Working Draft of AICPA Accounting and Valuation Guide

# Valuation of Portfolio Company Investments of Venture Capital and Private Equity Funds and Other Investment Companies

Released May 15, 2018

Part II: Appendixes A-C, Glossary

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# Appendix A

### Valuation Process and Documentation Considerations

- A.01 An effective valuation process enables management to estimate fair value of its investments consistent with the guidance in Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) 820, *Fair Value Measurement*. An effective valuation process is thus an important part of management's system of internal control over financial reporting. This appendix discusses some considerations related to internal control over financial reporting; however, it does not provide a complete summary of internal control considerations and documentation considerations.
- A.02 As indicated in AU-C200.A2 of the Clarified Auditing Standards of the AICPA, management has responsibility "for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error."
- A.03 As discussed in AU-C540.A21 of the Clarified Auditing Standards of the AICPA:
  - The preparation and fair presentation of the financial statements also requires management to establish financial reporting processes for making accounting estimates, including adequate internal control. Such processes include the following:
    - Selecting appropriate accounting policies and prescribing estimation processes, including appropriate estimation or valuation techniques, including, when applicable, the appropriate models
    - Developing or identifying relevant data and assumptions that affect accounting estimates
    - Periodically reviewing the circumstances that give rise to the accounting estimates and reestimating the accounting estimates as necessary
- A.04 As part of having an effective system of internal control over financial reporting, management should be aware of the particular risks associated with the fund's fair value measurements and evaluate whether the fund has controls placed in operation that adequately address its financial reporting risks. In addition, the fund would need to support its fair value measurement assumptions that a market participant would consider in measuring fair value. An integral part of this support is the creation and maintenance of sufficient and appropriate documentation pertaining to valuation methodologies employed, inputs and assumptions used and the resulting output associated with the fair value measurements.

- **A.05** SEC regulations also require that fund management create policies and procedures related to valuation. Specifically, under rule 206(4)–7 of the Investment Advisers Act of 1940 ("Advisers Act"), it is unlawful for an investment adviser registered with the SEC to provide investment advice unless the adviser has adopted and implemented written policies and procedures reasonably designed to prevent violation of the Advisers Act by the adviser or any of its supervised persons. Such written policies and procedures should address, among other things, processes to value client holdings and assess fees based on those holdings. Such written policies and procedures should consider and address the risks associated with conflicts. Often times such written policies and procedures employ the use of US GAAP for valuing client holdings.
- **A.06** The following are select principles that are important to the establishment and maintenance of an effective valuation process:
  - a. Unit of Account
    - i. The asset being valued is aligned with the unit of account for accounting purposes, considering how market participants would transact acting in their economic best interest
  - b. Valuation Methodologies
    - i. Valuation methodologies are chosen in a manner that produces a fair value consistent with the principles of FASB ASC 820
    - ii. Changes in valuation methodologies are identified each reporting period and assessed for reasonableness
    - iii. Changes in valuation methodologies between periods are monitored and assessed for indications of bias
    - iv. Changes in valuation methodologies are appropriately made to reflect developments in portfolio companies and adequately supported
  - c. Significant Inputs Used in the Valuation
    - i. All significant inputs to an investment valuation are clearly identified. Examples of key inputs could include discount rates, profit margins, growth rates, royalty rates, and selected market multiples.
    - ii. All significant unobservable inputs are calibrated to any relevant transactions in the portfolio company's instruments and then updated for changes between the transaction date and the measurement date
    - iii. All significant inputs to an investment valuation are analyzed individually and in the aggregate as to the relevance, reliability, accuracy and reasonableness of those inputs and the corresponding degree of reliability is adequately considered in the fair value determination

- iv. Changes in significant inputs over periods are monitored and assessed for indications of bias
- d. Outputs and Conclusions
  - i. Valuation methodologies, significant inputs and the resulting fair value estimates are reviewed for reasonableness by individuals in the organization with the appropriate skill sets necessary to determine that the fair valuation is reasonable and who are sufficiently independent so that conflicts of interest are minimized
  - ii. Management reviews to assess the reasonableness of methodologies, inputs and the resulting fair value estimate are performed with sufficient granularity to prevent a material misstatement in any financial statement that includes or is reliant on such investment valuations
  - iii. Financial statement disclosures prepared by the fund's personnel are reviewed by the fund's management to determine they are fairly presented in accordance with U.S. generally accepted accounting principles and are consistent with the fair value estimates
- e. Administration of the Process
  - i. The valuation process is supported by adequately detailed written policies and procedures consistent with the principles discussed in this appendix.
  - ii. The performance of control activities associated with the valuation process are contemporaneously documented to facilitate management review processes as well as third-party assessment of the sufficiency and reasonableness of the fair value estimate

## **Appendix B**

## Valuation Reference Guide

- **B.00.01** This appendix provides a reference guide to several technical issues to be considered as well as certain inputs or calculations that may be used in valuing interests in privately-held companies. The PE/VC Task Force (task force) hopes that this reference may be helpful to practitioners who perform valuations in this industry. Nevertheless, this appendix is not exhaustive and is not intended to substitute for training in the valuation field. Although this guide cannot cover every valuation issue, this appendix provides a brief overview of the following topics:
  - Relationship between Fair Value and Stages of Enterprise Development
  - The Initial Public Offering Process
  - Valuation Implications of a Planned Public Offering
  - Venture Capital Rates of Return
  - Table of Capitalization Multiples
  - Derivation of the Weighted-Average Cost of Capital
  - Rights Associated with Preferred Stock
  - Models Used in Calculating Discounts for Lack of Marketability
  - Valuation Issues Stand-alone Option-like Instruments
  - Valuation Issues Convertible Instruments

#### **Relationship Between Fair Value and Stages of Enterprise Development**

**B.01.01** Fair value is estimated as of a specific date. The fair value of the interests within an enterprise is not static; rather, fair value changes over time as all of the elements that enter into estimating fair value change over time. As discussed in paragraphs 1.15–.20, one of the principal elements contributing to a change in fair value over time is the stage of development of the enterprise. Typically, value is created as an enterprise advances through the various stages of its development. As an enterprise progresses through the stages, it may achieve certain milestones, resulting in correspondingly diminished uncertainty and perceived risk and thereby enhancing the value of the enterprise. If, however, progress slows, ceases, or reverses, and the enterprise fails to progress through the "normal" stages of development, value would likely be diminished.

