.[109] The critical question is

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[104] *See In re Iridium Operating LLC,* 373 B.R. at 349 ("Courts examining the question of adequate capital also place great weight on the ability of the debtor to obtain financing").

[105] 2005 WL 2234606, at *13 (D. Del. 2005).

[106] *Id.* at *11.

[107] *Id.* at *13 n. 40.

[108] *Id.* at *15. *See also id.* at *31 ("All of the professionals involved in the Spin-off, as well as independent third parties that purchased VFI's stock and, later, its bonds, believed that VFI's assets were adequate to operate the businesses in which it was engaged.").

Another illustration is provided by *Credit Managers Association of Southern California v. Federal Co.,* 629 F. Supp. 175 (C.D. Cal. 1985). The court found that the firm had adequate capitalization because its principal lender "was willing to lend substantial sums. . . both before and after" the allegedly fraudulent transfer. *Id.* at 187. To be sure, the lender was extending secured credit, and the terms of the lending could have indicated that the debtor was inadequately capitalized. The court indirectly addressed this issue, noting that the interest rate was one to three percentage points above prime. *Id.* at 178, n.4. It appears that the court did not think the terms of financing were indicative of distress.

[109] *See, e.g.,* In re Tronox Inc., 503 B.R. 239, 298 (S.D.N.Y. 2013) ("At the outset, Defendants' reliance on Tronox's ability to issue $450 million in debt does not deserve any weight in the solvency analysis. The debt that Tronox issued was secured by all of the assets of all of the Tronox companies, and the sophisticated lenders who bought this debt well knew they would come first in any bankruptcy or liquidation of the enterprise.").

whether the debtor obtained junior capital on terms comparable to those offered by solvent borrowers.

Of course, the sufficient conditions proposed in this paper—for finding reasonably equivalent value when the debtor made transfers for the benefit of a corporate group, and for finding solvency and adequate capitalization—have limited reach. These conditions won't be satisfied in many cases. But valuation disputes can be more predictable, faster, and cheaper if courts begin by asking whether these conditions are satisfied, and turn to the contestable methods of valuation only if they are not.[110]

Conclusion

In this paper, we conduct a quantitative and qualitative analysis of 143 valuation disputes in Chapter 11 from 1990 to the present. Our quantitative analysis demonstrates that disagreement about valuation is large and pervasive, particularly with respect to Clawback cases such as fraudulent transfers. Competing experts disagree about the key inputs in DCF and multiples-based valuations, though we find that disagreement about the key inputs in DCF valuations occurs more frequently than disagreement about the key inputs in multiples-based valuations.

Our qualitative analysis reveals important departures from finance theory and evidence, particularly with respect to the discount rates used in the DCF method. In our view, DCF appears to be a less reliable method overall than multiples, as judges seem to do a better job spotting manipulation in multiples-based valuations than in DCF. We provide rules of thumb to assist judges in ruling out problematic assumptions, such as company-specific risk premia, that appear in many cases in our sample. We also advocate the use of market-based evidence over expert valuation and multiples-based approaches over DCF whenever possible.

Our proposals represent incremental steps toward a Chapter 11 process with less expert-induced valuation uncertainty. More aggressive steps could be taken. For example, bankruptcy judges could appoint mediators to resolve conflict among experts. Alternatively, judges could require conflicting experts to meet and draft a joint report setting out points of agreement and disagreement. Experts might even testify together at trial, and ask each other questions. A similar procedure (so-called "hot tubbing") is applied in Australia and other

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[110] Schwartz & Bryan make a similar proposal. *See supra* note 25, at 939. They argue that a court can frequently value an enterprise using market evidence, which they define broadly to include not just market prices but also the contemporaneous actions and views of informed insiders and market actors (e.g., lenders, creditors, analysts). They propose that courts apply Federal Rule of Evidence 702(a) to require "a party wishing to call a valuation expert to make a motion by the close of fact discovery affirmatively showing that the trier of fact cannot reach a reasoned decision about value by relying on market evidence in the fact record." *Id*. at 952.

jurisdictions.[111] Alternatively, judges could announce that they will apply a "final-offer arbitration" approach to valuation disputes. Under this approach, judges would select the valuation report that is most persuasive and adopt it in its entirety. Judges would not average valuations across experts; nor would they adopt a valuation that combines pieces of each expert's report. The virtue of this "final-offer arbitration" approach is that it might induce experts to be less extreme or biased in their reports.[112] The more extreme or biased a report is, the less likely the judge will choose the report and the more likely the judge will select the other expert's report. Exploring the costs and benefits of these alternatives is left for future work.

