

# Industry Peer Information and the Equity Valuation Accuracy of Firms Emerging from Chapter 11

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## Abstract:

Abstract. Valuation plays a central role in determining Chapter 11 reorganization outcomes. However, obtaining accurate valuation estimates of reorganized firms is challenging because of limited firm-specific market-based information and the oft-conflicting incentives of claim-holders. We examine the role of industry peer information in reducing misvaluations and its implications for unintended interclaimant wealth transfers and post reorganization performance. First, we find that the availability of relevant industry peer information is negatively associated with equity valuation errors for firms emerging from Chapter 11. Cross-sectional results suggest that the relation between industry peer information and valuation errors varies substantially with debtors' information environment and case characteristics. Second, we find that industry peer information quality is associated with better ex post financial performance of emerged firms because of lower overvaluation. Finally, we document the role of industry peer information in substantially reducing the frequency and magnitude of unintended wealth transfers between claimants arising from equity valuation errors.

**Keywords:** Peer Information, Bankruptcy, Chapter 11, Valuation, Postemergence performance, Bargaining Influences, interclaimant wealth transfers

## 1. Introduction

Chapter 11 of the U.S. Bankruptcy Code enables reorganization of financially distressed but otherwise operationally viable businesses. We study whether the availability and relevance of debtors' industry peer information affects the socioeconomically important but difficult valuation problem in Chapter 11 reorganizations. Specifically, we examine the role of bankrupt firms' industry peer information in reducing errors in reorganization value estimation and its consequences in terms of improving the ex post performance of emerged firms and mitigation of unintended interclaimant wealth transfers. Although the importance of peer information has been documented in various corporate settings, Chapter 11 reorganizations offer a unique opportunity to study valuation exercises conducted under court oversight and against the backdrop of multiple and often-competing stakeholder influences. The importance of Chapter 11 in the global business environment cannot be emphasized enough—as Warren and Westbrook (2009, p. 604)

state: “In the pantheon of extraordinary laws that have shaped American economy and society and then echoed throughout the world, Chapter 11 of the U.S. Bankruptcy Code deserves a prominent place.” A key question that bankruptcy courts as well as the negotiating stakeholders must grapple with is whether the business is worth saving or if it is more efficient to liquidate the business piecemeal. Getting this crucial decision wrong can potentially lead to the reorganization of otherwise unviable businesses (e.g., Weiss and Wruck 1998) or inefficiently liquidate businesses that are viable (e.g., Bernstein et al. 2019a, b). In other words, there are potentially adverse consequences of both Type I and Type II errors in terms of misallocation of resources in the economy. These important capital allocation decisions are informed by the expected valuation of reorganized firms emerging from Chapter 11 (i.e., the debtor), making it the centerpiece of the Chapter 11 decision-making process (Levitin 2016, Ayotte and Morrison 2018).

Valuation plays a central role in the determination of Chapter 11 outcomes. First, a key requirement for approval of a Chapter 11 restructuring plan is that the debtor must demonstrate to the bankruptcy court that its expected reorganization value under Chapter 11 (i.e., proforma “going concern” value) is greater than its liquidation value under a hypothetical liquidation under Chapter 7. Second, it determines the distributions received by creditors and equity holders of bankrupt firms. However, an accurate estimation of reorganized value is difficult because of a lack of firm-specific market-based information and the conflicting incentives of junior and senior creditors to try and influence plan valuations (Gilson et al. 2000, Ayotte and Morrison 2009). Consistent with this, studies document large differences between court-approved valuations<sup>1</sup> and the market value of reorganized firms postemergence, suggesting substantial court misvaluations (Lehavy 2002, Butler 2003).<sup>2</sup> Misvaluations may cause two adverse consequences. First, they may lead to the reorganization of otherwise unviable businesses (e.g., Weiss and Wruck 1998), resulting in poor ex post performance of firms emerging from bankruptcy (Hotchkiss 1995).<sup>3</sup> Second, they may lead to significant unintended wealth transfers among claimholders (Demiroglu et al. 2022).

Our study approaches the Chapter 11 valuation problem by building on an extensive literature that focuses on the capital market implications of peer firm information. This literature emphasizes information spillovers among firms in various settings, such as initial public offerings (IPOs), mergers and acquisitions (M&As), and secondary equity markets (e.g., Foucault and Frésard 2014, Shroff et al. 2017, Yu et al. 2019, Chen et al. 2022, Bourveau et al. 2023). In the context of our study, bankrupt firms undergo significant capital structure, organizational, and operational changes during the Chapter 11 process, rendering firm-specific information from the prebankruptcy period significantly less relevant. We thus contend that peer information may be especially important in the Chapter 11 bankruptcy setting that is potentially characterized by an opaque information environment.<sup>4</sup>

In practice, industry peer information is widely used by valuation advisors (or investment banks) hired by the debtor (and if necessary, various creditors) and by bankruptcy judges during valuation trials. Valuation advisors (typically, specialist investment banks) not only rely on the uncertain financial forecasts furnished by the debtors but also on valuation multiples of peer firms and market transactions involving peer firms (Moyer 2005, Sontchi 2012).<sup>5</sup> Both methods, discounted cash flow (DCF) and comparable firm multiples, almost invariably use industry as one of the dimensions to define the bankrupt firm’s peers and/or determine one or more of the valuation inputs, such as projected cash flows or the discount rate (Moyer 2005).<sup>6</sup> Moreover, the

importance of market multiples-based approaches in the resolution of valuation disputes seems to have increased as bankruptcy judges have become increasingly adept at evaluating market multiples (Ayotte and Morrison 2018, p. 1823). In our sample, the discounted cash flow and comparable firm multiple approaches are used in 91% of the cases; the precedent M&A transactions approach is used in 49% of the cases; and other valuation approaches, such as the risk-adjusted net asset value model, are used in 21% of the cases.

Motivated by valuation approaches used in practice, we use three empirical measures to capture the availability and relevance of industry peer information for valuation of reorganized firms in Chapter 11 bankruptcy. Our first measure, *Earnings Synchronicity*, gauges the relevance of industry peer information by measuring the synchronicity of earnings among the bankrupt firm and its industry peer firms (i.e., degree of similarity and the economic strength linkage) in the year prior to Chapter 11 filing (Shroff et al. 2017). Our second measure, *Precedent M&A Deals*, captures the number of completed M&A transactions within the bankrupt firm industry.<sup>7</sup> We contend that prior enterprise valuation exercises involving industry peer firms in the M&A setting serve as an important source of information for valuing the reorganized entity (e.g., Sontchi 2012). Therefore, our second measure reflects the availability of such comparable transaction data for use in bankruptcy valuations. Our third measure, *Multiple Valuation Gap*, captures the difficulty in determining the bankrupt firm’s valuation estimate by measuring the valuation performance based on enterprise value (*EV*) to *earnings before interest, taxes, depreciation, and amortization (EBITDA)* ( $EV/EBITDA$ ) multiple within the bankrupt firm’s industry (e.g., Liu et al. 2002).<sup>8</sup> It is motivated by the comparable firm multiples approach, which is a commonly used valuation approach by valuation experts in Chapter 11 cases. Practitioners frequently rely on valuation multiples, such as the  $EV/EBITDA$  multiple, of other publicly traded companies when valuing the focal firm (e.g., Moyer 2005, Altman et al. 2019). Overall, peer information quality (*PIQ*) is an aggregate measure that is the sum of these three normalized measures ranging from zero to three (see Section 3.2.2 for details).

Consistent with our expectation, the results indicate that peer information quality and its three components are negatively related to the ex post valuation errors of reorganized firms emerging from Chapter 11. The effect is statistically significant and economically meaningful. A one-unit increase in overall *PIQ* is associated with a 27%–42% decrease in valuation error. Cross-sectional analyses corroborate our main results and suggest substantial heterogeneity in the relation between industry peer information and valuation errors. First, we analyze the impact of firm-specific information. Consistent with the argument in Shroff et al. (2017), we find that the

usefulness of industry peer information in reducing valuation errors is more pronounced for firms with lower firm-specific information environment (i.e., smaller firms, firms with lower financial analyst coverage, and firms with no Securities and Exchange Commission (SEC) filings during the Chapter 11 process). Second, we find that the effect of industry peer information is attenuated in the presence of constituencies with strong bargaining influence over Chapter 11 outcomes, such as the presence of an unsecured creditor committee, an equity committee, a “debtor-in-possession” (*DIP*) lender, and a newly appointed chief executive officer (CEO) after the bankruptcy filing.<sup>9</sup> Third, we find stronger effects for experienced valuation advisors and bankruptcy courts (specifically, the Delaware and Southern District of New York courts that handled a disproportionately large percentage of Chapter 11 cases in our sample).

As discussed earlier, misvaluations may lead to the reorganization of otherwise unviable businesses (i.e., overvaluations), resulting in poor ex post performance of firms emerging from bankruptcy (e.g., Hotchkiss 1995, Weiss and Wruck 1998). We employ path analyses to examine the effect of peer information on the ex post performance of firms emerging from Chapter 11. The results suggest that higher peer information quality is associated with smaller overvaluation upon emergence from Chapter 11. More importantly, the results show that peer information is associated with better ex post financial performance of emerged firms via the reduction of overvaluation. Another adverse consequence of misvaluations is that they may lead to significant unintended wealth transfers among claimholders, resulting in distributional efficiency and fairness problems (Demiroglu et al. 2022). We document the role of industry peer information in substantially reducing the frequency and magnitude of unintended wealth transfers between claimants arising from misvaluations. These findings concerning the role of peer information in affecting ex post performance and allocation outcomes speak to the broader socioeconomic debate on the efficiency of bankruptcy outcomes and the aspects of the debtors’ milieu that may be associated with the heterogeneity in outcomes.

Our study contributes to the academic literature along several dimensions. First, it contributes to a large body of literature in accounting and finance on the externalities of peer firm information in various capital market settings, such as IPO pricing, stock prices, and M&As (e.g., Foucault and Frésard 2014). We add to this literature by documenting the role of industry peer information in the economically important Chapter 11 bankruptcy setting. Our research setting is not only characterized by heightened information uncertainty, but it also poses important socioeconomic questions because of its broad labor market and societal effects (Altman et al. 2019).<sup>10</sup>

Our work also relates to the accounting literature that examines the role of peer firms’ information in the valuation of a focal firm (e.g., Chen et al. 2022). We highlight the valuation role of peer information in the Chapter 11 context, where valuation plays a central role in not only determining the reorganization versus liquidation decision but also, the distribution of value among different stakeholders. Our findings indicate the usefulness of peer information in reducing misvaluations and unintended interclaimant wealth transfers in Chapter 11 reorganizations.

Finally, our paper adds to studies that examine Chapter 11 reorganizations. Finance and accounting research sheds light on misvaluations in Chapter 11 plans (e.g., Gilson et al. 2000, Lehavy 2002, Butler 2003, Demiroglu et al. 2022) and on the ex post performance of the reorganized firms (e.g., Hotchkiss 1995, Alderson and Betker 1999, Eberhart et al. 1999, Morrison 2007). The legal literature also provides useful analyses of the valuation frictions in bankruptcies (e.g., Ayotte and Morrison 2018). Our paper extends these studies by discussing and empirically documenting the complementary role of industry peer information as an additional channel to mitigate inherent valuation frictions. Our study has potential policy implications for insolvency practitioners and policymakers interested in evaluating the ex post performance of firms emerging from Chapter 11 as well as other similar restructuring regimes.

## 2. Chapter 11 Reorganizations and the Valuation Process

### 2.1. Chapter 11 Reorganization Process

Financially distressed firms should ideally develop a plan to remedy the causes behind their problems, contact key creditors and solicit their support to seek waivers or extensions, or locate additional financing (i.e., debt or equity). If appropriate steps are taken and additional funding is obtained, a business can survive and recuperate. If additional financing cannot be obtained through customary channels and the company cannot meet its operational cash flow needs, an out-of-court restructuring or workout may be attempted. However, out-of-court restructuring typically involves achieving a difficult consensus among the various impaired claimants. If out-of-court restructuring is infeasible, then financially distressed firms may choose one of the two types of filings: (1) a Chapter 7 filing to liquidate or (2) a Chapter 11 filing to reorganize using a legal process, which is the focus of our study. Under Chapter 11, the distressed firm (i.e., the debtor) files a petition for bankruptcy protection and must submit a reorganization plan to the court within 120 days after filing the initial petition.<sup>11</sup> In some cases, the debtors are able to reach an agreement on the reorganization plan with the creditors prior to filing for Chapter 11; these “prepackaged”

filings have the advantage of reducing the time spent in bankruptcy (i.e., from filing the petition to emergence).

In the proposed reorganization plan, the debtor classifies the claimants, estimates the reorganization value, and lays out the distributions (e.g., cash and/or equity in the reorganized firm) to be made to each class of claimants based on the absolute priority rule (*APR*). Claims are grouped into classes that typically include (Altman et al. 2019) (1) secured creditor claims, (2) priority administrative expense claims, (3) other priority claims, (4) unsecured claims, and (5) prepetition equity holder claims. A finite distributable value and *APR* imply that junior claimants, such as unsecured creditors and prepetition equity holders, typically prefer a higher valuation, whereas senior claimants, such as secured creditors, prefer a lower valuation to obtain a larger share of the distributable value. We examine the role played by conflicting incentives of the negotiating claimholders for estimating low versus high reorganization valuations in Section 4.4. The reorganization value proposed in the plan by the debtor to claimants is typically performed by the debtors' specialist investment banks or valuation advisory firms.