- **B.01.02** The achievement of a milestone does not necessarily in and of itself enhance value. As with any other determinant of value, the fund should consider the milestone in conjunction with other relevant factors when estimating an overall value at a point in time. However, all else being equal, the progressive achievement of milestones, such as those listed in paragraph 13.42(c), tends to enhance the value of the portfolio company.
- **B.01.03** Different valuation approaches may be more appropriate for some stages of enterprise development than for other stages.<sup>1</sup> Please see paragraph 1.15 for a description of the typical stages of development as presented in this guide; other sources may indicate different numbers of stages. Paragraphs B.01.04-.01.09 discuss which approaches are typically considered more or less appropriate in each stage. As discussed in paragraph 5.04, the fund should apply more than one approach when appropriate and when sufficient data are available, and then would compare and assess the results. Under Statement on Standards for Valuation Services (SSVS) No. 1, Valuation of a Business, Business Ownership Interest, Security, or Intangible Asset (AICPA, Professional Standards, VS sec. 100), and the Appraisal Foundation's Uniform Standards of Professional Appraisal Practice (as noted in footnote 3 in paragraph 5.04), the fund should consider all three approaches (market, income, and asset) for valuing an enterprise, and if one or more is not used, the fund should explain such nonuse. As discussed in paragraph .42 of SSVS No. 1, the fund should correlate and reconcile the results obtained under different approaches and methods and assess the reliability of the results under different approaches and methods. Based on this analysis, the fund should then determine whether the fair value estimate should reflect the results of one method or a combination of the results of more than one method.
- **B.01.04** *Stage 1.* Because the enterprise has no product revenue and little or no expense history, it is typically unable to make reliable cash flow forecasts; therefore, using the income approach may be challenging. Because of the lack of comparative information available for publicly traded or privately held start-up enterprises, the market approach using the guideline public company or guideline company transactions methods may also be challenging. Valuation techniques that may be appropriate include the following:
  - *a.* Calibration to a recent round of financing. Calibrating to a recent round of financing provides the most reliable indicator of the value of the enterprise at stage 1 if relevant and reliable transactions have occurred in the enterprise's equity interests. If transactions have occurred or are pending, but are not arm's length or not concurrent with the valuation date, these transactions should still be considered, making adjustments as needed, considering the nature of the transaction and any changes in value that have occurred since the transaction (or that are expected to occur prior to the transaction). See paragraphs 5.08–.09 and 10.31 for more details.
  - *b. Asset accumulation method.* The asset accumulation method may be an appropriate indicator of the value of the enterprise at stage 1, but it is complicated

<sup>&</sup>lt;sup>1</sup> Please note that the use of different valuation techniques at different stages of development is not inconsistent with the guidance in Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) 820-10-35-25 because changing facts and circumstances may require the use of different valuation techniques.

by the possible existence of internally developed intangible assets and goodwill not captured on the balance sheet of the enterprise. As discussed in paragraphs 5.95–.103, the asset approach is based on the principle that the fair value of an enterprise is equal to the fair value of its assets less the fair value of its liabilities. For early-stage enterprises, a significant amount of value may lie in intangible assets (for example, patented and unpatented technology assets, copyrights, domain names, and so on). Thus, the application of the asset approach to an earlystage enterprise necessitates a consideration of the value of intangible assets. Unless the enterprise has recently undergone a business combination or change of control, intangible assets will likely not be recognized in the enterprise's balance sheet. The identification and valuation of intangible assets can add significant complexity to the asset approach. The likelihood that intangible assets are significant to the fair value of an enterprise's assets increases as the enterprise moves through the stages of development. Without a consideration of intangible assets, the asset approach may be unreliable.

- **B.01.05** Stage 2. The income approach (discounted cash flow [DCF] method) will likely be more relevant than in stage 1; however, the enterprise may still have significant difficulty in forecasting cash flows. As such, the fund may choose to use the income approach during stage 2 as a secondary approach (that is, for purposes of comparison with the results obtained from another approach) and will typically use a DCF method and relatively high discount rate. Similar to stage 1, the guideline public company and guideline company transactions methods generally would not provide a reliable estimate of value because of (a) the lack of publicly traded start-up enterprises and transactions from which to obtain comparative information and (b) the fact that market multiples could exhibit substantial dispersion from one enterprise to the next, making it difficult to determine any kind of reliable "average" multiple. Additionally, because stages 1 and 2 enterprises have yet to generate revenue or profits, there is generally no financial metric to which the fund can apply a multiple. As with stage 1, the asset approach (asset accumulation method) also may be appropriate during stage 2; however, it is more likely that intangible assets will be a material part of the enterprise's value, thus adding complexity to this approach. After stage 2, the relevance of the asset approach tends to diminish significantly because it will likely be more reliable to measure the value of intangible assets and goodwill in aggregate through the use of a method under the income or market approaches that incorporates enterprise-level cash flows. Similar to stage 1, calibrating to a recent transaction will often be the most indicative method in stage 2. The reliability of the calibrated analysis will likely increase because investments made by venture capital firms during stage 2 may provide a more reliable indicator of fair value than the investments made by angel investors in stage 1. Please see paragraphs 13.39-.43, "Early Stage Companies With No Recent Financing Rounds," for a discussion of approaches that may apply for valuing early stage companies when there are no recent financing rounds.
- **B.01.06** *Stage 3.* Although, generally, there is no product revenue during this stage, the fund may be able to obtain financial forecast information that is more reliable than comparable information obtained in earlier stages and, therefore, may have a reasonable basis for application of the income approach. However, similar to stage 2, both the income

approach and market approach present challenges. Funds who use the income approach during stage 3 typically use a DCF method and relatively high discount rate. However, because profits for the enterprise may still be years in the future, and the venture capital rates of return cited for investments in this stage span a wide range (for example, 30 percent to 50 percent), the income approach value may be hard to estimate with any degree of certainty. A market approach using the guideline public company and guideline company transactions methods also may be difficult to apply, given the lack of publicly traded start-up enterprises from which to obtain comparable information. Therefore, rather than relying exclusively on these methods, because it is typical for multiple rounds of institutional financing to have occurred by this stage, calibration may provide a reliable indication of value that should be used as a basis for comparison to any other indication.

- **B.01.07** *Stage 4.* Both the income and market approaches are typically appropriate for stage 4. The reliability of a financial forecast would tend to be higher in stage 4 than in stage 3 because more information is available on which to base the forecast; therefore, the discount rate for a DCF method under the income approach would tend to be lower in stage 4 than in stage 3, reflecting the lower degree of risk. If there are comparable publicly traded enterprises from which to obtain information, the fund may consider such enterprises under a market approach and adjust the valuation, considering the enterprise's relative size, expected growth, and profitability. Moreover, because for a particular enterprise there will have been at least as many rounds of financing by stage 4 as there were by stage 3, the fund will likely have a reasonable basis for application of the market approach using calibration.
- **B.01.08** Stage 5. Income and market approaches would generally be appropriate, as in stage 4, and the discount rate for a DCF method under the income approach would tend to be lower in stage 5 than in stage 4. Under a market approach, because the portfolio company may be closer to a liquidity event in stage 5 than in stage 4, adjustments to the valuation based on comparisons with publicly traded start-up portfolio companies would tend to be lower in stage 5. Calibration should still be considered, especially for arm's-length transactions with new investors. However, if there are no new investors or if the round is led by a strategic investor with existing investors tagging along at low levels, calibration may not provide a reliable indication of value. For example, small investments made by existing investors in the period leading up to an initial public offering most often do not reflect a negotiated price.
- **B.01.09** *Stage 6.* Both the income and market approaches would be appropriate for an enterprise in this stage. Because the enterprise has an established financial history, the reliability of forecasted results would tend to be higher than in an earlier stage; therefore, the discount rate for a DCF method under the income approach would tend to be lower than in an earlier stage. For an income approach that uses the expected present value technique, the existence of an established financial history would enable the development of a more reliable set of probabilities than would be the case if that valuation technique were applied in an earlier stage. As in stage 5, calibration should be considered for arm's-length transactions.

