The Art and Science of Valuation: **Delaware Court Perspectives on DCF Analyses**

By Rajan Singh, Esq.

The Delaware Court of Chancery frequently determines a firm's fair value in the context of appraisal proceedings,[1] utilizing any techniques or methods generally considered acceptable in the financial community.[2] In practice, each side in an appraisal proceeding offers testimony from its own valuation expert. The court then chooses the parts of each expert's valuation that it finds convincing and makes such additional modifications it deems appropriate. Delaware courts have produced an extensive body of case law on appropriate valuation practices, and it is helpful to understand how courts view these practices in order to produce a valuation that a court will view as credible, thereby reducing the risk that it will be successfully contested.

While the Delaware Supreme Court has expressly declined to adopt a formal presumption in favor of any one valuation methodology, it has recognized that the deal price resulting from a well-run, arm's-length sale process is often the most reliable indicator of fair value in statutory appraisal proceedings.[3] Nonetheless, the discounted cash flow (DCF) valuation methodology remains a highly respected approach that is frequently used by the courts, particularly in the absence of a robust market-based indicator. Among DCF models, the weighted average cost of capital (WACC) method (i.e., the adjusted cost of capital method) is the most frequently used in practice.[4] This article focuses on Delaware courts' views of DCF valuations using the WACC method.

At its most basic level, a DCF valuation consists of the following steps: projecting firm cash flows over a discrete projection period; arriving at the firm's terminal value following the discrete projection period; determining an appropriate discount rate; and discounting cash flows and terminal value to present value using that discount rate.[5] While fundamental DCF method components may appear straightforward, each in fact involves a considerable degree of nuance and complexity.

Cash Flow Projections[6]

The reliability of a DCF valuation is only as good as its input quality, with the discrete cash flow projection arguably being the most important valuation input overall.[7] Either a top-down or bottom-up approach may be used to create the projection. The top-down approach uses high-level industry and market data (working "down" to firm revenue), while the latter uses detailed information at the business or product level to build "up" to firm revenue. The Court of Chancery has expressed a strong preference for projections prepared using a bottom-up approach rather than a top-down process and has determined that such method is more likely to produce reliable projections.[8]

In evaluating the reliability of projections, courts will also consider both the source of projections and the context in which they were prepared. As firm management typically has the best first-hand knowledge of the firm's operations, the courts prefer projections that are prepared by management in the ordinary course of business and have determined that such projections are deemed to be reliable.[9] A valuation

---

1 See 8 Del. C. § 262 (entitling stockholders who have perfected appraisal rights to obtain an appraisal by the Court of Chancery of the fair value of the stockholders' shares).

2 Weinberger v. Uop, 457 A.2d 701, 713 (Del. 1983).

3 See DFC Global Corp. v. Muirfield Value Partners, L.P., 172 A.3d 346, 366–69 (Del. 2017) (declining to adopt a presumption in favor of deal price, but emphasizing its reliability when derived from a robust sale process); Dell, Inc. v. Magnetar Global Event Driven Master Fund Ltd., 177 A.3d 1, 20–23 (Del. 2017) (reaffirming that deal price is persuasive when the market for the stock is semi-strong efficient); Verition Partners Master Fund Ltd. v. Aruba Networks, Inc., 210 A.3d 128, 137–39 (Del. 2019) (holding that deal price minus synergies was a reliable estimate of fair value); Brigade Leveraged Capital Structures Fund Ltd. v. Stillwater Mining Co., 240 A.3d 3, 12–18 (Del. 2020) (deal price upheld as reliable even where the sale process was not perfect but adequate).

4 Robert W. Holthausen and Mark E. Zmijewski, *Corporate Valuation: Theory, Evidence & Practice* (Cambridge Business Publishers, 2014), 177.

5 The formula for a DCF valuation using the WACC method and a continuing value approach is as follows:

$$V_F = \sum_{t=1}^{C} \frac{FCF_t}{(1 + r_{WACC})^t} + \frac{FCF_{C+1}}{(r_{WACC} - g)} \times \frac{1}{(1 + r_{WACC})^C}$$

where V_F = value of the firm, C = number of years in the discrete forecast period, FCF = free cash flow of the firm, g = perpetual growth rate, r_{WACC} = weighted average cost of capital of the firm. See Holthausen and Zmijewski, *Corporate Valuation*, 174.