Upon preparation of the proposed reorganization plan, the debtor and the creditors enter into negotiations. If the debtor and creditors reach a consensus on the reorganization value, a consensual plan is reached. The consensual reorganization plan must be sanctioned and approved by the court to ensure that the plan meets the statutory requirements and is fair and reasonable (e.g., it provides more value to the claimants than in a liquidation). However, if the debtor and creditors do not reach a consensus on the value of the reorganized firm, a valuation trial is held in bankruptcy court, and the estimated value is determined by the bankruptcy judge. In Online Appendix B, we illustrate the plan negotiation processes and outcomes using a recently concluded Chapter 11 case.

## 2.2. Chapter 11 Valuation Process

Reorganization valuation is generally conducted by the plan proponent along with their valuation bank. In most instances, the plan proponent is the debtor. The debtor's management and/or their restructuring advisors (prominent firms inter alia include Alix Partners, Alvares & Marsal, and FTI Consulting) prepare detailed proforma financial statements. These proforma financials form the basis of the enterprise valuation exercise that is conducted by a specialist investment bank or valuation advisory firm (prominent specialist firms inter alia include Houlihan Lokey, Lazard Ltd., PJT Partners, Moelis & Co., Evercore Inc., Rothschild and Co., and Perella Weinberg Partners).

Debtors usually file a "valuation analysis" exhibit with the disclosure statement outlining the key valuation estimates and the approach used by the valuation

advisor. We provide one such representative example in Online Appendix A by reproducing sections of the valuation analysis exhibit from the Chapter 11 disclosure statement filed by Seadrill Ltd. The valuation analysis is conducted by Seadrill Ltd.'s investment banker and valuation advisor—Houlihan Lokey. As is typical, the valuation approach is preceded by disclaimers and caveats.<sup>12</sup> Furthermore, the valuation analysis exhibit clearly outlines the techniques followed by the valuation advisor in arriving at a valuation estimate: "(a) a discounted cash flow analysis, (b) a selected publicly traded comparable companies analysis, and (c) a selected precedent transactions analysis."

The use of peer information is evident throughout the approaches followed. For example, in outlining the DCF approach, the valuation advisor outlines the use of data concerning peer firms to infer the appropriate discount rate (additional emphasis is added with italics): "These cash flows were then discounted at a range of estimated weighted average costs of capital, which was determined by reference to, among other things, the cost of debt of *selected companies that are similar to the Consolidated Operating Company and the Non-Consolidated Entities in certain respects and the estimated cost of equity of selected publicly traded companies that are similar to the Consolidated Operating Company and the Non-Consolidated Entities in certain respects.*" In discussing the precedent transactions approach, the valuation advisor highlights the selection of transactions from a similar industry environment (additional emphasis is added with italics): "The precedent transactions analysis is based on the *implied enterprise values of companies and assets involved in publicly disclosed merger and acquisition transactions that have operating and financial characteristics comparable in certain respects to the Consolidated Operating Company and/or the Non-Consolidated Entities.* In connection with this analysis, Houlihan Lokey reviewed *relevant transactions announced during the current oil and gas industry environment.*" Similarly, the valuation advisor makes clear the use of peer information in the comparable firm multiples approach by stating the following (additional emphasis is added with italics): "The comparable company analysis estimates the value of a company based on a *relative comparison with other publicly traded companies with similar operating and financial characteristics.* Under this methodology, the enterprise value for each selected public company is determined by examining the trading prices for the equity securities of such company in the public markets and adding the outstanding net debt for such company."

The valuation estimates from these approaches are then likely aggregated by the valuation advisor using an undisclosed weighting approach (e.g., equal weighting) to arrive at a range of consolidated distributable values.<sup>13</sup> Finally, expected postemergence debt is subtracted from the estimated distributable value derived



to arrive at the implied equity value upon emergence. The valuation advisor ends the valuation statements with a caveat that is salient to the topic of our paper: “Because valuation estimates are inherently subject to uncertainties, none of the Debtors, Houlihan Lokey or any other person assumes responsibility for their accuracy or any differences between the estimated valuation ranges herein and any actual outcome.” Disclaimers such as this are not uncommon in bankruptcy valuation statements and highlight the possibility that negotiating parties may question the assumptions that underpin these valuation models, potentially triggering a valuation dispute. In Online Appendix C, we provide additional descriptive analysis and discussion about the valuation approaches and methodologies used in practice, additional descriptive discussion on bankruptcy valuation cases heard in federal courts, and a summary of arguments related to the use of peer information in the valuation process *In re Chemtura Corp.*, 439 B.R. 561.<sup>14</sup>

### 2.3. Importance of Court-Approved Valuation in Chapter 11 Reorganizations

Estimating reorganization value requires forecasting the expected postreorganization cash flows of the reorganized firm. As discussed earlier, an accurate estimate of the reorganized firm value is particularly difficult as is evident in large on-average misvaluations (e.g., Gilson et al. 2000, Lehavy 2002, Butler 2003, Demiroglu et al. 2022). For example, Lehavy (2002) reports that relative to the market value of equity immediately upon emergence, the fresh-start equity value is, on average, 4% understated and exhibits significant cross-sectional variation. He finds that although the misstatement is increasing in the relative bargaining power of the claimants and the probability of postemergence losses, firms that retain their CEO throughout the bankruptcy process and firms that use a prepackaged filing exhibit greater understatement. Related to this, Gietzmann et al. (2018) examine the effect of distress-oriented, loan-to-own hedge funds (i.e., “vulture” funds) on the valuation of firms emerging from Chapter 11. They document that vulture funds attain bargaining power in the bankruptcy negotiations by acquiring the debt positions of the distressed firms and exercising this power to influence the valuation in their favor to earn excess ex post returns from trading the stock or selling the firm’s assets at higher market prices postemergence.

Misvaluations may lead to two adverse consequences resulting in misallocation of resources in the economy. First, they may lead to the reorganization of otherwise unviable businesses (e.g., Weiss and Wruck 1998), resulting in poor ex post performance of firms emerging from bankruptcy (Hotchkiss 1995). Hotchkiss (1995) documents that firms emerging from Chapter 11 underperform compared with industry averages. Second,

they may lead to significant unintended wealth transfers among claimholders (i.e., affect recovery rates of different claimants), resulting in distributional efficiency and fairness problems (Demiroglu et al. 2022). To address this problem, scholars have suggested various alternative market-based mechanisms. Roe (1983) proposes that the price of the public offering of a small portion of the newly issued shares prior to emerging from Chapter 11 can serve as a reliable signal of the reorganization value. Baird (1993) suggests a direct auction of a firm’s assets while the firm is in Chapter 11. Bebchuk (1988, 2002) suggests distributing option-like securities of the reorganized firm that are designed in such a way that all classes of creditors receive their fair share based on the true value of the reorganized firm postemergence. Empirically, Demiroglu et al. (2022) find that court-approved valuation errors are significantly lower for those firms in Chapter 11 with publicly traded bond prices. They conclude that the presence of verifiable and transparent bond prices is a valuable source of information for estimating reorganized firm value.

### 2.4. Industry Peer Information and Accuracy of Court-Approved Valuations

A growing literature examines the relevance of earnings information provided by a firm’s industry peers. In early work, Foster (1981, p. 202) and Clinch and Sinclair (1987) show that earnings releases by one company are value relevant for stock prices of other companies within the same industry. More recent work, such as Amiram et al. (2017), provides empirical evidence on the relevance of industry risk forecasts to debt pricing.<sup>15</sup> Foster (1981, p. 202) explains these arguments intuitively: “[E]arnings of companies are affected by (a) economy factors, (b) industry factors, and (c) company-specific factors ... The earnings releases of other companies in the same industry are one source of information on the impact of [these] industry-wide trends for any single company.”

A vast body of literature focuses on the effect of peer firm information on the valuations and capital allocation decisions of related firms. One setting in which the role of information spillovers within peer firms has not been examined is Chapter 11 bankruptcy, which is arguably characterized by more information asymmetry, valuation uncertainty, and labor market consequences than most economic and financial decisions in other settings (e.g., IPOs, stock prices, and M&As). One strand of this literature examines the effect of peer firm information on focal firms’ capital allocation decisions (e.g., Badertscher et al. 2013, 2019; Foucault and Frésard 2014; Shroff et al. 2017; Bernard et al. 2020). Badertscher et al. (2013) find that greater presence of public firms in an industry increases the responsiveness of private firms to investment opportunities by enriching the industry’s information environment and reducing uncertainty (i.e., positive externalities of peer firms). Shroff et al.

(2017) find that the information environment of peer firms is more important (in determining the cost of financing) when there is less firm-specific information. Another strand examines the effect of peer firms' valuation (e.g., stock prices) on focal firms (e.g., Foucault and Frésard 2014, Dessaint et al. 2019). The Graham and Harvey (2001) survey results indicate that firms rely on price multiples and valuation of peer firms for investment and capital budgeting decisions, and Foucault and Frésard (2014) document the role of peer firms' stock prices in shaping the investment behavior of focal firms. Yu et al. (2019) and Gao et al. (2020) examine the attributes of peer information, such as earnings quality and predictability, in determining the efficiency of IPO pricing. Another strand more related to our study examines the role of peer firm information on the valuation of focal firms. Specifically, Chen et al. (2022) investigate the usefulness of public peer firm information in the private M&A setting characterized by opaque information environment because of lack of publicly available information. They find that public peer firm information helps acquirers to more precisely value private target firms. In Bourveau et al. (2023), interviews with M&A experts and empirical evidence show that higher comparability between public and private firms is associated with greater value relevance of private firms' reported financial information. Firms emerging from bankruptcy undergo significant capital structure, organizational, and operational changes during the Chapter 11 process, rendering firm-specific information from the prebankruptcy period significantly less meaningful if not entirely meaningless. Thus, bankruptcy setting is similarly characterized by opaque information environment. Building on these studies, we investigate the valuation implications of industry peer information in bankruptcy setting.

Industry peer information plays a central role in various elements of the Chapter 11 valuation exercise. For example, as Moyer (2005) argues, the bankrupt firm's industry is often the starting point in choosing peers for a comparable-based analysis. Further, even in a DCF exercise, various valuation inputs, such as future cash flows and discount rates, hinge crucially on the valuation experts' understanding of industry conditions (Ayotte and Morrison 2018). In other words, although peers can be selected based on various dimensions, such as size and geography, these attributes are prone to significant discretion and thus, ad hoc heterogeneity (Ayotte and Morrison 2018). Descriptive statistics from our sample reinforce the role of peer information in valuation exercises employed in practice. As discussed in Section 2.3, we observe that the DCF and comparable firm multiple approaches are commonly used, whereas the precedent M&A transaction method is used in about half of the cases. Ninety-three percent of these cases use information from peers with "similar operations and

line of business," and 76% of these cases use information from peers with "similar financial conditions." Accordingly, we predict that the relevance and availability of industry peer firm information are associated with lower bankruptcy-related misvaluations.

However, the predicted relation is not tautological. First, the specific choice of peer firms by valuation advisors is generally unobservable to researchers, and our choice of peer group may not reflect the peers chosen in practice. Furthermore, the choice of industry peers in practice may be subject to unobservable biases resulting from the conflicting incentives of various claimholders (e.g., Ayotte and Morrison 2018, Eaton et al. 2022).<sup>16</sup> Second, as we argue later, the usefulness of industry peer information may be affected by other sources of information, such as available firm-specific information. Third, a weak form of market efficiency is implied in our prediction. In other words, we assume that the market gets it right over the course of three months upon emergence from bankruptcy. Market inefficiency would work against us finding results consistent with the prediction. As such, whether and how industry peer information is associated with valuation errors of firms emerging from Chapter 11 are open empirical questions.

### 3. Sample Selection, Variable Definitions, and Research Design

#### 3.1. Sample and Data

Our main data source for bankruptcy information is the University of California, Los Angeles–LoPucki Bankruptcy Research Database (BRD). The information available in this data set includes filing type (e.g., Chapter 11 or Chapter 7), bankruptcy court, filing date, plan confirmation date, whether the reorganization plan is prepackaged, whether the debtor obtains debtor-in-possession financing, whether the firm emerges from bankruptcy, emergence date, and the outcome of emergence (e.g., whether the firms emerge as a public or private firm). We supplement the BRD using data obtained from [bankruptcydata.com](http://bankruptcydata.com) (New Generation Research) as necessary.

To construct the sample, we first obtain a list of Chapter 11 bankruptcy reorganizations by U.S. public firms over the 2000–2018 period and require the firm to have successfully emerged from Chapter 11 as a reorganized publicly listed entity.<sup>17</sup> This process leaves us with 530 cases. We further require that the firms have postemergence accounting information from COMPUSTAT, market value of newly issued equity from the Center for Research in Security Prices (CRSP) or COMPUSTAT security, and prebankruptcy analyst coverage data from Institutional Brokers' Estimate System (I/B/E/S). This filtering process reduces the number of bankruptcy cases to 183.