**B.01.10** Paragraphs B.01.04–.01.09 summarize, stage by stage, which valuation approach(es) would typically be appropriate or inappropriate for each stage. That information also may be looked at in a different way. The following table summarizes, approach by approach, in which stages or circumstances that approach would typically be used:

Valuation	Stages or Circumstances for Which Approach Is
Approach	Typically Appropriate or Not Appropriate
Market	The guideline public company and guideline company transactions methods typically increase in applicability and feasibility as an enterprise progresses through the middle stages and enters later stages of its development (for example, as an enterprise passes through stages 3–6). It is unlikely that comparable enterprises with readily determinable fair values will be identified during earlier stages. Investments by friends, family, or angel investors in shares of the enterprise's stock, which typically occur during earlier stages, may indicate a negotiated transaction price that reflects fair value and might be used in calibration, although related party transactions cannot be presumed to reflect fair value without further analysis. As institutional rounds of financing occur, calibration may be used to provide an indication of value and corroborate the indications of value under other valuation techniques. All investments in the enterprise's equity should be examined to determine if they are reflective of market participant assumptions regarding the firm's value. (Synergies specific to a particular buyer would ordinarily be factored out of a fair value estimate; see paragraph 5.55.)
Income	The income approach typically is applied to later-stage enterprises (for example, stages 4–6) as opposed to early-stage enterprises because there is a greater likelihood at later stages of there being a financial history on which to base a forecast of future results. The income approach may be appropriate in earlier stages with a relatively high discount rate; however, consideration should be given to the reliability of the forecast and the selection of an appropriate discount rate, given the usually speculative nature of the forecast at this early stage.
Asset	<ul> <li>Historically, the asset approach (using the asset accumulation method) has been applied primarily to enterprises in stage 1 and some enterprises in stage 2. The asset approach would typically be applied under any of the following circumstances:</li> <li>There is a limited (or no) basis for using the income or market approaches. That is, there are no comparable market transactions, and the enterprise has virtually no financial history and, consequently, is unable to use past results to reasonably support a forecast of future results.</li> <li>The enterprise has not yet made significant progress at research and development and has not yet developed a product.</li> <li>A relatively small amount of cash has been invested.</li> </ul> The use of the asset approach is generally less appropriate once an enterprise has generated significant intangibles and internal goodwill. The generation of these intangibles often starts to gain momentum in the middle stages of the enterprise's development and continues to build through the later stages.

### The Initial Public Offering Process<sup>2</sup>

- **B.02.01** A private enterprise might undertake an initial public offering (IPO) of securities for numerous reasons, including the following:
  - a. Immediate liquidity for existing investors in debt and equity securities. In an IPO, an enterprise may sell newly issued securities (a primary offering), existing securities holders may sell securities (a secondary offering), or both may occur. A secondary offering may provide immediate liquidity for existing securities holders. However, only the shares covered (that is, listed on the front cover of the IPO prospectus) by the Securities Act of 1933 (the 1933 Act) registration statement are publicly tradable free and clear of all restrictions. The remaining securities remain unregistered and subject to restrictions on public resale.
  - b. Subsequent liquidity for existing investors in debt and equity securities. Coincident with its IPO, an enterprise usually applies to list its securities on a national exchange or market, which provides an active, liquid aftermarket for the enterprise's securities. Rule 144, "Selling Restricted and Control Securities," of the 1933 Act provides a safe harbor for sales of unregistered and control stock by affiliates (that is, officers, directors, or 10 percent shareholders) and nonaffiliates of the registrant. Under Rule 144, following an IPO, any investor may resell unregistered securities after a six-month holding period from the date of purchase, subject to volume limitations applicable to sales by affiliates of the issuer. Absent a public registration, unregistered securities may be sold after a one-year holding period, subject again to volume limitations and public information requirements for sales by affiliates. Thus, even though an enterprise typically does not register all of its securities in an IPO, existing investors obtain the prospect of liquidity in the public aftermarket after satisfying any legal or contractual holding period restrictions.
  - *c. Maximizing the value of an enterprise's securities.* Public securities markets tend to maximize the exchange value of an enterprise's securities by
    - i. maximizing the number of potential buyers (that is, providing liquidity),
    - ii. minimizing the asymmetry of information among potential buyers (that is, providing timely, complete, and accurate disclosures about the enterprise, as well as about alternative investments),
    - iii. minimizing transaction costs for buyers and sellers, and

<sup>&</sup>lt;sup>2</sup> Filing an IPO is a complex process and the details fall outside the scope of this guide. The purpose of this section is to provide an overview of the IPO process to provide context for the valuation issues discussed in section B.03. This section contains references to various Securities and Exchange Commission (SEC) forms that could be used in specific circumstances. Please note that, in some cases, in addition to the forms listed here, there may be other forms that could be used for a specific purpose. Furthermore, although references to forms in this appendix are accurate as of the writing of this guide, they are subject to change. Therefore, for the latest information, readers should refer to the SEC website at <u>www.sec.gov</u>.

- iv. maximizing the subsequent marketability of purchased securities (that is, eliminating holding periods and providing future liquidity).
- *d.* Access to financing in public capital markets. Once an enterprise completes its IPO, it can access the public capital markets. In a subsequent registration, an enterprise may raise capital through a primary offering of its equity or debt securities. Larger, seasoned enterprises may be eligible to obtain even more timely access to the public capital markets by filing a "shelf" registration statement (Form S-3). Given that public markets tend to provide the most efficient source of capital at the lowest cost, an enterprise can reduce its cost of capital and, consequently, increase its market value by going public.
- e. Equity "currency." In addition to the ability to sell securities for cash, a public enterprise obtains the ability to register shares for other uses, such as the acquisitions of businesses (Form S-4) or compensation to employees, officers, and directors (Form S-8). Such equity currency may provide an efficient means for financing growth through acquisitions. Also, such equity currency may be an attractive form of compensation (for example, stock options and performance plans, stock purchase plans) in view of the liquidity of the shares issued. Equity compensation arrangements allow an enterprise to conserve cash, and they may offer tax advantages to the enterprise and increase employee loyalty and motivation.
- *f. Enhanced status*. Successfully completing an IPO enhances the status and credibility of an enterprise. For many start-up enterprises, the IPO is perceived to validate the prospects of the enterprise in the eyes of customers, suppliers, employees, and investors. In addition, the IPO may serve as a branding event, which increases the public and market awareness of the enterprise and its products and services.
- *g. Capital financing.* The primary offering of securities in an IPO provides capital to fund growth (for example, investments in plant and infrastructure, research and development, sales and marketing, business acquisitions, and geographic expansion).
- *h.* Avoiding economic penalties. In some cases, a private enterprise may have obtained financing that contemplates a public exchange offer for registered securities or that contains penalties (for example, higher interest rates or dividend and liquidation preferences) if the enterprise does not file or complete an IPO by a specified date.
- **B.02.02** The process to complete an IPO may be lengthy. Preparation for an IPO begins well before the filing of a registration statement with the Securities and Exchange Commission (SEC). Key considerations in preparing for an IPO include the following:
  - *a. Corporate governance*. Enterprises evaluate the structure and composition of their board of directors to ensure that they are appropriate for a public enterprise. For

example, enterprises will need independent outside directors who can provide specialized expertise, independent perspectives, and enhanced credibility with the investment community. Enterprises also prepare by forming special committees of the board, particularly an audit committee, which is responsible for oversight over the financial reporting process, internal audit, and the independent auditors. Enterprises that plan to list their securities on a national exchange also prepare to comply with the respective listing requirements.