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[111] *See generally* Elizabeth Reifert, note, *Getting into the Hot Tub: How the United States Could Benefit from Australia's Concept of 'Hot Tubbing' Expert Witnesses*, 89 U. Det. Mercy L. Rev. 103 (2011); Francis P. Kao, Justin L. Heather, Ryan A. Horning, and Martin V. Sinclair, Jr., *Into the Hot Tub … A Practical Guide to Alternative Expert Witness Procedures in International Arbitration*, 44 International Lawyer 1035 (2010).

[112] Casey and Simon-Kerr also discuss the potential variance-reducing benefits of final-offer arbitration. *See* Anthony J. Casey and Julia Simon-Kerr, *A Simple Theory of Complex Valuation*, 113 Michigan L. Rev. 1175, 1210 (2015).

Figures

Figure 1: Number of Cases per Year
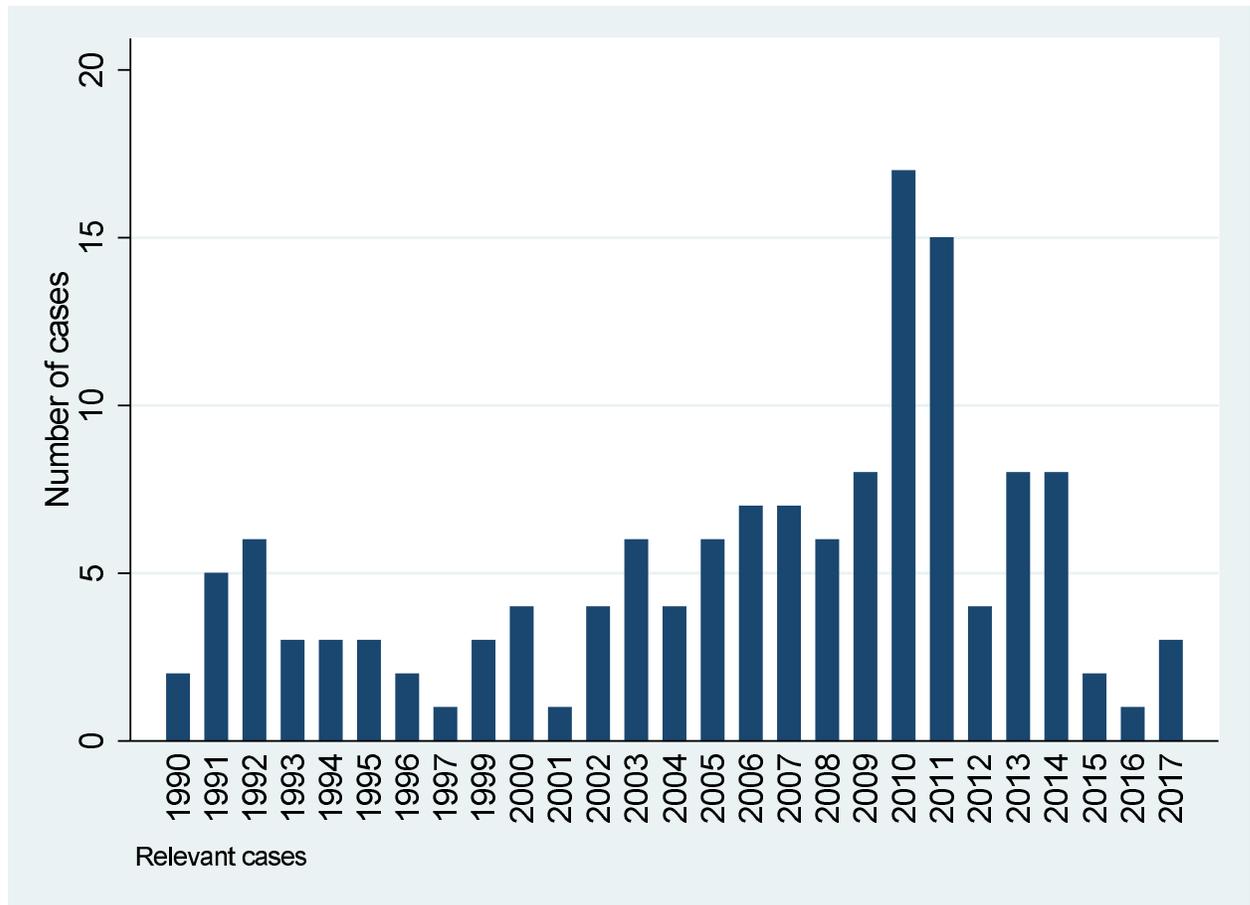
Figure 2: Percentage by Which Low Valuations Differ from High Valuations