Next, we hand collect the court-approved valuation of each emerged firm's newly issued common stock. Following Demiroglu et al. (2022), we obtain fresh-start equity values from postemergence Form 10-K annual reports using the SEC Electronic Data Gathering, Analysis, and Retrieval (EDGAR) database. We supplement these data with estimated equity values collected from court disclosure statements obtained from [bankruptcydata.com](http://bankruptcydata.com). We use the midpoint value if the disclosure statement provide a range estimate of equity value. Our final sample includes 135 cases in which the firm emerges from Chapter 11 with publicly traded stock and has nonmissing postemergence accounting, analyst, and stock market information.

### 3.2. Definition of Key Variables

**3.2.1. Valuation Error.** Following Demiroglu et al. (2022), we calculate the court-approved valuation error as

$$\text{Valuation Error} = |V_{\text{court}} - V_{\text{market}}| / [(V_{\text{court}} + V_{\text{market}}) / 2],$$

where  $V_{\text{court}}$  is the court-approved postemergence equity value. We use fresh-start equity values obtained from the first 10-K filing after emergence if the firm adopts fresh-start accounting (FSA). If firm is not qualified for FSA, we instead use equity values obtained from Chapter 11 disclosure statements. If the firm makes a rights offering and includes the issue amount in the fresh-start value, we subtract the value of the offering from the fresh-start value. Following Demiroglu et al. (2022, p. 1191), we define  $V_{\text{market}}$  as the average market value of the stocks during the first three months after emergence, discounted back to the confirmation date of the court plan of reorganization using CRSP equal-weighted industry returns. The stock market value is intended to capture the intrinsic value of the newly issued equity. Using the average equity value over the three-month horizon reduces concerns that the value might be temporarily depressed immediately after emergence (Gilson et al. 2000).<sup>18</sup>

**3.2.2. Industry Peer Information Measures.** Motivated by valuation approaches used in practice (see Section 2.3 for details), we use three empirical measures to capture the availability and relevance of industry peer information in bankruptcy valuation. First, we estimate the relevance of industry peer information for the bankrupt firm by measuring the synchronicity of its earnings with industry peer firms' earnings in the year prior to bankruptcy. This measure captures the strength of economic linkages or similarity in the line of business among firms in the same industry, which reflects the importance of peer firm selection with similar operations or financial conditions. We follow Shroff et al. (2017) and measure *Earnings Synchronicity* as the mean value of adjusted  $R^2$  obtained from regressing each firm's quarterly earnings on the aggregate quarterly earnings in its North American Industry Classification

System (NAICS) three-digit industry. Specifically, for each firm-year, we regress the firm's return on assets (ROA) on the aggregate NAICS three-digit industry-level ROA using the previous 16 quarters of data to obtain the adjusted  $R^2$  values.<sup>19</sup> Then, we take the mean value of adjusted  $R^2$  for all firms in the same industry-year. The *Earnings Synchronicity* measure is at the industry-year level, and we use the value in the year prior to bankruptcy in our regressions.

Second, we calculate *Precedent M&A Deals* as the number of completed M&A deals within the industry of the bankrupt firm (public targets with the acquirer obtaining more than 50% of shares) in each NAICS three-digit industry over the five-year window prior to each bankruptcy case.<sup>20</sup> This measure captures the availability of information that is essential to the applicability of the precedent M&A transactions approach.

Third, we measure the difficulty in determining the firm's valuation estimates by measuring the distance between its  $EV/EBITDA$  multiple and that of its industry peers in the year prior to the Chapter 11 filing. This measure reflects the extent to which common industry peer multiples are useful for the purposes of valuing the focal firm. Specifically, we first calculate the mean value of the  $EV/EBITDA$  multiple for each NAICS three-digit industry-year, denoted as  $\frac{EV_{j,t}}{EBITDA_{j,t}}$ , where  $j$  indicates industry  $j$  and  $t$  represents year  $t$ . Following prior studies (e.g., Loughran and Wellman 2011), we estimate  $EV$  as market value of equity plus total debt ( $DLC + DLTT$ ) plus preferred stock value ( $PSTKRV$ ) minus cash and short-term investments ( $CHE$ ), and we use Compustat variable  $OIBDP$  as  $EBITDA$ . We then multiply the mean multiple value with each firm's  $EBITDA$  to obtain a predicted  $EV$  value, and we calculate a predicted equity value based on the predicted  $EV$  value:

$$\widehat{MEq}_{i,j,t} = \frac{EV}{EBITDA_{j,t}} \times EBITDA_{i,j,t} + CHE_{i,j,t} - DLC_{i,j,t} - DLTT_{i,j,t} - PSTKRV_{i,j,t},$$

where  $i$  denotes firm  $i$ ,  $j$  indicates industry  $j$ , and  $t$  represents year  $t$ . We obtain the valuation gap for each firm by taking the absolute difference between the actual equity value and predicted equity value scaled by the average of the two:  $|\widehat{MEq}_{i,j,t} - MEq_{i,j,t}| / [(\widehat{MEq}_{i,j,t} + MEq_{i,j,t}) / 2]$ . Finally, we obtain an industry-year level valuation gap measure, *Multiple Valuation Gap*, by taking the average valuation gap for each firm in the industry and the year.<sup>21</sup>

Finally, we create an aggregate  $PIQ$  measure based on the three individual measures. Specifically, we sort the raw values of *Earnings Synchronicity*, *Multiple Valuation Gap*, and *Precedent M&A Deals* into deciles. We multiply *Multiple Valuation Gap* by  $-1$  before the transformation so that it increases in valuation accuracy. We normalize each rank so that each has a minimum value of zero and a maximum value of one.  $PIQ$  index is our aggregate



measure that is the sum of these three normalized measures, and thus, it ranges from zero to three.<sup>22</sup>

### 3.3. Research Design

Following Demiroglu et al. (2022), we estimate the following ordinary least squares (OLS) regression to test our hypotheses:

$$\begin{aligned} \text{Valuation Error} = & \alpha + \beta \text{Peer Information Quality} \\ & + \lambda \text{Controls} + \text{Year FEs} \\ & + \text{Industry FEs} + \epsilon, \end{aligned} \quad (1)$$

where *PIQ*, the variable of interest, is one of the three individual measures or the aggregate index described in Section 3.2.2. We expect the coefficient on *PIQ* to be negative, implying that a higher *PIQ* is associated with lower *Valuation Error*.

We control for emerged firm characteristics that have been shown to affect court-approved plan valuation errors, including *Size*, *Leverage*, *Earnings Volatility*, and *Goodwill* (e.g., Demiroglu et al. 2022). We also include the percentage of the debtor's debt that is secured at the time of default to capture the effects of the firm's debt structure. We further control for bankruptcy characteristics, such as whether the reorganization plan is prepackaged, whether the debtor obtains *DIP* financing, the presence of unsecured creditors' or equity holders' committees, whether the firm replaces the CEO after its bankruptcy filing, and whether the firm adopts FSA. To account for the potential effects of the firm's information environment prior to bankruptcy, we employ the debtor's analyst coverage in the year prior to the bankruptcy filing. Detailed variable descriptions are available in the appendix. We also include industry fixed effects to control for time-invariant industry-level characteristics, and we include year fixed effects to account for time-period and macro effects.<sup>23</sup>

## 4. Empirical Results

### 4.1. Descriptive Statistics

Table 1 presents the descriptive statistics for the sample of 135 bankrupt firms that have emerged as publicly traded firms over the 2000–2018 sample period. The sample size is consistent with prior literature in the Chapter 11 bankruptcy setting. Panel A of Table 1 reports the summary statistics for the variables used in our analyses. All variables are defined in the appendix. The average (median) firm has a valuation error of 0.71 (0.55). The mean (median) *PIQ* is 1.42 (1.22). The interquartile range for *PIQ* is 1.00 (=2.00 – 1.00), indicating considerable clustering around the median. The log of postemergence total assets has a mean (median) of 7.02 (7.08). The average (median) firm has a leverage ratio (postemergence book value of total debt scaled by total assets) of 0.37 (0.33), a goodwill ratio (postemergence goodwill value scaled by total assets) of 0.06 (0.00), and earnings volatility

(standard deviation of quarterly earnings during the first two years postemergence) of 0.37 (0.15). The mean (median) of *Fresh Start Accounting* (an indicator variable) is 0.96 (1.00), indicating that 96% of the sample firms adopted fresh-start accounting upon emergence. The mean (median) analyst coverage (analyst coverage in the year prior to bankruptcy) is 6.34 (5.92), and the mean (median) secured debt ratio (secured debt divided by total liabilities in the year prior to bankruptcy) is 0.30 (0.03). The data show that an official unsecured creditor committee is present in 70% of our sample cases and that an official equity committee is appointed in 14% of the cases. In 56% of the cases, the debtor obtains financing from a *DIP* lender. The firm's CEO is replaced after the filing in 79% of the cases. These characteristics are largely consistent with those reported in related contemporary studies (e.g., Demiroglu et al. 2022).

Panel B of Table 1 presents the sample distribution by year (2000–2018). The observations are more concentrated in the years 2000, 2002–2003, 2009, and 2016–2017, with year 2009 representing the highest number of observations (i.e., 16% of the sample). Panel C of Table 1 reports the sample distribution by industry using the Fama–French 12-industry classification. Firms are distributed evenly across industries, with no industry representing more than 20% of the sample. Online Appendix C provides additional descriptive analysis.

Table 2 presents Pearson and Spearman correlations. By construction, *PIQ* is positively correlated with each of its three subcomponents (*Earnings Synchronicity*, *Multiple Valuation Gap*, and *Precedent M&A Deals*). Consistent with our prediction, *PIQ* and its subcomponents exhibit negative pairwise correlations with *Valuation Error*, and the correlations are statistically significant, except for *Precedent M&A Deals*.

### 4.2. Univariate Analyses of the Relation Between Peer Information and Valuation Error

Table 3 reports the results of univariate analyses of the association between industry peer information (i.e., *PIQ* and its three subcomponents) and *Valuation Error*. We partition the sample based on the median values for *PIQ* and each of its three components, and we compare the average *Valuation Error* for each subsample. The first row presents the results for *PIQ*, and subsequent rows document the results for *Earnings Synchronicity*, *Multiple Valuation Gap*, and *Precedent M&A Deals*, respectively. Consistent with our prediction, the high *PIQ* subsample has lower *Valuation Error* (0.57) compared with the low *PIQ* subsample with *Valuation Error* of (0.86). The third column indicates that the difference between the mean *Valuation Error* for the two subsamples is statistically significant (difference = –0.29,  $t = -3.05$ ), providing evidence on the relation between industry peer information and the valuation accuracy of debtors that emerge from Chapter 11 as publicly traded firms. Similarly, the



**Table 1.** Descriptive Statistics

Panel A: Summary statistics						
Variables	N	Mean	Standard deviation	P25	P50	P75
<i>Valuation Error</i>	135	0.71	0.56	0.25	0.55	1.05
<i>PIQ</i>	135	1.42	0.65	1.00	1.22	2.00
<i>Earnings Synchronicity (Raw)</i>	135	0.24	0.16	0.10	0.21	0.39
<i>Multiple Valuation Gap (Raw)</i>	135	-1.02	0.33	-1.25	-0.92	-0.81
<i>Precedent M&amp;A Deals (Raw)</i>	135	30.93	47.66	3.00	12.00	31.00
<i>Leverage</i>	135	0.37	0.26	0.20	0.33	0.49
<i>Goodwill</i>	135	0.06	0.11	0.00	0.00	0.06
<i>Fresh Start Accounting</i>	135	0.96	0.21	1.00	1.00	1.00
<i>Size (log of total prefilings assets)</i>	135	7.02	1.86	6.16	7.08	7.97
<i>Earnings Volatility</i>	135	0.37	0.83	0.05	0.15	0.31
<i>Pre-Bankruptcy Coverage</i>	135	6.34	5.46	1.29	5.92	10.83
<i>Prepackaged Bankruptcy</i>	135	0.50	0.50	0.00	1.00	1.00
<i>Secured Debt</i>	135	0.30	0.37	0.00	0.03	0.60
<i>Creditor Committee</i>	135	0.70	0.46	0.00	1.00	1.00
<i>Equity Committee</i>	135	0.14	0.35	0.00	0.00	0.00
<i>CEO Replaced</i>	135	0.79	0.41	1.00	1.00	1.00
<i>DIP Financing</i>	135	0.56	0.50	0.00	1.00	1.00
<i>Experienced Advisor</i>	75	0.36	0.48	0.00	0.00	1.00
<i>Experienced Court</i>	135	0.67	0.47	0.00	1.00	1.00
<i>Chapter 22</i>	135	0.07	0.26	0.00	0.00	1.00