- b. Controls, compliance processes, and records. Enterprises consider the adequacy of their compliance procedures, books and records, and internal accounting controls in light of all applicable laws and regulations. In addition to verifying full compliance with laws and regulations applicable to the company's existing business, including the provisions of the Foreign Corrupt Practices Act of 1977, companies would need to assess their ability to comply with any incremental requirements associated with becoming a publicly traded company, including the provisions of Section 13(b) of the Securities Exchange Act of 1934 (the 1934 Act). In addition, enterprises consider whether they have adequate disclosure controls and procedures that will allow the timely preparation of reports required by the SEC under the 1934 Act, and they prepare for management certification of their periodic reports following an IPO. Also, enterprises prepare for the annual evaluation of the effectiveness of their internal controls over financial reporting and, if applicable, the related examination and attestation by their registered public accounting firm, which is required in annual reports following the IPO. Enterprises consider the adequacy of their accounting systems and personnel for meeting SEC periodic reporting deadlines, which, for larger enterprises, could accelerate after their first year as a public enterprise. The task force recommends that companies consult with their legal counsel and independent auditors well in advance of their plans to go public to assess their IPO readiness based upon these and other factors and to ensure that their independent auditors satisfy the independence requirements established by the SEC, which may be different from those applicable to private companies under AICPA standards.
- *Executive management*. Enterprises consider the character, skills, experience, and overall composition of their executive management team. Enterprises contemplating an IPO often look to hire a CEO and CFO who have prior experience at public enterprises or with the IPO process. In addition, enterprises consider the composition and strength of other key members of the management team (for example, heads of operations, production, sales, marketing, accounting, human resources, information systems, internal audit, treasury, and legal). Enterprises consider their code of ethics applicable to executive and financial officers, which must be publicly disclosed following the IPO. Under federal securities laws, officers of public enterprises have significant duties and obligations and could face significant penalties and sanctions for violations.
- *d. Employee compensation.* Enterprises develop an employee compensation strategy and implement an effective compensation system. Employee compensation programs are critical in competing for talent, retaining employees, and using

incentives to align employee performance with business strategies. Developing an employee compensation strategy is complex and considers, among other things, philosophy; organizational culture and dynamics; competitive factors; potential dilution (from using stock or options as compensation); and legal, tax, and accounting implications.

- **B.02.03** One of the key steps in the IPO process is the selection of the lead, or managing, underwriter. An IPO usually is executed as an underwritten offering whereby an underwriting syndicate assembled by the lead underwriter distributes the shares to investors using its established contacts and distribution channels. The selection of a recognized underwriter lends additional credibility to the offering and enterprise. Considerations for selecting a lead underwriter include, among other things, geographic scope, industry specialization, minimum underwriting criteria, reputation, experience, syndication capability, aftermarket support, and service offerings. Underwriters typically play a significant role in maintaining a strong and stable aftermarket for the enterprise's securities. They serve as market makers, buy and sell shares on the interdealer market, and help maintain interest among analysts and investors. The lead underwriter has primary responsibility for recommending the initial price of the shares to be sold. Because underwriters are compensated only if the offering is completed (except for any expenses the enterprise agrees to reimburse), they tend not to agree to underwrite unless they are reasonably confident that the offering will be completed. The final underwriting agreement usually is not signed until just before the registration statement is declared effective by the SEC. Ordinarily, there is no legal obligation for either the enterprise or underwriters to proceed with the IPO until that time. However, underwriters prepare a letter of intent that describes the preliminary understanding of the arrangement (for example, underwriters' commission, estimated offering price, overallotment option, underwriter warrants, and right of first refusal on future offerings), but that does not create a legal obligation for either the enterprise or underwriters to proceed with the offering. As a condition of the underwriting agreement, certain existing shareholders are often required to execute a lock-up agreement, which restricts their ability to sell shares for a period of time—usually up to 180 days following the IPO, subject to extension of up to an additional 18 days under limited circumstances.
- **B.02.04** The two common types of underwriting agreements are firm commitment and best efforts. In a firm-commitment underwriting agreement, the underwriters agree to purchase all the shares in the offering and then resell them to the public. Any shares not sold to the public are paid for and held by the underwriters for their own account. In a best-efforts underwriting agreement, the underwriters simply agree to use their best efforts to sell the shares on behalf of the enterprise. Some best-efforts agreements are all-or-nothing arrangements—the offering is withdrawn if the shares cannot all be sold. Others set a lower minimum number of shares that must be sold before the offering price (or, in the case of debt securities, an interest rate) and total proceeds in advance. The offering price is not finalized until just before the registration statement becomes effective because that price must be responsive to current market conditions at that time. Underwriters may estimate a range for the offering price based on market conditions existing at the time of their estimate; however, that estimate is not binding. The actual

offering price is affected by market conditions as of the effective date of the offering, the completion of the underwriters' due diligence, the success of the road show (see paragraph B.02.08), and investor demand for the securities offered. The net proceeds to the enterprise also will be reduced by the underwriters' commission (generally around 7 percent) and any agreed-upon reimbursement of underwriters' expenses (for example, legal fees incurred by the underwriters' counsel to review compliance with state securities laws—commonly referred to as "Blue Sky Laws"). In addition, the enterprise is likely to incur additional direct and incremental costs in an IPO.

