The strategic choice of peers in M&A valuations

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Abstract

We examine the strategic choice of peer comparables in fairness opinions (FOs) used in M&A valuations. Using a hand-collected sample of peer comparable analyses and a regulatory shock to appraisal lawsuit risk, we show that target-sought FOs employ lower-valued peers when litigation risk is higher. Cross-sectionally, the bias is stronger when the target CEO is retained and owns fewer shares in the target. Although the selection of downward-biased peers reduces appraisal lawsuit likelihood, it is also associated with lower premiums. We conclude that FO valuations are driven, at least in part, by the strategic motive to mitigate litigation risk.

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1. Introduction

We study the strategic choice of peers in fairness opinions (FOs) used in mergers and acquisitions. A fairness opinion is "an opinion provided by an outside advisor, usually, though not necessarily, an investment bank, that a transaction meets a threshold level of fairness from a financial perspective" (Davidoff 2006). The vast majority of mergers contain FOs, and peer comparables analysis is among the most popular valuation techniques.[1] Despite the ubiquitous nature of FOs in mergers, however, their role is not well understood. On the one hand, early studies argue that FOs are a tool for investment bankers to negotiate over transaction price (Davidoff, Makhija, and Narayanan 2011), and evidence in Cain and Denis (2013) and Shaffer (2021) suggests that target-sought FOs reveal information not previously available to market participants. On the other hand, Kisgen et al. (2009) find little evidence of a relation between the use of target-sought FOs and merger premiums, and Shaffer (2021) finds evidence of potential biases in FO valuations made via adjustments in the valuation discount rate.[2] These latter studies point to potential bias in FOs, but the question of *why* FOs exhibit bias remains largely unanswered.

Our central prediction is that peer firms are chosen strategically in target-sought FO valuations to mitigate litigation risk. Litigation arises in mergers when target shareholders believe the transaction price was too low. A particularly important development in the M&A market in recent years has been the rise of appraisal lawsuits (e.g., Korsmo and Myers 2015; Jiang, Li, Mei, and Thomas 2016). Originating as a mechanism to protect minority shareholders who may be forced to give up their shares without consent, appraisal laws give target shareholders the right to oppose a merger offer, and to receive a judge's appraised value of their shares in place of the original merger price (Stewart 2021). Appraisal lawsuits are potentially costly because they can increase the transaction price as well as generate deadweight costs that damage the

[1] Kisgen, Qian, and Song (2009) find that approximately 80% of target firms obtained a FO for mergers occurring over 1994-2003. Duff & Phelps, a financial consultancy firm, reviewed over 3,000 mergers taking place from 2006-2016 and found that the most common valuation method in FOs was the use of peer comparables, followed by discounted cash flow (DCF) analysis (Bartell and Janssen 2017).

[2] Although Kisgen et al. (2009) find no relation between the use of target-sought FOs and merger premiums, they find some evidence that the use of *acquirer-sought* FOs is associated with lower deal premiums. However, Cain and Denis (2013, footnote 13) speculate that this finding may reflect a selection bias in which acquirer-sought FOs are observable only for the largest acquisitions, which are likely to feature lower premiums.

combined firm's post-merger value. For instance, in an appraisal lawsuit involving the 2013 buyout of Dell, Inc., the Delaware Court of Chancery ruled that the fair value of Dell's common stock at the merger's effective date was 28% higher than the original price.[3] Moreover, Jiang et al. (2016) find that appraisal petitions typically take 1-3 years following merger completion to resolve (80% of petitions settle instead of going to trial), implying a substantial investment of time and money.

We hypothesize that heightened appraisal risk leads to the selection of lower-valued firms as peer comparables in target-sought FO valuations in order to portray the deal price as "fair" and, consequently, ward off costly appraisal lawsuits.[4] Since FO valuations generally feature a range of values that could be considered fair to target shareholders, such a strategy predicts the range of values will be downward-biased so as to place the agreed-upon takeover price at or near the upper end of the range. The implication of this bias for peer comparables analysis is that lower-valued peers will be selected to make the target valuation appear attractive in comparison.[5]

Our prediction relies on understanding the incentives of two key parties involved in the issuance of target-side FOs: target CEOs and investment advisors. Prior work suggests that target managers (and by extension, merger outcomes) are susceptible to the influence of acquirer-provided incentives.[6] We conjecture that target CEOs whose interests are more aligned with the post-merger firm (e.g., CEOs who are retained by the merged firm) and less aligned with the target firm (e.g., CEOs with lower target ownership) have strong incentives to avoid a costly appraisal lawsuit that may damage the future

[3] *In re Appraisal of Dell, Inc.* C.A. No. 9322-VCL.

[4] We focus primarily on target-sought FOs because appraisal lawsuits are initiated by shareholders of the target firm. However, we examine acquirer-sought FOs as a falsification test in Section 4.2.7.

[5] Anecdotal evidence suggests that peer comparables analysis contained in FOs is employed in appraisal lawsuits. For instance, in *In re Appraisal of Jarden Corp.* (Del. Ch. July 19, 2019), expert witnesses for both the petitioner and the respondent used comparables analysis to support their respective valuations. As the court noted: "Both experts developed their peer set by drawing from the peer set developed by Barclays in its valuation work for [Jarden]...They then made adjustments based on their own sense of comparability." The court ultimately ruled against the petitioners, arguing that their expert witness had not justified his departures from the original set of peers in the FO: "Failing to ground his peer set in any objective methodology is all the more problematic given [his] apparent willingness to adjust the management/Barclay's peer set when it suited him to yield a higher valuation for Jarden."

[6] For instance, targets receive lower premiums when target CEOs are granted equity or bonuses as part of the merger (e.g., Fich, Cai, and Tran 2011; Fich, Rice, and Tran 2016), as well as when the CEO is retained by the merged firm (Hartzell, Ofek, and Yermack 2004). In addition, target firms depress earnings just prior to being acquired in order to boost, or "spring-load," post-acquisition performance in friendly takeovers (Chen, Thomas, and Zhang 2016).

performance of the combined firm. In a similar vein, prior research suggests that investment advisors may have incentives to ensure mergers are completed without the added complication of appraisal lawsuits. Kisgen et al. (2009) note that banks frequently provide both advisory services and an FO, with advisory fees contingent on deal completion. Moreover, Shaffer (2021) suggests that advisors cater to managers by providing biased FO valuations, and that a primary constraint on such bias is the reputational risk of providing inaccurate estimates. We exploit some of these forces in our empirical analysis.

A challenge in testing our hypothesis is to obtain exogenous variation in appraisal risk. We address this challenge by employing a landmark 2007 ruling by the Delaware Court of Chancery *In re Appraisal of Transkaryotic Therapies, Inc.* (hereafter, "Transkaryotic"), which significantly strengthened appraisal rights in Delaware. Recent studies have shown that the ruling, which was largely unexpected, substantially increased the frequency and magnitude of appraisal claims related to Delaware-incorporated target firms, such that nearly one in three Delaware mergers have faced appraisal lawsuits in recent years (Stewart 2021). Accordingly, the Transkaryotic ruling allows for the use of a difference-in-differences (DiD) research design to compare the change in peer firm selection for targets incorporated in Delaware ("treated" firms) after the 2007 ruling to the change in peers selected by targets incorporated elsewhere ("control" firms). Additionally, although the Delaware ruling occurred in 2007, prior work has found that appraisal lawsuits did not increase substantially until 2011 and beyond (e.g., Korsmo and Myers 2015). Consequently, we perform our main analysis in both a traditional DiD model as well as in a dynamic analysis in order to more precisely attribute our findings to the increase in (ex-post) appraisal risk.

We test our hypothesis using a unique sample of hand-collected peer comparables data from 663 target-sought FO valuations for 611 mergers completed over the period 2000-2015 (eight years before and after the 2007 court ruling).[7] Peer comparables analysis is typically conducted using valuation multiples such as the enterprise value-to-sales (EVS) ratio. To identify strategic selection of peers in FOs, we follow Larcker, McClure, and Zhu (2020) and compare the median valuation multiple for the group of selected

[7] There are more FO valuations than mergers because target firms sometimes obtain multiple FOs (e.g., Liu 2020).

peers with the distribution of median valuation multiples for all possible peer firm portfolios that could have been selected. This process yields a measure of bias for the selected peer group (denoted as *Peer Portfolio Percentile* or *PPP*), which serves as our primary dependent variable. For instance, the mean *PPP* in our sample equals 0.384, indicating that the average portfolio of chosen peer firms sits in the 38th percentile of the distribution of all potential peer firm portfolios. To provide context, *PPP* values below (above) 0.50 indicates that the selected peer group has valuation multiples below (above) the median of available peer firm portfolios.

Consistent with our hypothesis, we find that following the Transkaryotic case, *PPP* declines for target firms incorporated in Delaware relative to targets incorporated in other states. In economic terms, *PPP* for Delaware targets decreases by 0.126 in the post-Transkaryotic period compared to non-Delaware targets, which represents a decrease of 32.8% relative to the sample mean. Notably, the decrease in *PPP* is concentrated in the 2011-2015 period, dovetailing with recent work documenting a substantial rise in appraisal lawsuits beginning in 2011 (e.g., Korsmo and Myers 2015; Boone, Broughman, and Macias 2019; Stewart 2021). Moreover, peer comparables exhibit similar trends for Delaware and non-Delaware target firms in the pre-Transkaryotic period, providing reassurance that our findings are not due to pre-existing trends. In addition, we find that the effect is concentrated in mergers involving large dollar amounts (rather than small dollar amounts), consistent with strategic peer choice among mergers most likely to attract appraisal arbitrageurs. Overall, we find a robust decline in *PPP* for Delaware targets coinciding with the increase in appraisal risk resulting from the Delaware court's decision.

Next, we explore cross-sectional variation based on the incentives of target firm CEOs and investment advisors, groups that are both closely involved in the issuance of FOs. Investigating target CEO incentives, we find evidence of a stronger post-Transkaryotic downward bias in *PPP* when the target CEO is both retained by the merged firm and has low target ownership (a relative decrease of 66.1%), than when these criteria are not met (a relative decrease of 26.8%). Examining investment advisor reputation, we find evidence of a larger post-Transkaryotic downward bias in *PPP* among FOs prepared by non-top-tier advisors (34.1% relative decrease) than among top-tier advisors (18.0% relative decrease). Although the

difference between the two groups is not statistically significant, the evidence is directionally consistent with advisors' reputational risk playing a role in constraining biased valuations. Overall, the findings pertaining to key parties' incentives shed light on the mechanism behind the bias of chosen peers in FOs.

Our next analysis examines two possible consequences of strategically selecting lower-valued peers in target-sought FO valuations: appraisal lawsuits and merger premiums. Consistent with prior research, we find a substantial (14.2%) overall increase in appraisal lawsuit likelihood among our sample of Delaware targets following the Transkaryotic decision. However, Delaware targets with higher *PPP* exhibit a 20.3% increase in appraisal lawsuit incidence, whereas those with lower *PPP* exhibit an increase of just 6.4%. These findings suggest that strategically selecting downward-biased peers can increase the post-merger value of the combined firm by reducing the likelihood of appraisal lawsuits.

Second, we investigate the relation between appraisal risk, peer selection, and merger premiums. Consistent with prior research (Callahan, Palia, and Talley 2018; Boone et al. 2019), we find that Delaware targets overall experience a relative increase in merger premiums of approximately 21.8% in the post-Transkaryotic period. However, this result is driven largely by mergers with higher *PPP* whereas Delaware target firms with low *PPP* experience an insignificant *decrease* in premiums following the court ruling, suggesting the possibility that the selection of lower-valued peers leads to lower premiums. When viewed in conjunction with the findings regarding appraisal lawsuits, these results imply that strategically selecting lower-valued peers reduces the threat of appraisal lawsuits, but may also lead to a lower takeover price for the target.

A concern for our main findings is that a lower *PPP* in response to heightened appraisal risk may reflect acquirers' preferences for less valuable targets in the wake of the court ruling, rather than the strategic selection of lower-valued peers.[8] To address this concern, we conduct two additional tests. First,

[8] Another potential concern relates to the implementation of FINRA Rule 5150 (originally approved by the SEC as Rule 2290) in October 2007, which required enhanced FO disclosures by investment banks regarding potential conflicts of interest (https://www.finra.org/rules-guidance/rulebooks/finra-rules/5150). However, although the new disclosure rule coincided closely with the Transkaryotic court ruling, it applied uniformly to all mergers. In contrast, we exploit the change in Delaware vs. non-Delaware mergers while controlling for overall time trends (i.e., year fixed effects), thus mitigating concerns that our inferences are confounded by the implementation of FINRA Rule 5150.

we perform a falsification test in which we examine a subset of firms that provide both target-sought and acquirer-sought FOs. By doing so, we compare *PPP* for the same sample of deals but exploit differences in incentives between acquirers and targets. One such difference is that appraisal lawsuits are initiated by shareholders of the target rather than the acquirer, suggesting that acquirer-sought FOs may be less sensitive to increased appraisal risk. Another difference is that the acquirer's shareholders may vote to reject the deal if they believe that the target firm is overpriced (i.e., that the acquirer is paying too much for the target), which they are more apt to believe if low-value peers are used for comparison. Consistent with our expectations (and in contrast to our findings for target-sought FOs), we find no evidence of a decrease in *PPP* in acquirer-sought FOs for mergers affected by the Transkaryotic ruling. Second, we repeat our main analysis with an alternative proxy for bias in peer firm choice that more directly compares the target and peer firms – the difference between the median EVS of the selected peers and the target's pre-merger EVS. We find that our inferences are similar using this alternative proxy for peer firm bias, supporting the view that our findings are the result of strategic behavior rather than a change in underlying merger fundamentals.