Panel B: Sample distribution by year			
Bankruptcy year	N	Percentage	Mean valuation error (%)
2000	11	8.15	79.43
2001	8	5.93	54.06
2002	19	14.07	97.86
2003	14	10.37	45.83
2004	5	3.7	54.75
2005	3	2.22	70.55
2006	3	2.22	51.78
2007	1	0.74	20.25
2008	2	1.48	9.18
2009	22	16.3	57.39
2010	2	1.48	40.34
2011	4	2.96	107.54
2012	3	2.22	85.04
2013	2	1.48	105.26
2014	4	2.96	23.08
2015	2	1.48	122.05
2016	17	12.59	93.08
2017	12	8.89	73.16
2018	1	0.74	48.70
Total	135	100	

Panel C: Sample distribution by industry			
Fama–French 12-industry classification scheme	N	Percentage	Mean valuation error (%)
Consumer nondurables—food, tobacco, textiles, apparel, leather, toys	5	3.7	79.39
Consumer durables—cars, TVs, furniture, household appliances	9	6.67	71.82
Manufacturing—machinery, trucks, planes, office furniture, paper, com printing	11	8.15	56.43
Oil, gas, and coal extraction and products	26	19.26	84.52
Chemicals and allied products	5	3.7	34.35
Business equipment—computers, software, and electronic equipment	11	8.15	59.04
Telephone and television transmission	19	14.07	69.26
Utilities	4	2.96	41.71
Wholesale, retail, and some services (laundries, repair shops)	8	5.93	56.43
Healthcare, medical equipment, and drugs	9	6.67	87.82
Finance	4	2.96	73.36
Other—mines, construction, BldMt (construction materials), transport, hotels, bus serv, entertainment	24	17.78	77.94
Total	135	100	

*Notes.* Panels A, B, and C present the summary statistics for the sample of bankrupt firms that emerge as publicly traded firms over the 2000–2018 period used in this study. Panel A reports the summary statistics, panel B presents the sample distribution by year, and panel C presents the sample distribution by industry using the Fama–French 12-industry classification. The list of bankrupt firms in the sample is obtained from the University of California, Los Angeles–LoPucki Bankruptcy Research Database and [bankruptcydata.com](http://bankruptcydata.com). Variables are defined in the appendix. P, percentile.

**Table 2.** Correlation Table

Panel A										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) <i>Valuation Error</i>		-0.223***	-0.156*	-0.218**	-0.075	0.146*	-0.119	-0.082	-0.204**	0.140
(2) <i>PIQ</i>	-0.223***		0.787***	0.633***	0.619***	0.080	0.045	-0.035	0.115	-0.130
(3) <i>Earnings Synchronicity</i>	-0.150*	0.791***		0.304***	0.323***	0.091	-0.028	-0.039	0.131	-0.020
(4) <i>Multiple Valuation Gap</i>	-0.220**	0.653***	0.301***		0.005	-0.073	0.124	0.079	0.150*	-0.155*
(5) <i>Precedent M&amp;A Deals</i>	-0.088	0.624***	0.322***	0.017		0.112	0.026	-0.145*	0.002	-0.114
(6) <i>Leverage</i>	0.176**	0.119	0.137	-0.049	0.166*		-0.033	-0.134	-0.101	0.080
(7) <i>Goodwill</i>	-0.090	0.098	0.022	0.098	0.085	-0.060		0.045	0.333***	-0.162*
(8) <i>Fresh Start Accounting</i>	-0.108	-0.046	-0.039	0.078	-0.143*	-0.290***	0.079		0.046	0.088
(9) <i>Size</i>	-0.309***	0.014	0.022	0.095	-0.096	-0.228***	0.086	0.136		-0.169*
(10) <i>Earnings Volatility</i>	0.173**	-0.031	0.078	-0.132	-0.010	0.236***	-0.121	-0.138	-0.398***	
(11) <i>Pre-Bankruptcy Coverage</i>	-0.022	-0.231***	-0.084	-0.238***	-0.156*	-0.177**	-0.110	-0.090	0.349***	0.067
(12) <i>Prepackaged Bankruptcy</i>	0.052	-0.127	-0.190**	-0.009	-0.064	0.041	-0.100	0.217**	-0.003	-0.160*
(13) <i>Secured Debt</i>	-0.126	-0.088	-0.090	-0.048	-0.044	0.028	-0.021	0.108	0.000	-0.050
(14) <i>Creditor Committee</i>	-0.170**	-0.124	-0.095	-0.019	-0.149*	-0.203**	0.055	0.017	0.404***	-0.044
(15) <i>Equity Committee</i>	-0.092	0.116	0.118	0.146*	-0.033	-0.152*	0.010	-0.119	0.156*	-0.133
(16) <i>CEO Replaced</i>	-0.024	0.280***	0.138	0.305***	0.133	0.012	0.158*	0.062	-0.001	-0.042
(17) <i>DIP Financing</i>	-0.179**	0.200**	0.254***	0.157*	-0.009	-0.194**	-0.061	0.169*	0.322***	-0.130
(18) <i>No Financial Filing</i>	0.079	0.093	0.048	-0.019	0.172**	-0.077	0.118	-0.086	-0.147*	-0.080
(19) <i>Experienced Advisor</i>	-0.179	0.083	0.110	0.169	-0.149	-0.073	-0.065	0.054	0.100	0.141
(20) <i>Experienced Court</i>	-0.075	0.059	-0.082	0.229***	-0.032	-0.082	-0.009	0.003	0.183**	-0.093

Panel B										
	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(1) <i>Valuation Error</i>	-0.048	0.095	-0.121	-0.134	-0.140	-0.048	-0.167*	0.040	-0.200*	-0.071
(2) <i>PIQ</i>	-0.237***	-0.097	-0.126	-0.128	0.103	0.277***	0.177**	0.085	0.073	0.036
(3) <i>Earnings Synchronicity</i>	-0.105	-0.190**	-0.150*	-0.095	0.118	0.138	0.254***	0.048	0.110	-0.082
(4) <i>Multiple Valuation Gap</i>	-0.222***	-0.008	-0.057	-0.020	0.146*	0.305***	0.157*	-0.020	0.170	0.227***
(5) <i>Precedent M&amp;A Deals</i>	-0.166*	-0.058	-0.089	-0.153*	-0.035	0.130	-0.019	0.165*	-0.162	-0.038
(6) <i>Leverage</i>	-0.216**	0.074	0.012	-0.173**	-0.150*	0.019	-0.167*	-0.080	-0.051	-0.041
(7) <i>Goodwill</i>	-0.057	-0.141	-0.047	0.172**	0.071	0.195**	0.086	0.049	-0.098	0.128
(8) <i>Fresh Start Accounting</i>	-0.064	0.217**	0.136	0.017	-0.119	0.062	0.169*	-0.086	0.054	0.003
(9) <i>Size</i>	0.376***	-0.139	-0.126	0.378***	0.212**	0.053	0.269***	-0.085	0.177	0.118
(10) <i>Earnings Volatility</i>	0.072	0.032	-0.001	0.009	-0.203**	-0.026	-0.244***	-0.149*	0.185	-0.028
(11) <i>Pre-Bankruptcy Coverage</i>		-0.026	-0.053	0.182**	0.082	-0.162*	0.102	-0.292***	0.010	0.049
(12) <i>Prepackaged Bankruptcy</i>	-0.035		0.277***	-0.222***	-0.067	-0.122	-0.202**	-0.269***	-0.113	0.037
(13) <i>Secured Debt</i>	-0.066	0.299***		-0.043	-0.087	-0.269***	0.047	-0.147*	-0.105	0.083
(14) <i>Creditor Committee</i>	0.124	-0.222***	-0.072		0.076	0.016	0.268***	-0.152*	0.056	0.033
(15) <i>Equity Committee</i>	0.062	-0.067	-0.066	0.076		0.160*	0.105	-0.108	0.084	-0.037
(16) <i>CEO Replaced</i>	-0.159*	-0.122	-0.263***	0.016	0.160*		0.113	0.140	0.075	0.098
(17) <i>DIP Financing</i>	0.075	-0.202**	0.011	0.268***	0.105	0.113		-0.060	0.089	0.141
(18) <i>No Financial Filing</i>	-0.244***	-0.269***	-0.113	-0.152*	-0.108	0.140	-0.060		-0.124	-0.004
(19) <i>Experienced Advisor</i>	-0.025	-0.113	-0.086	0.056	0.084	0.075	0.089	-0.124		0.098
(20) <i>Experienced Court</i>	0.051	0.037	0.044	0.033	-0.037	0.098	0.141	-0.004	0.098	

Notes. This table presents the correlations among variables used in our analyses. The sample includes bankrupt firms that emerge as publicly traded firms over the 2000–2018 period. The list of bankrupt firms in the sample is obtained from the University of California, Los Angeles–LoPucki Bankruptcy Research Database and [bankruptcydata.com](http://bankruptcydata.com). Variables are defined in the appendix.

\*Significance at the 10% level; \*\*significance at the 5% level; \*\*\*significance at the 1% level.

univariate results for the *Earnings Synchronicity* and *Multiple Valuation Gap* subcomponents are supportive of the predicted negative association between industry peer information and valuation error, whereas the result for *Precedent M&A Deals* is not statistically significant.

### 4.3. Multivariate Analyses of the Relation Between Peer Information and Valuation Error

Our primary argument is that the relevance and availability of industry peer information are important factors

in developing valuation estimates. We predict a negative association between *PIQ* and equity valuation error for firms emerging from Chapter 11. Table 4 reports the results of OLS regression analyses. Column (1) in Table 4 reports the results without any controls or fixed effects. Column (2) in Table 4 reports the results with controls but no fixed effects. Columns (1) and (2) in Table 4 provide comfort that the results are not driven by model overfitting because of fixed effects. In subsequent analyses, we use the empirically more restrictive fixed effects

**Table 3.** Univariate Analyses

	(1)			(2)			(3)	
	High			Low			$\Delta = \text{High} - \text{Low}$	<i>t</i> -statistic
	<i>N</i>	Mean	Standard deviation	<i>N</i>	Mean	Standard deviation		
<i>PIQ</i>	72	0.57	0.51	63	0.86	0.58	-0.29	-3.05**
<i>Earnings Synchronicity</i>	68	0.63	0.51	67	0.79	0.60	-0.16	-1.67*
<i>Multiple Valuation Gap</i>	68	0.63	0.53	67	0.78	0.58	-0.15	-1.55
<i>Precedent M&amp;A Deals</i>	70	0.74	0.57	65	0.68	0.55	0.06	0.62

*Notes.* This table presents the results of univariate analyses examining the relation between industry peer information (*PIQ*) and court-approved plan valuation errors. The sample includes bankrupt firms that emerge as publicly traded firms over the 2000–2018 period. The list of bankrupt firms in the sample is obtained from the University of California, Los Angeles–LoPucki Bankruptcy Research Database and [bankruptcydata.com](http://bankruptcydata.com). Variables are defined in the appendix.

\*Significance at the 10% level using a two-sided test; \*\*significance at the 5% level using a two-sided test;  $\hat{\Delta}$  significance at the 10% level using a one-sided test.

specification used in column (4) in Table 4 while noting that the fixed effects themselves do not affect the statistical significance of our test variables in a meaningful way. Column (3) in Table 4 documents the results with controls and industry fixed effects, and column (4) in Table 4 presents the results with controls and both industry and year fixed effects. Consistent with our prediction, the coefficient on *PIQ* is negative and statistically significant at the 5% level or better in all four columns.<sup>24</sup> The fact that the predicted negative association remains despite an extensive set of firm, time, and bankruptcy controls also mitigates potential sample selection concerns. Focusing on the fourth column in Table 4, the coefficient estimate on *PIQ* is negative and statistically significant ( $-0.299$ ,  $t = -2.55$ ), suggesting an inverse relation between industry peer information and valuation error.<sup>25</sup> The results are also economically meaningful. A unit increase in *PIQ* index is associated with a 27%–42% reduction in *Valuation Error* using different specifications compared with the sample mean value.<sup>26</sup> In terms of dollar value, a one-unit increase in *PIQ* index is associated with a reduction in valuation errors of \$38.64–\$60.11 million for an average case in our sample.<sup>27</sup> As a robustness test, we compute *Valuation Error* measured at the end of the third month after emergence and replicate Table 4 analyses. Although the coefficients (untabulated) are relatively smaller in size and statistical significance, the coefficient estimate on *PIQ* is negative and statistically significant in all four columns in Table 4.

Next, we replicate the Table 4 analyses using *PIQ* sub-components. Table 5 reports the results for *Earnings Synchronicity*, *Multiple Valuation Gap*, and *Precedent M&A Deals*, respectively. We use the same regression specification as in column (4) in Table 4 for all columns in Table 5. The results show that the coefficients for the three components are negative and statistically significant at the 10% significance level or better. A one-unit increase in *Earnings Synchronicity*, *Multiple Valuation Gap*, and *Precedent M&A Deals* is associated with a 63%, 56%, and 58% reduction in valuation error relative to

the sample mean, respectively. In Online Appendix D, we report several sensitivity analyses, including showing robustness to additional controls, subperiod analyses, and alternative measurement approaches.