- **B.02.05** A second key step in the IPO process is the preparation of the registration statement, which must be filed with the SEC. Preparation and review of the registration statement is a joint effort involving enterprise executives, enterprise attorneys, auditors, underwriters, and underwriters' attorneys. The registration statement contains the prospectus, which is both a selling document and disclosure document. The prospectus must comply with SEC rules and regulations regarding its form and content, and it must not materially misstate any information or omit any material information. Controlling shareholders, executives, directors, underwriters, and experts providing information for the registration statement are subject to liability under Section 11 of the 1933 Act for false or misleading statements or omissions. Preparation of the registration statement may take two months or more, particularly if an audit is required of previously unaudited financial statements of either the enterprise or recent significant acquired businesses or if the enterprise needs to obtain resolution of any questions from the SEC staff on a prefiling basis. The Jumpstart Our Business Startups Act (the "JOBS Act") was signed into law on April 5, 2012 to encourage public capital raising in the United States by companies with less than \$1 billion in revenue. Companies that meet the criteria to qualify as Emerging Growth Companies (EGCs) under the JOBS Act are granted certain accommodations with respect to the IPO process including the ability to confidentially submit a draft registration statement to the SEC for nonpublic review.
- **B.02.06** Once a registration statement is filed, a successful IPO still is not assured, and the registration process typically takes an additional three to six months. In fact, a significant percentage of IPO filings are withdrawn without becoming effective. A number of factors could contribute to the decision to withdraw an IPO filing. Some of these factors involve the IPO process itself (for example, the inability to comply with SEC disclosure requirements or resolve SEC staff comments, a poor road show, or resignation of the enterprise's underwriters or auditors). In other cases, an IPO filing might be withdrawn due to market conditions (for example, reduced market liquidity or demand for IPOs, changes in interest rates and costs of capital, or changes in market sector valuations). An IPO also might be withdrawn due to adverse business developments (for example, loss of a customer or prospective customer, inability to meet product development milestones, increased competition, loss of key personnel, or inability to obtain financing) or an unexpected change in the outlook or profile of the industry, including as a result of changes in technology, regulatory developments, or material developments among the enterprise's competitors. In other cases, an IPO might be withdrawn because a financial or strategic buyer acquires the enterprise.

- **B.02.07** Once filed, an IPO registration statement is reviewed by staff accountants and lawyers in the SEC's Division of Corporation Finance. The purpose of the SEC's review is not to evaluate the quality of an offering but, rather, to assess the compliance of the registration statement with the SEC's rules and regulations, including the clarity of the disclosures, fair presentation, and compliance of any financial statements with accounting principles generally accepted in the United States of America. When the SEC staff completes its review of the initial filing (usually within 30 days), it will issue the enterprise a comment letter identifying any deficiencies noted or requesting supplemental information. Responding to and resolving SEC staff comments may require several letters and amendments to the registration statement.
- **B.02.08** Following substantial resolution of the SEC staff's comments, a preliminary prospectus (the red herring), which includes the then estimated range of offering prices, is printed so that the underwriters can begin their selling efforts, and the enterprise can begin its road show. During the road show, executives of the enterprise travel to meetings with members of the underwriting syndicate and prospective investors. The road show gives participants the opportunity to ask questions and evaluate the strength of the management team and the enterprise's strategy and prospects. The road show may take from one to two weeks, and during this period, the underwriters build and monitor the book, which is the list of tentative orders to purchase securities once the offering is priced.
- **B.02.09** Following the road show and shortly before the underwriting agreement is signed and the registration statement is declared effective, the underwriters meet with the enterprise to agree upon the offering price. The price depends on many factors, among them the success of the road show and the demand reflected in the book in light of the planned size of the offering. In some cases, the size of the offering may be increased or decreased to address demand and market conditions. In addition, the price is set considering, among other things, current market conditions (for example, economic growth rates and interest rates), current market valuation multiples within the enterprise's industry, current levels of competition, the nature and timing of other recent or pending offerings in the market, projections of enterprise revenue growth and profitability, the pro forma effects of the proposed use of the funds from the IPO, and the potential dilution from contingent and convertible instruments. In short, pricing IPO stock is subjective and does not rely solely upon quantitative valuation techniques typically used by valuation specialists in rendering reports on their estimate of fair value. Underwriters typically advise an enterprise to set a price that will produce an active aftermarket in the shares and a modest price rise (for example, 10 percent to 15 percent) in secondary market trading following the offering.
- **B.02.10** Once all SEC staff comments have been resolved, and the registration statement has been updated to reflect all current and material information, the enterprise files its pricing amendment, which discloses the offering price, the underwriters' commission, and the net proceeds to the enterprise. The formal underwriting agreement is executed at this time. Following a request to accelerate effectiveness, the SEC staff declares the registration statement effective, and the final prospectus is printed and distributed.

- **B.02.11** Until the closing of the offering, the enterprise or its underwriters still may decide to withdraw the offering for any reason (see paragraph B.02.06), including material adverse events, although this is uncommon. The closing for firm-commitment underwritings generally occurs on the third trading day after the registration statement becomes effective. The closing for best-efforts underwritings generally occurs 60–120 days after the effective date, provided the underwriters have sold at least the minimum number of shares specified in the underwriting agreement. At the closing, the enterprise issues the securities to the underwriters and receives the proceeds (net of the underwriters' commission) from the offering.
- **B.02.12** Immediately after the IPO takes place, the enterprise's registered shares begin trading on the selected market or exchange. The market price of a new issue may be extremely volatile in the initial trading period. Unless an investor's shares are registered in the IPO, those shares may be resold in the public market only after satisfying the holding period and volume limitations of Rule 144 of the 1933 Act. The ability of an investor to resell securities also may be subject to contractual restrictions agreed upon with the enterprise at the time of investment, with other investors (for example, a voting trust arrangement), or as a condition of the underwriting agreement (typically a lock-up agreement, as discussed in paragraph B.02.03). Thus, even if the enterprise successfully completes an IPO, its private investors are not necessarily assured of realizing the IPO offering price. That is, investors in privately held enterprises cannot always expect to obtain immediate liquidity upon the IPO and may be required to bear market risk following the IPO until they can sell shares, whether privately (and, thus, subject to marketability discounts) or in the public market (after satisfying legal and any contractual holding periods).

#### Valuation Implications of a Planned Initial Public Offering

- **B.03.01** Section B.01 discusses the stages of development of a privately held portfolio company and the associated considerations for estimating the fair value of its equity interests. As a portfolio company prepares for an initial public offering (IPO), it typically would need to demonstrate continued success in the execution of its business plan and strategy by meeting important milestones. In addition, when preparing for an IPO, as discussed in the section B.02, a portfolio company would need to consider the rigors of the public marketplace and comply with the legal and regulatory requirements of being a public company. This section discusses aspects of the IPO process and the IPO itself that affect enterprise value and, consequently, the fair value of the portfolio company's equity interests. In addition, the discussion of the IPO process in the previous section highlights the associated risks and uncertainties that a portfolio company faces during this lengthy, complex, and costly undertaking.
- **B.03.02** This section cites the most recent data available to the task force from various research studies and other sources. Readers are cautioned that such data may not reflect the business environment as of their reading and are presented only for the purpose of explaining the concepts in this chapter; more recent data may be available elsewhere. When performing a valuation, readers are also cautioned not to use the data in this chapter as the sole basis for estimating discounts or discount factors. Rather, the facts and

circumstances of the portfolio company and its equity interests should be considered in determining the appropriate data to use in the valuation.

