

Preliminary Draft
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Appraisal Arbitrage – Is There a Delaware Advantage?

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DRAFT: June 2015

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We thank Michael Cliff, Charles Nathan, and Kevin Shannon for providing helpful comments.

The authors and other professionals of Analysis Group, Inc. have advised clients on appraisal litigation matters. The opinions expressed do not necessarily reflect those of Analysis Group, Inc. All errors remain the authors' own.

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I. INTRODUCTION

There has been an increase in recent years in appraisal rights actions filed in the Delaware Chancery Court. The uptick is seen both in the number of appraisal petitions being filed and the total dollar amount at stake in appraisal proceedings.³ Commentators have linked the recent rise in appraisal actions to the emergence of appraisal arbitrageurs⁴ – hedge funds that seek to find transactions where the court-appraised value is likely to be higher than the transaction price. Merion Capital and Magnetar Financial are two of the prominent appraisal arbitrageurs. For example, it is reported that as of early 2015, Merion Capital had about \$1 billion under management and was participating in several active appraisal cases.⁵

Appraisal arbitrageurs take relatively large positions in the common stocks of public companies that are targets of mergers or acquisitions. In 2014, Merion Capital sought an appraisal of 1,255,000 shares of Ancestry.com common stock, which were worth more than \$40 million at the transaction price of \$32 per share.⁶ Arbitrageurs take a position after an M&A transaction is announced, often several months after the deal announcement. They then dissent from the proposed merger, forego the merger consideration, and seek a higher value than the transaction price via an appraisal action pursuant to Section 262 of the Delaware General Corporation Law.⁷

Appraisal arbitrage is not risk free. Arbitrageurs spend considerable time and resources identifying potential investment opportunities. Once an appraisal action is launched, the arbitrageurs must go through a fairly lengthy litigation process to demonstrate that the consideration offered to the target shareholders is lower than the fair value of the target stock. Of course, after that lengthy process, there is always a possibility that the court-determined value turns out to be even lower than the consideration paid in the transaction.

Market observers have devoted a fair amount of attention to possible reasons underlying the recent rise in appraisal actions. A number of commentators have connected the increase to recent rulings reaffirming appraisal rights of shares bought by appraisal arbitrageurs after the record date of the relevant transactions.⁸ Other reasons posited for the current surge in appraisal activity include the relatively high interest rate on the appraisal award and a belief that the Delaware Chancery Court may feel more comfortable finding fair values in excess of, rather than below, the transaction price. This hypothesis seems to be based on the observation of recent rulings in which court-determined fair values have been mostly at or above the

³ For example, see Myers M., and C. R. Korsmo, “Appraisal Arbitrage and the Future of Public Company M&A,” Working Paper, Brooklyn Law School, August 2014, Forthcoming in *Washington University Law Review*.

⁴ *Ibid.*

⁵ Hoffman, Liz, “Hedge Funds Plan to Seek Higher Price for Safeway,” *The Wall Street Journal*, February 2, 2015.

⁶ *In Re Appraisal of Ancestry.com*, C.A. No. 8173-VCG, January 5, 2015, p. 3.

⁷ Section 251(h) of the Delaware corporation law also permits appraisal for target shareholders in exchange offers.

⁸ See, for example, O’Keefe, Nicholas, “Delaware Appraisal Actions Are Likely to Continue to Increase in Frequency Following Two Recent Delaware Chancery Court Decisions,” in Kaye Scholer LLP’s *M&A and Corporate Governance Newsletter*, Winter 2015.

transaction price.⁹ Of course, one needs to be mindful of the potential selection bias when drawing conclusions based on outcomes of appraisal actions – that is, dissenting shareholders may be more likely to seek appraisal in instances where the transaction price is in fact lower than the fair value. However, it is interesting to note that in the *Ancestry.com* matter (which is one of the three recent cases where the Court-appraised fair value is equal to the actual transaction price), Vice Chancellor Glasscock’s valuation result was \$31.79, but chose to adopt the slightly higher actual transaction price of \$32 as “the best indicator of Ancestry’s fair value as of the Merger Date.”¹⁰ Such decisions lend support to the notion that the Delaware Chancery Court is likely to determine fair value that is at least equal to the transaction price.

In this paper, we examine the extent to which economic incentives may have improved for appraisal arbitrageurs in recent years, which could help to explain the observed increase in appraisal activity. We investigate three specific issues.

First, we examine the economic implications of permitting appraisal rights to shares that were purchased after the record date. We do not question the legislative intent behind this law; instead, we simply investigate the economic implication. The ability to delay the investment allows appraisal arbitrageurs to get a better sense of the value of the target, while at the same time helping reduce its exposure to the risk of loss related to investing in a target that fails to close the transaction. Allowing appraisal arbitrageurs to delay their investment in target company stock is akin to giving them a valuable option for free.

Second, recent rulings in appraisal matters have signaled a preference by the Delaware Chancery Court for the discounted cash flow (“DCF”) valuation method in determining the fair value of the target stock. We examine the extent to which the Chancery Court’s preferences, with respect to certain inputs to the DCF method, may be affecting economic incentives for appraisal arbitrageurs. Specifically, we find that recent rulings in appraisal proceedings suggest that the Court prefers to use the supply-side equity risk premium in computing the target firm’s cost of equity.¹¹ While using the supply-side equity risk premium is consistent with the view generally accepted by academic researchers that, going forward, the equity risk premium is likely to be lower than was observed in the past, it may be inconsistent with the common practice of investment bankers advising M&A deals. This finding implies that appraisal arbitrageurs may be able to take advantage of the wedge

⁹ Richter, Philip, Robert C. Schwenkel, David N. Shine, and Gail Weinstein, “The Rise of Delaware Appraisal Arbitrage: A Survey of Cases and Some Practical Implications,” *Insights: The Corporate & Securities Law Advisor*, Volume 28, Number 7, July 2014, pp. 18-24; Anderson, Jeremy D., and José P. Sierra, “Unlocking Intrinsic Value Through Appraisal Rights,” *Law360*, September 10, 2013.

¹⁰ *In Re Appraisal of Ancestry.com*, C.A. No. 8173-VCG, January 30, 2015, pp. 56-57. Furthermore, Vice Chancellor Glasscock stated the following in his opinion to support the adoption of the transaction price: “it would be hubristic indeed to advance my estimate of value over that of an entity for which investment represents a real—not merely an academic—risk, by insisting that such entity paid too much.” See, *In Re Appraisal of Ancestry.com*, C.A. No. 8173-VCG, January 30, 2015, p. 56.

¹¹ As discussed in more detail below, the equity risk premium is a key input when estimating a company’s cost of equity. The supply-side equity risk premium is one of several ways to measure the equity risk premium.

between the valuation inputs commonly used by investment bankers providing fairness opinions to parties in M&A transactions and those preferred by the Court.

Finally, we examine the Delaware statutory rate on the appraisal award. We find that during the five-year period between 2010 and 2014, the statutory rate, which is set at the Federal Reserve Discount Rate plus 5%, is higher than the yield on corporate bonds with maturity and credit risk that correspond to risk of appraisal (three-year with credit ratings of “BB”¹² or higher). This shows that the Delaware statutory rate compensates appraisal petitioners for significantly more than the time value in question. Furthermore, this result also suggests that, in instances where the credit rating of the surviving entity after an M&A deal is at least “BB,” the statutory rate more than compensates petitioners for a bond-like claim. While it is debatable whether the extent to which an arbitrator’s decision to seek appraisal is driven by the statutory rate, our findings are consistent with the notion that the relatively high current statutory rate does improve the economics in favor of arbitrageurs.

A few policy implications flow from our results: First, from an economic perspective, it seems reasonable to limit a dissenting shareholder’s appraisal rights to only the shares held as of the record date. This suggestion is not new and has been made by several commentators.¹³ Setting the cut-off at the record date, instead of at an earlier time, such as the deal announcement date, allows an appraisal arbitrageur time to evaluate whether to purchase a target company’s stock for purposes of bringing an appraisal claim later. At the same time, denying appraisal rights to shares acquired after the record date helps reduce the value transfer (*i.e.*, the value of the delay option) from the acquirer/target to appraisal arbitrageurs.

Second, with respect to the potential wedge between the Court’s preference and investment bankers’ common practices for certain valuation inputs, we do not suggest that the Court should simply adopt investment bankers’ valuation assumptions, as doing so would defeat the purpose of an appraisal action. However, our findings do indicate that the Court may want to be mindful of certain systematic differences in valuation inputs which could create profiteering opportunities for those seeking appraisal. Conversely, investment bankers and deal lawyers should also be sensitive to these systematic differences, and should at least be aware of the potential implication of continuing adopting certain valuation assumptions.

Finally, our benchmarking analysis of the Delaware statutory interest rate indicates that it may be useful to contemplate a change in either the interest rate itself or the amount on which the interest rate is paid (or both). We recognize that it may not be possible to set an interest rate based on the characteristics of a target or an acquirer without increasing the scope of issues that are likely to be litigated in an appraisal proceeding. Given this consideration, it

¹² Throughout this paper, we use Standard & Poor’s credit rating designations. Moody’s credit rating equivalent to S&P’s “BB” is “Ba2.”

¹³ Mervis, Theodore, N., Trevor S. Norwitz, Andrew J. Nussbaum, William Savitt, and Ryan A. McLeod, “Delaware Court Decisions on Appraisal Rights Highlight Need for Reform,” *Harvard Law School Forum on Corporate Governance and Financial Regulation*, January 21, 2015.

may be more practical to adopt a change that limits the amount on which the interest rate is paid.