Difference = (High Value - Low Value)/High Value
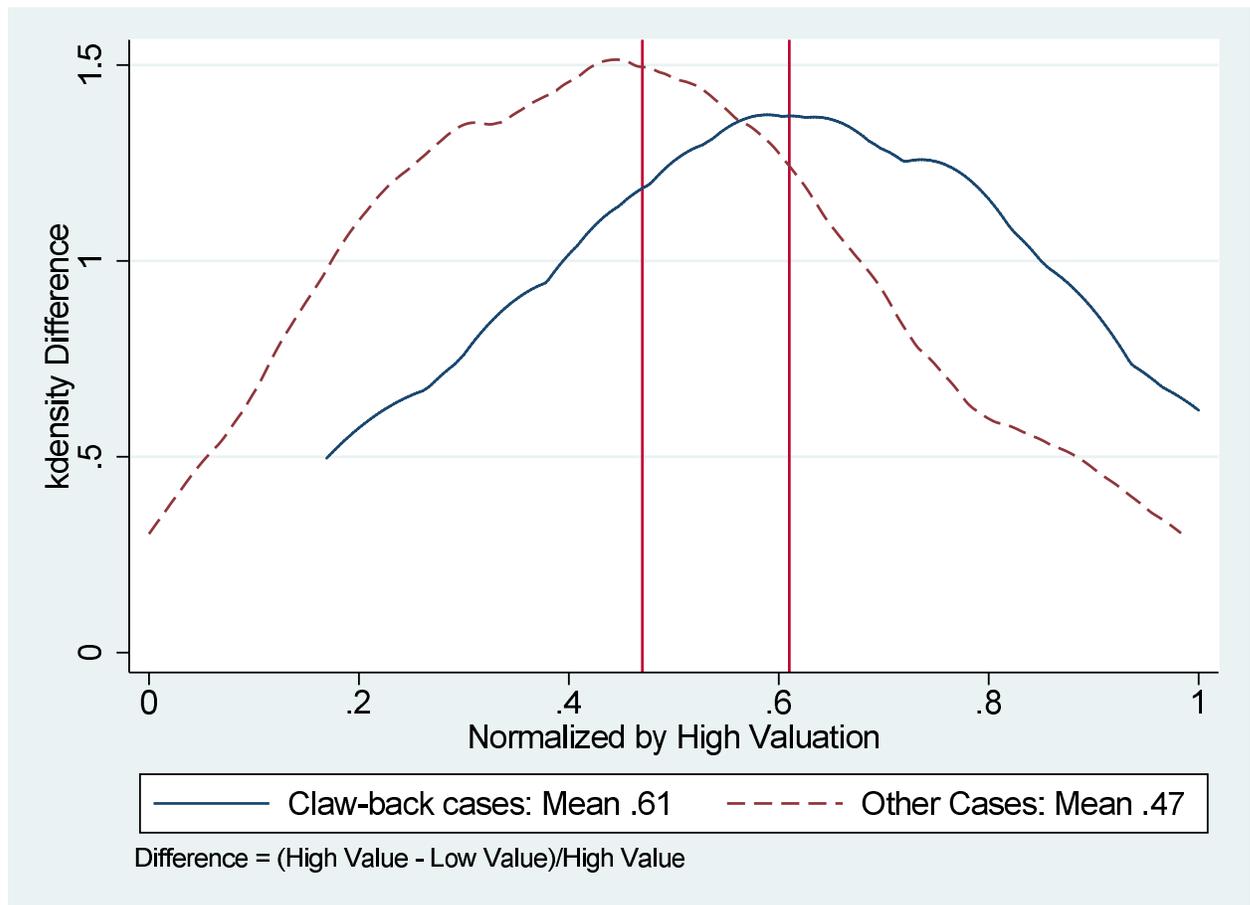
Note: This figure plots the percentage difference between the high and low valuation, using the high-valuation as the reference point. Thus, if the high and low values equal each other, the difference in this figure is equal to zero. If the low value is more than 100% smaller than the high value, the difference is equal to 1.0 or greater in this figure.