6 When applying the DCF method, valuation professionals typically use forecasts rather than projections. Although the two terms are often used interchangeably, they do not mean the same thing. Forecasts are generally based on expected trends, while projections involve hypothetical scenarios, so forecasts are generally more appropriate for valuation purposes. Nevertheless, the term projections is used in this article because that is the term used by the Delaware courts.

7 See In re Appraisal of SWS Group, Inc., 2017 Del. Ch. LEXIS 90, 31 (Del. Ch. May 30, 2017) (noting that "absent reliable projections a DCF analysis is simply a guess.") (internal quotations omitted); see also Huff Fund Investment Partnership v. CKx, INC., 2013 Del. Ch. LEXIS 262, 1 (Del. Ch. Nov. 1, 2013) ("[W]ithout reliable … projections, any values generated by a DCF analysis are meaningless. The reliability of a DCF analysis therefore depends, critically, on the reliability of the inputs to the model.") (internal quotations omitted).

8 HBK Master Fund L.P. v. Pivotal Software, Inc., 2023 Del. Ch. LEXIS 769, 72-73 (Del. Ch. Aug. 14, 2023) ("Projections prepared using a bottom-up process generally are more reliable than projections prepared using a top-down process.") (internal quotations omitted).

9 *Huff Fund*, 2013 Del. Ch. LEXIS at 29 ("Under Delaware appraisal law, when management projections are made in the ordinary course of business, they are generally deemed reliable.") (internal quotations omitted).

professional who alters management projections for a DCF model should have a clear and reasonable basis for such alterations.[10] Likewise, courts are highly skeptical of projections prepared:

- Outside of the ordinary course of business,
- By a management team with no long-term projection creation experience,
- By a management team with a motive to alter projections (e.g., to protect their jobs),
- When litigation was likely and probably affected the neutrality of the projections, or
- Using "speculative" or "arbitrary" assumptions or those suggesting a dramatic firm turnaround despite no underlying changes justifying such an improvement.[11]

Similarly, the Court of Chancery is skeptical of projections reflecting "hoped for" results (rather than expected results) and prepared without the opportunity for the board of directors to review and discuss the projections with management.[12]

With respect to the time period for the projections, courts have not prescribed a specific timeframe and will examine a variety of factors when evaluating whether the timeframe used is reasonable. These factors include:

- The anticipated duration of the firm's high-growth stage before it enters into a moderate, steady-state growth stage, and
- Management's degree of confidence in its ability to accurately project the firm's future cash flows over the selected period.[13]

The credibility of a valuation therefore hinges on its cash flow projection reliability, which Delaware courts assess based on preparation methodology, source, context, and assumption rationality.

Terminal Value

Although it is possible to calculate a firm's terminal value in several ways, the academic literature focuses on the perpetual growth model and exit multiples method.[14] Commonly used perpetual growth models include the Gordon growth model (GGM) and the McKinsey value driver model (VDM). Delaware courts have accepted both the GGM and the VDM, as well as the exit multiples method, as valid methodologies for determining terminal value.[15]

---

10 Cede & Co. v. Technicolor, Inc., 2003 Del. Ch. LEXIS 146, *27 (Del. Ch. Dec. 31, 2003) ("Experts who … vary from management forecasts should proffer legitimate reasons for such variance.")
11 *HBK Master Fund L.P.,* 2023 Del. Ch. LEXIS at 71–72.
12 Ibid.
13 See In re ISN Software Corp. Appraisal Litigation, 2016 Del. Ch. LEXIS 125, 14 (balancing the company's current stage within its lifecycle, the length of time it will remain in that stage, and the reliability of the projections available to estimate future cash flows).
14 See, e.g., Joshua Rosenbaum and Joshua Pearl, *Investment Banking: Valuation, Leveraged Buyouts, and Mergers & Acquisitions* (John Wiley & Sons, Inc., 2009), 132 (stating that the exit multiple method and perpetuity growth method are two widely accepted methods used to calculate terminal value).
15 See Ramcell, Inc. v. Alltel Corp., 2022 Del. Ch. LEXIS 312, 75 (Del. Ch. Oct. 31, 2022) ("The Court of Chancery has accepted both GGM and the VDM as valid means [sic] calculating a firm's terminal value."); See also Kruse v. Synapse Wireless, Inc., 2020 Del. Ch. LEXIS 238, *41 (Del. Ch. July 14, 2020) ("Two common methods for computing a firm's terminal value are the perpetual growth model … and an exit multiples method … .)".