The rest of this paper is organized as follows: In Section II, we discuss the value of delay. Section III explores differences in valuation inputs used by market participants and the Delaware Chancery Court. Section IV compares the Delaware statutory rate to several different benchmarks. Section V concludes the paper.

II. THE FREE OPTION

Recent opinions related to the appraisal of *Ancestry.com, Inc.*¹⁴ and *BMC Software, Inc.*¹⁵ have affirmed that, pursuant to Section 262 of the Delaware General Corporation Law, an appraisal proceeding can be sought by a stockholder who acquired the stock of the target company after the record date, as long as the number of shares for which appraisal is sought does not exceed the total number of shares that voted against the M&A transaction.¹⁶

So, how do the *Ancestry.com* and *BMC Software* rulings help appraisal arbitrageurs? As an initial matter, we note that for our purposes, we ignore legal issues surrounding the eligibility of shareholders with no ability to vote on the transaction to bring an appraisal action. Similarly, we also ignore the legislative intent to allow such shareholders to bring an appraisal suit. We limit our discussion to economic issues only; that is, we examine whether, and how, granting appraisal rights to shares bought after the record date helps appraisal arbitrageurs.

A. Value of Delay

It is well established in finance that the ability to delay an investment is valuable because it allows the investor to make a more informed investment decision.¹⁷ A simple hypothetical example helps illustrate the value of delay. Suppose that an investor has the opportunity to invest \$100 in an asset today. Further assume that, as of today, the best information available suggests that there is an equal chance that at the end of some period of time, say T , the \$100 will become either \$120 or \$80.¹⁸ Now assume that this investor has the ability to delay investing the \$100 in the asset for some time, such that she could refine her assessment of the possible outcomes at the end of time period T using new information that may emerge after

¹⁴ *In Re Appraisal of Ancestry.com*, C.A. No. 8173-VCG, January 5, 2015.

¹⁵ *Merion Capital LP and Merion Capital II LP v. BMC Software, Inc.*, C.A. No. 8900-VCG, January 5, 2015.

¹⁶ *Ibid*, p. 16. The Court ruled in *Transkaryotic Therapies* that for the purposes of determining whether appraisal can be sought by the petitioner, shares that abstained or did not vote should be treated as votes against the transaction. See, *In Re Appraisal of Transkaryotic Therapies, Inc.*, C.A. No. 1554-CC, May 2, 2007, pp. 3 and 5.

¹⁷ For a detailed discussion of this topic, see Dixit, Avinash K. and Robert S. Pindyck, *Investment Under Uncertainty*, Princeton University Press, 1994.

¹⁸ In economic terms, the expected gain from this investment is zero as of today. The expected gain is equal to the expected value of the asset at the end of period T minus the cost of the investment (which is \$100). When there is an equal chance that at the end of period T the \$100 could become either \$120 or \$80, the expected value of the asset at the end of period T is calculated to be \$100 (*i.e.*, \$120 x 50% + \$80 x 50%). For purposes of this illustration, we ignore the time value of money.

today. Suppose the new information allows the investor to figure out that the likelihood of the positive scenario – *i.e.*, \$100 becoming \$120 – is 75 percent. She can then invest her \$100 in the asset with the expectation of making a gain of \$10.¹⁹ Similarly, if waiting results in the revelation that the asset value at the end of period T is more likely to be \$80, then the investor can simply avoid making the investment. Thus, in either outcome of this hypothetical example, the investor benefits from the ability to delay the investment decision.

One can use a similar construct to analyze an appraisal arbitrageur's ability to delay purchasing a target's stock, and to surmise the effect that such an ability has on the economics of the appraisal arbitrageur. We start by assuming that on date t_a , a target, say Company A, announces a friendly all-cash transaction at a consideration of $\$X$ per share. On the announcement date t_a , an appraisal arbitrageur learns about the transaction (along with the rest of the public). Suppose that subsequently, on date t_n (the notice date), Company A gives a notice to its shareholders that a shareholder meeting will be held on t_m (the meeting date), in which those who hold Company A stock as of t_r (the record date) will be able to vote on the transaction.²⁰ The Delaware appraisal statute requires that the fair value determination be done as of the date of deal closing, t_c . Thus, the question facing the arbitrageur is how likely it is that the fair value of Company A's stock as of t_c will be higher than the contemplated offer price of $\$X$.

Under the current statute, the arbitrageur can seek appraisal for shares bought after the record date. In order to perfect appraisal rights, the statute also requires that a dissenting shareholder deliver (via the record holder of the shares) a written demand for appraisal to the target company, before the shareholder meeting on the at-issue transaction (*i.e.*, before t_m). Thus, allowing an arbitrageur to seek appraisal for shares bought after the record date effectively enables her to postpone the share purchase until at least t_m . In practice, however, the extant interpretation of the statute is that the written demand for appraisal that needs to be delivered to the target company prior to the shareholder meeting can simply be a generic one, without specifying the number of shares for which appraisal will be sought. Thus, an appraisal arbitrageur could make a demand before the shareholder vote without having established any significant position in the target's stock, thereby preserving the flexibility to acquire the target stock shares any time before the deal closing. To sum up, allowing arbitrageurs to seek appraisal for shares bought after the record date enable them, in practice, to delay the share purchase until t_c . Alternatively, if appraisal rights were available only to the

¹⁹ This hypothetical example assumes that waiting for some time does not result in an increase in the cost of the investment, *i.e.*, that it remains at \$100. In the scenario where delay is possible, a revised probability of 75% to realize an asset value of \$120 at the end of period T , and the corresponding revised probability of 25% to realize only \$80, result in a new expected value of \$110 (*i.e.*, $\$120 \times 75\% + \$80 \times 25\%$). Thus, the expected gain from the investment is \$10, which is \$110 minus \$100.

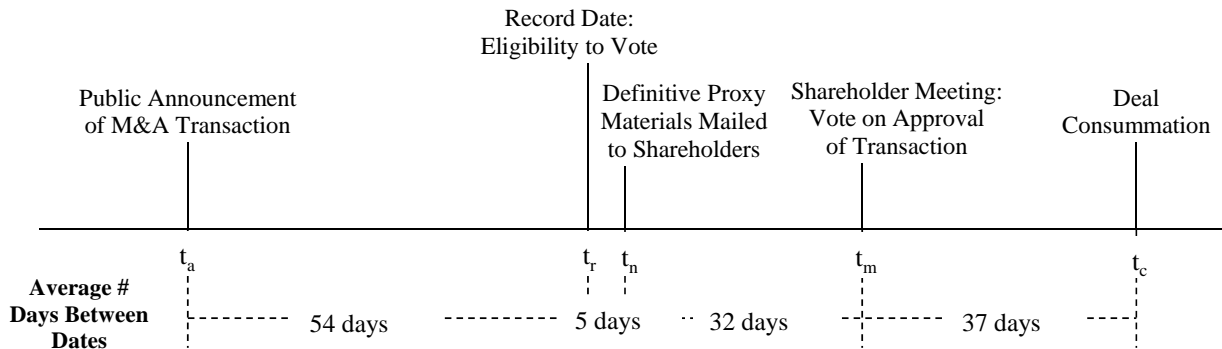
²⁰ The notice of call for shareholders' meeting is different from the notice of setting a record date. Public companies are required to immediately notify the SEC when a date for the taking of a record of its shareholders is established. Such notice must be given at least ten days in advance of the record date. See, for example, Section 703 of *NYSE MKT Company Guide* for NYSE-listed companies (<http://wallstreet.cch.com/MKT/CompanyGuide/>).

shares held as of the record date, then once a target company announces the setting of the record date, an arbitrageur would have to buy the target stock during the period between the announcement of the setting of the record data and the record date t_r itself. So, how does it help the appraisal arbitrageur to allow her to postpone the investment decision from t_r to t_c ?

To understand the economic implication of such a delay, we empirically examine the typical length between t_r and t_c by reviewing the timeline of cash-only friendly deals.²¹ For the purposes of our review, we identified 562 transactions involving U.S. targets with a deal value of at least \$500 million that were closed between January 1, 2010, and December 31, 2014.²² We then further limited our review to observations meeting the following criteria: (1) the initial reception of the target’s board of directors to the deal was not hostile; (2) the acquirer did not own more than 50% of the target shares before the deal announcement, but owned more than 50% of the target shares after the transaction closing; (3) the consideration was paid entirely in cash; and (4) the target shareholders voted on the deal. The resulting sample contains 156 transactions.

Figure 1 shows the evolution of a typical cash-only friendly transaction. The chart shows that, on average, a friendly cash-only deal takes 128 days to close. The average time period between the announcement date and the record date is 54 days, and the average time period between the record date and the deal consummation is 74 days (*i.e.*, 5 days between the record date and the notice date, plus 32 days between the notice date and the shareholder meeting date, plus 37 days between the notice date and the deal consummation).

Figure 1: Timeline of a Typical Deal Process



Casual observation of the financial markets suggests that many things can happen during a 74-day period from t_r to t_c that may affect the valuation. While the fair value of a company

²¹ As a practical matter, the time it takes to close a friendly deal, *i.e.*, the number of days between the deal announcement (t_a) and the deal closing (t_c), is dependent on, among others, the amount of time required for getting clearance or approvals from the SEC and other regulatory authorities. However, our focus here is on the length from the record date (t_r) to the deal closing (t_c).