- In preparing for an IPO, a portfolio company may attempt to project its ultimate IPO **B.03.03** price. In addition, a portfolio company also may obtain an estimate of the IPO price when it selects an investment banker to perform underwriting services. Ultimately, the managing underwriter and the company's board or management, or both, have primary responsibility for finalizing the IPO price. That price is not finalized until the date the registration statement becomes effective. Estimates of the IPO price at earlier stages of the process, including the estimated price range in a preliminary prospectus, are not binding and presume the successful completion of the offering under market conditions that are conducive to the offering. Early estimates of IPO prices by investment bankers, particularly those made as part of the selection process, often differ from the final IPO price because, among other things, the estimates are made at relatively early stages, and the bankers may not yet have performed all their due diligence on the portfolio company's financial projections. Even after the company files its preliminary prospectus with an estimated IPO price range and commences the offering, the company and managing underwriter may reassess the demand for the IPO and change the estimated price range, either upward or downward. In addition, the actual IPO price may be materially influenced by the specific supply and demand characteristics of the market at or near the date of the actual pricing. These factors can include other offerings coming to market, announcements by guideline public companies or competitors and the market performance of their shares, or other developments in the company's industry or region. Therefore, management or an underwriter's estimate of the ultimate IPO price is generally not likely to be a reasonable estimate of the fair value for pre-IPO equity transactions of the portfolio company.
- **B.03.04** Also, the ultimate IPO price is generally not likely to be a reasonable estimate of the fair value for pre-IPO equity transactions of the portfolio company. The value of a private portfolio company before and after a successful IPO may be significantly different.<sup>3</sup> In addition, the IPO event itself increases enterprise value because, among other things, it allows the portfolio company access to the public capital markets.<sup>4</sup>

<sup>&</sup>lt;sup>3</sup> Alternatively stated, in determining the value of privately-issued instruments relative to the ultimate initial public offering (IPO) price, some discount generally is expected. This discount reflects both the uncertainty regarding the success of the IPO and its price and the increase in marketability of the shares and correspondingly lower cost of capital following the IPO.

See, for example, John D. Emory, F.R. Dengel III, and John D. Emory Jr., "Expanded Study of the Value of Marketability as Illustrated in Initial Public Offerings of Common Stock May 1997 through December 2000," *Business Valuation Review* (December 2001): 4–20.

See also Shannon P. Pratt, *Business Valuation Discounts and Premiums* (Hoboken, NJ: John Wiley & Sons, Inc., 2009).

See also Shannon P. Pratt, Valuing a Business: The Analysis and Appraisal of Closely Held Companies, 5th ed. (New York: McGraw-Hill, 2007).

<sup>&</sup>lt;sup>4</sup> A number of studies have attempted to isolate the portion of the discount described in the preceding footnote that is attributable solely to marketability.

See, for example

<sup>•</sup> Karen H. Wruck, "Equity Ownership Concentration and Firm Value: Evidence From Private Equity Financings," *Journal of Financial Economics* 23, no. 1 (June 1989): 3–28.

- **B.03.05** The IPO price also reflects an estimate of the expected valuation of the company's shares based upon its position following a successful IPO. As a result, it normally incorporates the effect of the issuance of primary shares by the company, the proceeds from which can be used to either reduce the company's debt level or provide capital to fully finance the company's expansion or development of its business plan. In contrast, most financings for earlier-stage companies do not allow the company to reach breakeven cash flows and become self-sustaining. Therefore, the IPO price recommendation may be free from the risk premium associated with the need to raise additional capital associated with earlier-stage companies.<sup>5</sup>
- **B.03.06** As discussed in section B.01, "Relationship Between Fair Value and Stages of Enterprise Development," the stage of operational development of an enterprise affects its value, which typically builds throughout the various stages of development, although generally not in a linear fashion. The stage of development will influence the perceived risk of investing in the portfolio company, which, in turn, will influence the valuation. The reduction in the amount of perceived risk can be observed in a declining cost of capital as the portfolio company progresses through the stages of development. A reduction in the cost of capital increases enterprise value, just as a decline in interest rates increases the value of a bond with fixed interest and principal payments.
- **B.03.07** Upon a successful IPO, enterprises typically experience a further reduction in their cost of capital. That is, the IPO event eliminates or mitigates many of the factors that may have contributed to a *marketability discount* or discount for lack of marketability for certain equity interests in the portfolio company, as discussed in chapter 9, "Control and Marketability." For example, the IPO generally
  - provides liquidity for the portfolio company's equity securities by providing a public resale market. Increased liquidity (that is, a larger pool of potential investors) is provided for equity securities listed on a national exchange or association versus equity interests not so listed.
  - provides capital to finance the portfolio company's further growth and de-risk operations, and reflects an expectation of reduced risk in the business, with more stable operations consistent with other public companies.
  - reduces limitations on the ability of the holder to transfer the equity securities. Purchases of registered securities in the IPO or aftermarket are not subject to the

• Frances A. Longstaff, "How Much Can Marketability Affect Security Values?" *The Journal of Finance* 50 (December 1995): 1767–74.

<sup>•</sup> Michael Hertzel and Richard L. Smith, "Market Discounts and Shareholder Gains for Placing Equity Privately," *Journal of Finance* 48, no. 2 (June 1993): 459–85.

<sup>•</sup> Mukesh Bajaj and others, "Firm Value and Marketability Discounts," *Journal of Corporation Law* 27 (Fall 2001): 89–115.

<sup>&</sup>lt;sup>5</sup> The degree to which the IPO provides the majority of the capital needed to retire debt or fund future operations depends on the market's current appetite for IPOs, the industry, and other factors. For example, in biotech, the IPO may be just one financing event in funding the long path to Food and Drug Administration approvals.

resale restrictions imposed under the federal securities laws on purchases of unregistered instruments. (See paragraph B.02.01(a).)

- reduces valuation uncertainty. Securities traded in active markets have readily determinable values, and Securities and Exchange Commission regulations require that public enterprises provide investors with financial statements and other information on a regular basis.
- reduces concentration of ownership. The sale of additional equity securities to investors in the public domain reduces the concentration of ownership and increases the proportionate amount of ownership in the enterprise that is available for purchase.
- reduces or eliminates the priority, preferences, and special rights that may be associated with senior classes of equity or shareholder debt instruments, together with many of the other rights or encumbrances that may be contained in a private company's shareholders' agreement.
- **B.03.08** The difference in the rates of return between privately held enterprises and publicly held enterprises can be observed historically on a portfolio basis. Paragraph B.04.03 tabulates portfolio returns of venture capital investors in privately held enterprises at various stages of development, as contrasted with returns on investments in publicly held companies over similar periods. The higher returns on venture capital investment portfolios are consistent with the expected higher cost of capital for privately held enterprises, particularly enterprises in the earlier stages of development. The reduction in the cost of capital upon an IPO can be observed historically on an enterprise basis. Paragraph B.04.02 tabulates the cost of capital for privately held enterprises at various stages of development. The cost of capital for public enterprises is typically lower. The typically lower cost of capital for newly public enterprises is associated with enhanced enterprise value.
- **B.03.09** A comparison of the cost of equity capital of enterprises before and after an IPO leads to the conclusion that an IPO typically reduces the enterprise's cost of capital and increases enterprise value. This general decline in the cost of equity capital, all else being equal, increases the value of the enterprise and is one factor in explaining why the IPO price for an enterprise often may be significantly higher than the fair value per share of a minority interest in the enterprise's equity interests in the period preceding the IPO. In simple terms, as illustrated in section B.05, "Table of Capitalization Multiples," a reduction in the discount rate (cost of capital) will increase the capitalization multiple (valuation) of an assumed perpetual annuity (enterprise), often significantly.
- **B.03.10** In summary, this section discusses and explains the factors that contribute to differences between the fair value of a portfolio company's equity interests in periods preceding the IPO and the ultimate IPO price. Among those factors are the marketability provided by the IPO event and the reduction in the newly public enterprise's cost of capital resulting from its access to more liquid and efficient sources of capital. Moreover, as more fully described in section B.02, the IPO process is complex and lengthy, with an