Ultimate**Software**
Subscription

#1 Best-Selling Business Valuation Software

FOUR Valuation Applications,
One Low Annual or Monthly Price

The Ultimate Software Subscription (built around Excel and Word) gives you access to ALL of our valuation software products for ALL versions of Microsoft Office back to 2013, includes ALL software updates, PLUS technical support. Both single and multi-user licenses are available.

Software Subscription Includes

1 BUSINESS VALUATION MANAGER™ PRO
BVM Pro (used by NACVA to train professional valuators), with over 90% market share, has been used by thousands of CPAs, valuators, and financial professionals for over three decades.

2 VALUSOURCE PRO INTERNATIONAL
ValuSource Pro International is built around International Financial Reporting Standards (IFRS) instead of GAAP so you can provide comprehensive valuation analysis and reports based on IFRS.

3 EXPRESS BUSINESS VALUATION
Express Business Valuation is the "light" version of BVM Pro and has a summary chart of accounts, no detailed DCF Method, and has fewer assumptions and options.

4 BUSINESS VALUATION REPORT WRITER
The Business Valuation Report Writer is a report module for BVM Pro and Express Business Valuation that saves you up to 50% of the time it takes to prepare and review written business valuation reports.

For more info call (800) 677-2009
NACVA1@NACVA.com | www.NACVA.com/store_home.asp

Ultimate**Software**
Subscription **PRICING**

Software is only available as part of the Ultimate Software Subscription.
Note: Prices and products subject to change.

Single-User ....$1,465 / year

or $135 per month

Business Valuation Manager Pro ✔
ValuSource Pro International ✔
Express Business Valuation ✔
Report Writer ✔
(works with all valuation products)

Visit website for more info and multi-user pricing.

PLUS
TECHNICAL SUPPORT
With the Unlimited Software Subscription, you get full technical support, including: support for technical issues like installation, program operation, database integration, as well as access to our team of certified valuators to help you use the software to complete specific valuation engagements.

COMPLETE DATABASE INTEGRATION
KeyValueData® databases integrate directly into all the valuation software in the Ultimate Software Subscription.

Courts tend to scrutinize chosen comparables closely and may view the terminal value with skepticism if selected companies do not sufficiently align with the subject company.

The exit multiples method calculates terminal value as a multiple of the firm's terminal year cash flow.[16] The multiple is often based on the current last 12 months' (LTM) trading multiple for comparable companies.[17] A common criticism of applying the multiples method within a DCF framework centers not on the methodology itself but on peer company selection; courts tend to scrutinize chosen comparables closely and may view the terminal value with skepticism if selected companies do not sufficiently align with the subject company.[18] In the *Jarden Corp.* decision, the Court of Chancery noted that to find a comparable peer group, the valuator must identify companies with similar risk profiles, costs of capital, return on invested capital, and growth as the firm being valued.[19] The subject company and those with comparable risk and growth profiles should also have similar value drivers (e.g., product lines, customer types, market segments, and operations types). The *Jarden* court also acknowledged that peers provided by firm management should be viewed with skepticism as management tends to provide "aspirational peers" rather than true competitors.[20]

A perpetual growth model assumes cash flows will grow at a fixed rate in perpetuity.[21] Accordingly, one critical component of the model is to determine an appropriate rate of growth to be applied following the discrete projection period. Delaware

Courts have defined upper and lower bands of the rate at which a firm should grow during the perpetual growth period. In the *3M Cogent* decision, the court stated that "a viable company should grow at least at the rate of inflation and ... the rate of inflation is the floor for a terminal value estimate for a solidly profitable company that does not have an identifiable risk of insolvency."[22] The *3M Cogent* court also noted that a terminal growth rate should not eclipse nominal gross domestic product (GDP) growth in the U.S. because, if assumed to grow at a higher rate indefinitely, cash flow would eventually exceed the GDP.[23] The perpetuity growth rate should therefore fall somewhere between the inflation rate and the projected nominal U.S. GDP growth rate.