²² We used the Thomson SDC M&A database to select transactions.

is not expected to fluctuate as much or as frequently as the market value of its stock, it would nevertheless be in the economic interest of the appraisal arbitrageur to delay her investment decision for the following reasons: First, postponing the share purchase to after the record date enables the arbitrageur to take advantage of any development or new information, including any relevant information concerning the at-issue transaction that may not be available until after the record date has been set. This, in turn, would help the arbitrageur better assess how likely it is that the fair value of the target company stock as of the deal closing will be higher than the contemplated offer price. Second, a delay may also help the arbitrageur minimize deal risk, *i.e.*, the risk of investing in shares of a target company that later fails to close the transaction.²³

The Free Option

The Delaware appraisal determination is based on the valuation of the target company as of the transaction closing date (t_c in Figure 1). From an appraisal arbitrageur's point of view, it is clearly best to wait until as close as possible to the closing date t_c to make a share purchase decision. This is because, by waiting, the arbitrageur can take into consideration any developments or new information when assessing the value of the target company relative to the transaction price.

A recent example that helps illustrate the value of waiting to invest is the precipitous decline in oil prices during the second half of 2014. Lower oil prices may help reduce the production cost for manufacturers using oil as a raw material (*e.g.*, plastic packaging makers), thereby improving their profitability. Lower oil prices may also mean more disposable income at the consumer level, which in turn would boost the outlook of retail or grocery company stocks. Thus, an arbitrageur evaluating appraisal actions for deals announced during the second half of 2014 could benefit from waiting in one of the two ways: (a) bringing actions against transactions where the drop in oil prices is likely to have a positive impact on the value of the target; or (b) avoiding appraisal actions against transactions involving oil companies and other firms that were negatively impacted by the drop in oil prices.

Waiting could also allow the arbitrageur to take advantage of a target-specific development such as a positive quarterly earnings surprise, an upward revision to the estimated reserve size of the target's natural resource assets, or an FDA approval of the target's new drug. For example, pharmaceutical company Transkaryotic Therapies, Inc., which was the subject of a Delaware appraisal matter about a decade ago, released "extraordinarily positive" phase III clinical trial outcomes for one of its drugs 10 days after the record date, but about a month before the shareholder vote on the transaction.²⁴

²³ In addition, keeping the return in dollar terms constant, an investor would generally prefer a shorter holding period. Allowing appraisal arbitrageurs to postpone the share purchase until the deal closing (thereby shortening the holding period as much as possible) is particularly beneficial if the appraisal matter is later resolved through a quick settlement.

²⁴ Despite the new positive outcomes, the offer price for Transkaryotic Therapies was not negotiated up. In addition, no other bidder emerged after the release of the clinical trial results. Plaintiffs in the case argued that the positive

Even if there are no such developments within the relevant timeframe, waiting to invest may be worthwhile for the arbitrageur. This is because, as Figure 1 shows, there is a key event between t_r and t_c , namely, the target company's delivery of a notice to its shareholders and the simultaneous filing of a definitive proxy statement (e.g., Form DEFM14A) with the SEC, on t_n . In the definitive proxy statement, the target notifies its shareholders of the date, time, and place of the upcoming shareholder meeting on the transaction. It also sets the record date that determines the eligibility for voting. Further, the definitive proxy statement provides detailed information regarding the background of the transaction, deal process, valuation, and opinions of the target's financial advisors, as well as the company's financial forecasts. Some of this information may have already been disclosed to the public in the target's preliminary proxy filings. That said, the definitive proxy statement often contains new information not available prior to the notice date, and this can help an investor better assess the target's value relative to the contemplated offer price.

Recent appraisal arbitrageurs have in fact taken advantage of this opportunity to delay investment. For example, Merion Capital started purchasing shares of Ancestry.com on December 4, 2012, the second trading day after the company's filing of the definitive proxy statement. Merion Capital continued purchasing shares through December 17, 2012, which was ten calendar days before the scheduled shareholder meeting.²⁵ Similarly, Merion Capital purchased shares of BMC Software in July 2013, with its last purchase on July 17, 2013. These purchases were made between BMC Software's filing of the definitive proxy statement on June 25, 2014, and the shareholder meeting on July 24, 2013.²⁶

Arbitrageurs' ability to delay investing can be viewed as equivalent to owning a call option. Specifically, in our hypothetical example above involving the acquisition of Company A, the call option held by the arbitrageur gives the arbitrageur the right (but not the obligation) to purchase Company A's stock before the deal closing date t_c at a price of $\$X$ per share.²⁷ The arbitrageur will exercise the option – i.e., purchase Company A's stock and later initiate an appraisal action – if at some point before t_c she estimates, based on the information available, that the fair value of Company A's stock as of t_c will exceed $\$X$ per share.²⁸

clinical trial outcomes demonstrated that Transkaryotic Therapies' stock was worth more than the offer price of \$37 per share. See *In Re Transkaryotic Therapies, Inc.*, C.A. No. 2776-CC, June 19, 2008, p. 10.

²⁵ *In Re Appraisal of Ancestry.com, Inc.*, C.A. No. 8173-VCG, January 5, 2015, pp. 3-4.

²⁶ *Merion Capital LP and Merion Capital II LP v. BMC Software, Inc.*, C.A. No. 8900-VCG, January 5, 2015, p. 2-5; and BMC Software, Inc., DEFM14A Filing, June 25, 2013.

²⁷ For the purposes of this discussion, we have made a number of simplifying assumptions so as to better focus on the underlying intuition, while avoiding technical exposition of options. For example, we assume that the strike price (i.e., the price at which the holder of the call options can buy the underlying security when the option is exercised) is equal to the contemplated offer price. Typically, after the announcement of a friendly cash-only deal, a target company's stock trades slightly below (but close to) the offer price.

²⁸ For ease of exposition, we ignore that the arbitrageur will not be able to realize the fair value of Company A's stock immediately. As we discuss later, it usually takes about three years for appraisal awards to be determined and paid. In reality, an arbitrageur has to consider other factors – such as the time delay to receive the appraisal award, the risk of losing the appraisal case, and the potential litigation costs – when deciding whether or not to exercise the option.

Conversely, if the arbitrageur determines that the expected payoff from exercising the option is less than \$X per share, then she will not purchase Company A's stock and initiate the appraisal action.

The option to delay purchase of shares is valuable, and our expectation is that it will likely be exercised more often by appraisal arbitrageurs after Delaware's recent reaffirmation of appraisal rights to shares bought after the record date. Moreover, arbitrageurs do not pay for this option. The Delaware appraisal statute essentially requires that companies that survive M&A transactions (and ultimately their shareholders) give such an option to arbitrageurs for free.

In addition to the option to delay, the Delaware appraisal statute also gives arbitrageurs 60 days after a deal closes to decide whether to bring an appraisal action or accept the transaction price.²⁹ The flexibility available to petitioners or arbitrageurs post-closing can also be viewed as an option. Whereas the ability to delay investment is akin to a call option, the ability to choose between bringing an appraisal action and accepting the transaction price is equivalent to a put option.³⁰ This is because in the context of appraisal actions, the post-closing flexibility allows arbitrageurs to either sell their shares to the entity that survives the transaction and receive the transaction price (that is, exercise the put option) or bring the appraisal action with the expectation of realizing an appraisal award higher than the transaction price.

Minimizing Deal Risk

Another benefit of delaying investment in a target's stock is that it helps minimize exposure to deal risk, *i.e.*, the risk that the announced transaction may not actually close. It is in an appraisal arbitrageur's interest to avoid investing tens or hundreds of millions of dollars in shares of a target that fails to later close the deal. This is because deal failure not only derails the goal of launching an appraisal lawsuit, but also exposes the appraisal arbitrageur to a potentially significant loss.

It is well established that the announcement of a transaction attracts merger arbitrageurs who assume deal risk in exchange for realizing the arbitrage spread.³¹ For all-cash deals, the arbitrage spread is the difference between the offer price of the pending transaction and the trading price of the target stock during the period between the deal announcement and the deal

²⁹ Section 262(e) of the Delaware General Corporation Law.

³⁰ A put option gives the holder the right but not the obligation to sell an asset at a predetermined price.

³¹ See, for example, Larcker, David F. and Thomas Lys, 1987, "An Empirical Analysis of the Incentives to Engage in Costly Information Acquisition: The Case of Risk Arbitrage," *Journal of Financial Economics*, Vol. 18, pp. 111-126; Mitchell, Mark and Todd Pulvino, 2001, "Characteristics of Risk and Return in Risk Arbitrage," *Journal of Finance*, Vol. LVI, No. 6, pp. 2135-2175; Jindra, Jan and Ralph A. Walkling, 2004, "Speculation Spreads, Arbitrage Profits and Market Pricing of Proposed Acquisitions," *Journal of Corporate Finance*, 10, pp. 495-526; and Jetley, Gaurav and Xinyu Ji, 2010, "The Shrinking Merger Arbitrage Spread: Reasons and Implications," *Financial Analysts Journal*, Vol. 66, No. 2, pp. 54-68.

resolution (either successful consummation or deal failure).³² Over the last few years, the average arbitrage spread for all-cash friendly deals, as measured a few days after the transaction announcement, has been around 2%.³³ Thus, in the current environment, a merger arbitrageur hopes to earn about 2% on average, before accounting for any transaction or hedging costs and ignoring the effect of leverage.