Our study contributes to three streams of literature. First, we add to the literature on the role of FOs in M&A. Prior work has provided preliminary evidence on the potential usefulness and bias of FOs (e.g., Kisgen et al. 2009; Cain and Denis 2013; Shaffer 2021), but there is little systematic evidence answering the question of *why* FO valuations may be strategic. We show that target-sought FOs become more downward-biased in response to an increased risk of appraisal lawsuits, and that this downward bias is associated with reductions in appraisal lawsuits and lower takeover premiums. Furthermore, our findings suggest that this behavior may stem from an agency conflict between the target CEO and shareholders. Additionally, we specifically examine strategic bias in FO valuations via the peer comparables methodology, which, despite its popularity as a valuation tool, has gone largely unstudied due to a lack of data availability. Overall, we use a novel dataset of peer comparables to provide evidence that litigation risk is an important driver of FO valuations, calling into question the notion that the primary purpose of FOs is to inform the parties involved in merger negotiations (e.g., Davidoff et al. 2011).

Second, we contribute to the small but growing literature on the role of Delaware appraisal law in the market for corporate control. Recent papers have noted how the 2007 changes in Delaware appraisal law led to the rise of appraisal arbitrage (e.g., Korsmo and Myers 2015; Jiang et al. 2016; Boone et al. 2019). Stewart (2021) extends this area of work by examining how target firms adjust their disclosures in response to heightened appraisal risk. We add to this literature by demonstrating a new mechanism through which the merging firms and their investment advisors appear to reduce the risk of appraisal lawsuits – by strategically applying a downward bias to the FO valuation the target's takeover price appears relatively more attractive.

Third, we contribute to the literature on peer choice. Previous research has examined peer choice and benchmarking in settings such as executive compensation (e.g., Faulkender and Yang 2010; Bizjak, Lemmon, and Nguyen 2011; Albuquerque, De Franco, and Verdi 2013), analysts' valuations (e.g., De Franco, Hope, and Larocque 2015), fund managers' investment portfolios (e.g., Chan, Lakonishok, and Swaminathan 2007), and IPO valuations (e.g., Kim and Ritter 1999; Roosenboom 2007; Paleari, Signori, and Vismara 2014). Our findings indicate that peer choice in FO valuations has potentially important implications for merger litigation, premiums, and overall welfare allocation in the market for corporate control.[9]

The remainder of our paper proceeds as follows. Section 2 discusses the background and hypothesis development. Section 3 describes the data and variable construction. Section 4 presents the research design and main results, and Section 5 concludes.

2. Fairness Opinions and Appraisal Lawsuits

2.1. Fairness opinions

[9] In concurrent work, Eaton, Guo, Liu, and Officer (2021) examine the determinants of peer choice in the M&A setting. However, Eaton et al. (2021) focus primarily on the informational role of FOs (e.g., identifying product market similarity as a key determinant), and do not consider the role of appraisal risk in peer selection, nor the role of peer selection on ex-post lawsuits.

It is standard practice for the target board of directors to seek a fairness opinion (FO) from an investment advisor when considering a proposed merger.[10] The stated purpose of the opinion is to provide an independent assessment of the target firm's value relative to the value of the proposed deal. The investment advisor typically provides a range of potential values of the target firm based on several different valuation methodologies, including using public company comparables, discounted cash flow (DCF) analysis, and historical trading prices, among others. After comparing the proposed deal's value with the range of values obtained from different analytical methods, investment advisors assert whether the price received in the transaction is "fair" from a financial point of view to the target shareholders. Once prepared, the FO is typically presented to the target's board prior to its vote on whether to approve the deal.

Notwithstanding their stated purpose, the actual value of FOs is ambiguous. Bebchuk and Kahan (1989) emphasize the limitations of FOs, specifically highlighting the problems of "discretion" and "conflicts of interest." The problem of discretion itself has two sources. The first is that courts have declined to specify what is meant by a "fair price" (e.g., whether the price should reflect the firm's value as a standalone entity, or the value to the acquirer given expected synergies). The second source of discretion arises because valuation is inherently uncertain and relies on simplifications, assumptions, and estimates, a wide range of which are justifiable.[11]

Consistent with the criticisms of FOs offered by Bebchuk and Kahan (1989), some studies examining their effects suggest that FOs provide little in the way of value or informativeness. For instance, Kisgen et al. (2009) find that the use of FOs by the target does not significantly affect the deal premium,

[10] The use of FOs became ubiquitous in mergers following a Delaware Supreme Court opinion in *Smith v. Van Gorkom* (1985), in which the court found the board of TransUnion Corporation liable for breaching its duty of care owed to the corporation and its shareholders. Although the offer price represented a substantial premium over the target's market price, the court focused on the hasty process by which the board approved the deal, and the failure to consider expert financial analysis. Since then, the vast majority of U.S. targets have sought a third-party assessment of the fairness of the merger (e.g., Kisgen et al. 2009; Cain and Denis 2013).

[11] A separate argument is the existence of conflicts of interest. For example, investment banks frequently serve as both an advisor to the transaction as well as the FO provider, but are compensated for advising fees only if the deal is completed. In addition, investment banks often have a strong incentive to cater to the interests of managers, and not necessarily shareholders, in the hope of retaining future business. The existence of conflicts of interest combined with substantial discretion has invited criticism of FOs in both the academic and practitioner spheres (see "*Opinions Labeling Deals 'Fair' Can Be Far From Independent*", Wall Street Journal, Dec. 29, 2004).

the acquirer's announcement-period return, or the likelihood of deal completion. Although Kisgen et al. (2009) find that the use of FOs by the acquirer is associated with lower deal premiums, subsequent work has theorized that this finding derives from a selection bias in which acquirer-sought FOs are observable only for large acquisitions, which are likely to have lower premiums (Cain and Denis 2013).

Nevertheless, other studies have argued that FOs, although imperfect, potentially provide incremental value to target boards and shareholders. Davidoff (2006) posits that, despite the inherent subjectivity, FOs can still provide value through their underlying analysis and can be used to negotiate the transaction price (Davidoff et al. 2011). Cain and Denis (2013) perform the first large-sample study on the content of FOs, examining target-sought and acquirer-sought FOs for 583 mergers from 1998-2005. They show that the difference between target firm valuations and the merger offer price positively predicts the market reaction to the public disclosure of target-sought FOs as well as the stock price reactions to the merger announcements. The authors infer from these findings that target-side FOs reveal information not previously available to market participants. Shaffer (2021) focuses on DCF valuations in FOs and presents a nuanced view of their potential value. The findings in Shaffer (2021) suggest that target-sought FOs can provide information about fundamental mispricing and expected synergies from the deal, but they also exhibit bias from catering to target managers, which reduces their usefulness.

Despite their long history of use and their importance in the market for corporate control, researchers have just begun to examine the contents of FO valuations. We posit that FO valuations can be strategically biased in response to appraisal risk and we seek to understand any strategic behavior by analyzing the selection of peer comparables. Furthermore, we exploit a setting that introduced plausibly exogenous variation in appraisal risk for Delaware-incorporated target firms to investigate this important question.

2.2. Delaware appraisal lawsuits

In the United States, appraisal laws give target shareholders the right to oppose a merger offer, have their shares judicially appraised, and receive the judge's appraised value from the acquirer in place of the original merger price. Appraisal evolved at the state level as a legal remedy to protect minority shareholders

who are sometimes forced to give up their shares without consent (e.g., Thompson 1995).[12] Historically, it was relatively rare for shareholders to exercise their appraisal rights due to various obstacles and limitations.[13] However, a landmark 2007 ruling by the Delaware Court of Chancery in *In re Appraisal of Transkaryotic Therapies, Inc.* made appraisal lawsuits a more viable option for shareholders.

The court's decision related to the 2005 acquisition of Transkaryotic Therapies, Inc., a public biopharmaceutical firm. A group of appraisal arbitrageurs claimed that the merger price substantially undervalued the firm because of promising test results for a new drug that were released after the date of record but before the shareholder vote date for the merger. The arbitrageurs responded to the news by acquiring more shares and notifying the firm of their intention to withhold the shares and seek appraisal. Transkaryotic argued that shares purchased after the record date were ineligible for appraisal because the investors could not demonstrate how they were voted. However, in a surprise ruling, the Delaware Court of Chancery ruled in favor of the arbitrageurs, thereby conferring appraisal rights on the disputed shares. The ruling effectively relaxed the requirements to qualify for appraisal rights by allowing investors to purchase shares up until the merger's closing date, and still seek appraisal on those shares.[14]

A consequence of the 2007 developments in Delaware appraisal law has been the rise of "appraisal arbitrage" in which hedge funds employ appraisal as an investment strategy. The strategy consists of hedge funds (arbitrageurs) carrying out the following steps: 1) purchasing a small number of shares in a company on the brink of an acquisition, 2) notifying the target firm of their intention to seek appraisal, 3) viewing

[12] During the early 1900s, most states required unanimous approval from target shareholders to sell a company. However, as share ownership became more dispersed over time, state laws were modified to require merely a majority or supermajority vote to approve the sale. At the same time, states introduced a right to judicial appraisal as a mechanism to protect minority shareholders opposed to the sale of the company.

[13] Thomas (2000) finds an average of 14 appraisal claims filed annually from 1977 to 1997 in Delaware, and most of those cases either were brought by individuals without legal counsel or involved the sale of a privately held firm. Obstacles to the use of appraisal have included: 1) for acquisitions of public companies, appraisal rights only apply to deals in which cash is included in the consideration; 2) a shareholder must notify the corporation of the intent to seek appraisal prior to the shareholder vote, vote against the merger (or abstain), continuously hold the shares through the close of the deal, and file suit within 120 days of closing; 3) the lack of feasibility of a class-action appraisal suit; 4) a shareholder seeking appraisal does not receive payment until the trial concludes (typically 1-3 years after filing suit) or until the case settles; and 5) courts have historically used low valuation methods that led to low appraisal awards (Boone et al. 2019).

[14] Figure 1 illustrates the effect of the Delaware court ruling within the merger and appraisal process timeline.

the outcome of the shareholder vote, and if the deal is approved, purchasing more shares prior to the deal closing and adding those additional shares to their appraisal claims (Jetley and Ji 2016; Kesten 2017). Jiang et al. (2016) suggest that appraisal arbitrageurs have earned average abnormal annual returns of 32.9% using this strategy. A consequence of these developments has been to substantially increase the likelihood that a Delaware target firm will be subject to an appraisal claim, such that in recent years nearly one in three appraisal-eligible deals has been subject to an appraisal lawsuit (Stewart 2021).

Appraisal lawsuits can be a long and costly process for the merging firms. By 2013-2016, the total value of dissenting shares in Delaware appraisal petitions had reached $1.5-2.0 billion annually. Furthermore, appraisal cases that proceed to trial typically take between one to three years before the chancery court issues a decision, and involve a costly "battle of experts" with both sides calling upon financial experts for testimony (Seretakis 2019). As a result, most appraisal petitions (approximately 80 percent) end in settlements with the petitioners (Jiang et al. 2016).

Researchers have just begun to investigate whether and how merging firms have responded to the increase in appraisal risk spurred by the Delaware law changes. Callahan et al. (2018) and Boone et al. (2019) examine potential changes in contract features, such as higher target premiums or greater use of "appraisal out" clauses. Stewart (2021) suggests that target firm managers may seek to limit the flow of positive information between the deal's announcement and completion to reduce the risk and expected costs of appraisal. Stewart's argument is based on prior work establishing that target managers are susceptible to acquirer-provided incentives, including the promise of future employment with the merged firm and/or merger bonuses contingent on deal completion (e.g., Morck, Shleifer, and Vishny 1988; Hartzell et al. 2004; Fich et al. 2011; Fich et al. 2016). Stewart (2021) finds that when appraisal risk is heightened following the 2007 Delaware rule changes, target firms withhold good news during the merger transaction period, consistent with target firm managers attempting to mitigate appraisal risk.

3. Data and variable construction

3.1. Sample selection

Table 1 Panel A outlines our sample selection process. We begin by obtaining data from SDC Platinum on all M&A transactions involving publicly traded U.S. firms (acquirers and targets) announced between January 2000 and December 2015 for a total of 2,899 deals. Following Cain and Denis (2013), we exclude deals in which the acquirer seeks less than 100 percent of the target's shares, deals structured as tender offers, and deals in which either the acquirer or target belongs to the financial services industry (firms with SIC codes 6000-6999). These criteria yield an initial sample of 1,464 mergers for which we examine SEC filings to extract FO valuations containing peer comparables analysis. We employ textual analysis using a Python script to examine the following SEC filings for acquirer and target firms: S-4, S-4/A, DEFM14A, DEF14A, DEFR14A, and SC14D9.[15] Our search yields a total of 1,018 mergers with 1,157 target-sought FO valuations containing peer comparables analysis.