Taken together, the results in Tables 3–5 are supportive of our prediction that the relevance and availability of industry peer information are negatively associated with valuation errors for firms emerging from Chapter 11.

#### 4.4. Cross-Sectional Analyses

We complement our main analyses with several cross-sectional analyses. Specifically, we exploit cross-sectional variations on (1) the availability of firm-specific information, (2) the role played by conflicting incentives of the negotiating claimholders for estimating low versus high valuations (i.e., creditor structure) as well as the role played by a newly appointed CEO, and (3) the role played by the expertise of valuation advisors employed by the debtor and the experience of the bankruptcy courts used.

The documented negative association between industry peer information and valuation error of emerged firms is likely to depend on the availability of other sources of information. As documented by Shroff et al. (2017), peer information and firm-specific information serve as substitutes in the corporate bond issuance setting, and the usefulness of peer information becomes weaker when the firm-specific information environment is richer. Accordingly, we follow Shroff et al. (2017) and predict that the effect of industry peer information in reducing valuation error in the Chapter 11 setting is more pronounced in the presence of less firm-specific information. We employ three proxies for the availability of firm-specific information. Our first measure, *Small*, is based on firm size (log of total assets) and reflects firms' overall disclosure level (e.g., Lang and Lundholm 1996, Hope and Thomas 2008, Maffett 2012). *Small* is an indicator variable equal to one if the firm's total assets value is lower than the sample median. Our second measure, *Low Coverage*, is based on number of financial analysts following the firms. Financial analysts

**Table 4.** The Relation Between Peer Information Quality (*PIQ*) and Errors in Court-Approved Valuation

Dependent variable = <i>Valuation Error</i>	(1)	(2)	(3)	(4)
<i>PIQ</i>	-0.193*** (-3.29)	-0.219*** (-3.30)	-0.231** (-2.55)	-0.299** (-2.55)
<i>Leverage</i>		0.256 (1.10)	0.317 (1.34)	0.326 (1.32)
<i>Goodwill</i>		-0.128 (-0.30)	0.034 (0.07)	0.274 (0.45)
<i>Earnings Volatility</i>		0.022 (0.27)	0.022 (0.24)	0.033 (0.36)
<i>Fresh Start Accounting</i>		-0.123 (-0.48)	-0.065 (-0.26)	-0.094 (-0.29)
<i>Pre-Bankruptcy Coverage</i>		0.002 (0.22)	0.001 (0.09)	-0.006 (-0.60)
<i>Size</i>		-0.070** (-2.48)	-0.114*** (-2.79)	-0.114*** (-2.74)
<i>Prepackaged Bankruptcy</i>		0.070 (0.75)	0.018 (0.17)	-0.003 (-0.02)
<i>Secured Debt</i>		-0.249* (-1.91)	-0.215 (-1.51)	-0.313* (-2.00)
<i>Creditor Committee</i>		-0.101 (-0.82)	-0.033 (-0.24)	-0.015 (-0.10)
<i>DIP Financing</i>		0.015 (0.15)	-0.011 (-0.10)	-0.008 (-0.06)
<i>Equity Committee</i>		-0.025 (-0.20)	0.008 (0.06)	0.037 (0.22)
<i>CEO Replaced</i>		0.032 (0.37)	0.069 (0.79)	0.099 (1.12)
Constant	0.983*** (9.55)	1.599*** (4.68)	1.793*** (5.00)	1.940*** (4.38)
Observations	135	135	135	135
Industry FE	No	No	Yes	Yes
Year FE	No	No	No	Yes
Clustering	Yes	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.043	0.112	0.087	0.119

*Notes.* This table presents the results of OLS regression analyses examining the relation between industry peer information (*PIQ*) and court-approved plan valuation errors. The sample includes bankrupt firms that emerge as publicly traded firms over the 2000–2018 period. The list of bankrupt firms in the sample is obtained from the University of California, Los Angeles–LoPucki Bankruptcy Research Database and [bankruptcydata.com](http://bankruptcydata.com). Variables are defined in the appendix. FE, fixed effect.

\*Significance at the 10% level using a two-sided test; \*\*significance at the 5% level using a two-sided test; \*\*\*significance at the 1% level using a two-sided test.

collect, process, and disseminate firm-specific information reflecting past performance and indicating future outlook (e.g., Beyer et al. 2010, De Franco and Hope 2011, Shroff et al. 2014). Prior research documents that lower analyst coverage is associated with lower reporting transparency (e.g., Lang et al. 2004), higher information uncertainty (Zhang 2006), and lower industry-wide information transfer (Piotroski and Roulstone 2004). *Low Coverage* is an indicator variable equal to one if analyst coverage is lower than the sample median. Our third measure, *No Financial Filing*, is based on the availability of SEC Form 10-K and Form 10-Q quarterly filings during the Chapter 11 process. Prior research documents the value relevance of 10-Ks and 10-Qs as important sources of comprehensive and significant information about business performance and financial position (e.g., Griffin 2003). Most of the firms (93.3%) in our sample continue to file 10-Ks or 10-Qs with the SEC

after their bankruptcy filing. Table 2 shows that small firms and firms with lower prebankruptcy analyst coverage are more likely to stop filing with the SEC. *No Financial Filing* is an indicator variable that equals one if the firm does not file 10-Ks or 10-Qs with the SEC during the Chapter 11 process.<sup>28</sup> We use the regression specification in column (4) in Table 4 and interact *PIQ* with our measures of firm-specific information availability (i.e., *Small*, *Low Coverage*, and *No Financial Filing*). Panel A of Table 6 presents the results that are consistent with our cross-sectional predictions. In column (1) in panel A of Table 6, the coefficient on  $PIQ \times Small$  is negative and statistically significant ( $-0.180$ ,  $t = -1.89$ ). In column (2) in panel A of Table 6, the coefficient on  $PIQ \times Low Coverage$  is negative but statistically insignificant ( $-0.071$ ,  $t = -0.61$ ), and in column (3) in panel A of Table 6, the coefficient on  $PIQ \times No Financial Filing$  is negative and statistically significant ( $-0.375$ ,  $t = -1.69$ ). Taken



**Table 5.** Components of Peer Information Quality (*PIQ*) and Errors in Court-Approved Valuation

Dependent variable = Valuation Error	(1)	(2)	(3)
<i>Earnings Synchronicity</i>	-0.450** (-2.27)		
<i>Multiple Valuation Gap</i>		-0.399* (-1.87)	
<i>Precedent M&amp;A Deals</i>			-0.412*** (-3.55)
<i>Leverage</i>	0.344 (1.40)	0.228 (0.93)	0.305 (0.99)
<i>Goodwill</i>	0.303 (0.56)	0.171 (0.28)	0.272 (0.38)
<i>Earnings Volatility</i>	0.073 (0.82)	0.024 (0.27)	0.023 (0.25)
<i>Fresh Start Accounting</i>	-0.062 (-0.22)	-0.088 (-0.27)	-0.083 (-0.24)
<i>Pre-Bankruptcy Coverage</i>	-0.006 (-0.56)	-0.004 (-0.39)	-0.001 (-0.10)
<i>Size</i>	-0.080** (-2.32)	-0.108*** (-2.83)	-0.113** (-2.42)
<i>Prepackaged Bankruptcy</i>	0.009 (0.07)	0.039 (0.29)	-0.011 (-0.08)
<i>Secured Debt</i>	-0.388** (-2.49)	-0.304** (-2.06)	-0.345* (-2.04)
<i>Creditor Committee</i>	-0.010 (-0.07)	-0.014 (-0.10)	-0.042 (-0.42)
<i>Equity Committee</i>	0.043 (0.27)	0.066 (0.44)	0.040 (0.21)
<i>CEO Replaced</i>	0.044 (0.48)	0.048 (0.48)	0.019 (0.25)
<i>DIP Financing</i>	0.009 (0.08)	-0.063 (-0.57)	-0.076 (-0.64)
Constant	1.491*** (4.23)	1.744*** (4.01)	1.785*** (4.14)
Observations	135	135	135
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Clustering	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.108	0.080	0.083

*Notes.* This table presents the results of OLS regression analyses examining the relation between each of the three components of the peer information quality (*PIQ*) measure and court-approved plan valuation errors. The sample includes bankrupt firms that emerge as publicly traded firms over the 2000–2018 period. The list of bankrupt firms in the sample is obtained from the University of California, Los Angeles–LoPucki Bankruptcy Research Database and [bankruptcydata.com](http://bankruptcydata.com). Variables are defined in the appendix. FE, fixed effect.

\*Significance at the 10% level using a two-sided test; \*\*significance at the 5% level using a two-sided test; \*\*\*significance at the 1% level using a two-sided test.

together, these findings suggest that industry peer information has a larger effect on reducing valuation error when there is less firm-specific information.

Next, we consider the role played by conflicting incentives of the negotiating claimholders for estimating low versus high valuations (Gilson et al. 2000, Demiroglu et al. 2022). Concerning claimants, a finite distributable value implies that junior claimants, such as unsecured creditors and prepetition equity holders,

typically prefer a higher valuation, whereas senior claimants, such as secured creditors, prefer a lower valuation to obtain a larger share of the distributable value. Ayotte and Morrison (2009) suggest that committees representing the interests of junior claimants can gain negotiating leverage using objections and other court motions. Further, as Demiroglu et al. (2022) suggest, the effect of junior claim-/interest-holder committees on valuation errors could go either way. On the one hand, they may enhance the reliability of the valuation process by bringing in valuable expert testimony. On the other hand, these are powerful bargaining parties that can indirectly influence the court process in their favored direction. With regard to the senior claimholders, *DIP* lenders are often granted superpriority status, often priming existing prepetition secured creditors through a court order. As Ayotte and Morrison (2009) and Eckbo et al. (2023) argue, *DIP* lenders receive extensive control rights and can exercise significant influence on the course of the Chapter 11 process through highly restrictive covenants and performance benchmarks—potentially resulting in a strong bargaining position with the debtor. Furthermore, newly appointed CEOs are often turnaround specialists who are evaluated on specific milestones that indicate turnaround success under their leadership. Plan confirmation is perhaps the most important milestone in a turnaround process within Chapter 11. On the one hand, as the likelihood of plan confirmation (compared with liquidation) increases with higher plan valuation, new CEOs who are compensated based on plan milestones may prefer a higher plan valuation. On the other hand, new CEOs may be compensated with option-like instruments based on the new equity of the reorganized entity, and as such, they may prefer a low plan valuation to ensure that the option-like instruments are in the money upon emergence. Thus, it is ex ante unclear which way the net effect of a new CEO on plan valuation will go. In addition, there is also the possibility of a new CEO being endogenously related to a more disruptive bankruptcy process, during which it is inherently more difficult to value the firm.

We predict that strong bargaining influence may veer the valuation away from fundamentals to the preferences of those specific constituencies. We proxy for the bargaining strength of different constituencies using the presence of (1) an unsecured creditors' committee, (2) an equity committee, (3) a *DIP* lender, and (4) an appointment of a replacement CEO after the bankruptcy filing. The results are presented in panel B of Table 6. In columns (1), (2), and (4) in panel B of Table 6, the coefficients are all positive and statistically significant for the interaction terms  $PIQ \times Creditor\ Committee$  (0.195,  $t = 2.38$ ),  $PIQ \times Equity\ Committee$  (0.260,  $t = 1.73$ ), and  $PIQ \times CEO\ Replaced$  (0.243,  $t = 1.90$ ). In column (3) in panel B of Table 6, the coefficient on  $PIQ \times DIP$  is positive but

**Table 6.** Cross-Sectional Analyses

Panel A: Firm-specific information environment			
Dependent variable = <i>Valuation Error</i>	(1)	(2)	(3)
<i>PIQ</i> × <i>Small</i>	-0.180* (-1.89)		
<i>PIQ</i> × <i>Low Coverage</i>		-0.071 (-0.61)	
<i>PIQ</i> × <i>No Financial Filing</i>			-0.375* (-1.69)
<i>PIQ</i>	-0.112** (-2.03)	-0.159*** (-2.80)	-0.128** (-2.68)
<i>Leverage</i>	0.201 (0.83)	0.232 (1.07)	0.302 (1.17)
<i>Goodwill</i>	0.289 (0.49)	0.311 (0.51)	-0.420 (-0.63)
<i>Earnings Volatility</i>	0.031 (0.30)	0.039 (0.42)	-0.012 (-0.11)
<i>Fresh Start Accounting</i>	-0.202 (-0.68)	-0.191 (-0.61)	0.006 (0.02)
<i>Pre-Bankruptcy Coverage</i>	-0.001 (-0.07)	-0.013 (-1.04)	-0.004 (-0.54)
<i>Size</i>	-0.089* (-1.70)	-0.071* (-2.00)	-0.109* (-2.01)
<i>Prepackaged Bankruptcy</i>	0.033 (0.30)	0.043 (0.36)	0.117 (0.85)
<i>Secured Debt</i>	-0.312* (-1.97)	-0.344** (-2.13)	-0.145 (-1.34)
<i>Creditor Committee</i>	-0.050 (-0.36)	-0.054 (-0.39)	-0.020 (-0.15)
<i>Equity Committee</i>	-0.067 (-0.40)	-0.043 (-0.28)	0.069 (0.50)
<i>CEO Replaced</i>	0.084 (0.84)	0.063 (0.66)	0.123 (1.35)
<i>DIP Financing</i>	0.030 (0.26)	0.048 (0.43)	0.039 (0.29)
<i>Small</i>	0.305* (1.72)		
<i>Low Coverage</i>		0.020 (0.06)	
<i>No Financial Filing</i>			1.159* (1.86)
Constant	1.689*** (3.01)	1.764*** (4.53)	1.505*** (3.16)
Observations	135	135	135
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Clustering	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.133	0.121	0.147