Tables

Table 1: Number of Filings by District

	(1)	(2)	(3)	(4)
	Delaware	SDNY	Other Districts	Total
Initial Sample Observations	36	39	151	226
Relevant Observations	24	23	96	143

Table 2: Percentage of Filings by Legal Issue

	(1)	(2)
	Percentage	Observations
Plan Confirmation	34%	49
Preferential or Fraudulent Transfer Action	23%	33
Adequate Protection or Lift Stay Motion	20%	29
Other	29%	41

Table 3: Disputes Over Inputs to Valuation Methods

	(1) All Cases N=141		(2) Clawback Cases N=33		(3) Other Cases N=108	
	%	N	%	N	%	N
Panel 1: DCF Disputes						
Number of DCF Cases		122		29		93
WACC Dispute	46%	56	52%	15	44%	41
Projection Dispute	74%	90	79%	23	72%	67
Terminal Value Dispute	15%	18	14%	4	15%	14
At Least One Input Disputed	84%	102	86%	25	83%	77
Panel 2: CC and TM Disputes						
Number of CC and TM Cases		105		22		83
Comparables Dispute	61%	64	73%	16	58%	48
Multiplier Dispute	20%	21	50%	11	12%	10
Market Value of Comparables Dispute	39%	41	50%	11	36%	30
At Least One Input Disputed	76%	80	95%	21	71%	59

Note: The terms in this table are defined as follows.

WACC dispute: Dispute over the calculation of the weighted average cost of capital (the discount factor).

Projection Dispute: Dispute over projected future cash flows.

Terminal Value Dispute: Dispute over the residual value at the end of the cash flow projection.

Comparables Dispute: Dispute over what companies or assets are comparable.

Multiplier Dispute: Dispute over which accounting variable should be used in the denominator of the multiple.

Market Value of Comparables Dispute: Dispute over the true value of the comparable companies or assets, as well as what adjustments are necessary to account for the difference between the comparable and the asset in question.

Table 4: Percentage of Experts Proposing Unequal Weighting of Valuations

	(1) Experts Proposing Non-Equal Weightings		(2) Experts Proposing Most Weight on Highest/Lowest Valuation	
	%	N	%	N
Yes	75.00	24	58.33	7
No	25.00	8	41.67	5
Total	100.00	32	100.00	12

Note: We see in our data that 32 experts generated multiple valuations (based on different methods) and proposed a final valuation based on a weighted average of the valuations. 24 of the 32 experts (75%) used unequal weights. We know the weights are unequal because the court's opinion says so. The court opinion, however, does not always report the valuation that received the largest weight. That is reported for only twelve of the 24 experts. Among these twelve, seven put largest weight on the valuation most favorable to the client who hired the expert.