We collect financial information from Compustat and CRSP for our target firms, excluding mergers in which the firm is missing information required to construct the control variables. We then manually match the name of each peer firm listed in the peer comparables analysis to its corresponding name in Compustat, a process that allows us to successfully match 96 percent of peers in our sample. We exclude peers with a negative value for enterprise value-to-sales (our primary proxy for peer firm value), and we remove FOs if the peer comparables analysis contains fewer than three peers within the same two-digit SIC industry code as the target firm, which precludes us from being able to compute *PPP* (our proxy for peer firm bias). Finally, we remove FOs for which the merger is withdrawn or has missing data needed to construct key control variables. These restrictions yield a final sample of 611 mergers with 663 target-sought FOs.[16]

[15] We search the SEC filings for tables or text containing peer comparables analysis by using the following keywords: "analysis of selected comparable publicly traded companies", "comparable companies analysis", "comparable public company analysis", "comparable analysis", "comparable companies", "comparable company analysis", "comparable public companies", "comparable public company", "comparable public company trading analysis", "comparable publicly traded companies", "comparables analysis", "peer group trading analysis", "public company analysis", "public trading multiples", "selected companies analysis", "selected public companies", "selected public companies analysis", "trading valuation", "peer group analysis" and "selected publicly traded companies."

[16] Although eligibility for Delaware appraisal generally requires that there be a cash component as part of the merger consideration, the Delaware Chancery Court's decision in *Krieger v. Wesco Financial Corp*, C.A. No. 6176-VCL (Del. Ch. Oct. 13, 2011) suggests that appraisal rights would likely apply in cash/stock election mergers as well.

3.2. Peer portfolio percentile (PPP)

To assess whether the selection of peer firms in merger valuations is strategic, we follow Larcker et al. (2020) and examine the distributional characteristics of the *portfolio* of peers selected. Specifically, we compare the median valuation multiple for the selected peer group with the distribution of median valuation multiples for all alternative peer groups that could have been selected. We use enterprise value-to-sales (EVS) as our primary valuation multiple, and we define potential peers as firms within the same two-digit Standard Industrial Classification (SIC) industry as the target.[17] The resulting measure, which we denote as the *Peer Portfolio Percentile* or *PPP*, allows us to assess whether the selected peer group generates a valuation benchmark that is at the 1st, 50th, 99th, or any other percentile of the distribution of plausible peer groups. The distribution-based measure captures whether the portfolio of peers selected has an unusually high or low valuation relative to other peer groups that could reasonably have been chosen.

To illustrate the mapping of peer comparables analysis in FOs into *PPP*, we provide an example merger in Appendix B. In our example, the target, Zygo Corporation ("Zygo") is a Delaware-incorporated firm being acquired by AMETEK, Inc. ("AMETEK") in an all-cash merger publicly announced on April 11, 2014. Zygo sought a FO from its investment advisor, Barclays plc, in which Barclays performed several types of valuation analyses, including an analysis of selected comparable companies, to arrive at its conclusion that the merger price offered by AMETEK was "fair" to Zygo's shareholders. As shown in Appendix B, Barclays selected eight peers to compare to Zygo, five of which are in the same 2-digit SIC industry as Zygo, and the first multiple employed for comparison is enterprise value-to-sales revenue (EVS). At the time of the merger, there were 207 possible peers within this industry grouping that could have been selected. The *PPP* for the chosen peers is 0.168, meaning that if we map the probability of

Consequently, we retain all-stock mergers in our sample. However, in untabulated robustness analyses, we find that our inferences are unchanged if we exclude all-stock mergers from our sample.

[17] We find that 83% of the selected peers in our sample belong to the same two-digit SIC industry as the target firm, suggesting that this industry classification provides a reasonable boundary for potential peers. Nevertheless, we perform multiple robustness analyses to ensure our findings are not sensitive to this choice. In Section 4.2.7, we report similar findings after modifying *PPP* to include all selected peers, using each peer firm's own two-digit SIC industry (regardless of whether the peer is in the same industry as the target) to determine the potential population of peers, as well as when we construct *PPP* using the Hoberg and Phillips (2010, 2016) industry classifications.

observing the median of the chosen peers to the empirical distribution function of all potential medians, the chosen median falls at approximately the 17th percentile.

Figure 2 Panel A provides a histogram of the *PPP* based on deciles for our sample of target-sought FO valuations, and displays a distribution skewed towards lower values. Panel B reports that the mean (median) *PPP* value is 0.384 (0.374), corresponding to the 38th (37th) percentile, indicating that selected peer portfolios tend to fall well within the bottom half of the distribution of all potential peer portfolios that could have been chosen. Moreover, selected peer portfolios fall within the bottom decile of the possible distribution more frequently than in any other decile. This univariate analysis provides preliminary evidence suggesting that peer selection in target-sought FO valuations tends to be pessimistic, or biased towards lower-valued peers.

3.3. Summary statistics

Table 2 Panel A reports summary statistics for the main sample of target-sought FO valuations. The panel shows that approximately 70% of the mergers in our sample involve Delaware-incorporated targets, slightly higher than but comparable to the 62% figure found in Stewart (2021). Summary statistics for other firm and deal characteristics are overall consistent with those in related work (e.g., Jiang et al. 2016; Callahan et al. 2018; Boone et al. 2019).

Table 2 Panel B reports summary statistics for the number of peers per target-sought FO valuation. The mean (median) total number of peers per FO valuation is 8.57 (8), whereas the mean (median) number of peers within the same two-digit SIC industry as the target is 6.94 (6). Table 2 Panel C displays mean and median values for the characteristics of the target firms (columns 1 and 2) and their selected peers (columns 3 and 4). Compared with the target firms, the selected peers tend to be relatively larger and more profitable, with greater growth opportunities and higher leverage.[18] In addition, the enterprise value-to-sales (EVS) ratios reflect higher valuation multiples for peer firms as compared to the target firms. Note that although

[18] Note that although the market values of the selected peers are generally higher than those of the target firms, these comparisons are based on the pre-merger trading prices of the target firms (that is, excluding the premium received in the merger).

we are directly comparing the target firm and chosen peers in this table, any bias in peer selection will be determined with respect to the population of potential peers. In other words, although the table indicates that relative to the targets, the chosen peers have relatively higher valuations, this does not necessarily mean that advisors select peers with an upwards valuation bias. Rather, we must compare the set of peer firms selected to the population of peer firms that *could have been* selected.

4. Research design and main results

4.1. Research design

To examine whether an increase in appraisal risk impacts the selection of peer firms in merger FO valuations, we estimate the following difference-in-differences model using target-sought FO valuations as the unit of analysis:[19]

$$PPP = \beta_0 + \beta_1 Target\ Delaware + \beta_2 Target\ Delaware \times Post2007 + \beta_k Controls + \alpha_{ind} + \delta_{year} + \epsilon \quad (1)$$

PPP represents the peer portfolio percentile of the selected peer group's valuation multiples compared to the portfolios of peers that could have been selected. *Target Delaware* is an indicator variable equal to one if the target firm is incorporated in Delaware, and zero otherwise. *Post2007* is an indicator variable equal to one if the merger is announced after December 31, 2007, and zero otherwise (e.g., Stewart 2021). In order to ensure an equal number of years before and after the court's rule passage (i.e., eight years in both the pre- and post-periods), we limit the sample to years 2000-2015.

Controls represents a vector of control variables shown in prior work to be associated with merger outcomes, and includes target firm and deal-level characteristics. Target firm-level controls include return on assets (*ROA*), book-to-market ratio (*BTM*), an indicator for whether the firm has an operating loss (*Loss*), and leverage (*Lev*). Merger-level controls include the natural log of the dollar amount of the deal (*Deal size*), the number of days from announcement to completion (*Deal length*) as in Wangerin (2019), the

[19] We use FOs rather than deals as the unit of analysis because some deals contain multiple FOs. In untabulated robustness analysis, we find that our inferences are unchanged if we restrict the sample to mergers with only one target-sought FO such that the unit of analysis is at the deal-level.

percentage of cash used for payment (*Percent cash*) and an indicator for whether an acquirer-sought FO is provided for the same deal (*Acquirer-sought FO*). Appendix A contains details on variable construction. In addition, we include target industry (Fama-French 48) and merger announcement year fixed effects.[20] Standard errors are clustered at the state level. We predict a negative β_2 coefficient for the term *Target Delaware* × *Post2007*, indicating that FO providers strategically choose lower-valued peers to make the takeover price appear more attractive when appraisal risk increases following the Delaware court's decision.[21]

4.2. Main results

4.2.1. Impact of appraisal risk on peer firm selection in target-sought FO valuations

Table 3 Panel A presents the results from estimating Eq. (1). The table shows the change in the choice of peer firms in target-sought FO valuations for Delaware firms following the 2007 Transkaryotic decision, compared to non-Delaware firms. In column 1, the negative coefficient for *Target Delaware x Post2007* (coef.= -0.126; t-stat.= -3.19) indicates that *PPP* decreases when appraisal risk increases (i.e., as in the case of Delaware target firms involved in deals after 2007). In other words, when the threat of appraisal goes up, advisors are more likely to select a portfolio of peers that makes the takeover price appear relatively more attractive. The magnitude of the coefficient for *Target Delaware x Post2007* indicates that *PPP* for Delaware target firms decreases by an average of 12.6 percentage points in the post-Transkaryotic period compared to non-Delaware targets, which represents a reduction of 32.8%, relative to the sample mean.

[20] In untabulated robustness tests, we find that our main inferences are unchanged by the inclusion of fixed effects for the target's state of incorporation. We omit state fixed effects in our primary specifications due to concerns about including a large set of fixed effects in tests with a relatively small sample size.

[21] Although it is possible that rational shareholders anticipate a downward-biased valuation in FOs, it may still be the optimal strategy for parties attempting to mitigate litigation risk, for at least two reasons. First, in the appraisal process a judge makes an assessment of the validity of the lawsuit and may be influenced by the peers selected in the FO valuation. Second, analagous to the finding in Stein (1989) with regard to earnings management, it may be the optimal strategy to select downward-biased peers even if the market rationally expects it, so long as the market cannot completely undo the effects of the bias for a given deal.

Next, we modify Eq. (1) by replacing *Post2007* with indicator variables *Y2002-2004*, *Y2005-2007*, *Y2008-2010*, *Y2011-2013*, and *Y2014-2015* to capture subperiods of the overall sample window. Our motivation for the subperiod analysis is twofold. First, it allows us to examine the pre-Transkaryotic period for any evidence of pre-existing differential trends in peer selection between Delaware and non-Delaware target firms. Second, the subperiod analysis allows us to more precisely identify the timing of the effect from the change in appraisal risk.

The results from estimating the modified Eq. (1) are reported in column 2 of Table 3 Panel A. The coefficients on *Target Delaware* × *Y2002-2004* and *Target Delaware* × *Y2005-2007* are insignificantly different from zero (coef.= -0.015; t-stat.= -0.20 and coef.= -0.038; t-stat.= -0.77, respectively), indicating no divergence between Delaware and non-Delaware targets in the pre-Transkaryotic period (note that 2000-2001 serves as the baseline period). In the post-Transkaryotic period, the coefficient on *Target Delaware* × *Y2008-2010* is insignificant, but the coefficients on *Target Delaware* × *Y2011-2013* and *Target Delaware* × *Y2014-2015* are negative and statistically significant (coef.= -0.194; t-stat.= -2.21 and coef.= -0.271; t-stat.= -4.25, respectively), indicating a substantial decrease in *PPP* for Delaware targets relative to non-Delaware targets during these years. The finding that *PPP* for Delaware targets did not decline significantly until 2011 dovetails with prior work suggesting that, although the relevant ruling occurred in 2007, the incidence of appraisal lawsuits did not immediately increase. Rather, it was not until 2011 and the following years that the number and proportion of eligible mergers attracting appraisal lawsuits rose substantially (e.g., Korsmo and Myers 2015; Boone et al. 2019; Stewart 2021).[22] This ex post evidence suggests that the pervasiveness of appraisal risk was not felt by many market participants until years after the 2007 court ruling.

[22] Korsmo and Myers (2015) discuss possible reasons for the lag between the Transkaryotic decision in 2007 and the rise in appraisal litigation beginning in 2011. They conclude that "it may simply be a case of a few investors who, somewhat by accident, found themselves considering appraisal as a method for salvaging an investment following a bad merger, became intrigued by the opportunity, and explored it further. As word spread of their success, others mimicked the strategy" (Korsmo and Myers 2015, p. 1582).