Courts have expressed skepticism when a generic growth rate is used without explanation as to how it relates to the firm being valued or its industry. In the *Ramcell* case, the Court of Chancery stated that absent a valid explanation, using a generic growth rate is inherently flawed and unreasonable; especially when industry growth rates are available.[24] This aligns with the academic literature, which provides that the best estimated long-run growth rate is the expected long-term consumption growth rate for the applicable industry's products and services, plus inflation.[25]

---

16 Rosenbaum and Pearl, *Investment Banking*, 132.
17 Rosenbaum and Pearl, *Investment Banking*, 132.
18 See Gholl v. eMachines, Inc., 2004 Del. Ch. LEXIS 171, 51 (Del. Ch. Nov. 24, 2004) ("Since a multiples approach is a market-based approach, its reliability depends on being able to identify comparable companies.").
19 In re Appraisal of Jarden Corp., 2019 Del. Ch. LEXIS 271, 74 (Del. Ch. July 19, 2019).
20 *Jarden Corp.*, 2019 Del. Ch. LEXIS at 74–75.
21 *Ramcell, Inc.*, 2022 Del. Ch. LEXIS at 66.
22 See Merion Capital, L.P. v. 3M Cogent, Inc., 2013 Del. Ch. LEXIS 172, 72 (Del. Ch. July 8, 2013).
23 See *3M Cogent*, 2013 Del. Ch. LEXIS at 723.
24 See *Ramcell, Inc.* 2022 Del. Ch. LEXIS at 67.
25 See Tim Koller, Marc Goedhart, and David Wessells, *Valuation: Measuring and Managing the Value of Companies* (John Wiley & Sons, Inc., 2005), 275.

The GGM,[26] which calculates the present value of an infinite cash flow stream, is "equivalent to a [DCF] analysis with certain simplifying assumptions, namely, (a) earnings grow at a constant rate into perpetuity and (b) all earnings are either distributed to shareholders or, if retained by the company, reinvested at the discount rate."[27] To determine terminal year free cash flow, the GGM applies the perpetual growth rate to the free cash flow from the last year of the discrete projection period. An alternative to the GGM, the VDM accounts for the reinvestment rate required to maintain perpetual growth; when the growth rate used to determine terminal value falls below the explicit projection period growth rate (which is often the case), it makes sense to also lower the reinvestment rate for achieving perpetual growth.[28]

Courts have noted the respective benefits and drawbacks of the GGM and VDM. The GGM is simple and easy to understand; it is not difficult to use the growth rate to increase the last period's cash flows and then calculate a perpetuity.

Courts have recognized this as a theoretically sound and widely accepted terminal value calculation method.[29] GGM drawbacks include high sensitivity to small discount rate or growth rate changes; a slight change in either metric will spark large swings in the firm's terminal value.[30] The GGM also does not address capital investment changes required to sustain growth during the perpetual growth period as compared to the discrete projection period.[31]

VDM benefits include less sensitivity to discount rate and growth rate changes, and its ability to quantify the link between steady state growth and the required reinvestment rate.[32] Drawbacks include its assumption that return on invested capital equals the applicable discount rate, potentially undervaluing firms that have a sustainable competitive advantage (e.g., patent protection or a strong brand reputation) that permits them to yield a higher return on investment than their cost of capital for the foreseeable future.[33]

---

26 The GGM can be expressed as:

$$\text{Terminal Value} = \frac{FCF_t \times (1+g)}{WACC - g}$$

where FCF_t = free cash flow at the end of the projection period, g = long-term growth rate, $WACC$ = weighted average cost of capital to the firm. See *Ramcell, Inc.*, 2022 Del. Ch. LEXIS at 71.