While the chance of deal failure has historically been low in general,³⁴ failed deals do expose arbitrageurs – both merger arbitrageurs and appraisal arbitrageurs – to potentially significant losses. The potential severity of loss stems from the fact that news about a possible deal failure can result in sharp declines in the target’s stock price.³⁵ For example, in October 2014, pharmaceutical company AbbVie Inc. withdrew its proposed acquisition of Shire Plc. after the Treasury Department announced new rules taking aim at tax inversion deals. In response, Shire’s stock price fell by more than 26% during the week after the deal termination.³⁶

Given the deal failure risk, it is economically sensible for appraisal arbitrageurs to wait to invest, because the risk of deal failure generally declines as the closing date draws nearer. Specifically, by waiting, appraisal arbitrageurs can observe the behavior of the merger arbitrage spread, which contains information concerning the market’s assessment of the deal failure risk. In addition, by the time the target shareholder meeting notice is distributed, any regulatory hurdles might have been cleared and the deal financing might be more secured, both of which would improve the chance of a successful close. Furthermore, as the meeting date gets closer, the target board will likely gain a better understanding of the degree of resistance by dissenting shareholders, because an appraisal demand must be submitted to the target before the voting in order to perfect appraisal rights. This information might sometimes prompt the target and acquirer to negotiate up the transaction price as a way to mitigate the appraisal threat.

In summary, delaying investment as close as possible to the date of deal closing also helps arbitrageurs reduce exposure to the risk of deal failure. This is because the ability to delay the investment allows arbitrageurs to observe the resolution of uncertainties that drive the risk of deal failure.

³² For example, once an all-cash acquisition of a target firm at the offer price of \$100 per share is announced, the stock price of the target is likely to evolve from somewhere around \$98 immediately after the deal announcement to essentially \$100 upon the deal closing. The difference between the offer price of \$100 and the trading price of the target stock prior to the deal closing, say \$98, is called the arbitrage spread.

³³ Unpublished research by the authors (available upon request).

³⁴ Studies have shown that, in the U.S., well over 90% of deals have eventually closed successfully since 2000 (with the exception of the 2008/2009 financial crisis, during which the deal failure rate spiked). See, Jetley, Gaurav and Xinyu Ji, 2010, “The Shrinking Merger Arbitrage Spread: Reasons and Implications,” *Financial Analysts Journal*, Vol. 66, No. 2, pp. 54-68; and unpublished research for recent years by the authors (available upon request).

³⁵ Officer, Micah S., 2007, “Are Performance Based Arbitrage Effects Detectable? Evidence from Merge Arbitrage,” *Journal of Corporate Finance*, 13, pp. 793-812.

³⁶ Gelles, David, “After Tax Inversion Rules Change, AbbVie and Shire Agree to Terminate Their Deal,” *The New York Times*, October 20, 2014.

B. Policy Implications

From a public policy perspective, it seems to be a good idea to have a group of professional investors dedicated to identifying and litigating deals done at prices that might not be fair to all shareholders. However, there does not seem to be an obvious economic argument for giving appraisal arbitrageurs the ability to free ride during the period between the record date and the deal closing, allowing them to wait while factors that might affect the value of the target company and the deal risk evolve. Accepting the notion that some period of time after a deal announcement probably should be given to appraisal arbitrageurs to make a decision regarding whether they should invest and seek appraisal, the question is: how much time should be given?

We suggest that the record date could be used as the cut-off for determining the eligibility of appraisal claims. As Figure 1 (above) shows, in recent years, the average number of days between the deal announcement and the record date has been 54 days. Allowing appraisal arbitrageurs the opportunity to delay investment until the record date would give them a meaningfully long period to observe the evolution of the merger arbitrage spread and the deal process. It would also enable them to process any new information (*e.g.*, new macroeconomic or firm-specific developments, or information concerning the deal valuation and process disseminated via the target’s preliminary proxy filings or press releases) when assessing the potential risk and reward of launching an appraisal lawsuit.

Some commentators have found that transactions with lower takeover premia or going-private transactions are more likely to face a counseled appraisal petition.³⁷ Others suggest that cases in which Delaware determined an appraisal award significantly higher than the transaction price tend to be “interested transactions.”³⁸ To the extent that such information – the takeover premium implied in a proposed transaction price, the going-private nature of a deal, or the dealing with “interested parties” – is useful for arbitrageurs to assess the merit and potential payoff of an appraisal action, it is typically known to the public well before the record date.

Furthermore, a waiting period of 54 days can help appraisal arbitrageurs better evaluate the deal risk. For example, in the U.S., a preliminary antitrust review by the Federal Trade Commission or the Department of Justice typically takes up to 30 days.³⁹ According to the FTC, the vast majority of deals reviewed by these two agencies are allowed to proceed after

³⁷ See, Myers, Minor, and Charles R. Korsmo, “Appraisal Arbitrage and the Future of Public Company M&A,” Working Paper, Brooklyn Law School, August 2014, Forthcoming in *Washington University Law Review*, pp. 39-40.

³⁸ Richter, Philip, Robert C. Schwenkel, David N. Shine, and Gail Weinstein, “The Rise of Delaware Appraisal Arbitrage: A Survey of Cases and Some Practical Implications,” *Insights: The Corporate & Securities Law Advisor*, Volume 28, Number 7, July 2014, pp. 18-24.

³⁹ See <https://www.ftc.gov/news-events/media-resources/mergers-and-competition/merger-review>, accessed in April 2015.

the first preliminary review.⁴⁰ For the deals that require an extended review, the second review takes another 30 days after the at-issue companies have satisfied the agencies' information request. Thus, a waiting period of 54 days is usually sufficient for many deals to clear the regulatory hurdle.

While evaluating, from a policy perspective, whether a free option should be given to appraisal arbitrageurs – thereby allowing them to delay their investment decision until after the record date – it may be useful to keep in mind that, under Delaware's current appraisal statute, shareholders contemplating an appraisal action have 60 days after the deal closes to decide whether to bring the appraisal lawsuit or to accept the price paid in the transaction. Given that shareholders get 60 days after a deal closes to evaluate whether they want to pursue an appraisal claim, granting appraisal arbitrageurs another option that allows them to delay their investment for free seems to improve the economics in their favor.

III. DCF-RELATED ARBITRAGE

Valuation is central to appraisal rights cases. However, the Delaware Chancery Court does not mandate that fair valuation must be established using any particular method. The general preference is “to take a more robust approach involving multiple techniques – such as a DCF analysis, a comparable transactions analysis (looking at precedent transaction comparables), and a comparable companies analysis (looking at trading comparables/multiples) – to triangulate a value range, as all three methodologies individually have their own limitations.”⁴¹ That said, a review of the recent Delaware opinions in appraisal matters suggests that the Court often rejects the comparable transactions analysis or comparable companies analysis in favor of a DCF analysis. The Court recognizes that “when the ‘comparables’ involve companies that offer different products or services, are at a different stage in their growth cycle, or have vastly different multiples, a comparable companies or comparable transactions analysis is inappropriate.”⁴² In *In Re Appraisal of Ancestry.com*, Vice Chancellor Glasscock, when commenting on the fact that both sides' valuation experts exclusively relied on the DCF approach, called the comparable companies and comparable transactions analyses “irrelevant and unhelpful ... given Ancestry's unique business and the concomitant difficulty of finding comparable companies or transactions.”⁴³

With respect to the DCF analysis, Vice Chancellor Parsons explained in his order on *3M Cogent* that, in simple terms, a DCF analysis “involves three basic components: (1) cash flow projections; (2) a discount rate; and (3) a terminal value.” Over the years, the Delaware Chancery Court seems to have developed a preference for certain valuation inputs into the discount rate estimation. When the Court's preference differs from the choices commonly

⁴⁰ See <https://www.ftc.gov/news-events/media-resources/mergers-and-competition/merger-review>, accessed in April 2015.

⁴¹ *S Muoio & Co., LLC v. Hallmark Entertainment Investments Co.*, C.A. No. 4729-CC, March 9, 2011, p. 58.

⁴² *In Re Appraisal of the Orchard Enterprises, Inc.*, C.A. No. 5713-CA, July 18, 2012, p. 9.

⁴³ *In Re Appraisal of Ancestry.com*, C.A. No. 8173-VCG, January 30, 2015, pp. 19-20.

used by investment bankers advising the deal valuation, such a divergence can create a systematic difference between the deal price and the fair value established by the Court.

A. Equity Risk Premium

One key input to the discount rate estimation is the cost of the target company's equity capital. One of the most widely used models for estimating the cost of equity capital is the Capital Asset Pricing Model ("CAPM").⁴⁴ According to the CAPM, the cost of equity for any publicly traded firm is equal to the risk-free rate plus a risk premium that accounts for non-diversifiable risk.⁴⁵ Equation (1) below shows the CAPM-based formula for a firm's cost of equity.

$$\text{Cost of Equity} = R_f + \beta_e \times \text{ERP} \quad (1)$$

In this formula, R_f is the risk-free rate, β_e is the equity beta, and ERP represents the estimate of the market equity risk premium. The beta of a company's stock measures the non-diversifiable, or systematic, risk associated with investing in the company's stock, which is driven by the correlation of the returns of the company's stock to the returns of the market portfolio. If a stock has a beta of 1, then the expected return of the stock will match the return of the market portfolio. The expected return of a stock with a beta of less (more) than 1 will be less (more) than that of the market portfolio. ERP is typically measured as the average return over the risk-free rate that an investor expects to earn from investing in a diversified portfolio of risky assets, *i.e.*, the market portfolio. As can be seen from Equation (1), all else being equal, a lower estimate of beta or ERP leads to a lower cost of equity.

Many academic studies have suggested that the market equity risk premium that investors should expect to receive going forward is likely to be lower than the observed historical equity risk premium, which is measured as an average excess return of the broad stock market over and above the risk-free rate over some reasonably long historical period.⁴⁶ However, in terms

⁴⁴ For a detailed discussion of the CAPM and related concepts, see Koller, Tim, Marc Goedhart, and David Wessels, *Valuation: Measuring and Managing the Value of Companies*, 4th Ed., Hoboken: John Wiley, 2005, pp. 295-315; Damodaran, Aswath, *Investment Valuation*, 2nd Ed., New York: John Wiley, 2002, pp. 69-71.