To provide visual evidence of the trends between Delaware and non-Delaware targets, we plot in Figure 3 each of the coefficients from the specification contained in column 2 of Table 3 Panel A along with 90% confidence intervals.[23] As shown in the figure, the coefficients are insignificantly different from zero until the 2011-2013 and 2014-2015 periods, at which point Delaware target firms exhibit a significant decrease in *PPP* relative to non-Delaware targets. Taken together, the findings in Table 3 Panel A and Figure 3 help to mitigate concerns regarding pre-existing differential trends in peer selection for Delaware and non-Delaware target firms.

4.2.2 Large vs. small mergers

Next we investigate whether our findings in Table 3 Panel A vary based on the size of the merger. Our rationale is that mergers involving larger dollar values represent potentially more lucrative investment opportunities for appraisal arbitrageurs than mergers involving relatively small dollar values (e.g., Stewart 2021). Consequently, we predict that strategic peer selection is more likely among large dollar value mergers in an attempt to mitigate appraisal risk. To test our conjecture, we partition our sample of mergers into those with above-median dollar values ("Large Deals") and those with below-median dollar values ("Small Deals"), and estimate Eq. (1) for each group separately. The results from our analysis are displayed in Table 3 Panel B.

The first column shows the results for mergers with large dollar values, and reveals a significantly negative coefficient on *Target Delaware* × *Post2007* (coef.= -0.174; t-stat.= -2.98), indicating a substantial decrease in *PPP* for large Delaware targets following the increase in appraisal risk. However, column 2, displaying the results for mergers with small dollar values, reveals a statistically insignificant coefficient on *Target Delaware* × *Post2007* (coef.= 0.019; t-stat.= 0.38), indicating no change in *PPP* for small Delaware targets in response to appraisal risk. These results suggest the strategic selection of peers takes place in mergers that are more attractive targets for appraisal arbitrage (i.e., large dollar value mergers), but

[23] Note that 2000-2001 has a zero coefficient and no confidence interval because it serves as the benchmark period.

not in mergers less likely to be targeted by appraisal (i.e., small dollar value mergers), consistent with our conjecture.

4.2.3. The influence of target CEO incentives

Next we examine whether target CEO incentives impact the relation between appraisal risk and the strategic selection of peer firms in target-sought FO valuations. We conjecture that under certain conditions, target CEOs may actually prefer a downward-biased selection of peers. For instance, target CEOs who expect to be retained by the merged firm would prefer to avoid a potentially costly appraisal lawsuit that could damage the future performance of the combined firm, and therefore would likely prefer the selection of downward-biased peers to reduce appraisal risk. Similarly, CEOs who own fewer shares in the target firm incur less personal cost if the takeover price is reduced a result of selecting downward-biased peers, and thus are more likely to be accepting of downward-biased peer selection that may result in a reduced premium.[24] We test our conjecture by bifurcating our sample of mergers into two groups based on the combined attributes of target CEO retention and target CEO ownership. The first group, which we classify as having high agency conflicts (High Agency Conflicts), consists of mergers in which the target CEO is both retained at the merged firm and also has below average ownership of the target firm's outstanding shares prior to the merger.[25] The second group (Low Agency Conflicts) consists of mergers in which at least one of those criteria is not met. In Table 4, we report the results from estimating Eq. (1) separately for each group to examine how target CEO incentives influence the relation between appraisal risk and the selection of peers.

The first (second) column of Table 4 displays the results from estimating Eq. (1) for mergers with high (low) agency conflicts. For both sets of mergers, we observe a negative and significant coefficient on

[24] It is worth noting that even if target managers hold significant equity in the target firm, they are unlikely to personally benefit from a judicial appraisal because only those shareholders who notify the company of their intent to seek appraisal prior to the shareholder vote and then vote to oppose the merger (or abstain from voting) are eligible to receive appraisal awards.

[25] Target CEO ownership is calculated as the fraction of common shares outstanding held by the target CEO as of the fiscal year prior to the public announcement of the merger. CEO holdings are manually collected from firms' financial filings.

Target Delaware × *Post2007*, indicating a downward bias in peer selection in response to appraisal risk. However, the magnitude of the effect is larger for mergers in which the target CEO has high agency conflicts (coef. = -0.254; t-stat.= -3.09) than for mergers in which the target CEO has low agency conflicts (coef.= -0.103; t-stat.= -3.50). An F-test reveals that the difference between the coefficients is marginally statistically significant (p-value = 0.07). This finding indicates that the downward bias in peer firm selection is more severe when target CEOs are retained by the merged firm and thus have a vested interest in the combined firm's post-merger performance, and when target CEOs are less heavily invested in the target firm's stock. Overall, the findings in Table 4 provide evidence consistent with target CEO incentives influencing the degree to which peer firms are strategically selected in target-sought FO valuations in response to appraisal risk.

4.2.4. The impact of advisor bank reputation

In this section, we consider the role of the investment advisor's reputation in the relation between appraisal risk and the strategic selection of peers in target-sought FO valuations. Prior work has focused largely on investment advisors for acquirer firms (e.g., Servaes and Zenner 1996; Rau 2000; Bao and Edmans 2011; Golubov et al. 2012), and finds mixed evidence on the question of whether a reputable FO advisor influences M&A outcomes. Early work by Servaes and Zenner (1996) and Rau (2000) find little evidence that the use of a first-tier investment advisor is associated with announcement-period returns, the likelihood of deal completion, or post-acquisition performance. However, more recent work by Kisgen et al. (2009), Bao and Edmans (2011), and Golubov et al. (2012) suggests that advisor reputation is positively associated with acquirer gains. Kisgen et al. (2009) examine target-side advisors as well, but find no evidence that the reputations of target-side investment advisors are associated with M&A outcomes.

To examine any potential influence of investment advisor reputation in our setting, we partition our sample of mergers into those in which the targets have retained top-tier investment advisors (Top Advisor) or non-top-tier investment advisors (Non-Top Advisor), based on the frequency with which the advisors are asked to provide FOs in M&A deals during the sample period (e.g., Rau 2000; Kisgen et al. 2009). Investment advisors are considered top-tier if they are among the top five most frequently used advisors for

target-sought FOs during the sample period, and non-top-tier advisors otherwise.[26] After partitioning our sample of mergers into those with top-tier advisors and those without, we estimate Eq. (1) separately for each group, and present the results in Table 5.

The first column of Table 5 displays the results for mergers when the target-sought FO is issued by a top-tier investment advisor. The coefficient on *Target Delaware* × *Post2007* is negative, but insignificantly different from zero (coef.= -0.069; t-stat.= -1.24), indicating that peer firm selection did not change substantially in response to increased appraisal risk when the FO was issued by a reputable investment advisor. In contrast, the results in column 2 display a negative and significant coefficient on *Target Delaware* × *Post2007* (coef.= -0.131; t-stat.= -2.80) for target-sought FOs with a non-top-tier advisor, indicating substantial downward bias in peer firm selection in response to appraisal risk. The results of an F-test reveal that the difference between the two coefficients is not statistically significant at conventional levels (p-value = 0.42). Although they lack statistical significance, the findings in Table 5 are directionally consistent with the notion that advisors' reputational concerns may constrain their willingness to provide biased FO valuations, consistent with conjectures in prior research (e.g., Kisgen et al. 2009; Shaffer 2021).

4.2.5. Peer firm selection and the incidence of appraisal lawsuits

We next seek to understand whether the strategic selection of peers in M&A valuations influences the incidence of appraisal lawsuits. To this end, we collect a comprehensive sample of appraisal petitions from Courthouse News Service beginning in 2003. As outlined in Table 6, Panel A, we begin with a sample of 322 lawsuit petitions filed from 2003 to 2015. After excluding those that are related to non-public target firms and those we are unable to match to our sample of targets possessing FOs, we obtain a final sample of 68 appraisal lawsuits pertaining to 60 mergers occurring during our sample period.

[26] The top five investment advisors in our sample are Morgan Stanley, Goldman Sachs, Bank of America Merrill Lynch, Credit Suisse, and JP Morgan. Collectively, these five investment advisors were responsible for issuing approximately 30% of target-sought FOs in our sample.

Figure 4 displays the incidence of appraisal lawsuits occurring in our sample over the period 2004-2015. Consistent with prior research, we observe a large and sustained increase in the number of appraisal lawsuits beginning in 2011 (e.g., Korsmo and Myers 2015; Boone et al. 2019; Stewart 2021). This pattern helps to triangulate our findings in Table 3, which showed that the downward-biased strategic selection of peer firms by Delaware target firms manifests primarily in the 2011-2015 period. Although the Transkaryotic ruling ostensibly increased appraisal risk for Delaware target firms in years beginning after 2007, prior work suggests that it took some time before the appraisal arbitrage strategy spread widely (e.g., Korsmo and Myers 2015).

To test our conjecture that downward-biased selection of peers mitigates appraisal risk, we partition our sample of mergers into terciles based on *PPP*, and label the bottom tercile as Low PPP mergers, and the top two terciles as High PPP mergers. Then for each group, we estimate a modified version of Eq. (1) in which the dependent variable is an indicator equal to one if the merger is subject to one or more appraisal lawsuits, and zero otherwise (*Appraisal Lawsuit*). Our prediction is that, if strategically selecting downward-biased peers leads investors to perceive the takeover price as relatively more attractive, they are less likely to initiate appraisal lawsuits. Therefore, we expect to observe a more muted (or no) increase among the Low PPP group of Delaware mergers following the Tranksaryotic decision, as compared to the High PPP group.

Table 6 Panel B displays the results of our investigation. The first column examines the change in Delaware appraisal lawsuits over time, without considering any potential influence of peer firm selection. Consistent with Figure 4, the results show a significantly positive coefficient on the interaction term *Target Delaware* × *Post2007* (coef.= 0.142; t-stat.= 3.88), suggesting that appraisal lawsuits increase substantially for mergers involving Delaware target firms following the Transkaryotic ruling. Columns 2-3 present the results for the subset of mergers with High PPP and Low PPP, respectively. Among the mergers with High PPP, we observe a significantly positive coefficient on *Target Delaware* × *Post2007* (coef.= 0.203; t-stat.= 4.70), indicating a substantial increase in appraisal lawsuits. However, among the mergers with Low PPP, we observe a statistically insignificant coefficient on *Target Delaware* × *Post2007* (coef.= 0.064; t-stat.=

1.09), denoting little meaningful change in appraisal lawsuit likelihood. An F-test reveals that the difference between the interaction coefficients for High and Low PPP mergers is statistically significant (p-value < 0.01). In terms of magnitude, our findings suggest that following the Transkaryotic decision, Delaware mergers experience an overall increase in appraisal lawsuit likelihood of 14.2%. However, this increase in appraisal lawsuits is observed primarily among mergers with relatively high PPP (20.3% increase), with a more muted effect among mergers with low PPP (6.4% increase). Overall, the findings in Table 6 indicate that the selection of lower-valued peers is associated with a smaller increase in appraisal lawsuits for Delaware targets following the proliferation of appraisal arbitrage, consistent with the strategic selection of peers mitigating the threat of appraisal lawsuits.

4.2.6. Appraisal risk, peer firm selection, and merger premiums

We next examine whether there is a relation between appraisal risk, the strategic selection of peer firms, and merger premiums. Prior work suggests that the increased risk of appraisal following the Transkaryotic decision led to higher premiums paid for Delaware target firms (Callahan et al. 2018; Boone et al. 2019).[27] The rationale is that acquirers are willing to pay a higher premium to reduce the possibility that target shareholders will view the takeover price as too low, and seek appraisal on the deal. We aim to understand whether the strategic selection of peers influences the relation between heightened appraisal risk and the takeover price. We follow the same procedure as in our appraisal lawsuit test, partitioning our sample of mergers into those with Low PPP (bottom tercile) and High PPP (top two terciles), and examining for each group any increase in merger premiums for Delaware targets following the Tranksaryotic decision. Our prediction is that, if the selection of peer firms is correlated with merger premiums, we expect to see a smaller (or no) increase in premiums among Delaware mergers with low PPP compared to those with high PPP.

The first column of Table 7 displays the overall effect of the Transkaryotic court ruling on merger premiums for Delaware targets. Consistent with prior work (e.g., Callahan et al. 2018; Boone et al. 2019),

[27] Prior work by Korsmo and Myers (2015), Jiang et al. (2016), and Kalodimos and Lundberg (2017) find that mergers with low premiums are more likely to be challenged by appraisal lawsuits.

we observe a significantly positive coefficient on *Target Delaware* × *Post2007* (coef.= 0.059; t-stat.= 1.96), indicating increased premiums for Delaware targets following the increase in appraisal risk. Columns 2-3 present the results for the subset of mergers with High PPP and Low PPP, respectively. Among the mergers with High PPP, we observe a significantly positive coefficient on *Target Delaware* × *Post2007* (coef.= 0.058; t-stat.= 1.82), indicating increased merger premiums. However, among the mergers with Low PPP, we observe a statistically insignificant negative coefficient on *Target Delaware* × *Post2007* (coef.= -0.051; t-stat.= -0.72), suggesting no change in merger premiums. In terms of magnitude, our results suggest that the Transkaryotic court ruling led to a relative increase of 21.8% in premiums, and that this overall effect is primarily due to mergers with higher values of *PPP*.[28] Although an F-test reveals that the difference between the interaction coefficients is not significant at conventional levels (p-value = 0.13), the results are consistent with the selection of lower-valued peers offsetting the increase in Delaware merger premiums arising due to appraisal risk.