uncertain outcome. During this process, the portfolio company's continued execution of its business plan will result in an increase in its enterprise value resulting from (a) changes in the amount and relative timing of its future net cash flows (estimated and actual) and (b) a reduction in the risk associated with achieving its projected results. In addition, changes in macroeconomic factors (for example, actual and projected rates of economic growth, current interest rates, and expectations about future interest rates) also may affect the extent to which an enterprise's value changes during the period culminating in its successful IPO. The task force believes that all such factors should be considered in the context of the facts and circumstances of the enterprise in valuing privately issued instruments in the periods preceding an IPO.

#### **Venture Capital Rates of Return**

- As described in chapter 1, "Overview of the Private Equity and Venture Capital **B.04.01** Industry and Its Investment Strategies," private equity and venture capital funds target rates of return that generally exceed the target rates of return expected to be generated by investments in publicly traded equity investments. This higher target rate of return is intended to compensate the fund for the relative illiquidity associated with holding a position in a portfolio company for which no active market exists, and in turn to compensate the limited partner investors in the fund for the lack of liquidity of their investment, which often involves committing to a 10 to 12 year liquidation period or potentially even longer. Venture capital funds, which tend to focus on earlier stage companies, may require an even higher target rate of return, which is intended to compensate the fund for the higher failure rates of earlier stage enterprises and the risks associated with developing a product or service and reaching a suitable market that can sustain a profitable business. Given the probability of experiencing losses across the portfolio, most venture capital investors focus on target rates of return rather than actual rates of return. Unless a venture investor operates with a sufficiently high target rate of return, the overall rate of return on the portfolio will not be sufficiently high to compensate for the many situations in which substantially all of the investors' capital receives no return.<sup>6</sup>
- **B.04.02** As a successful portfolio company advances through the various stages of development and the associated risk declines as milestones are achieved or as progress is made towards executing on a business plan, the target rates of return for an investment in a portfolio company would likely decline. The extent to which these return expectations would be adjusted over time would depend on many factors, including the industry, the competitive environment, the degree of technological or obsolescence risk, the track record of the portfolio company's management team and many other considerations.

<sup>&</sup>lt;sup>6</sup> For example, according to data obtained from Cambridge Associates, of the 1,606 biotech companies backed by U.S. venture capital firms between 1986 and 2008, 44 percent of the companies did not return the investors' capital. Although the average realized rate of return on these companies was approximately 25 percent, in order to compensate for the 44 percent loss rate, the investors would have needed to target a return in excess of 40 percent. Note that as discussed in paragraph B.04.02, venture capital and private equity fund returns have remained relatively consistent over time; therefore, despite their age, these academic studies are still regarded as providing reasonable indications of the target range of returns by stage of development. Calibration should be used to estimate the rate of return for any specific investment consistent with the projected cash flows for that investment.

The following publications provide guidance about the rates of return expected by venture capital investors at various stages of an entity's development through successful exits. A summary is set forth in the following table:<sup>7</sup>

#### **Rates of Return**

		Scherlis and	Sahlman and	
Stage of Development	$Plummer^1$	Sahlman <sup>2</sup>	Others <sup>3</sup>	$Everett^4$
Start-up <sup>5</sup>	50%-70%	50%-70%	50%-100%	25% - 60%
				(median 35%)
First stage or early development <sup>6</sup>	40%-60%	40%-60%	40%-60%	15% - 50%
				(median 25%)
Second stage or expansion <sup>7</sup>	35%-50%	30%-50%	30%-40%	15% - 50%
				(median 25%)
Bridge/initial public offering (IPO) <sup>8</sup>	25%-35%	20%-35%	20%-30%	15% - 50%
				(median 25%)

<sup>1</sup> James L. Plummer, *QED Report on Venture Capital Financial Analysis* (Palo Alto: QED Research, Inc., 1987).

- <sup>2</sup> Daniel R. Scherlis and William A. Sahlman, "A Method for Valuing High-Risk, Long Term, Investments: The 'Venture Capital Method,'" Harvard Business School Teaching Note 9-288-006 (Boston: Harvard Business School Publishing, 1989).
- <sup>3</sup> William A. Sahlman and others, *Financing Entrepreneurial Ventures*, Business Fundamentals (Boston: Harvard Business School Publishing, 1998).
- <sup>4</sup> Craig R. Everett, "2017 Private Capital Markets Report" (Malibu: Pepperdine University Graziadio School of Business and Management, 2017). Note that this publication also includes rates of return for many other types of private capital investments, as well as summaries of other information captured in Pepperdine's annual industry survey. See <u>http://digitalcommons.pepperdine.edu/gsbm\_pcm\_pcmr/10</u>.
- <sup>5</sup> As described in the publications referenced in this table, start-up-stage investments typically are made in portfolio companies that are less than one year old. The venture funding is to be used substantially for product development, prototype testing, and test marketing.
- <sup>6</sup> As described in the publications referenced in this table, early development-stage investments are made in portfolio companies that have developed prototypes that appear viable and for which further technical risk is deemed minimal, although commercial risk may be significant.
- <sup>7</sup> As described in the publications referenced in this table, portfolio companies in the expansion stage usually have shipped some product to consumers (including beta versions).
- <sup>8</sup> As described in the publications referenced in this table, bridge/IPO-stage financing covers such activities as pilot plant construction, production design, and production testing, as well as bridge financing in anticipation of a later IPO.

Note that the results of these studies provide ranges of target rates of return, rather than point estimates, because there is significant variability in the industry profiles and risk characteristics of portfolio companies and market participants can have substantially differing views of the required rate of return even for the same investment. While these publications are not recent studies that incorporate recent performance expectations, the task force believes they still provide relevant perspectives on the return expectations of

<sup>&</sup>lt;sup>7</sup> The stages in the table are based on the study that was performed and do not match the stages defined in Table 1-1, "Stages of Enterprise Development," in chapter 1. See footnote 3 in paragraph 1.15.

investors in private company instruments. Although relative rates of return may change over time due to changes in stock market performance, in practice, the task force believes that market participant expectations, particularly in the context of early stage investments, do not change significantly over time, given the very long holding periods of most venture capital investments. The fact that it can take an early stage company ten years or more to grow from an investable idea to an operating business which is prepared to go public or be an acquisition candidate tends to reduce the investors' expectations about their ability to perfectly time an exit with the exact moment of a peak in the relevant equity markets. As a result, while actual venture capital and private equity fund performance changes based upon market conditions and is often correlated to equity market performance, in practice, target rates of return for private company investments in most sectors tend be relatively constant.