⁴⁵ A basic tenet of finance is that risk that is diversifiable can be easily avoided, and therefore should not lead to a high expected return. In other words, one should not expect to be compensated for risk that can easily be avoided. If all of the risk associated with an investment is diversifiable, then the investment should earn a risk-free rate of return. However, in reality, the risk associated with an investment is typically not completely diversifiable, because the outcomes (or payouts) of the investment are at least partially correlated with the overall market. To the extent that one faces non-diversifiable risk, one could expect to earn a return higher than the risk-free rate to compensate for that additional non-diversifiable risk. Non-diversifiable risk is also known as systematic risk.

⁴⁶ For example, see, Fama, Eugene and Kenneth French, 2002, "The Equity Premium," *Journal of Finance*, Vol. 57, No. 2, pp. 637-659. In this paper, Fama and French demonstrate that stock returns between 1951 and 2000 were higher than returns based on growth in dividends and earnings. Similarly, economist Jeremy Siegel claims that the forward-looking equity risk premium may be significantly lower than the historical average. See, Siegel, Jeremy, 1992, "The Equity Premium, Stock and Bond Returns Since 1802," *Financial Analysts Journal*, Vol. 48, No. 1 (January/February), pp. 28-38; Siegel, Jeremy and Richard Thaler, 1997, "Anomalies: The Equity Premium Puzzle," *Journal of Economic Perspectives*, Vol. 11, No. 1 (Winter), pp. 191-200; Siegel, Jeremy, 1999, "The

of how a forward-looking ERP should be measured, there is considerable debate among academics. For example, a number of models have been proposed that seek to determine the forward-looking ERP by connecting equity returns to the production of the real economy.⁴⁷

Over the past few years, the Delaware Chancery Court seems to be moving away from using a historical ERP, in favor of one that reflects the growing academic opinion that the forward-looking ERP is likely to be lower than the ERP that has been observed in the past. For example, in *In Re Appraisal of Golden Telecom*, then Vice Chancellor Strine adopted a 6% ERP, which was 1.1% lower than the comparable historical ERP. In explaining his reasons for selecting the 6% over the historical 7.1% ERP, he referred to academic studies on forward-looking ERPs, including, in particular, the studies that proposed estimation of ERPs by linking equity returns to productivity of the real economy. For example, the *Golden Telecom* opinion stated that:

Although it is true that Ibbotson does not disavow the use of the Historic ERP as a basis for valuing corporations on a going forward basis, the text is utterly devoid of any explication of why the Historic ERP should be used. By contrast, the 2003 article by Ibbotson and Chen explains that “investors’ expectations for long-term equity performance should be based on the supply of equity returns produced by corporations” because “[t]he supply of stock market returns is generated by the productivity of the corporation in the real economy.” And, Ibbotson’s 2008 Valuation

Shrinking Equity premium,” *Journal of Portfolio Management*, Vol. 26, No. 1 (Fall), pp. 10-17. Siegel updated his outlook on the equity premium estimate in 2011 and projected significantly lower bond returns and a much higher equity premium for the next decade, stating that “[r]eal bond returns are on track to be much lower. Ten-year TIPS are now yielding about 1 percent, so the excess returns of stocks over bonds should be in the 5–6 percent range, which is higher than the historical average.” See, Siegel, Jeremy, “Long-Term Stock Returns Unshaken by Bear Markets,” published in *Rethinking the Equity Risk Premium*, December, 2011, the Research Foundation of CFA Institute, pp. 143-147.

⁴⁷ For example, see, Diermeier, Jeffrey, Roger Ibbotson, and Laurence B. Siegel, 1984, “The Supply for Capital Market Returns,” *Financial Analysts Journal*, Vol. 40, No. 2 (March/April), pp. 74-80. In this paper, the authors make a distinction between the returns that investors require to compensate them for risk (*i.e.*, the demand for returns in the capital market) and the returns made available from macroeconomic performance (*i.e.*, the supply of returns). They suggest that the returns available for distribution among the various claimants are set by the productivity of businesses. See, also, Grinold, Richard and Kenneth Kroner, 2002, “The Equity Risk Premium – Analyzing the Long-Run Prospects for the Stock Market,” *The Investment Research Journal*, Vol. 5, Issue 3, pp. 7-20. Grinold and Kroner propose a model that links equity returns to gross domestic product (GDP) growth and divides equity returns into three components: income returns (the percentage of market value distributed to shareholders through both dividends and share repurchases), nominal earnings growth, and returns from the evolution of P/E ratio. By contrast, Ibbotson and Chen divide the historical equity risk premium into four factors: the income return, inflation, the growth in real earnings per share (“EPS”), and the growth (*i.e.*, change) in the P/E ratio, and claim that the first three factors of equity returns are generated by “the productivity of corporations in the real economy,” or the “supply side,” while the fourth factor stems from investor demand and is unrelated to the supply side of the economy. Ibbotson and Chen introduced a “supply-side equity risk premium” that includes only the first three components of equity returns. Put differently, the supply-side equity risk premium is equivalent to the historical equity risk premium, excluding the returns from growth in the P/E ratio. See Ibbotson, Roger and Peng Chen, 2003, “Long-Run Stock Returns: Participating in the Real Economy,” *Financial Analysts Journal*, Vol. 59, No. 1 (January/February), pp. 88-98.

Yearbook makes a strong argument for the supply side method by stating that “over the long run, equity returns should be close to the long-run supply estimates.”

Ibbotson’s reasoning comports with the strong weight of professional and academic thinking ... that the most responsible estimate of ERP is closer to 6.0% than 7.1%.⁴⁸

As Table 1 (below) shows, subsequent to the *Golden Telecom* decision, other Delaware Chancery Court judges have also embraced, to varying degree, supply-side ERP measures that are lower than the historical ERPs. We reviewed all Delaware appraisal opinions issued since 2010 and found eight (including *Golden Telecom*) that discussed and disclosed the choice of the ERP by the Court. In five of them, the opinions explained that the ERPs adopted by the Court were based on a supply-side estimate.⁴⁹ Additionally, in *American Commercial Lines, Inc.*, Vice Chancellor Laster used a 5.5% ERP estimate and stated that this measure was based on “several sources, including Duff & Phelps, Ibbotson Associates, and Pratt & Grabowski.”⁵⁰ Even though the Court did not explicitly label the 5.5% estimate as a supply-side ERP, we note that the figure was much closer to the applicable supply-side measure than to the historical ERP.⁵¹ In *Hesco Bastion Environmental, Inc.*, an ERP of 6.14%, based on Ibbotson’s estimate for the years 1926 through 2011, was adopted by the Court. Here again, the Court did not explain in the opinion whether the chosen ERP was a supply-side or historical measure. However, an examination of the applicable Ibbotson publication shows that 6.14% was Ibbotson’s supply-side ERP estimate for the years 1926 through 2011.⁵² Lastly, in *Rural Metro*, Vice Chancellor Laster gave consideration to both the 6.7% historical ERP and the 6% supply-side ERP.

Table 1: The Equity Risk Premium Measures Adopted by the Delaware Chancery Court in Appraisal Matters Since *Golden Telecom*

Case Name	Decision Date	Delaware Chancery Court Judge	ERP Adopted by Court
Global GT LP and Global GT LTD v. Golden Telecom, Inc.	4/23/2010	Leo Strine	6%

⁴⁸ *In Re Appraisal of Golden Telecom.*, C.A. No. 3698-VCS, April 23, 2010, pp. 15-16. Note that the citations in the quote have been omitted.

⁴⁹ These five are: *Golden Telecom*, *Just Care*, *Orchard Enterprises*, *3M Cogent*, and *Ancestry.com*.

⁵⁰ *IQ Holdings, Inc. v. American Commercial Lines, Inc.*, C.A. No. 6369-VCL, April 10, 2013, p. 4.

⁵¹ For example, in 2010 (*i.e.*, the year when the American Commercial Lines transaction was closed), the historical ERP calculated by Ibbotson for the period from 1926 to 2009 was 6.7%, whereas its supply-side measure for the same period was 5.2%. See Ibbotson SBI 2010 Valuation Yearbook, p. 66.

⁵² Ibbotson SBI 2012 Valuation Yearbook, p. 66.

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Tull N. Gearreald, Jr., et al. v. Just Care, Inc.	4/30/2012	Donald Parsons, Jr.	5.73%
In Re Appraisal of the Orchard Enterprises, Inc.	7/18/2012	Leo Strine	5.2%
IQ Holdings, Inc. v. American Commercial Lines, Inc.	3/18/2013	Travis Laster	5.5%
Merion Capital, L.P., et al. v. 3M Cogent, Inc.	7/8/2013	Donald Parsons, Jr.	5.20%
Patricia Laidler v. Hesco Bastion Environmental, Inc.	5/12/2014	Sam Glasscock, III	6.14%
In Re Rural Metro Corporation Stockholders Litigation	10/10/2014	Travis Laster	Both 6.7% and 6% were considered
In Re Appraisal of Ancestry.com, Inc.	1/30/2015	Sam Glasscock, III	6.11%

While the purpose of this paper is not to participate in the ERP debate, we do investigate the extent to which Delaware’s recent shift away from the historical ERP might have created an opportunity for appraisal arbitrageurs. We start by comparing the ERP estimates commonly used by target financial advisors to contemporaneous measures of the supply-side ERP measure. For this analysis, we focus on M&A deals that were closed between 2010 and 2014. We further limit our sample to transactions involving a U.S. publicly traded target with a transaction value of at least \$500 million.⁵³

Out of the 268 deals reviewed, only 25 targets disclosed the ERP that the financial advisors used in their DCF analyses. These are presented in Table 2.