4.2.7. Falsification and robustness tests

A potential concern with our main findings is that a decrease in *PPP* in response to increased appraisal risk may reflect a shift in the underlying economics of mergers – specifically, a preference for less valuable target firms – rather than the strategic selection of peers. In this section, we perform tests to mitigate this concern, as well as examine the robustness of our main findings to different measurement choices.

First, we conduct a falsification test in which we examine acquirer-sought (as opposed to target-sought) FOs. We theorize that acquirers have different incentives than target firms regarding peer selection in M&A, for two main reasons. First, appraisal lawsuits are initiated by shareholders of the target firm rather than the acquiring firm, leading us to expect that acquirer-sought FO valuations will be less sensitive to the increase in appraisal risk following the Transkaryotic decision. Second, the acquirer's shareholders

[28] The magnitude of the increase in premiums for Delaware targets following the court ruling can be computed as the coefficient on *Target Delaware* × *Post2007* scaled by the mean value of *Premium*, or (0.059 / 0.270) = 21.8%. Note that our finding is of the same order of magnitude as that in Callahan et al. (2018), who find a relative increase of 9.7-17.2% for appraisal-eligible deals.

may vote to reject the deal if they believe that the proposed takeover price represents an overvaluation of the target firm. Consequently, acquirers may prefer that peers with upward-biased valuations are selected, to convey to the acquirer's shareholders that the target is being purchased at a relative discount.

To perform our falsification test, we collect acquirer-sought FOs with peer comparable analysis for as many deals as possible in our main sample. Employing the same procedure as for target-sought FOs, we find 131 acquirer-sought FOs within our sample. After matching the peers in acquirer-sought FOs, we compute *PPP* following the same procedure as for target-sought FOs. We then use the sample of acquirer-sought FOs to estimate the dynamic version of Eq. (1) to examine any changes in *PPP* over time. The results of our analysis are presented in Table 8.

In the first column of Table 8, we replicate our dynamic findings from Table 3 employing target-sought FOs within the subsample of 131 mergers that also contain acquirer-sought FOs. Consistent with our findings in Table 3, we observe a downward bias in the selection of peers for Delaware target firms during 2011-2013 and 2014-2015 among target-sought FOs. Column 2 of Table 8 presents the results of our falsification test examining peer choice among acquirer-sought FOs. In contrast to the findings for target-sought FOs, we do not find any evidence of a change in peer selection for Delaware targets in the post-Transkaryotic period among acquirer-sought FOs. By showing that targets-sought FOs respond to appraisal risk with strategic peer selection, and that the same effect is not present among acquirer-sought FOs (for the same sample of deals), we strengthen our interpretation that our main findings are the result of strategic behavior, rather than due to changes in the underlying economics of the mergers.

Next, we examine the robustness of our main findings to two sets of alternative potential peer groups. First, we expand the definition of potential peers for target firms by modifying the construction of *PPP* to include peers outside of the target's industry. Specifically, we include all selected peer firms using each peer's two-digit SIC industry to determine the potential population for those peers outside the target's industry, as opposed to restricting the potential population of peers to those within the target's industry

(*PPP overall*).[29] Second, we construct a version of *PPP* based on the target firm's Hoberg and Phillips (2010, 2016) industry (*PPP (Hoberg Phillips)*). Table 9 Panel A displays the results from estimating Eq. (1) using *PPP overall* and *PPP (Hoberg Phillips)* as the dependent variables. We observe significantly negative coefficients on the interaction term, *Target Delaware* × *Post2007* with respect to both dependent variables, providing reassurance that our main findings are robust to the use of alternative potential peer groups.

Last, we perform two additional robustness tests. First, we construct an alternative measure of bias in peer firm selection as the natural log of one plus the difference between the median EVS multiple of the chosen peers and the one year lagged EVS of the target (*Peer EVS - Target EVS*). The first column of Table 9 Panel B displays the results from estimating Eq. (1) with *Peer EVS - Target EVS* as our dependent variable, and reveals a significantly negative coefficient on *Target Delaware* × *Post2007*, indicating a decrease in the value of selected peers relative to Delaware targets following the Transkaryotic decision. Second, we estimate Eq. (1) using *Target EVS* as the dependent variable and display the results in column 2 of Panel B. The results reveal an insignificant coefficient on *Target Delaware* × *Post2007*, indicating no change in the value of targets selected following the increase in appraisal risk. Overall, the findings in this section provide reassurance that our main results are robust to the use of alternative peer groups, alternative measures of bias in peer choice, and help to rule out the concern that they are due to a shift in the underlying fundamentals of mergers, rather than the strategic selection of peers.

5. Conclusion

We study the strategic choice of peers in FO valuations obtained in M&A. Using a unique, hand-collected dataset of peer comparables, and employing a landmark 2007 Delaware court ruling that gave rise to the practice of appraisal arbitrage among hedge funds, we find evidence of a downward-biased selection of peers among targets facing an increased risk of appraisal lawsuits. Moreover, we find that the effect is stronger when target CEOs are retained by the merged firm and hold less equity in the target firm, pointing

[29] Note that the expanded definition of potential peers used to construct *PPP overall* allows for a larger sample of target-sought FO valuations (803 as compared to 663 in our original sample).

to a potential agency conflict between the target shareholders and CEO. Examining the consequences, we find evidence that the selection of lower-valued peers successfully reduces appraisal lawsuit incidence, but is also associated with lower takeover premiums received by the target. Overall, our findings are consistent with peer comparables in target-sought FOs being strategically selected to mitigate litigation risk.

Our findings contribute to three streams of literature. First, we extend the literature on the role of FOs in M&A. Although prior work suggests the existence of biases contained in FO valuations, we provide a clear explanation along with systematic evidence demonstrating *why* FOs exhibit bias. Moreover, we are the first to study the relation between litigation and FO valuations with the use of peer comparables, the most widely used valuation methodology in recent years. Second, we contribute to the literature on the role of Delaware appraisal law in the M&A market. In addition to showing the impact of appraisal risk on FO valuations, we further show the influence of FO valuations on merger outcomes such as the incidence of appraisal lawsuits and target premiums. Finally, we add to the literature on peer choice. Although the strategic selection of peers has been examined in settings such as executive compensation, analysts' valuations, fund investment portfolios, and IPO valuations, we are among the first to study the implications of peer choice in the market for corporate control.

Our findings on the strategic choice of peers in M&A and its consequences have several implications. First, it is important for M&A market participants such as target shareholders and boards to be cognizant of the incentives of target managers and investment advisors involved in FO preparation. The results of our study suggest that target CEOs facing appraisal risk may prefer downward-biased FO valuations if their incentives are aligned with the post-merger firm, which in turn is associated with reduced premiums for target shareholders. Furthermore, it is important for those involved in the appraisal process, including the courts, to be aware of the tendency for peer comparables to be biased in certain situations. Finally, as the M&A market has become increasingly flooded with litigation, it is important to understand how firms respond, and what, if any, inefficiencies and costs arise as a result.

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Appendix A
Variable definitions

This appendix provides a detailed description of the procedures used to compute each of the variables used in our analyses. Our data are obtained from Compustat, CRSP, SDC Platinum, and firms' financial filings available on EDGAR. Appraisal lawsuit data is provided by Courthouse News Service. All continuous variables except for *PPP*, *PPP overall*, and *PPP (Hoberg Phillips)* are winsorized at 1% and 99% of the distribution.

Variable	Definition
PPP	Peer Portfolio Percentile, computed as the percentile of the median EVS multiple for the selected peer group relative to the distribution of median EVS multiples for all alternative peer groups that could have been selected based on the target firm's two-digit SIC industry. EVS is calculated as the sum of the firm's market capitalization and debt minus cash holdings divided by total sales.
PPP overall	Peer Portfolio Percentile overall, computed as the percentile of the median EVS multiple for the selected peer group relative to the distribution of median EVS multiples for all alternative peer groups that could have been selected based on each peer firm's two-digit SIC industry. EVS is calculated as the sum of the firm's market capitalization and debt minus cash holdings divided by total sales.
PPP (Hoberg Phillips)	Peer Portfolio Percentile based on the Hoberg and Phillips (2010, 2016) industry classifications, computed as the percentile of the median EVS multiple for the selected peer group relative to the distribution of median EVS multiples for all alternative peer groups that could have been selected based on the target firm's Hoberg and Phillips (2010, 2016) industry classification. EVS is calculated as the sum of the firm's market capitalization and debt minus cash holdings divided by total sales.
Peer EVS - Target EVS	The natural log of one plus the difference between the median EVS multiple for the selected peer group and the EVS multiple for the target. EVS is calculated as the sum of the firm's market capitalization and debt minus cash holdings divided by total sales.
Target EVS	The natural log of one plus the EVS multiple of the target firm, where EVS is calculated as the sum of the firm's market capitalization and debt minus cash holdings divided by total sales.
Appraisal Lawsuit	An indicator variable equal to one if there is at least one appraisal lawsuit filed for the merger, and zero otherwise.
Premium	The natural log of one plus the offer price divided by the target's closing stock price one week prior to the merger announcement.
Target Delaware	An indicator variable equal to one if the target firm is incorporated in Delaware, and zero otherwise.
Post2007	An indicator variable equal to one if the merger is announced after calendar year 2007, and zero otherwise.
Y2002-2004	An indicator variable equal to one if the merger is announced in calendar years 2002, 2003 or 2004, and zero otherwise.
Y2005-2007	An indicator variable equal to one if the merger is announced in calendar years 2005, 2006 or 2007, and zero otherwise.
Y2008-2010	An indicator variable equal to one if the merger is announced in calendar years 2008, 2009 or 2010, and zero otherwise.
Y2011-2013	An indicator variable equal to one if the merger is announced in calendar years 2011, 2012 or 2013, and zero otherwise.
Y2014-2015	An indicator variable equal to one if the merger is announced in calendar years 2014 or 2015, and zero otherwise.
ROA	The ratio of the target firm's income before extraordinary items to total assets for the fiscal year prior to the merger announcement.
BTM	The ratio of the target firm's book value of assets to the market value of assets for the fiscal year prior to the merger announcement, where market value of assets is defined as the book value of assets plus the market value of equity minus the book value of equity.

Loss	An indicator variable equal to one if the target firm's net income is negative for the fiscal year prior to the merger announcement, and zero otherwise.
Lev	The target firm's total current and long-term debt scaled by total assets, for the fiscal year prior to the merger announcement.
Deal size	The natural log of the value of the merger transaction measured at the announcement date of the merger.
Deal length	The number of days between the merger announcement date and completion date.
Percent cash	The percentage of the overall merger consideration consisting of cash, per SDC.
Acquirer-sought FO	An indicator variable equal to one if an acquirer-sought FO is available for the merger, and zero otherwise.

Appendix B
Example of peer comparables analysis

This appendix provides an example of a comparable company analysis contained in a target-sought fairness opinion (Zygo 2014). The target, Zygo Corporation ("Zygo"), is a Delaware-incorporated firm, and the acquirer is AMETEK, Inc. The deal was announced publicly on April 11, 2014 and completed on June 20, 2014. Zygo retained Barclays plc ("Barclays") to provide it with financial advisory services and a fairness opinion in connection with the proposed merger. The following excerpt is taken from Zygo's DEFM 14A filing made on May 21, 2014:

Selected Comparable Company Analysis. In order to assess how the public market values shares of similar publicly traded companies, Barclays reviewed and compared specific financial and operating data relating to Zygo with selected companies that Barclays deemed comparable to Zygo. The selected comparable companies were:

- Electro Scientific Industries, Inc.
- II-VI Incorporated
- Nanometrics Incorporated
- Newport Corporation
- Nova Measuring Instruments, Ltd.
- Orbotech Ltd.
- Rofin-Sinar Technologies Inc.
- Rudolph Technologies, Inc.