27 See *Ramcell, Inc.*, 2022 Del. Ch. LEXIS at 71.
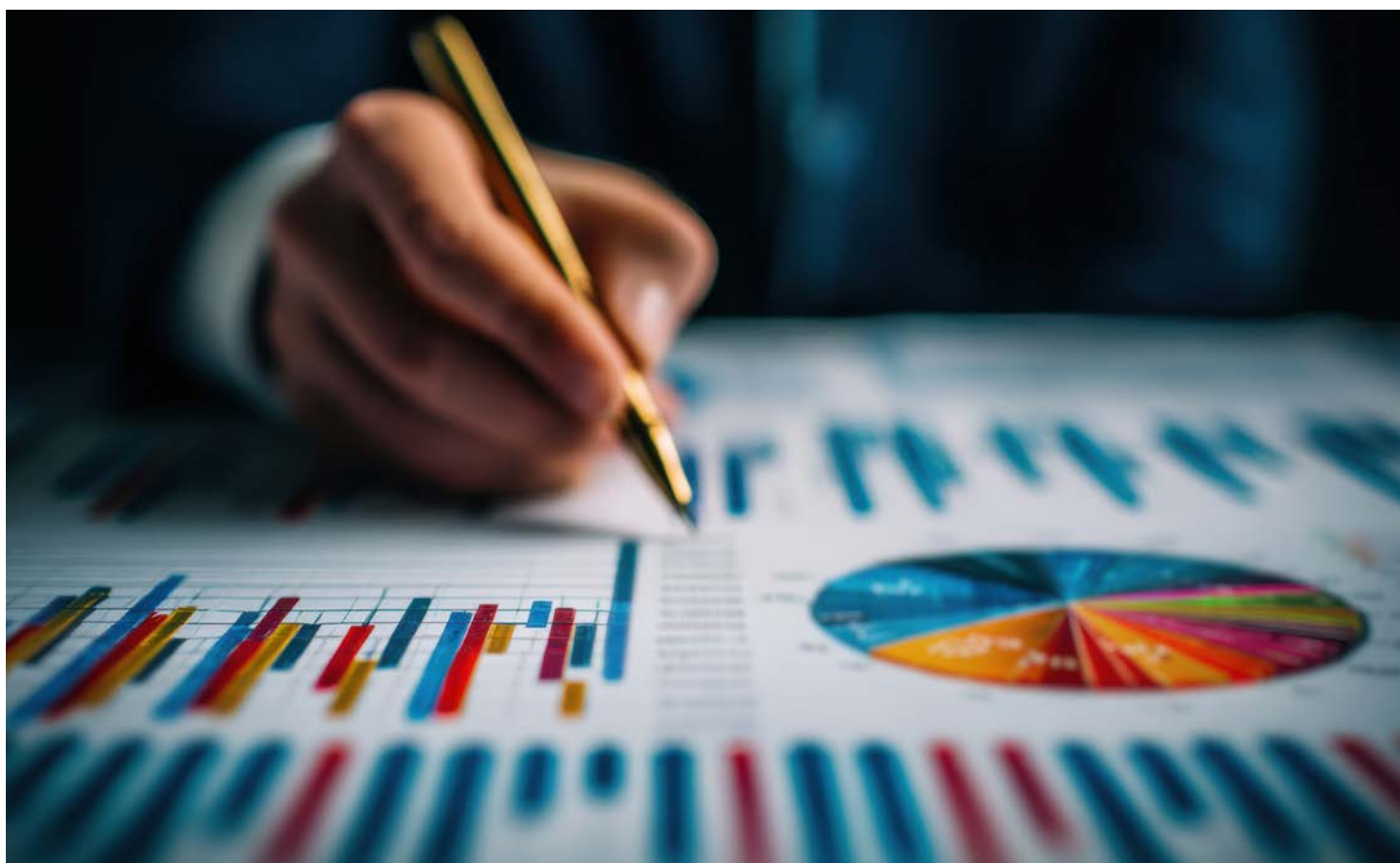28 Koller, Goedhart, and Wessells, *Valuation*, 274.
29 *Ramcell, Inc.*, 2022 Del. Ch. LEXIS at 72.
30 Ibid.
31 Ibid.
32 Ibid.
33 Ibid., 73–74.

While it is common for terminal value to represent a significant portion of a firm's total enterprise value, courts are wary of valuations that rely too heavily on that aspect of value. As a general rule, the Court of Chancery views terminal values that account for more than 70 percent of the firm's estimated total value as a red flag. While exceeding this threshold does not necessarily result in rejection of a valuation, the higher the percentage, the more likely it is that the court will consider the valuation speculative.[34] A valuation professional who arrives at a terminal value representing more than the 70 percent threshold should have strong support for the reliability of the projections used for the explicit forecast period and the firm's growth rate following the discrete forecast period.