Table 2: ERP Inputs Used by Target Financial Advisors in Selected Transactions

Date of Target Fairness Opinion	Target Financial Advisor	Acquirer Name	Target Name	ERP Used by Target's Banker [A]	Supply-Side ERP [B]	Spread⁵⁴ of [A] Over [B]
12/17/2009	Goldman Sachs	72 Mobile Holdings LLC	Airvana Inc	6.47%	5.70%	0.77%
4/11/2010	Goldman	Cerberus	DynCorp	6.67%	5.20%	1.47%

⁵³ Similar to our analysis underlying Figure 1 above, we also limited our review to observations meeting the following criteria: (1) the initial reception of the target’s board of directors to the deal was not hostile; (2) the acquirer did not own more than 50% of the target shares before the deal announcement, but owned more than 50% of the target shares after the transaction closing; and (3) the consideration was paid entirely in cash. However, for the fairness opinion review, we did not limit the data to deals that required target shareholder voting. Our sample for this analysis contains 268 deals.

⁵⁴ In instances where more than one ERP was used by a target’s banker, the spread represents the difference between the supply side ERP and the mid-point of the range of ERPs used by the banker.

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	Sachs	Capital Management LP	International LLC			
9/17/2010	Jefferies	Hellman & Friedman Capital	Internet Brands Inc	6.70%	5.20%	1.50%
11/14/2010	Qatalyst Partners	EMC Corp	Isilon Systems Inc	5.20% - 6.70%	5.20%	0.75%
11/14/2010	Morgan Stanley	EMC Corp	Isilon Systems Inc	6.00%	5.20%	0.80%
11/8/2010	Jefferies	Chevron Corp	Atlas Energy Inc	7.10%	5.20%	1.90%
11/22/2010	Perella Weinberg	J Crew Group Inc SPV	J Crew Group Inc	6.70% - 10.05%	5.20%	3.18%
3/31/2011	Houlihan Lokey	Providence Equity Partners LLC	SRA International Inc	5.25%	6.00%	(0.75%)
4/25/2011	Barclays	Saleen Acquisition Inc	Smart Modular Technologies	6.70%	6.00%	0.70%
5/9/2011	Gleacher & Company	Apollo Global Management LLC	CKx Inc	7.17%	6.00%	1.17%
8/3/2011	Morgan Stanley	Blackstone Capital Partners VI	Emdeon Inc	4.00% - 6.00%	6.00%	(1.00%)
3/9/2012	Sandler O'Neill	MUFG Americas	Pacific Capital Bancorp,CA	6.10%	6.14%	(0.04%)
3/18/2012	Moelis	Zayo Group LLC	AboveNet Inc	6.60%	6.14%	0.46%
7/2/2012	Macquarie Capital	One Equity Partners LLC	MModal Inc	6.50%	6.14%	0.36%
7/8/2012	JPMorgan	Thomson Reuters Corp	FX Alliance Inc	7.50% - 8.50%	6.14%	1.86%
7/3/2013	Peter J. Solomon Company	Investor Group	American Greetings Corp	6.70%	6.11%	0.59%
5/9/2013	Guggenheim Securities	TowerBrook Capital Partners LP	True Religion Apparel Inc	5.50% - 6.50%	6.11%	(0.11%)
12/17/2012	Guggenheim Securities	Nielsen Holdings NV	Arbitron Inc	5.50% - 6.50%	6.14%	(0.14%)
1/30/2013	Macquarie Capital	Scientific Games Corp	WMS Industries Inc	6.14%	6.11%	0.03%
3/6/2013	Guggenheim Securities	Sycamore Partners LLC	Hot Topic Inc	5.50% - 6.50%	6.11%	(0.11%)
8/11/2013	Lazard	Investor Group	Dole Food Co Inc	6.70%	6.11%	0.59%
6/21/2013	JPMorgan	Tenet Healthcare	Vanguard Health Systems	6.50% - 7.50%	6.11%	0.89%

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		Corp	Inc			
7/15/2013	Macquarie Capital	Bally Technologies Inc	SHFL entertainment Inc	6.14%	6.11%	0.03%
11/18/2013	BMO Capital	DSM Pharmaceutical Products	Patheon Inc	6.10%	6.11%	(0.01%)
6/8/2014	Deutsche Bank	Analog Devices Inc	Hittite Microwave Corp	6.90%	6.11%	0.79%
7/31/2014	Macquarie Capital	Scientific Games Corp	Bally Technologies Inc	6.11%	6.11%	0.00%

In one of the 25 deals, the targets retained two separate financial advisors and disclosed the ERP choice by each financial advisor; therefore, Table 2 lists 26 entries. Of the 26 observations, bankers' ERPs exceeded the contemporaneous supply-side ERPs published by Ibbotson in its Valuation Yearbooks in 18 instances, or 70% of the time.⁵⁵ When bankers' ERPs exceeded the contemporaneous supply-side ERPs, the median spread⁵⁶ was 78 basis points.

Information presented in Table 2 suggests that the academic community and the Delaware Court may have moved towards ERP measures that are lower, on average, than those used by investment bankers when valuing target companies. Such a gap in the ERP estimates between Delaware and investment bankers seems to be favorable to appraisal arbitrageurs, because, all else being equal, a lower ERP results in a lower discount rate, which in turn leads to a higher valuation outcome under a DCF valuation approach. Of course, we are not claiming that the use of the historical ERP by a target's financial advisor can help predict, with any degree of certainty, that the fair value of the target company appraised by the Delaware Chancery Court will be higher than the transaction price. Rather, the inference we draw from Table 2 is that when Delaware uses a lower ERP (*e.g.*, the supply-side ERP) to compute the cost of equity, but adopts all other valuation assumptions used by a target's financial advisor, the DCF-based estimate of the target's value is likely to be higher than that calculated by the financial advisor.⁵⁷

The existence of a wedge in the ERP estimates between Delaware and investment bankers raises some interesting questions. For example, why is it that investment bankers seem to prefer higher ERP estimates? The question becomes all the more intriguing if one

⁵⁵ In one of the 18 observations, the contemporaneous supply-side ERP fell within the range of the banker's ERP choices, but was lower than the midpoint of the range.

⁵⁶ For the observed instances in which the midpoint of the ERP range exceeded the supply-side ERP, the spread represents the extent to which the midpoint exceeded the supply-side ERP.

⁵⁷ Of course, even if the DCF-based value determined by the Court is higher than that estimated by the target's financial advisor, whether or not this means that the Court-appraised fair value will be higher than the transaction price will depend on how the transaction price compares to the DCF-based value calculated by the financial advisor.

recognizes that there is little reason to doubt that institutional investors, equity analysts, and other sophisticated market participants should be generally aware of the academic literature that questions the market's ability to deliver an equity risk premium in the future that is in line with the historical risk premium. Does all of this imply that acquirers will get a good deal if they can get targets to accept valuation numbers based on a higher ERP? Or does the higher ERP used by bankers suggest some skepticism regarding the cash projections (often provided by target management) used for determining a target's DCF value? We leave these and related questions for others to explore.

For the purposes of this paper, we point to the wedge between bankers' ERP assumptions and those used by the Court (as shown in Table 2) and posit that the existence of such a wedge may have contributed to the recent surge in appraisal arbitrage. We do not suggest that the Court should adopt investment bankers' ERP choices – for them to do so would defeat the purpose of an appraisal action.⁵⁸ However, our findings do indicate that the Court may want to be mindful that its embrace of a lower ERP, such as the supply-side ERP, could create opportunities for appraisal arbitrageurs. Conversely, investment bankers and deal lawyers should also be sensitive to the use of a higher ERP, such as the historical ERP, and should at least understand the potential implications of such a choice.

B. Point Estimate

Delaware's appraisal statute provides that, through the appraisal proceeding, "the Court shall determine the fair value of the shares exclusive of any element of value arising from the accomplishment or expectation of the merger or consolidation."⁵⁹ We understand that, under the appraisal statute, the term "fair value" is a legal concept. There may be an issue equating fair value to a transaction price, as the latter is likely to reflect some synergies associated with the transaction, whereas fair value is not supposed to include synergies.⁶⁰ That said, however, it is clear that an observed M&A transaction price is the result of negotiations around a given set of valuation estimates. When this is the case, the transaction price will, at least in part, reflect the negotiating skills of the parties involved in the deal. For example, an acquirer and a target could agree that the value of the target's stock is somewhere between \$16 and \$20 per share, but ultimately consummate the deal at \$17.25 due to the superior negotiating ability of the acquirer or its advisors.

Delaware's appraisal statute requires the court to determine a point estimate, rather than a range, of the fair value of the target company. An implication of this requirement is that the court may determine a fair value that is higher than the transaction price but still within the

⁵⁸ In appraisal practices, the Delaware Chancery Court typically does not consider valuation inputs used by investment banks advising parties to an M&A transaction during a negotiation process. Similarly, experts hired by both parties also tend to develop their own independent assumptions regarding inputs to a DCF model or other valuation methods.

⁵⁹ Section 262(h) of the Delaware General Corporation Law.

⁶⁰ Hamermesh, Lawrence A. and Michael L. Wachter, "The Fair Value of Cornfields in Delaware Appraisal Law," *Journal of Corporate Law*, Vol. 31 (2005), pp. 119-166.

range of values considered by the transaction parties. In the example above, this would happen if the court-appraised fair value of the target stock were somewhere between \$17.26 and \$20 per share.