Barclays calculated and compared various financial multiples and ratios of Zygo and the selected comparable companies. As part of its selected comparable company analysis, Barclays calculated and analyzed each company's enterprise value to certain financial criteria (including revenue and…EBITDA) for calendar years 2013 and 2014…and each company's ratio of its current stock price to estimated earnings per share…All of these calculations were performed, and based on publicly available financial data and closing prices, as of April 9, 2014, the last trading date prior to the delivery of Barclays' opinion. The results of this selected comparable company analysis are summarized below:

	Multiple Range of Comparable Companies					
	CY13E			**CY14E**		
	Low	**Median**	**High**	**Low**	**Median**	**High**
EV / Revenue	0.88x	1.52x	2.25x	0.83x	1.30x	1.56x
EV / EBITDA	7.2x	8.9x	13.3x	5.9x	8.2x	10.0x
P/E	17.0x	20.4x	21.0x	12.9x	17.3x	27.6x

Barclays selected the comparable companies listed above because their businesses and operating profiles are reasonably similar to that of Zygo. However, because of the inherent differences between the business, operations and prospects of Zygo and those of the selected comparable companies, Barclays believed that it was inappropriate to, and therefore did not, rely solely on the quantitative results of the selected comparable company analysis. Accordingly, Barclays also made qualitative judgments concerning differences between the business, financial and operating characteristics and prospects of Zygo and the selected comparable companies that could affect the public trading values of each in order to provide a context in which to consider the results of the quantitative analysis…Based upon these judgments, Barclays selected a range of 1.30x to 1.70x multiples of CY14E revenue, 6.5x to 8.5x multiples of CY14E EBITDA and 15.0x to 18.0x multiples of CY14E net income and applied such ranges to the corresponding metric in the management projections to calculate the following implied prices per share of Zygo common stock:

	Low	**High**
CY14E Revenue	$17.00	$20.63
CY14E EBITDA	$17.68	$21.52
CY14E Net Income	$14.92	$17.77

Barclays noted that on the basis of the selected comparable company analysis, the transaction consideration of $19.25 per share was within the range of values per share implied by the analysis of CY14E revenue and CY14E EBITDA and above the range of values implied by the analysis of CY14E net income.

Figure 1
Timeline of the merger and the Delaware appraisal process

This figure, drawn from Jetley and Ji (2016), shows the timeline for a typical friendly all-cash deal. The brackets connecting 'Record date' and 'Deal Consummation' refer to the impact of the 2007 Delaware Court of Chancery ruling on the appraisal process. Prior to the ruling, any shares on which an investor intended to seek appraisal must have been held as of the Record date to have appraisal rights on those shares. But after the ruling, so long as the investor had notified the target firm of their intention to seek appraisal on even a single share, the investor can obtain additional shares up until the completion of the merger and still seek appraisal on those additional shares. Thus the Delaware court ruling allowed appraisal arbitrageurs to view the outcome of the shareholder vote on the deal before purchasing additional shares on which to seek appraisal, effectively eliminating any risk of investing in deals that would end up being terminated.

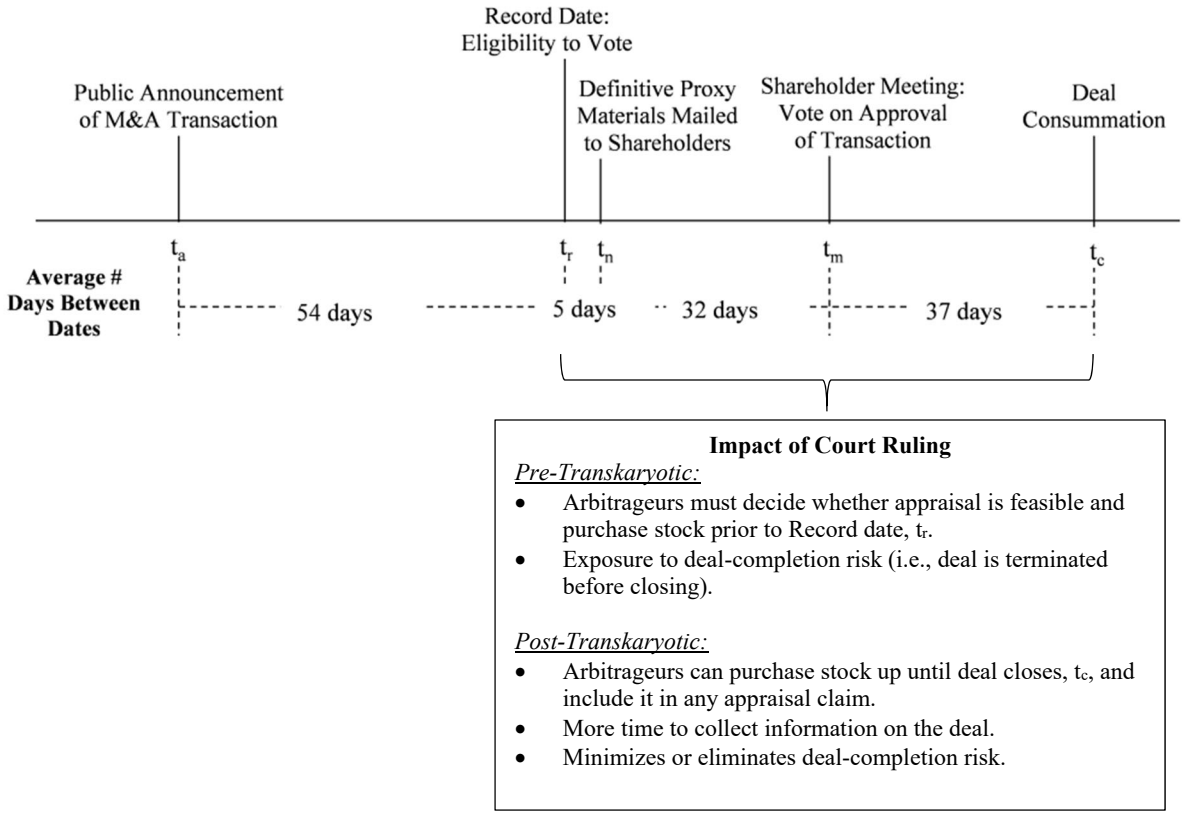
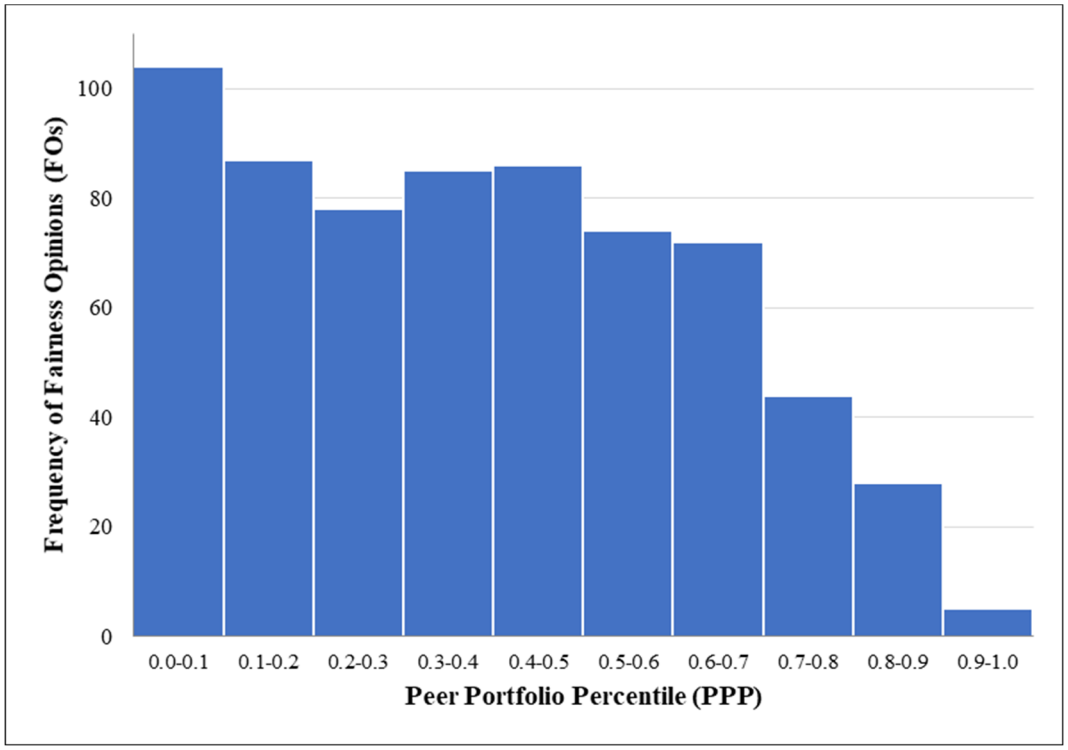


Figure 2
Distribution and summary statistics for PPP in target-sought FO valuations

Panel A presents a histogram for the distribution of the Peer Portfolio Percentile (*PPP*) for target-sought FO valuations in our sample. The potential peers are those that are in the same two-digit SIC industry code as the target firm. Panel B reports summary statistics for *PPP*.

Panel A: Distribution of PPP



Panel B: PPP summary statistics

	N	Mean	Std Dev.	Min	P25	P50	P75	Max
PPP	663	0.384	0.245	0.000	0.171	0.374	0.575	0.984

Figure 3
Examining peer selection in target-sought FO valuations for Delaware mergers over time

This figure provides a visual representation of the change over time in peer selection (*PPP*) among target-sought FO valuations for Delaware-incorporated targets. The x-axis represents mergers announced during years 2000-2001, 2002-2004, 2005-2007, 2008-2010, 2011-2013, and 2014-2015. The y-axis represents the difference in *PPP* for target-sought FO valuations among Delaware-incorporated targets and non-Delaware-incorporated targets. A version of Eq. (1) is estimated but the *Post2007* indicator variable is replaced by separate indicator variables for each of the time periods listed along the x-axis. The coefficients are plotted along with a 90% confidence interval, calculated based on standard errors clustered at the state level. Note that 2000-2001 has a coefficient of zero and no confidence interval because it serves as the benchmark period.

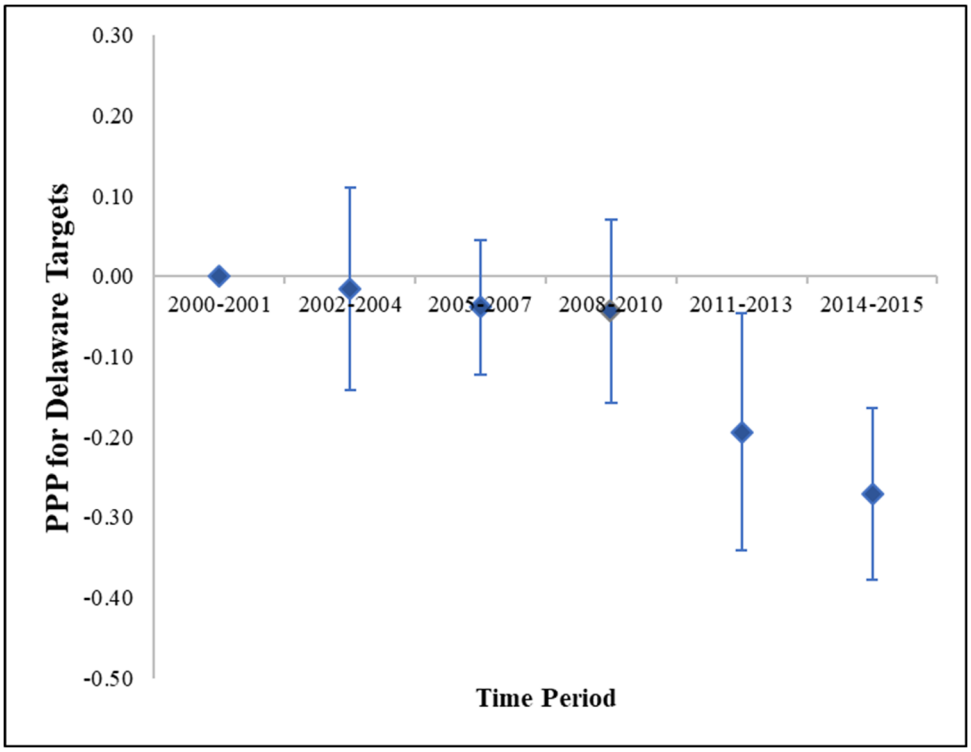


Figure 4
Appraisal lawsuits involving Delaware-incorporated public target firms by year

This figure plots, by year, the number (left axis) and percentage (right axis) of mergers of Delaware-incorporated public target firms that face an appraisal challenge in our sample over the period 2004-2015. Data on appraisal lawsuits is provided by Courthouse News Service.