Discount Rate

The final DCF valuation component is determining the firm's WACC, a weighted composite of its cost of equity and after-tax debt.[35] To determine WACC, a valuator must determine the firm's cost of equity, its after-tax cost of debt, and the weights to assign to each.

The Court of Chancery has held that in most cases, the WACC should be based on the firm's target capital structure rather than its current one,[36] the former representing the anticipated debt-equity mix over the firm's lifetime. This makes sense as it aligns the perpetual nature of projected cash flows with the firm's expected long-term business financing. Using current debt-to-equity ratios (rather than

---

34 *HBK Master Fund L.P.*, 2023 Del. Ch. LEXIS at 102; see In re Appraisal of Solera Holdings., Inc., 2018 Del. Ch. LEXIS 256, 2018 WL 3625644, at 32 (Del. Ch. July 30, 2018) (discounting petitioners' DCF analysis in part because "nearly 88% of petitioners' enterprise valuation is attributable to periods *after* the five-year Hybrid Case Projections"). Gray v. Cytokine Pharmasciences, Inc., 2002 Del. Ch. LEXIS 48, 2002 WL 853549, at 9 (Del. Ch. Apr. 25, 2002) (criticizing a valuation where the terminal value accounted for over 75 percent of the total value); see *Gholl*, 2004 Del. Ch. LEXIS at 13 (criticizing discounted cash flow valuation where the exit multiples method for calculating terminal year value resulted in the terminal value representing over 70 percent of its total present value).

35 The formula to calculate WACC is as follows:

$$WACC = [K_D \times W_D (1 - t)] + (K_E \times W_E)$$

where K_D = cost of debt capital, W_D = average weight of debt in capital structure, t = effective tax rate for the firm, K_E = cost of equity capital, W_E = average weight of equity capital in capital structure. See *Merion Capital, L.P.*, 2013 Del. Ch. LEXIS at 50.

36 *Jarden Corp.*, 2019 Del. Ch. LEXIS at 96–97.

In cases involving the determination of control value, using the target—or optimal—capital structure is especially important to ensure a fair outcome for minority shareholders.

target ratios) would distort the cost of capital analysis.[37] Moreover, in cases involving the determination of control value, using the target—or optimal—capital structure is especially important to ensure a fair outcome for minority shareholders, who may otherwise be disadvantaged by an artificially depressed valuation based on a suboptimal current capital structure.

Courts have accepted a modified version of the capital asset pricing model (CAPM) to determine the cost of equity. CAPM has three components: the risk-free rate, equity beta, and equity risk premium.[38] CAPM is then modified to account for firm size by adding a size premium as necessary.[39] The Court of Chancery has determined that a size premium is generally acceptable for smaller firms to account for the higher rate of return required by investors for the greater risk associated with investing in a small firm.[40] The court has also accepted using the 20-year U.S. treasury bond return for the risk-free rate as a universally accepted corporate valuation practice that is appropriate for DCF valuations.[41]

The equity beta is intended to reflect the covariance between the rate of return on a firm's stock and that of the overall market, and is determined by regressing a firm's stock price change against a selected stock index change.[42] For a public company, the beta should be based on the same index where its stock trades.[43] When valuing a private company, the average beta of comparable publicly traded companies should be used. Although it is often difficult to determine which public companies are comparable to a private firm being valued, the Court of Chancery provided useful guidance to valuation professionals in the *Ramcell* decision, suggesting they "'estimate a correlation between revenues or operating income of the comparable [public] firms and the [private] firm being valued.' If the correlation is high, the firms are comparable."[44]

The Court of Chancery accepts raw equity betas that look back either two or five years with weekly or monthly return intervals as appropriate.[45] Courts have also accepted "adjusted betas" and consider their utility on a case-by-case basis. Adjusted betas are typically provided by service providers and are raw betas adjusted to account for the observation that over time, betas revert to an average (e.g., 1.0 or an average beta of the peer group).[46] Valuation professionals should also be cautious when using proprietary betas provided by service providers (including so-called "predictive betas") that fail to publicly disclose sufficient information to permit the valuator to fully