So, what is the potential implication for appraisal arbitrage? We argue that transactions consummated at a price that is on the lower end of the DCF value range established by the target’s financial advisors might be more attractive to appraisal arbitrageurs, because arbitrageurs could start by showing that the fair value of the target is at least equal to the mid-point of the target financial advisor’s DCF value range.

A review of recent M&A transactions shows that transaction prices are frequently below the mid-point of the DCF price range. Table 3 (below) reports the details of this analysis. The information shown in the table is collected from the same sample as that used for Table 2. However, Table 3 contains more observations than Table 2 because DCF ranges are disclosed much more often in targets’ proxy filings than ERP values. Specifically, out of the 268 deals reviewed, all but nine reported the DCF ranges.

Table 3: Deal Prices Relative to DCF Price Ranges Established by Target Financial Advisors⁶¹

Year of Deal Closing	# of Deals	Deal Price Below Lower Bound of Range	Deal Price Within Lower Half of Range	Deal Price Within Higher Half of Range	Deal Price Above Higher Bound of Range
2010	49	0%	24%	53%	22%
2011	59	2%	34%	49%	15%
2012	53	2%	40%	40%	19%
2013	59	3%	36%	49%	12%
2014	39	3%	23%	54%	21%
Total	259	2%	32%	49%	17%

As Table 3 demonstrates, over the period from 2010 to 2014, over one third of the deals were consummated at a price below the midpoint of the DCF range established by the target’s financial advisor(s). In some years, this was true in as many as over 40% of the deals. Of course, this fact alone does not mean that the Delaware appraisal statute gives appraisal arbitrageurs any particular advantage. However, a combination of various factors, including Delaware’s choice for the ERP, the statutory requirement for determining a point estimate of value, and the Court’s reluctance to give the actual transaction price much weight under an appraisal proceeding, does present a favorable environment for appraisal arbitrageurs.

⁶¹ When a target company hired multiple bankers to value the proposed transaction, we combined the valuation outcomes of all bankers to establish a DCF price range.

The Court's practice of ignoring the merger price in determining fair value is based on the statutory requirement that fair value be computed without giving any consideration to the anticipated gains from the merger.⁶² Clearly, it would not make sense, economic or otherwise, to give weight to the actual transaction price if a sales process is found to be flawed. However, in the absence of such a finding, it might be useful for the Court to keep the actual transaction price in mind when appraising the fair value of a publicly traded target company, especially in instances where the target's stock trades in an efficient market.⁶³ Recently, there have been several instances where the Chancery Court has relied on the actual transaction price. For example, in *CKx, Inc.*, the Chancery Court did "rely on the merger price as the best and most reliable indication of CKx's value."⁶⁴ In *Ancestry.com*, the Court also ultimately deferred to the actual transaction price.⁶⁵ Similarly, in April 2015, Vice Chancellor Noble ruled in the *Autoinfo* appraisal that the deal price in this transaction was a strong indicator of the target's value and, accordingly, set the fair value of the target company at the transaction price.⁶⁶

Even in instances where the sales process is less than ideal, it may still be useful to subject the DCF value of a publicly traded target to some form of a market check. While it is possible that market participants, including institutional investors, may not fully understand the value of the target's assets or strategy, it is unlikely that the value of a public company can remain hidden from sophisticated investors. For example, it is not clear how or why potential acquirers with industry expertise, or institutional investors following active investment strategies, would be unable to appropriately value the target.⁶⁷ Furthermore, the notion that a public firm can be sold for a price that is lower than its fair value also seems to be inconsistent with the recent growth and development in shareholder activism. Between 2010 and 2014, assets under management of activist hedge funds grew from under \$50 billion to over \$110 billion.⁶⁸ In an environment in which activist investors devote tens of billions of dollars

⁶² Hamermesh, Lawrence A. and Michael L. Wachter, "The Fair Value of Cornfields in Delaware Appraisal Law," *Journal of Corporate Law*, Vol. 31 (2005), pp. 119-166.

⁶³ There are three forms of market efficiency. Under the weak form definition, a market is efficient if prices reflect the information contained in the record of past prices. If a market is efficient in the weak sense, then it is impossible to make consistently superior profits by studying past returns. The semi-strong form of market efficiency requires that prices reflect not just past prices but all other public information. When a market is efficient in the semi-strong sense, prices will adjust immediately to any public information. Under the strong form definition, prices reflect all information, whether public or private. In such a market, no investors can consistently outperform the market. See, Ross, Stephen A., Randolph W. Westerfield, and Jeffrey Jaffe, *Corporate Finance*, 7th edition, New York: McGraw-Hill, 2005, pp. 354-357.

⁶⁴ See *Huff Fund Investment Partnership and Bryan E. Bloom v. CKx, Inc.*, C.A. No. 6844-VCG, October 31, 2013, p. 13.

⁶⁵ *In Re Appraisal of Ancestry.com*, C.A. No. 8173-VCG, January 30, 2015, pp. 56-57.

⁶⁶ *Merlin Partners LP. and AAMAF, LP. v. Autoinfo, Inc.*, C.A. No. 8509-VCN, April 30, 2015.

⁶⁷ For additional discussion of the concept of hidden value, see Kraakman, Reinier, and Bernard Black, "Delaware's Takeover Law: The Uncertain Search for Hidden Value," *Northwestern University Law Review*, Vol. 95, 2002, pp. 521-566.

⁶⁸ HFR Industry Reports data cited in J.P. Morgan, "The activist revolution: Understanding and navigating a new world of heightened investor scrutiny," January 2015.

trying to unlock value by forcing firms to, among other things, modify or change strategy, it seems unlikely that shareholders of a public firm would willingly agree to an unfair transaction price.

IV. INTEREST RATE

Under the current Delaware appraisal statute, absent good cause (*e.g.*, appraisal petitioners pursuing claims in bad faith), a petitioner is awarded interest, regardless of whether the Court-appraised fair value is higher or lower than the transaction price. The statute provides that “interest from the effective date of the merger through the date of payment of the judgment shall be compounded quarterly and shall accrue at 5% over the Federal Reserve discount rate.”⁶⁹ Recently, market observers have devoted a fair amount of attention to the Delaware statutory interest rate. Some argue that in today’s low interest rate environment, the relatively generous statutory interest rate may have encouraged appraisal cases.⁷⁰

Again, we do not attempt to examine the legislative intent of the statutory rate. However, benchmarking the statutory rate against market rates may shed some light on the extent to which the statutory rate could facilitate appraisal arbitrage. For the purposes of benchmarking, we focus on both the risk-free rate and the yield on U.S. corporate bonds, both with a maturity of three years. Our reason for benchmarking to three-year rates is that, in recent years, the resolution of an appraisal matter has typically taken about three years.⁷¹ To approximate the risk-free rate, we use the three-year constant maturity Treasury (“CMT”) rate.⁷² Comparing the statutory rate to the risk-free rate is useful to the extent that the statutory rate is designed to compensate petitioners for the time value of money only. On the other hand, the yields of corporate bonds with three years to maturity may serve as useful benchmarks if the purpose of the statutory rate is to compensate petitioners for having a bond-like claim on either the target company or the combined entity surviving the at-issue transaction. Bond-like claim is more appropriate than an equity-like one, because the risk faced by a petitioner is mostly idiosyncratic. Aside from litigation risk, the remaining risk is that the post-transaction entity is unable to pay the judgment from the appraisal action. For the purposes of benchmarking the statutory rate to corporate bond yields, we do not explore the question of whether the fair value to be paid to the petitioner is a claim on the target

⁶⁹ Section 262(h) of the Delaware General Corporation Law.

⁷⁰ See, for example, Kirkland & Ellis, “Appraisal Rights — The Next Frontier in Deal Litigation?” May 1, 2013.

⁷¹ We identified thirteen appraisal matters since 2010 for which the Delaware Chancery Court determined a fair value. For these thirteen cases, the time to resolution ranges from 1.9 years to 12.1 years, with an average of 3.6 years. The case that took 12.1 years to resolve was *In Re Sunbelt Beverage Corp. Shareholder Litigation*, which was stayed for a number of years pending the outcome of a related matter in a different jurisdiction. Excluding *Sunbelt*, the average time to resolution is estimated to be 2.9 years.

⁷² A constant maturity Treasury rate is an interpolated yield based on the yields of the recently auctioned U.S. Treasury securities. A three-year CMT rate is the yield on Treasury securities with a three-year term. On any given day, a three-year CMT rate represents an estimate of what the yield on a three-year Treasury security would be if it were issued on that day.

company or a claim on the combined entity. Instead, to get a general sense of the extent to which the statutory rate represents compensation for a bond-like claim, we benchmark the statutory rate against the yields of a broad range of corporate bonds, issued by both industrial and financial firms in the U.S., with credit ratings between “AA” and “BB.”⁷³

Table 4 compares the Delaware statutory rate to selected benchmark interest rates for the years 2010 through 2014. For a given year, the statutory rate is based on the average Federal Reserve discount rate for the year. The table shows that, based on the average Federal Reserve discount rate, the Delaware statutory interest rate was between 5.09% and 5.18% during the period from 2010 to 2014. During the same period, the risk-free rate (*i.e.*, the yearly average three-year CMT rate) went from a high of 1.11% in 2010 to a low of 0.38% in 2012, with a recent climb up to 0.90% in 2014. A comparison of the statutory rate to the risk-free rate shows that the former compensates appraisal petitioners for much more than the time value of money.