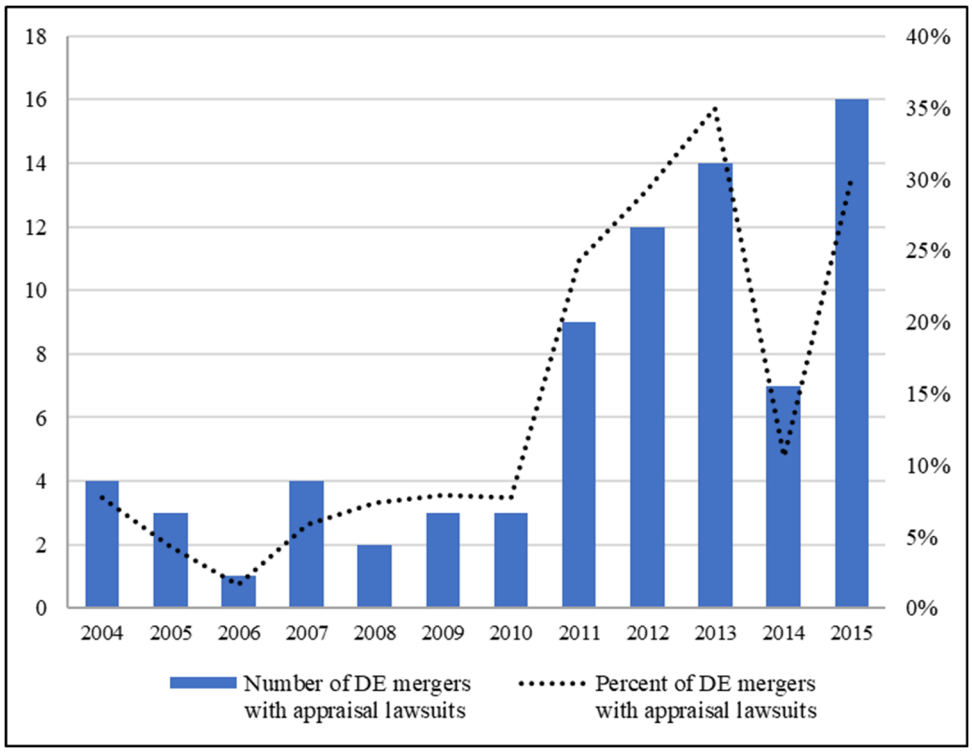


Table 1
Sample selection and distribution

This table presents the sample selection procedure and sample distribution by year. Panel A shows the steps to obtain the final sample of mergers and target-sought FOs used throughout the analysis. Panel B lists the number and percentage of sample target-sought FOs by merger announcement year, as well as the numbers pertaining to mergers involving Delaware-incorporated and non-Delaware-incorporated target firms.

Panel A: Sample selection procedure

	Remaining mergers	Remaining FOs
SDC mergers with U.S. public target and acquirer firms (2000-2015)	2,899	-
Less: Mergers for which the acquirer seeks less than 100 percent of the target	2,658	-
Less: Mergers structured as tender offers	2,268	-
Less: Mergers for which the acquirer or target is in the financial services industry	1,464	-
Less: Mergers for which we are unable to identify a target-sought FO	1,018	1,157
Less: FOs for which we are unable to match the target or peer firms to Compustat	952	1,083
Less: FOs for which *PPP* cannot be computed	746	808
Less: FOs for withdrawn mergers	704	765
Less: FOs for targets with missing data required for control variables	611	663
Sample of mergers and FOs	611	663

Panel B: Sample distribution by announcement year

Year	Number of merger FOs	Percent of sample	Number of DE merger FOs	Number of non-DE merger FOs
2000	79	11.92%	47	32
2001	67	10.11%	43	24
2002	29	4.37%	20	9
2003	33	4.98%	28	5
2004	34	5.13%	25	9
2005	65	9.80%	40	25
2006	58	8.75%	39	19
2007	46	6.94%	33	13
2008	27	4.07%	20	7
2009	30	4.52%	21	9
2010	31	4.68%	19	12
2011	23	3.47%	18	5
2012	35	5.28%	26	9
2013	29	4.37%	22	7
2014	37	5.58%	33	4
2015	40	6.03%	32	8
Total	663	100.00%	466	197

Table 2
Summary statistics

This table presents summary statistics for the main sample and variables of interest. Panel A reflects summary statistics for characteristics of the target-sought FOs, mergers, and target firms during the period 2000-2015. Panel B presents summary statistics regarding the number of peers within the target-sought FO valuations. Panel C shows the mean and median values for characteristics of the target firm and the selected peer firms in target-sought FOs, as well as tests for the differences in the mean and median values between the two groups of firms.

Panel A: Summary statistics for main sample

	N	Mean	Std Dev.	Min	P25	P50	P75	Max
Dependent variables:								
PPP	663	0.38	0.24	0.00	0.17	0.37	0.57	0.98
PPP overall	803	0.37	0.25	0.00	0.16	0.34	0.56	0.98
PPP (Hoberg Phillips)	569	0.35	0.24	0.00	0.14	0.34	0.54	0.99
Peer EVS - Target EVS	560	0.41	0.87	-2.93	0.01	0.29	0.77	4.42
Target EVS	560	0.87	0.66	-1.09	0.45	0.76	1.17	4.43
Appraisal Lawsuit	488	0.12	0.33	0.00	0.00	0.00	0.00	1.00
Premium	632	0.27	0.24	-1.44	0.13	0.25	0.38	1.44
Independent variables:								
Target Delaware	663	0.70	0.46	0.00	0.00	1.00	1.00	1.00
ROA	663	-0.07	0.31	-3.74	-0.09	0.02	0.07	0.34
BTM	663	0.64	0.34	0.02	0.40	0.60	0.82	2.15
Loss	663	0.41	0.49	0.00	0.00	0.00	1.00	1.00
Lev	663	0.20	0.22	0.00	0.00	0.13	0.33	1.15
Deal size	663	6.54	1.81	1.42	5.35	6.54	7.79	11.19
Deal length	663	128.46	81.99	29.00	77.00	105.00	153.00	693.00
Percent cash	663	0.48	0.43	0.00	0.00	0.44	1.00	1.00
Acquirer-sought FO	663	0.26	0.44	0.00	0.00	0.00	1.00	1.00

Panel B: Number of peers within fairness opinions

	N	Mean	Std Dev.	Min	P25	P50	P75	Max
Total number of peers	663	8.57	4.13	3.00	6.00	8.00	11.00	35.00
Peers within target 2-digit SIC code	663	6.94	3.42	3.00	4.00	6.00	9.00	27.00

Panel C: Target and peer firm characteristics

	Target firms		Peer firms		Difference in means	Difference in medians
	Mean (1)	Median (2)	Mean (3)	Median (4)	(3) - (1)	(4) - (2)
Sales ($)	1,620.86	211.85	4,140.90	542.77	2520.04***	330.92***
Market value ($)	2,327.47	443.48	8,131.37	1,223.25	5803.9***	779.77***
ROA	-0.07	0.02	-0.03	0.04	0.04***	0.02***
BTM	0.63	0.58	0.57	0.54	-0.06***	-0.04***
Loss	0.43	0.00	0.32	0.00	-0.11***	0.00
Lev	0.19	0.10	0.20	0.15	0.01**	0.05***
EVS (Enterprise value-to-sales)	6.76	1.62	14.81	1.98	8.05***	0.36***

Table 3
The impact of appraisal risk on peer selection in target-sought FO valuations

Panel A presents the results from examining the impact of appraisal risk on peer firm selection in target-sought FO valuations. Panel B presents the results separately for mergers involving above-median dollar values ("Large Deals") in column 1, and below-median dollar values ("Small Deals") in column 2. The sample consists of mergers with target-sought FO valuations announced between 2000 and 2015. The dependent variable, *PPP*, is the percentile of the median peer EVS relative to the distribution of possible medians that could have been selected based on the target firm's two-digit SIC industry. *Target Delaware* is an indicator variable equal to one if the target firm is incorporated in Delaware, and zero otherwise. *Post2007* is an indicator variable equal to one for mergers announced in calendar years beginning after 2007, and zero otherwise. A constant term is included in all regressions, but not reported. All variables are defined in Appendix A. The t-statistics are reported below coefficient estimates in parentheses and are calculated based on standard errors clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively, using a two-tailed *t*-test.

Panel A: Full sample

Dependent variable:		*PPP*	
	Pr. Sign	(1)	(2)
Target Delaware		-0.001	0.019
		(-0.03)	(0.47)
Target Delaware × *Post2007*	-	-0.126***	
		(-3.19)	
Target Delaware × *Y2002-2004*	0		-0.015
			(-0.20)
Target Delaware × *Y2005-2007*	0		-0.038
			(-0.77)
Target Delaware × *Y2008-2010*	-/0		-0.044
			(-0.64)
Target Delaware × *Y2011-2013*	-		-0.194**
			(-2.21)
Target Delaware × *Y2014-2015*	-		-0.271***
			(-4.25)
ROA		-0.036	-0.037
		(-1.32)	(-1.39)
BTM		-0.037	-0.038
		(-0.92)	(-0.92)
Loss		0.057**	0.063**
		(2.43)	(2.74)
Lev		-0.161***	-0.147***
		(-6.27)	(-5.20)
Deal size		0.020**	0.020**
		(2.61)	(2.70)
Deal length		-0.000**	-0.000**
		(-2.55)	(-2.43)
Percent cash		-0.032	-0.026
		(-1.16)	(-1.06)
Acquirer-sought FO		-0.047***	-0.045***
		(-3.00)	(-2.80)
Year FE		Yes	Yes
Industry FE		Yes	Yes
S.E. clustered by state		Yes	Yes
Observations		663	663
R-squared		0.213	0.223

Table 3 (continued)

Panel B: Large vs. small mergers

Dependent variable:		*PPP*	
Group:		Large Deals	Small Deals
	Pr. Sign	(1)	(2)
Target Delaware		0.015	-0.042
		(0.46)	(-1.61)
Target Delaware × *Post2007*	-,0	-0.174***	0.019
		(-2.98)	(0.38)
ROA		-0.243***	-0.048*
		(-3.60)	(-1.92)
BTM		-0.190	0.026
		(-1.31)	(1.12)
Loss		0.008	0.056**
		(0.18)	(2.72)
Lev		-0.175***	-0.034
		(-4.01)	(-0.51)
Deal size		0.012	0.028***
		(1.52)	(3.20)
Deal length		-0.000***	0.000
		(-2.78)	(0.20)
Percent cash		-0.001***	0.000
		(-4.49)	(1.00)
Acquirer-sought FO		-0.077**	-0.018
		(-2.67)	(-0.53)
p-value for difference in coef. on *Target Delaware* x *Post2007*		< 0.01	
Year FE		Yes	Yes
Industry FE		Yes	Yes
S.E. clustered by state		Yes	Yes
Observations		333	330
R-squared		0.364	0.196

Table 4
The impact of appraisal risk on peer selection conditional on target CEO incentives

This table presents the results from examining the effect of target CEO incentives on the relation between appraisal risk and peer firm selection in target-sought FO valuations. The sample consists of mergers with target-sought FO valuations announced between 2000 and 2015. The sample is partitioned into mergers in which there are High Agency Conflicts and Low Agency Conflicts, based on two criteria: target CEO retention at the merged firm and target CEO ownership prior to the merger. The merger is classified as having High Agency Conflicts when the target CEO is retained at the merged firm and target CEO ownership prior to the merger is below the sample mean. Otherwise, the merger is classified as having Low Agency Conflicts. Column 1 (column 2) displays the relation between appraisal risk and peer firm selection in target-sought FO valuations for the High Agency Conflicts (Low Agency Conflicts) group. The dependent variable, *PPP*, is the percentile of the median peer EVS relative to the distribution of possible medians that could have been selected based on the target firm's two-digit SIC industry. *Target Delaware* is an indicator variable equal to one if the target firm is incorporated in Delaware, and zero otherwise. *Post2007* is an indicator variable equal to one for mergers announced in calendar years beginning after 2007, and zero otherwise. A constant term is included in all regressions, but not reported. All variables are defined in Appendix A. The t-statistics are reported below coefficient estimates in parentheses and are calculated based on standard errors clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively, using a two-tailed *t*-test.

Dependent variable:		*PPP*	
Group:		High Agency Conflicts	Low Agency Conflicts
	Pr. Sign	(1)	(2)
Target Delaware		-0.000	0.009
		(-0.01)	(0.50)
Target Delaware × *Post2007*	-,0	-0.254***	-0.103***
		(-3.09)	(-3.50)
ROA		0.138***	-0.054**
		(3.33)	(-2.05)
BTM		0.094*	-0.058**
		(1.85)	(-2.21)
Loss		0.146***	0.061***
		(3.02)	-3.19
Lev		-0.184*	-0.152***
		(-1.95)	(-4.95)
Deal size		0.024*	0.021***
		(1.88)	-2.73
Deal length		-0.001**	-0.000***
		(-2.51)	(-2.85)
Percent cash		-0.152***	-0.013
		(-3.31)	(-0.57)
Acquirer-sought FO		-0.165***	-0.024
		(-6.07)	(-1.48)
p-value for difference in coef. on *Target Delaware* x *Post2007*		0.07	
Year FE		Yes	Yes
Industry FE		Yes	Yes
S.E. clustered by state		Yes	Yes
Observations		102	561
R-squared		0.564	0.220

Table 5
The impact of appraisal risk on peer selection conditional on financial advisor reputation

This table presents the results from examining the effect of financial advisor reputation on the relation between appraisal risk and peer firm selection in target-sought FO valuations. The sample consists of mergers with target-sought FO valuations announced between 2000 and 2015. Column 1 (column 2) displays the impact when the target firm uses a top-tier (non-top-tier) financial advisor to issue a FO valuation. Financial advisor reputation is based on how often they are asked to provide FOs in mergers during the sample period. Financial advisors are considered top-tier if they are among the top five most frequently used advisors, and non-top-tier otherwise. The dependent variable, *PPP*, is the percentile of the median peer EVS relative to the distribution of possible medians that could have been selected based on the target firm's two-digit SIC industry. *Target Delaware* is an indicator variable equal to one if the target firm is incorporated in Delaware, and zero otherwise. *Post2007* is an indicator variable equal to one for mergers announced in calendar years beginning after 2007, and zero otherwise. A constant term is included in all regressions, but not reported. All variables are defined in Appendix A. The t-statistics are reported below coefficient estimates in parentheses and are calculated based on standard errors clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively, using a two-tailed *t*-test.