Panel B: Bargaining influence of specific constituencies				
Dependent variable = <i>Valuation Error</i>	(1)	(2)	(3)	(4)
<i>PIQ</i> × <i>Creditor Committee</i>	0.195** (2.38)			
<i>PIQ</i> × <i>Equity Committee</i>		0.260* (1.73)		
<i>PIQ</i> × <i>DIP</i>			0.206 (1.57)	
<i>PIQ</i> × <i>CEO Replaced</i>				0.243* (1.90)
<i>PIQ</i>	-0.295*** (-4.10)	-0.182*** (-4.15)	-0.321*** (-3.65)	-0.406*** (-3.50)
<i>Leverage</i>	0.181	0.289	0.263	0.103

**Table 6.** (Continued)

Panel B: Bargaining influence of specific constituencies				
Dependent variable = <i>Valuation Error</i>	(1)	(2)	(3)	(4)
	(0.61)	(1.14)	(1.08)	(0.31)
<i>Goodwill</i>	0.083	-0.534	0.400	0.548
	(0.08)	(-0.61)	(0.65)	(0.65)
<i>Earnings Volatility</i>	-0.018	-0.024	0.035	-0.020
	(-0.27)	(-0.24)	(0.33)	(-0.15)
<i>Fresh Start Accounting</i>	-0.127	0.060	-0.016	-0.145
	(-0.54)	(0.24)	(-0.05)	(-0.28)
<i>Pre-Bankruptcy Coverage</i>	-0.013	-0.005	-0.006	-0.006
	(-1.08)	(-0.49)	(-0.61)	(-0.48)
<i>Size</i>	-0.080	-0.129*	-0.133***	-0.147**
	(-1.26)	(-2.00)	(-3.02)	(-2.59)
<i>Prepackaged Bankruptcy</i>	0.069	0.042	-0.059	-0.058
	(0.60)	(0.41)	(-0.47)	(-0.36)
<i>Secured Debt</i>	-0.191	-0.131	-0.266	-0.213
	(-1.45)	(-1.12)	(-1.56)	(-1.30)
<i>Creditor Committee</i>	-0.435***	0.003	-0.055	-0.048
	(-3.22)	(0.03)	(-0.40)	(-0.31)
<i>Equity Committee</i>	-0.080	-0.482	0.004	0.025
	(-0.53)	(-1.51)	(0.03)	(0.11)
<i>CEO Replaced</i>	0.117	0.158	-0.008	-0.354
	(1.24)	(1.40)	(-0.09)	(-1.36)
<i>DIP Financing</i>	0.100	-0.027	-0.365	-0.070
	(0.72)	(-0.20)	(-1.21)	(-0.48)
<i>Constant</i>	1.908***	1.760***	2.289***	2.683***
	(4.63)	(4.31)	(4.54)	(4.75)
<i>Observations</i>	135	135	135	135
<i>Industry FE</i>	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes
<i>Clustering</i>	Yes	Yes	Yes	Yes
<i>Adjusted R<sup>2</sup></i>	0.224	0.143	0.133	0.099

Panel C: Valuation experience of valuation advisors and bankruptcy courts		
Dependent variable = <i>Valuation Error</i>	(1)	(2)
<i>PIQ × Experienced Advisor</i>	-0.206*	
	(-1.72)	
<i>PIQ × Experienced Court</i>		-0.397**
		(-2.45)
<i>PIQ</i>	-0.007	0.011
	(-0.05)	(0.09)
<i>Experienced Advisor</i>	0.300	
	(1.46)	
<i>Experienced Court</i>		0.561*
		(1.88)
<i>Leverage</i>	-0.484	0.344
	(-1.15)	(1.16)
<i>Goodwill</i>	0.674	0.019
	(0.84)	(0.03)
<i>Earnings Volatility</i>	0.019	0.023
	(0.12)	(0.26)
<i>Fresh Start Accounting</i>	-0.425	-0.159
	(-0.59)	(-0.49)
<i>Pre-Bankruptcy Coverage</i>	0.005	-0.012
	(0.49)	(-0.95)
<i>Size</i>	0.065	-0.076
	(1.25)	(-1.55)
<i>Prepackaged Bankruptcy</i>	-0.116	0.019
	(-0.47)	(0.15)
<i>Secured Debt</i>	-0.206	-0.318**
	(-0.91)	(-2.46)

**Table 6.** (Continued)

Panel C: Valuation experience of valuation advisors and bankruptcy courts		
Dependent variable = <i>Valuation Error</i>	(1)	(2)
<i>Creditor Committee</i>	-0.174 (-1.62)	0.017 (0.17)
<i>Equity Committee</i>	-0.200 (-0.89)	-0.042 (-0.28)
<i>CEO Replaced</i>	0.058 (0.31)	0.097 (1.16)
<i>DIP Financing</i>	-0.174 (-1.51)	0.044 (0.38)
Constant	1.040 (1.22)	1.302** (2.66)
Observations	75	135
Industry FE	Yes	Yes
Year FE	Yes	Yes
Clustering	Yes	Yes
Adjusted $R^2$	0.448	0.377

*Notes.* This table presents the results of OLS regression analyses examining the cross-sectional relation between industry peer information (*PIQ*) and court-approved plan valuation errors. Panel A presents the effects of the firm's information environment, panel B documents the effects of bargaining influence of different constituencies, and panel C presents the effects of valuation experience of valuation advisors and bankruptcy courts. The sample includes bankrupt firms that emerge as publicly traded firms over the 2000–2018 period. The list of bankrupt firms in the sample is obtained from the University of California, Los Angeles–LoPucki Bankruptcy Research Database and [bankruptcydata.com](http://bankruptcydata.com). Variables are defined in the appendix. FE, fixed effect.

\*Significance at the 10% level using a two-sided test; \*\*significance at the 5% level using a two-sided test; \*\*\*significance at the 1% level using a two-sided test.

statistically insignificant (0.206,  $t = 1.57$ ). Overall, the results are consistent with our prediction, suggesting that the negative association between industry peer information and valuation error becomes much weaker in the presence of constituencies with strong bargaining influence over Chapter 11 outcomes.

In addition, we consider the role played by valuation advisors employed by the debtor (and in some cases, the creditors). Disclosure statements that accompany Chapter 11 plans typically include a valuation exhibit, which gives details about the valuation approaches used and the range of reorganization value estimates (Newton 2003). For industry peer information to be useful in generating accurate valuation estimates, an important assumption is that the weighting and use of such information by valuation experts is appropriate. Ayotte and Morrison (2018) stress the weighting issue in valuation disputes and suggest that weights are often self-serving and arbitrarily chosen. We expect this tendency to be mitigated for experienced valuation advisors for whom reputational costs are likely to be more salient. We argue that advisors with more experience in valuing bankrupt firms not only will have the necessary incentives and expertise but also, will have access to relevant databases concerning peer information (e.g., information from prior bankruptcy cases). Thus, we predict that more experienced bankruptcy valuation advisors are better able to incorporate industry peer information in their value determinations, thereby enhancing the negative association between industry peer information and valuation error. The analyses regarding

the role of valuation advisors and bankruptcy courts are tabulated in panel C of Table 6. In column (1) in panel C of Table 6, the coefficient on  $PIQ \times Experienced Advisor$  is negative and statistically significant ( $-0.206$ ,  $t = -1.72$ ).

Further, relying upon the qualitative analyses in Ayotte and Morrison (2018) concerning bankruptcy courts' increasing reliance on market-based evidence in resolving valuation disputes, we argue that the ability of courts to accurately incorporate industry peer information increases with their experience in handling such valuation dispute cases. Ayotte and Morrison (2018) argue that bankruptcy courts increasingly rely on evidence from market-based transactions, which usually involve information from peer companies in the same industry. The authors also show that a disproportionately large percentage of valuation dispute cases are decided in the District of Delaware and the Southern District of New York.<sup>29</sup> This is also consistent with other anecdotal observations that these two jurisdictions are the most popular venues for bankruptcy filings and that they have developed considerable experience and expertise dealing with complex cases (LoPucki 2005). Accordingly, we expect the effects of industry peer information to be stronger for cases filed in the District of Delaware and the Southern District of New York. *Experienced Court* is an indicator variable if the case is filed in these two districts. The results are tabulated in column (2) in panel C of Table 6. The coefficient on  $PIQ \times Experienced Court$  is negative and statistically significant ( $-0.397$ ,  $t = -2.45$ ). Overall, the findings suggest that the effect of industry peer information on valuation



errors is stronger in the presence of more experienced valuation advisors and bankruptcy courts.

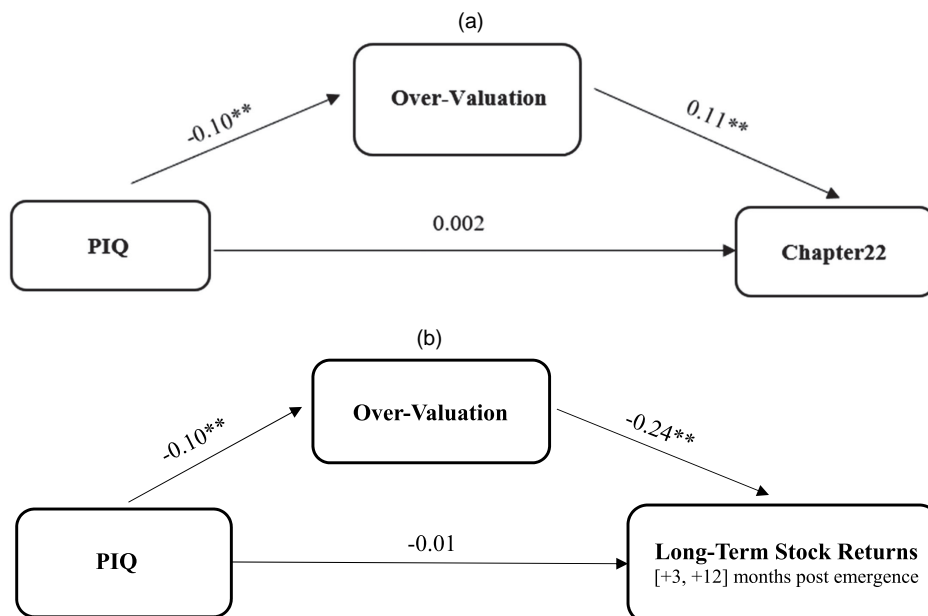
Taken together, the cross-sectional results suggest substantial heterogeneity regarding the association between industry peer information and valuation errors based on firm-specific information environment and case characteristics, such as the presence of constituencies with strong bargaining influence over Chapter 11 outcomes, and the experience of valuation advisors and bankruptcy courts.

#### 4.5. Ex Post Performance of Firms Emerging from Bankruptcy

Next, we examine the effect of industry peer information on the ex post performance of firms that emerge from bankruptcy. Critics argue that Chapter 11 might enable the reorganization of otherwise unviable business (e.g., Weiss and Wruck 1998). Hotchkiss (1995) shows that firms emerging from Chapter 11 underperform compared with industry averages. This is surprising given the “best interests of creditors test” requirement for Chapter 11 reorganization plans. This test requires the plan to demonstrate that the reorganization value (or proforma “going concern” value) is greater than the hypothetical liquidation value. Thus, if the reorganization value is overstated, it is likely that such firms are inefficiently reorganized. In our setting, to the extent that *PIQ* reduces the likelihood of overvaluation in reorganization plans, we expect *PIQ* to be positively associated with better ex post performance of emerged firms.