Table 4: Benchmarking the Delaware Statutory Rate Against Selected Benchmark Interest Rates, 2010 to 2014⁷⁴

Interest Rate	2010	2011	2012	2013	2014
<i>Avg. Delaware Statutory Rate</i>	5.18%	5.10%	5.14%	5.11%	5.09%
Avg. 3-Year CMT Yields	1.11%	0.75%	0.38%	0.54%	0.90%
Avg. Yields on Industrial Bonds					
3-Year AA Industrial Bonds	1.72%	1.29%	0.81%	NA	NA
3-Year A Industrial Bonds	1.63%	1.38%	0.91%	1.06%	1.27%
3-Year BBB Industrial Bonds	2.14%	2.03%	1.60%	1.64%	1.70%
3-Year BB Industrial Bonds	4.49%	4.05%	3.45%	2.56%	2.28%
Avg. Yields on Financial Bonds					
3-Year AA Financial Bonds	1.95%	1.71%	1.26%	1.16%	1.25%
3-Year A Financial Bonds	2.40%	2.03%	1.47%	1.43%	1.47%
3-Year BBB Financial Bonds	3.36%	2.83%	2.32%	1.89%	1.83%
3-Year BB Financial Bonds	6.56%	5.03%	3.97%	2.87%	3.09%

⁷³ Based on Standard & Poor’s credit rating designations. Moody’s credit ratings equivalent to S&P’s “AA” to “BB” are “Aa2” to “Ba2”. Under each rating in our analysis, we include the half plus notch and the half minus notch as well. For example, the “A” rating covers “A+,” “A,” and “A-.”

⁷⁴ Data are from Bloomberg LP and the Federal Reserve Bank.

Table 4 also presents a comparison of the statutory rate to the yields of three-year corporate bonds issued by U.S. industrial or financial firms. Between 2010 and 2014, the average yields on “BBB” bonds issued by industrial firms ranged from 1.60% to 2.14%, compared to the relatively stable statutory rate of slightly over 5%. Thus, the Delaware statutory rate easily exceeded the yield of investment-grade corporate bonds (*i.e.*, those with credit ratings of “BBB-”⁷⁵ or higher) in recent years. In fact, the statutory rate has also been higher than the “BB”-rated yield (which is below investment grade). In 2013 and 2014 in particular, the Delaware statutory rate was about twice the average yield of the “BB”-rated credit. Thus, in cases where the credit of the target company or the surviving combined entity is rated “BB” or higher, the statutory rate appears to overcompensate petitioners for a bond-like claim.

The lower panel of Table 4 repeats this comparison but uses the yield of corporate bonds issued by financial, instead of industrial, firms. In general, the yields of corporate bonds issued by financial firms are higher than those issued by industrial firms.⁷⁶ In keeping with the objective of covering the required rates of return on bond-like claims of acquirers as well as targets, and given that a large fraction of acquirers are financial buyers, as opposed to strategic ones, it seems reasonable to benchmark the statutory rate to the yields of bonds issued by financial firms.⁷⁷ Table 4 shows that, with the exception of 2010,⁷⁸ the yields on “BB”-rated corporate bonds issued by financial firms were lower than the statutory rate. The table also shows that, for 2013 and 2014, the Delaware statutory rate exceeded the yields of “BB”-rated financial bonds by at least two percentage points. These results also support the notion that, in recent years, the statutory rate has compensated appraisal petitioners for more than the time value of money and for more than a bond-like claim. While the extent to which the statutory rate drives arbitrageurs’ decision to seek appraisal may be debatable, the data presented above do demonstrate that the relatively high Delaware statutory rate improves the economics in their favor.

From a policy perspective, we recognize that it may not be possible to set an interest rate based on the characteristics of a target or an acquirer without increasing the scope of issues that are likely to be litigated in an appraisal proceeding. Given this consideration, it may be more practical to adopt a change that limits the amount on which the interest rate is paid. In this regard, a recent legislative proposal presented by the Council of the Delaware Bar

⁷⁵ Moody’s equivalent rating is “Baa3.”

⁷⁶ See, for example, Elton, Edwin J., Martin J. Gruber, Deepak Agrawal, and Christopher Mann, “Explaining the rate spread on corporate bonds,” *Journal of Finance*, 2001, Vol. 56, pp. 247–277.

⁷⁷ In our sample of 268 transactions, about one third of the acquirers were financial firms (based on the first two digits of their SIC codes falling between “60” and “67”).

⁷⁸ In 2010, yields of bonds issued by financial firms likely still reflected the market’s concerns related to the 2008/2009 financial crisis. As Table 4 shows, the annual average yield of “BB”-rated financial bonds never exceeded that of “BB”-rated industrial bonds by more than 100 basis points after 2010, but that spread was much higher in 2010, at 207 basis points.

Association’s Corporation Law Section recommended that respondents to an appraisal proceeding be given “the option to cut off the accrual of interest by paying to the appraisal claimants a sum of money of the corporation’s choosing. Thereafter, with respect to the amount paid, interest would not accrue. Interest would only accrue if the judicial award exceeded the amount paid, and then would accrue only on the excess.”⁷⁹ On one hand, the Council’s proposal appears to be a practical way to limit the extent to which the statutory rate may serve to improve the economics for appraisal arbitrageurs. On the other hand, however, prepaying part of the fair value at the beginning of an appraisal proceeding might further encourage appraisal arbitration. This is because paying appraisal claimants a portion of the target’s fair value upfront effectively supplies capital to claimants to pre-fund their appraisal pursuits, which in turn is likely to reduce the cost of bringing an appraisal action.

Recent discussion around the statutory rate has also focused on its possible compensation of petitioners for their litigation risk.⁸⁰ From an economic perspective, and under the assumption that parties to a lawsuit are expected to bear their own costs and risks, we see little reason to expect the statutory rate to defray any part of the litigation risk or costs associated with appraisal litigations (*e.g.*, the risk that the court-appraised fair value may be lower than the transaction price).⁸¹

V. CONCLUSION

In the paper, we explore three possible reasons for the observed increase in appraisal actions. First, we examine the extent to which appraisal arbitration may be facilitated by petitioners’ ability to bring an appraisal claim based on shares acquired after the record date of the at-issue transaction. Relying on basic finance principles, we argue that allowing a petitioner to delay the purchase of shares on which appraisal is sought does in fact favor appraisal arbitration – that, by delaying their investment in the target’s stock until as close to the valuation date (that is, the date on which the transaction closes) as possible, arbitrageurs are able to benefit from better information about the value of the target, and, potentially, to avoid taking on a deal with a high risk of failure. One way to rebalance the playing field would be to allow appraisal only on shares acquired prior to the record date. Setting the record date as a cut-off would give sophisticated investors that specialize in appraisal arbitration nearly two months after a deal is announced, on average, to evaluate the transaction. At the same time, it would force arbitrageurs to assume some of the deal risk, including the

⁷⁹ “Section 262 Appraisal Amendments,” Council of the Corporation Law Section of the Delaware State Bar Association, March 16, 2015.

⁸⁰ Myers, Minor, and Charles R. Korsmo, “Appraisal Arbitration and the Future of Public Company M&A,” Working Paper, Brooklyn Law School, August 2014, Forthcoming in *Washington University Law Review*.

⁸¹ This holds true unless the intent of the statutory rate is for target companies (or the surviving combined entities) to either subsidize a portion of petitioners’ litigation costs or to absorb some of their litigation risk. As mentioned above, it is beyond the scope of this paper to explore the legislative intent of the statutory rate.

risk that the fair value of the target may fall between the record date and the date of deal closing.

A review of recent Chancery Court opinions suggests that Delaware currently prefers the DCF method to other valuation methods in determining the fair value of a corporation. In the paper, we document the emergence of a systematic difference between the ERP used in DCF value determination by the Court and that used by investment banks advising target companies. We show that the ERP used by the Court is typically lower than that used by the targets' bankers. Fundamental finance theory informs us that, all else being equal, the lower the ERP, the lower a firm's measured cost of capital and, consequently, the higher the DCF valuation. We posit that the wedge between the ERPs used by bankers and the ERP that the Delaware Chancery Court apparently prefers may have also contributed to the recent rise in appraisal arbitration.

We recognize that the ERP continues to be one of many unsolved puzzles in corporate finance and, thus, ERPs used by different people are likely to vary. From a policy perspective, it clearly does not make sense for courts to simply adopt valuation assumptions made by targets' bankers, as this would defeat the purpose of the appraisal process. However, it may be useful to keep the merger price in mind while determining the fair value of publicly traded targets whose stocks trade in an efficient market. The merger price is likely to be an especially useful benchmark in instances where the sale process that resulted in the transaction was fair. Even in instances where the sales process may be deficient, a DCF method-based valuation of a public firm could benefit from a market check. In an environment in which activist investors devote tens of billions of dollars trying to unlock value by forcing firms to, among other things, modify or change strategy, it seems unlikely that shareholders of a public firm would willingly agree to an unfair transaction price.

Finally, we examine the extent to which the Delaware statutory interest rate may encourage appraisal arbitration. Benchmarking the statutory rate against an array of recent bond and CMT yields shows that the statutory rate more than compensates appraisal petitioners for the time value of money or for a bond-like claim on the surviving entity, so long as the debt of the entity bearing the appraisal claim is rated at least "BB." Our conjecture is that, while the statutory rate may not be the main factor driving appraisal arbitration, it does help improve the economics for arbitrageurs. The proposal by the Council of the Delaware Bar Association's Corporation Law Section to limit the amount of interest paid by appraisal respondents – by allowing them to pay appraisal claimants a sum of money at the beginning of the appraisal action – seems like a practical way to address concerns regarding the statutory rate. However, at the same time, such a practice might further encourage appraisal arbitration, because paying appraisal claimants a portion of the target's fair value upfront effectively supplies capital to claimants to pre-fund their appraisal pursuits.