Dependent variable:		*PPP*	
Group:		Top Advisor	Non-Top Advisor
	Pr. Sign	(1)	(2)
Target Delaware		-0.038	0.001
		(-1.15)	-0.07
Target Delaware × *Post2007*	0,-	-0.069	-0.131***
		(-1.24)	(-2.80)
ROA		-0.254**	-0.034*
		(-1.99)	(-1.82)
BTM		-0.148	0.015
		(-1.17)	-0.57
Loss		0.052	0.050**
		-0.89	-2.52
Lev		-0.279***	-0.108***
		(-4.08)	(-2.99)
Deal size		0.018**	0.024***
		(1.96)	(3.01)
Deal length		0.000	-0.000***
		(1.26)	(-3.50)
Percent cash		-0.005	-0.040
		(-0.09)	(-1.60)
Acquirer-sought FO		-0.063**	-0.052***
		(-2.01)	(-3.12)
p-value for difference in coef. on *Target Delaware* x *Post2007*		0.42	
Year FE		Yes	Yes
Industry FE		Yes	Yes
S.E. clustered by state		Yes	Yes
Observations		203	460
R-squared		0.379	0.221

Table 6
The relation between peer firm selection and the incidence of appraisal lawsuits

Panel A displays the sample selection process for appraisal lawsuits filed during calendar years 2003 to 2015, as obtained from Courthouse News Service. Panel B presents the results from examining the relation between peer firm selection bias and the incidence of appraisal lawsuits. The sample consists of mergers with target-sought FO valuations announced between 2003 and 2015. The sample is partitioned into mergers with Low PPP and High PPP. The merger is classified as having Low PPP (High PPP) if *PPP* is in the bottom tercile (top two terciles) of the sample. Column 1 displays the results for the entire sample of mergers, whereas column 2 (column 3) displays the results for the High PPP (Low PPP) group. The dependent variable, *Appraisal Lawsuit*, is an indicator variable equal to one if there is at least one appraisal lawsuit filed for the merger, and zero otherwise. *Target Delaware* is an indicator variable equal to one if the target firm is incorporated in Delaware, and zero otherwise. *Post2007* is an indicator variable equal to one for mergers announced in calendar years beginning after 2007, and zero otherwise. A constant term is included in all regressions, but not reported. All variables are defined in Appendix A. The t-statistics are reported below coefficient estimates in parentheses and are calculated based on standard errors clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively, using a two-tailed *t*-test.

Panel A: Appraisal lawsuit sample selection

	Remaining lawsuits	Remaining mergers
Appraisal lawsuits filed in Delaware Chancery Court (2003-2015)	322	-
Less: Lawsuits for non-public targets and those unable to match to SDC	173	137
Less: Lawsuits for mergers with non-public acquirers	97	74
Less: Lawsuits for targets missing FOs or control variables	68	60
Sample of mergers with appraisal lawsuits	68	60

Table 6 (continued)

Panel B: Regression analysis

Dependent variable:		*Appraisal Lawsuit*		
Group:		All	High PPP	Low PPP
	Pr. Sign	(1)	(2)	(3)
Target Delaware		0.029*	0.001	0.054
		(2.05)	(0.07)	(1.50)
Target Delaware × *Post2007*	+,+,0	0.142***	0.203***	0.064
		(3.88)	(4.70)	(1.09)
ROA		0.026**	0.034**	0.027**
		(2.46)	(2.41)	(2.44)
BTM		-0.092***	-0.099***	-0.046
		(-4.69)	(-4.10)	(-1.23)
Loss		0.074***	0.090***	0.040**
		(6.03)	(6.09)	(2.14)
Lev		0.128***	-0.016	0.479***
		(4.51)	(-0.64)	(6.07)
Deal size		0.004	0.023***	-0.017*
		(1.34)	(3.13)	(-1.89)
Deal length		0.000**	-0.000	0.000***
		(2.08)	(-0.01)	(5.80)
Percent cash		0.154***	0.144***	0.180**
		(3.84)	(10.03)	(2.50)
Acquirer-sought FO		-0.019	-0.042***	0.009
		(-1.65)	(-3.28)	(0.29)
p-value for difference in coef. on *Target Delaware* x *Post2007*			< 0.01	
Year FE		Yes	Yes	Yes
Industry FE		Yes	Yes	Yes
S.E. clustered by state		Yes	Yes	Yes
Observations		488	324	164
R-squared		0.379	0.426	0.477

Table 7
The relation between appraisal risk, peer selection, and merger premiums

This table presents the results from examining the relation between appraisal risk, peer firm selection in target-sought FO valuations, and merger premiums. The sample consists of mergers with target-sought FO valuations announced between 2000 and 2015. The sample is partitioned into mergers with Low PPP and High PPP. The merger is classified as having Low PPP (High PPP) if *PPP* is in the bottom tercile (top two terciles) of the sample. Column 1 displays the results for the entire sample of mergers, whereas column 2 (column 3) displays the results for the High PPP (Low PPP) group. The dependent variable, *Premium*, is the natural log of one plus the offer price divided by the target's closing stock price one week prior to the merger announcement. *Target Delaware* is an indicator variable equal to one if the target firm is incorporated in Delaware, and zero otherwise. *Post2007* is an indicator variable equal to one for mergers announced in calendar years beginning after 2007, and zero otherwise. A constant term is included in all regressions, but not reported. All variables are defined in Appendix A. The t-statistics are reported below coefficient estimates in parentheses and are calculated based on standard errors clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively, using a two-tailed *t*-test.

Dependent variable:		*Premium*		
Group:		All	High PPP	Low PPP
	Pr. Sign	(1)	(2)	(3)
Target Delaware		-0.050***	-0.016	-0.078***
		(-2.98)	(-0.87)	(-3.15)
Target Delaware × *Post2007*	+,+,0	0.059*	0.058*	-0.051
		(1.96)	(1.82)	(-0.72)
ROA		-0.044***	-0.095***	0.179***
		(-4.05)	(-8.93)	(4.17)
BTM		0.055*	0.100***	-0.061
		(1.83)	(4.03)	(-1.05)
Loss		0.008	-0.020	0.078**
		(0.40)	(-0.97)	(2.45)
Lev		-0.029	-0.059	0.070
		(-0.53)	(-0.67)	(1.05)
Deal size		-0.004	-0.005	0.001
		(-0.81)	(-1.34)	(0.09)
Deal length		-0.000	-0.000**	-0.000*
		(-1.21)	(-2.12)	(-1.74)
Percent cash		0.064***	0.015	0.132***
		(3.46)	(0.79)	(3.45)
Acquirer-sought FO		0.030*	0.034*	0.017
		(1.77)	(1.82)	(0.48)
p-value for difference in coef. on *Target Delaware* x *Post2007*			0.13	
Year FE		Yes	Yes	Yes
Industry FE		Yes	Yes	Yes
S.E. clustered by state		Yes	Yes	Yes
Observations		632	421	211
R-squared		0.130	0.189	0.292

Table 8
Falsification test: The impact of appraisal risk on peer selection in acquirer-sought FO valuations

This table presents the results of a robustness test examining the impact of appraisal risk on peer firm selection in target-sought FOs for a subsample of mergers containing acquirer-sought FOs (column 1), as well as the results of a falsification test examining the impact of appraisal risk on peer firm selection in acquirer-sought FO valuations (column 2). The sample consists of mergers with both target-sought and acquirer-sought FO valuations announced between 2000 and 2015. The dependent variable, *PPP*, is the percentile of the median peer EVS relative to the distribution of possible medians that could have been selected based on the target firm's two-digit SIC industry. *Target Delaware* is an indicator variable equal to one if the target firm is incorporated in Delaware, and zero otherwise. A constant term is included in all regressions, but not reported. All variables are defined in Appendix A. The t-statistics are reported below coefficient estimates in parentheses and are calculated based on standard errors clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively, using a two-tailed *t*-test.

Dependent variable:		*PPP*	
Group:		Target-sought FOs	Acquirer-sought FOs
	Pr. Sign	(1)	(2)
Target Delaware		0.069	-0.079
		(0.99)	(-1.02)
Target Delaware × *Y2002-2004*	0	-0.122	0.099
		(-1.16)	(0.77)
Target Delaware × *Y2005-2007*	0	-0.130	0.067
		(-1.24)	(0.76)
Target Delaware × *Y2008-2010*	0	0.124	0.057
		(1.27)	(0.60)
Target Delaware × *Y2011-2013*	-,0	-0.411***	-0.168
		(-2.87)	(-1.50)
Target Delaware × *Y2014-2015*	-,0	-0.494***	0.013
		(-2.94)	(0.11)
ROA		0.069**	0.196***
		(2.49)	(4.68)
BTM		-0.107**	-0.063
		(-2.12)	(-0.66)
Loss		0.219***	0.242***
		(3.23)	(5.48)
Lev		-0.342**	-0.087
		(-2.48)	(-0.64)
Deal size		0.013	0.031**
		(0.96)	(2.14)
Deal length		-0.000	-0.000
		(-0.11)	(-1.30)
Percent cash		-0.079	-0.115
		(-1.41)	(-1.39)
Year FE		Yes	Yes
Industry FE		Yes	Yes
S.E. clustered by state		Yes	Yes
Observations		131	131
R-squared		0.414	0.450

Table 9
The impact of appraisal risk on peer selection in target-sought FO valuations: Robustness

Panel A presents the results from examining the robustness of the main findings to the use of alternative potential peer groups. Panel B presents the results from examining an alternative measure of peer firm selection bias (column 1), and a falsification test examining changes in the value of selected targets (column 2). The sample consists of mergers with target-sought FO valuations announced between 2000 and 2015. *PPP overall* is the percentile of the median peer EVS relative to the distribution of possible medians that could have been selected based on each peer's two-digit SIC industry. *PPP (Hoberg and Phillips)* is the percentile of the median peer EVS relative to the distribution of possible medians that could have been selected based on the target's Hoberg and Phillips (2010, 2016) industry. *Peer EVS - Target EVS* is the natural log of one plus the difference between the median EVS of the selected peers and the EVS of the target firm. *Target EVS* is one plus the natural log of the EVS of the target firm. *Target Delaware* is an indicator variable equal to one if the target firm is incorporated in Delaware, and zero otherwise. *Post2007* is an indicator variable equal to one for mergers announced in calendar years beginning after 2007, and zero otherwise. A constant term is included in all regressions, but not reported. All variables are defined in Appendix A. The t-statistics are reported below coefficient estimates in parentheses and are calculated based on standard errors clustered at the state level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively, using a two-tailed *t*-test.

Panel A: Alternative potential peer groups

Dependent variable:		*PPP overall*	*PPP (Hoberg Phillips)*
	Pr. Sign	(1)	(2)
Target Delaware		0.034*	0.010
		(1.76)	(0.38)
Target Delaware × *Post2007*	-	-0.145***	-0.077*
		(-3.90)	(-1.75)
ROA		-0.034	-0.001
		(-1.50)	(-0.07)
BTM		-0.001	0.027
		(-0.04)	(0.80)
Loss		0.031*	-0.009
		(1.85)	(-0.56)
Lev		-0.099**	-0.031
		(-2.41)	(-0.84)
Deal size		0.009	0.002
		(1.39)	(0.19)
Deal length		-0.000*	0.000
		(-1.91)	(0.13)
Percent cash		-0.032*	-0.064***
		(-1.70)	(-4.06)
Acquirer-sought FO		-0.031**	-0.045**
		(-2.67)	(-2.17)
Year FE		Yes	Yes
Industry FE		Yes	Yes
S.E. clustered by state		Yes	Yes
Observations		803	569
R-squared		0.149	0.135

Table 9 (continued)

Panel B: Comparison of changes in peer EVS to target EVS and a falsification test

Dependent variable:		*Peer EVS - Target EVS*	*Target EVS*
	Pr. Sign	(1)	(2)
Target Delaware		0.207**	0.090
		(2.48)	(1.21)
Target Delaware × Post2007	-,0	-0.185*	-0.075
		(-2.03)	(-1.05)
ROA		-0.102	0.099***
		(-1.64)	(3.49)
BTM		-0.029	-0.842***
		(-0.29)	(-5.81)
Loss		0.260***	0.144***
		(5.03)	(3.17)
Lev		0.261**	-0.637***
		(2.52)	(-9.79)
Deal size		0.036	0.080***
		(1.32)	(5.35)
Deal length		-0.001***	-0.001***
		(-3.81)	(-4.59)
Percent cash		-0.252***	-0.120**
		(-4.33)	(-2.49)
Acquirer-sought FO		0.101*	0.113***
		(1.91)	(3.20)
Year FE		Yes	Yes
Industry FE		Yes	Yes
S.E. clustered by state		Yes	Yes
Observations		560	560
R-squared		0.360	0.581