We examine these arguments using path analysis. We employ two proxies to measure firms’ performance upon emerging from bankruptcy: (1) the likelihood of filing for Chapter 22 within three years of emerging from bankruptcy (*Chapter 22*) and (2) the long-term stock returns after emergence (i.e., [+3, +12] months postemergence). Overvaluation (*Over-Valuation*) equals the absolute value of valuation error when court-approved value is higher than the market value and zero otherwise (i.e., the raw valuation error is truncated at zero). Panel (a) of Figure 1 shows the results for *Chapter 22*. Although *PIQ* is negatively associated with *Over-Valuation* [ $PIQ \rightarrow Over-Valuation = -0.10$ ] (significance at the 5% level), *Over-Valuation* is positively associated with *Chapter 22* [ $Over-Valuation \rightarrow Chapter 22 = 0.11$ ] (significance at the 5% level). The indirect effect of *PIQ* on the likelihood of filing for Chapter 22 within three years via *Over-Valuation* [ $PIQ \rightarrow Over-Valuation \rightarrow Chapter 22 = -0.01$ ] (significance at the 5% level) is negative and statistically significant at the 5% level. Panel (b) of Figure 1 shows the results for long-term stock returns. *PIQ* is negatively associated with *Over-Valuation* [ $PIQ \rightarrow Over-Valuation = -0.10$ ] (significance at the 5% level), and *Over-Valuation* is negatively associated with *Long-Term Stock Return* [ $Over-Valuation \rightarrow Long-Term Stock Return = -0.24$ ] (significance at the 5% level). The indirect effect of *PIQ* on *Long-Term Stock Return* via *Over-Valuation* [ $PIQ \rightarrow Over-Valuation \rightarrow Long-Term Stock Return = 0.02$ ] (significance at the 10% level) is positive and statistically significant at the 10% level. Overall, these results suggest that industry peer information is

**Figure 1.** Ex Post Performance of Firms Emerging from Bankruptcy Using Path Analyses



Notes. (a) Chapter 22. Indirect effect ( $PIQ \rightarrow Over-Valuation \rightarrow Chapter 22$ ) = -0.01 (significance at the 5% level). Direct effect ( $PIQ \rightarrow Chapter 22$ ) = 0.002. (b) Long-term stock returns. Indirect effect ( $PIQ \rightarrow Over-Valuation \rightarrow Long-Term Returns$ ) = 0.02 (significance at the 10% level). Direct effect ( $PIQ \rightarrow Long-Term Returns$ ) = -0.01. \*\*Significance at the 5% level.

associated with better ex post performance of emerged firm because of lower overvaluation.<sup>30</sup>

#### 4.6. Interclaimant Wealth Transfers

An important consequence of misvaluations is that they may lead to significant unintended wealth transfers among claimholders (Demiroglu et al. 2022), which have long attracted research attention (e.g., Betker 1995). We study the role of peer information in reducing the frequency and magnitude of potential wealth transfers. As *PIQ* is associated with lower misvaluations, we expect higher *PIQ* to be associated with fewer and smaller amounts of such wealth transfers.

We follow Demiroglu et al. (2022) and focus on *unintended* wealth transfers that are driven by plan misvaluations instead of intended deviations from *APR* that are part of negotiated and agreed-upon reorganization plans. Such intended wealth transfers are a deliberate result of Chapter 11 negotiations. Unintended wealth transfers are more frequent and significant than intended transfers (Demiroglu et al. 2022). Demiroglu et al. (2022) partition the claimants into different groups based on their contractual seniority (e.g., secured, unsecured, subordinated, and equity holders), and they calculate unintended wealth transfer. However, we adopt a more parsimonious approach, and we partition our claimants into only creditors and pre-existing shareholders.<sup>31</sup> Similar to Demiroglu et al. (2022), we do not consider intragroup violations of *APR* as unintended wealth transfers.<sup>32</sup> This is a conservative approach that likely offers a lower-bound estimate for the frequency and magnitude of unintended wealth transfers. Following the Demiroglu et al. (2022) approach in calculating the magnitude of wealth transfers, we compare each party's distribution in the plan with the hypothetical distributions that they would have received if they had known the ex post equity market value. The difference reflects the expected wealth transfer because of misvaluation. We scale the raw amount of the transfer by the average of the plan and market valuation.

An unintended wealth transfer can occur when *APR* is not violated in the reorganization plan (based on the plan equity value prior to emergence) and when the plan valuation estimate is different from the postemergence market value. Consider an example with only two classes of claimants: creditors and shareholders. Suppose both parties receive newly issued common stock in the reorganization plan and the creditors (shareholders) have an estimated recovery of 100% (lower than 100%) based on the plan valuation number. If the market value of newly issued stock turns out to be lower than the plan valuation after emergence, then there is an unintended wealth transfer from creditors to shareholders. The shareholders would have received less newly issued stock in the plan if all participants had known the ex post valuation when voting on the plan.

Similarly, an unintended wealth transfer from shareholders to creditors can occur. For example, suppose that creditors receive 100% of the newly issued stock and have an estimated recovery rate of 95%, whereas shareholders recover nothing. If the plan valuation of equity is substantially lower than the postemergence market value, a wealth transfer from shareholders to creditors can occur. In other words, shareholders would have received some newly issued stock if all participants had known the accurate ex post valuation (which is much greater than plan value in this case).<sup>33</sup>

We hand collect detailed information of distribution plans from court documents (e.g., cash, debt, equity distribution to each class, and each class's allowed claim amount). We are able to calculate wealth transfers for 94 of 135 cases in our sample. We find that 14 of the 94 cases involve at least one wealth transfer from one party to another. We categorize the wealth transfers by their gains and losses, and we tabulate the average amount and percentage (relative to average equity value) in panel A of Table 7. The average magnitude of wealth transfers from creditors to shareholders is around \$46.57 million, which is 7.07% of the average equity value. The average magnitude of wealth transfers from shareholders to creditors is \$1,037.50 million, which is 94.56% of the average equity value.

Next, we examine whether peer information is helpful in reducing the frequency and magnitude of wealth transfers. The results, estimated using a linear probability model, are tabulated in panel B of Table 7.<sup>34</sup> In the first four columns in panel B of Table 7, the dependent variable is an indicator variable that equals one if the case involves at least one unintended wealth transfer and zero otherwise. In the last four columns in panel B of Table 7, the dependent variable is the magnitude of the transfer (if any), which is calculated as the raw transfer amount scaled by the average of court and market equity valuation, and zero if there is no wealth transfer.<sup>35</sup> The specifications are similar to those in Tables 4 and 5 as we gradually add controls and fixed effects to the models. Standard errors are clustered by year. The results in panel B of Table 7 suggest that *PIQ* is negatively associated with both the frequency and the magnitude of unintended wealth transfers, and the effects are statistically significant using various specifications, except in column (3) in panel B of Table 7. In terms of economic significance, the coefficients in columns (4) and (8) in panel B of Table 7 suggest that a one-unit increase in *PIQ* is associated with a 7.3% (0.3%) decrease in the frequency (magnitude) of unintended wealth transfers between claimants.<sup>36</sup>

## 5. Conclusion

Valuation plays a central role in determining Chapter 11 reorganization outcomes. However, an accurate valuation estimate of the reorganized firm is challenging because of

**Table 7.** Unintended Wealth Transfers

Panel A: The magnitude and direction of unintended wealth transfers								
Class That Losses	Class That Gains			Net gain/loss, \$				
	Creditors	Shareholders						
Creditors		\$46.57 7.07% 11		990.93				
Shareholders	\$1,037.50 94.56% 3			-990.93				

Panel B: The effects of peer information quality (PIQ) on wealth transfers								
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Incurrence of wealth transfer				Magnitude of wealth transfer			
PIQ	-0.07*	-0.063*	-0.056	-0.073**	-0.004**	-0.004***	-0.004***	-0.003**
	(-1.69)	(-1.79)	(-1.44)	(-2.21)	(-2.62)	(-3.36)	(-3.62)	(-2.56)
Observations	94	94	94	94	94	94	94	94
Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Industry FE	No	No	Yes	Yes	No	No	Yes	Yes
Year FE	No	No	No	Yes	No	No	No	Yes
Clustering	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.110	0.068	0.086	0.058	0.120	0.108	0.406	0.457

*Notes.* This table documents unintended interclaimant wealth transfers because of misvaluation using the approach in Demiroglu et al. (2022). Claimants are partitioned broadly into creditors and existing shareholders. Panel A presents the magnitude and direction of wealth transfers between creditors and pre-existing shareholders. Panel B shows the regression results of examining the effects of peer information quality (PIQ) on the incurrence and magnitude of unintended wealth transfers between creditors and existing shareholders. The calculation procedure is described in Section 4.6. The sample includes bankrupt firms that emerge as reorganized publicly traded firms over the 2000–2018 period. The list of bankrupt firms in the sample is obtained from the University of California, Los Angeles–LoPucki Bankruptcy Research Database and [bankruptcydata.com](http://bankruptcydata.com). Variables are defined in the appendix. FE, fixed effect.

\*Significance at the 10% level using a two-sided test; \*\*significance at the 5% level using a two-sided test; \*\*\*significance at the 1% level using a two-sided test.

limited firm-specific market-based information and the conflicting incentives of claimholders. Inaccurate valuation estimates could potentially lead to inefficient reorganized value distribution outcomes upon emergence. Thus, it is not surprising that valuation is often contentious and reflects the various competing incentives and pressures from different claimants.

We examine the role of bankrupt firms' industry peer information in reducing plan valuation errors, and we examine the implications for unintended interclaimant wealth transfers and postemergence performance. First, we find that industry peer information is associated with equity valuation errors for firms emerging from Chapter 11. Cross-sectional analyses indicate that the relation between industry peer information and court-approved plan valuation accuracy varies predictably with the firm-specific information environment, the bargaining power of different constituencies (e.g., the presence of powerful senior and junior claimants and newly appointed CEOs), and the experience of valuation advisors and bankruptcy courts. Second, we find that industry peer information is associated with better ex post performance of emerged firms because of lower overvaluation. Third, we document the role of industry peer information in substantially reducing the frequency and

magnitude of unintended wealth transfers between claimants arising from equity valuation errors.

Our findings speak to a topic of considerable socioeconomic importance. Estimates of reorganization value have a bearing not only on the crucial liquidation versus reorganization decision but also, on allocation of value among various stakeholders. We highlight the role of industry peer information in this important valuation exercise.

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## Appendix. Variable Definitions

Variables	Definition	Source
<i>Valuation Error</i>	The absolute difference between the court's determined equity value and the average market value in the first 3 months after emergence scaled by the average of the two values. Plan equity value is obtained from the first 10-K filing after emergence if the firm adopts fresh-start accounting and from the court documents otherwise. Market value of equity is obtained from CRSP and Compustat, and it is measured as the average of discounted market value (back to the emergence date using CRSP equal-weighted industry return) during the first 3 months after emergence.	10-K, case filings from <a href="http://bankruptcydata.com">bankruptcydata.com</a> , CRSP, COMPUSTAT
<i>Peer Information Quality (PIQ)</i>	An aggregate index that ranges from 0 to 3 that is based on earnings synchronicity, prior M&A activity, and multiple valuation gap.	COMPUSTAT, CRSP, UCLA-LoPucki Bankruptcy Research Database, <a href="http://bankruptcydata.com">bankruptcydata.com</a>
<i>Earnings Synchronicity (Raw)</i>	Earnings synchronicity for each NAICS 3-digit industry-year, which is the mean value of adjusted $R^2$ of regressing each firm's earnings on industry-level earnings. The value is calculated in the year prior to bankruptcy.	COMPUSTAT
<i>Multiple Valuation Gap (Raw)</i>	The average valuation error for firms in each NAICS 3-digit industry-year using the mean value of $EV/EBITDA$ multiple of all firms in the same industry. The value is calculated in the year prior to bankruptcy.	COMPUSTAT, CRSP
<i>Precedent M&amp;A Deals (Raw)</i>	The number of completed M&A deals (public targets with the acquirer obtaining more than 50% of shares) in each NAICS 3-digit industry over the 5-year window prior to each bankruptcy case. We require the target firm to be in the same NAICS 3-digit industry as the bankrupt firm.	Securities Data Corporation
<i>Leverage</i>	Book value of total debt divided by total assets upon emergence from Chapter 11. The value is calculated using the first 10-K filing after emergence.	COMPUSTAT
<i>Goodwill</i>	Goodwill divided by total assets upon emergence from Chapter 11. The value is calculated using the first 10-K filing after emergence.	COMPUSTAT
<i>Fresh Start Accounting</i>	An indicator variable that equals 1 if the firm adopts fresh-start accounting and 0 otherwise.	10-K
<i>Size</i>	Natural logarithm of total assets upon emergence from Chapter 11. The value is calculated using the first 10-K filing after emergence.	COMPUSTAT
<i>Earnings Volatility</i>	Standard deviation of quarterly earnings during the first 2 years after emergence.	COMPUSTAT
<i>Pre-Bankruptcy Coverage</i>	Analyst coverage in the year prior to bankruptcy.	I/B/E/S
<i>Prepackaged Bankruptcy</i>	An indicator variable that equals 1 if the plan of reorganization is prepackaged and 0 otherwise.	UCLA-LoPucki Bankruptcy Research Database, <a href="http://bankruptcydata.com">bankruptcydata.com</a>
<i>Secured Debt</i>	Secured debt divided by total liabilities measured in the year prior to bankruptcy.	COMPUSTAT
<i>Creditor Committee</i>	An indicator variable that equals 1 if an unsecured creditors committee is formed during bankruptcy and 0 otherwise.	UCLA-LoPucki Bankruptcy Research Database, <a href="http://bankruptcydata.com">bankruptcydata.com</a>
<i>Equity Committee</i>	An indicator variable that equals 1 if equity holders form a committee during bankruptcy.	UCLA-LoPucki Bankruptcy Research Database, <a href="http://bankruptcydata.com">bankruptcydata.com</a>
<i>CEO Replaced</i>	An indicator variable that equals 1 if the CEO is replaced after the bankruptcy filing.	UCLA-LoPucki Bankruptcy Research Database
<i>DIP Financing</i>	An indicator variable that equals 1 if the debtor obtains debtor-in-possession financing and 0 otherwise.	UCLA-LoPucki Bankruptcy Research Database, <a href="http://bankruptcydata.com">bankruptcydata.com</a>