---

37 *Jarden Corp.*, 2019 Del. Ch. LEXIS at 97.
38 CAPM is expressed as follows:

$$E(R_i) = r_f + \beta_i\,[E(Rm) - r_f]$$

where $E(R_i)$ = security i's expected return, r_f = risk-free rate, β_i = stock's sencxsitivity to the market, $E(R_m)$ = expected return of the market. See Koller, Goedhart, and Wessells, *Valuation*, at 294–295.
39 In re Appraisal of the Orchard Enterprises, Inc., 2012 Del. Ch. LEXIS 165, 61–63 (Del. Ch, July 18, 2012) (noting that there is an evolving view that the returns to the firm are influenced by size and that a size premium is appropriate in calculating the discount rate).
40 *Orchard Enterprises*, 2012 Del. Ch. LEXIS at 66.
41 *Jarden Corp.*, 2019 Del. Ch. LEXIS at 99.
42 *Ramcell, Inc.*, 2022 Del. Ch. LEXIS at 53; DFC Global Corp. v. Muirfield Value Partners, L.P., 172 A.3d 346, 385 (Del. 2017).
43 *Jarden Corp.*, 2019 Del. Ch. LEXIS at 100.
44 *Ramcell, Inc.*, 2022 Del. Ch. LEXIS at 54 (quoting Aswath Damodaran, *Private Company Valuation*, https://pdfs.semanticscholar.org/c94a/584368b85eb7197c66f910db970a759b3010.pdf [last visited Sept. 12, 2022]).
45 *Jarden Corp.*, 2019 Del. Ch. LEXIS at 100.
46 R. Scott Widen, "Delaware Law, Financial Theory and Investment Banking Valuation Practice," *NYU Journal of Law & Business* 4, no. 2 (Spring 2008): 584.

Delaware courts recognize that valuation is both an art and a science, and that developing a valuation involves the application of subjective judgment and experience to nuanced issues.

understand the beta calculation. For example, in the *Golden Telecom* decision, the Court of Chancery rejected the use of a Barra beta (an MSCI-provided predictive beta product) because the beta provider did not publicly disclose the weight of each factor used in its proprietary model or explain the changes in different versions of the model, and because the valuation professional who relied on it did not fully understand all details of the model.[47]

There is a lack of consensus in the valuation community regarding whether to base the equity risk premium on long-term historical data (e.g., from 1926–2015) for stock premiums—commonly referred to as the "historical ERP" or "long-term ERP"—or otherwise adjust the long-term historical data to account for long-term risk premium declines (commonly referred to as the "supply-side ERP").[48] The Court of Chancery has adopted the use of supply-side ERPs as the default method in appraisal actions but has noted the utility of using the unadjusted long-term ERP in some cases.[49]

Conclusion

Delaware courts recognize that valuation is both an art and a science, and that developing a valuation involves the application of subjective judgment and experience to nuanced issues. Although Delaware courts do not mandate a single valuation methodology, a DCF analysis grounded in well-supported assumptions and rigorous financial reasoning has traditionally carried significant weight in valuation litigation. However, where a credible market-based indicator is available—such as a deal price resulting from a robust sale process—courts have increasingly questioned the reliability of DCF models created solely for litigation. An understanding of how a court will evaluate the components of a DCF valuation will help professionals develop valuations that withstand judicial scrutiny. As the body of Delaware case law continues to evolve, staying attuned to the courts' reasoning and valuation trends will remain essential for producing credible, litigation-resilient valuations. **VE**

Rajan Singh, Esq., is a corporate and securities attorney whose practice includes mergers and acquisitions, corporate governance, joint ventures, venture capital, and restructuring matters. He regularly advises investment banks and valuation professionals in connection with fairness opinions and related valuation analyses. Email: rajan.singh@wbd-us.com.

---

47 Global GT LP v. Golden Telecom, Inc., 993 A.2d 497, 520 (Del. Ch. 2010).
48 *Jarden Corp.*, 2019 Del. Ch. LEXIS at 100.
49 *SWS Group, Inc.*, 2017 Del. Ch. LEXIS 90, 44 ("While it is true that a case-by-case determination of ERP remains appropriate, here there is no basis in the factual record to deviate from what this Court has recently recognized as essentially the default method in these actions.").