## Appendix. (Continued)

Variables	Definition	Source
<i>Small</i>	An indicator variable that equals 1 if the firm's total asset value is lower than the sample median.	COMPUSTAT
<i>Low Coverage</i>	An indicator variable that equals 1 if the firm's analyst coverage is lower than the sample median.	I/B/E/S
<i>No Financial Filing</i>	An indicator variable that equals 1 if the firm does not file 10-Ks or 10-Qs with the SEC during the Chapter 11 process.	SEC EDGAR
<i>Experienced Advisor</i>	An indicator variable that equals 1 if the valuation advisor is among the top 3 advisors based on sample frequency.	Manually collected from case filings from <a href="http://bankruptcydata.com">bankruptcydata.com</a>
<i>Experienced Court</i>	An indicator variable that equals 1 if the filing is in the District of Delaware or the Southern District of New York.	UCLA–LoPucki Bankruptcy Research Database, <a href="http://bankruptcydata.com">bankruptcydata.com</a>
<i>Over Valuation</i>	Overvaluation equals the absolute value of valuation error when court-approved value is higher than the market value and 0 otherwise.	10-K, case filings from <a href="http://bankruptcydata.com">bankruptcydata.com</a> , CRSP, COMPUSTAT
<i>Chapter 22</i>	An indicator variable that equals 1 if the firm files for Chapter 11 again within the first 3 years after emergence.	UCLA–LoPucki Bankruptcy Research Database, <a href="http://bankruptcydata.com">bankruptcydata.com</a>
<i>Longer-Term Stock Returns</i>	Buy-and-hold stock returns over the 3- to 12-month horizon after emergence.	CRSP

Note. UCLA, University of California, Los Angeles.

## Endnotes

<sup>1</sup> In this study, we refer to “court valuation” as the valuation of the reorganized debtor used in a court-approved plan of reorganization. The valuation is not directly determined or influenced by the bankruptcy court, except when a valuation trial occurs and the estimated value is determined by a bankruptcy judge upon failure in reaching a negotiated settlement. See Section 2 for more details.

<sup>2</sup> Following Demiroglu et al. (2022), we operationalize valuation error as the difference between court-approved postemergence equity value and the average market value of the stock during the first three months after emergence, discounted back to the confirmation date of the court plan of reorganization using CRSP equal-weighted industry returns. See Section 3.2.1 for more details.

<sup>3</sup> Importantly, misvaluation can also lead to an inefficient liquidation of an otherwise operationally viable business. Although it would be interesting to measure the counterfactual of how a liquidated firm would look if it had continued as a going concern, such inefficient liquidation is not estimable given our data and measurement approach.

<sup>4</sup> Numerous legal and institutional mechanisms affect the information environment of companies undergoing insolvency proceedings. One such mechanism is “fresh-start accounting” (FSA) under U.S. generally accepted accounting principles (GAAP). FSA entails updating the assets and liabilities of the reorganized entity to reflect current fair values. The adoption of FSA could have been an important firm-level determinant of the quality of valuation estimates in this study. However, debtors adopt FSA in 96% of the cases in our sample, implying limited usefulness of this firm-specific feature in explaining cross-sectional variation in valuation errors.

<sup>5</sup> See Online Appendix A for an anecdotal example concerning the valuation of Seadrill Limited in Chapter 11. The valuation exhibit is obtained from Kroll Restructuring Administration.

<sup>6</sup> We do not consider the use of dimensions other than industry (such as size and geography) as they are prone to significant discretion and could result in ad hoc heterogeneity (Ayotte and Morrison 2018).

<sup>7</sup> Specifically, we use the number of M&A transactions in which the target firm is in the debtor's NAICS three-digit industry.

<sup>8</sup> In practice, *EV/EBITDA* multiples may be based on the trailing 12-month *EBITDA*, the forecasted *EBITDA*, or a combination thereof.

<sup>9</sup> *DIP* financing refers to loans provided to firms during Chapter 11 bankruptcy or similar legal insolvency resolution processes. Typically, *DIP* loans receive seniority to other outstanding claims by way of a court-ordered priming lien on the assets of the bankrupt firm.

<sup>10</sup> We thank an anonymous reviewer for suggesting this point.

<sup>11</sup> The Bankruptcy Code allows businesses to file a petition with a bankruptcy court in the following four locations (Altman et al. 2019): (1) the state of incorporation; (2) the principal place of business, which in most cases, is the state in which the corporate headquarters are located; (3) the state in which corporate assets reside; and (4) any district where a bankruptcy case is pending against the firm's affiliate. In the past two decades, more than 50% of the petitions with at least 50 million in book assets have been filed in the District of Delaware and the Southern District of New York.

<sup>12</sup> For example, the valuation advisor states: “In preparing the estimates set forth below, Houlihan Lokey has relied upon the accuracy, completeness, and fairness of financial and other information furnished by the Debtors. Houlihan Lokey did not attempt to independently audit or verify such information, nor did it perform an independent appraisal of the assets or liabilities of the Reorganized Debtors. Houlihan Lokey did not conduct an independent investigation into any of the legal or accounting matters affecting the Reorganized Debtors, and therefore makes no representation as to their potential impact on the Total Distributable Value.” Additionally, “Houlihan Lokey does not offer an opinion as to the attainability of the Financial Projections. As disclosed in the Disclosure Statement, the future results of the Reorganized Debtors are dependent upon various factors, many of which are beyond the control or knowledge of the Debtors and Houlihan Lokey, and consequently are inherently difficult to project.”

<sup>13</sup> Ayotte and Morrison (2018, p. 1834) suggest that in disputed cases, valuation experts may weigh the estimates from the various valuation approaches in a manner that is consistent with their clients' incentives.

<sup>14</sup> See *In re Chemtura Corp.*, 439 B.R. 561, 2010 Bankr. LEXIS 3773 (U.S. Bankruptcy Court for the Southern District of New York October 21, 2010, Decided).

<sup>15</sup> Information transfers have also been documented in other economic contexts, such as nuclear accident news (Bowen et al. 1983) and merger announcements (Eckbo 1983). Research in strategy and industrial organization also highlights the importance of industry factors for a firm's core strategies for innovation and marketing (Mauri and Michaels 1998). For example, firms operating in the same industry face similar technological and innovative opportunities (Cohen and Klepper 1992). Companies operating in different industries face different levels of regulatory oversight, industry growth, sensitivity to external shocks, and industry structures (e.g., Mauri and Michaels 1998, Amiram et al. 2017).

<sup>16</sup> Although research on the choice of peer groups in the bankruptcy setting is scarce, Eaton et al. (2022) provide related evidence in the M&A setting. They show that investment banks strategically select peers with high valuation multiples to justify higher deal premiums.

<sup>17</sup> We start our sample from the year 2000 because court documents are more widely available in the New Generation Research Database starting in 2000. Further, our operationalization of valuation error requires limiting the sample to firms that emerge from Chapter 11 as publicly listed entities with available stock price data.

<sup>18</sup> Our inferences are robust to using a six-month horizon after emergence from Chapter 11 (untabulated).

<sup>19</sup> We require at least eight observations for these regressions. Our inferences are robust to using the previous 12 or 20 quarters for the estimation.

<sup>20</sup> We choose a five-year window to allow for sufficient variation in this measure. However, our inferences remain unchanged if we use a shorter three-year window.

<sup>21</sup> In untabulated analyses, we find that our results are robust to two alternative definitions. First, we compare the industry average multiple with the firm to construct the valuation gap measure. Specifically, in the year prior to bankruptcy, we calculate the average value of the *EV/EBITDA* multiple at the NAICS three-industry level. We then calculate the firm's implied equity value using its *EBITDA* combined with the industry-average multiple, take the difference with its actual equity value, and scale the absolute value of the difference by the average value of the two. Finally, we convert the measure into a rank and make it increase with information quality (the sample size for this approach reduces to 72 because of the negative value of the firm's *EBITDA*). Second, we use the standard deviation of the *EV/EBITDA* multiple scaled by its mean. Our inferences remain unchanged.

<sup>22</sup> Our findings are robust to using the first principal component of the three individual measures. These results are tabulated in Table OAD1 of Online Appendix D.

<sup>23</sup> Industry fixed effects are measured at the Fama–French 12 level, and year fixed effects are based on the year that the firm emerges from bankruptcy. Our main inferences are robust to using either NAICS two-digit industry fixed effects or Standard Industrial Classification (SIC) two-digit industry fixed effects. Similarly, our main findings are robust to using bankruptcy-year fixed effects.

<sup>24</sup> The magnitude and statistical significance of coefficients on the control variables are largely consistent with prior research (e.g., Demiroglu et al. 2022).

<sup>25</sup> We calculate the variance inflation factors (VIFs) for each of the independent variables. The mean value of VIF is 1.33, with a maximum of 1.86, thereby mitigating multicollinearity concerns.

<sup>26</sup> The percentage is calculated as the magnitude of the coefficient divided by the sample mean value. For example, the economic magnitude for *PIQ* in column (1) of Table 4 is  $0.193/0.71 = 27\%$ . Similarly, the percentages for columns (2)–(4) are  $0.219/0.71 = 31\%$ ,  $0.231/0.71 = 33\%$ , and  $0.299/0.71 = 42\%$ , respectively.

<sup>27</sup> The average value of court and market valuation is \$143.12 million for an average case in our sample. The reduction in valuation errors is calculated as  $\$143.12 \text{ million} \times 27\% = \$38.64 \text{ million}$  and  $\$143.12 \text{ million} \times 42\% = \$60.11 \text{ million}$ , respectively.

<sup>28</sup> By design, firms in our sample emerge from Chapter 11 as publicly listed entities and subsequently file 10-Ks and 10-Qs. The lack of 10-Ks or 10-Qs filings during the Chapter 11 process indicates that such firms (1) delay their filings, (2) replace their filings with other periodic statements, or (3) face a very short bankruptcy period (i.e., less than a quarter for 10-Qs and less than a year for 10-Ks to be filed).

<sup>29</sup> Specifically, in the Ayotte and Morrison (2018) study, of the total of 94 bankruptcy courts, the District of Delaware and the Southern District of New York bankruptcy courts handled 47 of the total of 143 valuation dispute cases.

<sup>30</sup> We also used the following three alternative performance measures for our path analysis: (1) *ROA*, (2) operational efficiency obtained from a data envelopment analysis exercise, and (3) operational profitability measured as *EBITDA* scaled by total asset. The results (untabulated) are consistent with those reported in Section 4.5.

<sup>31</sup> The reason for adopting this classification approach is twofold. First, the classification and ranking of the “subordinated” category is a priori unclear and ad hoc. Second, the secured versus unsecured gradations beg the question of overcollateralization/undercollateralization and contractual and structural subordination. Therefore, we restrict the main analysis to the broad classes that we can very confidently rank—creditors versus equity holders.

<sup>32</sup> Our sample differs from Demiroglu et al. (2022). We do not detect cases of unintended wealth transfers that involve third parties. The reason that intragroup violations of *APR* are not considered is that the court-approved plans may provide consideration to different classes of claimants within the same group (e.g., unsecured creditors), even when one class is of higher seniority than the other (e.g., senior unsecured versus junior unsecured).

<sup>33</sup> Misvaluations do not always lead to wealth transfers. Suppose creditors received all the newly issued stock and have an estimated recovery of less than 100%; if the plan value is higher than the ex post market value, then there are no wealth transfers between classes. In other words, plan distributions in this case would have remained the same if participants had known the accurate market value.

<sup>34</sup> The results are similar if using a probit or logit model without industry or year fixed effects.

<sup>35</sup> If the case exhibits more than one wealth transfer, we take the sum of the magnitude as the dependent variable.

<sup>36</sup> In untabulated analyses, similar to Demiroglu et al. (2022), we partition the claimants into different groups based on their contractual seniority (e.g., secured, unsecured, subordinated, and equity holders) and calculate unintended wealth transfer. We are able to calculate wealth transfers for 94 of 135 cases in our sample. We find that 37 of the 94 cases are involved with at least one wealth transfer from one party to another, and the total number of transfers is 40. We categorized the wealth transfers by gainers and losers, and we tabulate the average amount and percentage (relative to average equity value). The patterns of wealth transfers in our sample are similar to those in Demiroglu et al. (2022). Untabulated results

document that the total amount of wealth transfers is about \$4,468 million, which represents 28% of the average equity value, and thus, it is highly economically meaningful. On average, secured creditors and subordinated claimholders are net gainers, whereas unsecured and equity claimholders are net losers. The magnitude of net gain or loss for each class of claimholders ranges from 6.8% to 16.0% (of the firm's equity value). In terms of economic significance, a one-unit increase in *PIQ* is associated with a 15.9% (7.9%) decrease in the frequency (magnitude) of unintended wealth transfers between claimants.

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