- As discussed in the sidebar "Resolution of Uncertainties over Time," following **B.04.03** paragraph 5.93, the risks associated with venture-capital backed investments may not be resolved smoothly over time, and thus value is unlikely to grow between milestones at the target rate of return. Therefore, when calibrating to a venture financing transaction and then using the calibrated model to estimate the value of a venture investment at interim measurement dates, it may be appropriate to use a scenario-based approach and explicitly model the probability of loss, then discount at a portfolio rate of return. As discussed in paragraph B.04.04, portfolio rates of return typically fall in the 15% to 25% range (500 to 1000 bps higher than the Russell 2000 index) across the various stages of development, reflecting a premium over the expected public equity returns, consistent with the higher risk and higher cost of capital associated with private enterprises. Furthermore, VC fund managers typically target rates of return in the 25% to 35% range (or more), reflecting the need to outperform their peers. The required rate of return for any specific investment given the estimated future payoffs may be estimated via calibration.
- **B.04.04** According to statistics published by Cambridge Associates, as of December 31, 2015, the net returns<sup>8</sup> from all venture capital funds exceeded the return for the Russell 2000 index by over 500 basis points over most measurement periods, falling below the Russell 2000 index in the 1 quarter and 15 year measurement periods, exceeding the index by between 300 and 500 basis points in the 5 and 10 year measurement periods, exceeding the index by between 500 and 1000 basis points in the 3 year and 30 year measurement periods, and exceeding the index by over 1000 basis points over the 1 year, 20 year, and 25 year measurement periods. But these net returns reflect the aggregate performance of all venture capital funds including the most successful funds and the least successful funds and all between. To continue to be successful at raising new capital and thereby be able to stay in business, however, most venture capital fund managers target rates of return that far exceed the median performance, seeking to perform in the top quartile of overall fund performance. Cambridge Associates has also published data which shows the performance of all venture capital funds in its database with vintages between 1981

<sup>&</sup>lt;sup>8</sup> Net returns are the distributions and remaining fund value attributable to limited partners after management fees and other fund expenses and net of the carried interest payable to the fund's general partner.

and 2014, showing that the top quartile funds exceeded the median returns of their vintage year by an average of more than 1200 basis points.



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### **Table of Capitalization Multiples**

- **B.05.01** The following table presents the capitalization multiples for a perpetual annuity at various combinations of assumed discount rates and growth rates. The range of discount rates presented is for illustrative purposes only and is not intended to limit the range of discount rates that the fund might consider appropriate in the particular facts and circumstances of a valuation.
- **B.05.02** If cash flows are expected to be perpetual and equal in each period, value is determined by "capitalizing" the cash flows rather than discounting them. The present value of a perpetual annuity of \$1, assuming a discount rate of 10 percent, is calculated as follows:

Present value =  $1 / (1.10) + 1 / (1.10)^2 + 1 / (1.10)^3 + \dots + 1 / (1.10)^n = 10$ 

(with *n* approaching infinity)

The same answer is obtained by a capitalization calculation that divides the constant perpetual cash flow by the discount rate, which is referred to here as a *capitalization rate*:

Present value = 1 / 0.10 = 10

**B.05.03** If the cash flows are expected to grow at a constant rate, and the required rate of return for the stock remains constant, the capitalization rate is obtained by subtracting the growth rate from the discount rate. The present value of a perpetual annuity of \$1, assuming a 1 percent constant growth rate and a discount rate of 10 percent, is calculated as follows:

Present value = 1 / (0.10 - 0.01) = 11.11

More generally, the formula is as follows:

Present value = $1 / (long term d$	scount rate – long term growth rate)	

	Growth Rate			
Discount Rate	0%	2%	5%	10%
2%	50.00			
5%	20.00	33.33		
10%	10.00	12.50	20.00	
20%	5.00	5.56	6.67	10.00
30%	3.33	3.57	4.00	5.00
40%	2.50	2.63	2.86	3.33
50%	2.00	2.08	2.22	2.50
60%	1.67	1.72	1.82	2.00
70%	1.43	1.47	1.54	1.67

**B.05.04** Capitalization multiples are frequently used in calculating a terminal value for use in the income approach. However, because neither the growth rate nor the required rate of return for the stock are expected to remain constant, this model is not ideal for estimating the terminal value for early stage companies. In many cases, the cash flows provided for a portfolio company cover only the next three to five years, which is too short a time frame to bring the portfolio company into the mature growth stage. Furthermore, by the time the portfolio company reaches the mature growth stage, the high entity-specific risk premium or venture capital rate of return used in calculating the discount rate would no longer apply. Therefore, the task force encourages the fund to consider a variety of methods for estimating the terminal value and to select the most appropriate based on reasoned judgment.

#### **Derivation of the Weighted Average Cost of Capital**

**B.06.01** The formula used to calculate *weighted average cost of capital* (WACC), together with an explanation of the variables used, is as follows:

WACC =  $k_E \times (E / (E + D)) + k_D \times (1 - T_C) \times (D / (E + D))$ , where

 $k_E = rf + \beta(rm) + P + A$ 

- **Cost of equity capital (kE).** The cost of equity capital is the return required by shareholders.
- **Risk-free rate (rf).** The risk-free rate is the return on government securities with a term similar to that of the investment being evaluated.
- Market risk premium (MRP = rm). The MRP, also known as the equity risk premium, is the additional rate of return over the risk-free rate that is expected by investors from investments with systematic risk equal to the "market" portfolio. The "market" portfolio may be thought of as a broadly diversified investment portfolio, often thought of as the return on an index such as the Standard and Poor's 500.
- **Relevered beta (B).** Relevered beta is a measure of the risk of an entity's stock relative to the risk of a diversified portfolio (the MRP). The theory and application of beta as a modifier of the MRP are well documented and widely accepted, and there are many available sources of beta. Because the estimation procedure is not controversial, those sources normally may be relied on.
- **Size premium (P).** Research has shown that small portfolio companies have larger betas than large portfolio companies. An adjustment for size is included in the calculation of WACC because small stocks outperform large stocks, even after adjusting for the systematic risk (beta) of small stocks. This phenomenon is widely known as the size effect.
- Alpha (A). Alpha is an entity-specific risk premium that is commonly used in situations when the specific risk associated with the subject entity is not sufficiently captured by MRP, beta, and size premium. Some of the risks that alpha adjusts for include considerations such as management depth and expertise, product line diversification, geographic diversification, or projection risk in excess of market participant assumptions.
- **Cost of debt (kD).** The cost of debt is the return required by lenders. The cost of debt is taken after tax because entities can deduct from their pretax profits the interest they pay on the money they borrow.
- Income tax rate  $(T_C)$ . The income tax rate for each entity is used to calculate the after-tax cost of debt.

- **Market value of equity** and debt (E and D, respectively). The market value of equity and debt are used to weight the cost of equity and cost of debt in arriving at the overall WACC. Although the market value of common equity is commonly used in the calculation, the carrying value of debt is often used as a proxy for the market value of debt in the WACC calculation, unless the difference between the market value and the carrying value is significant.
- **B.06.02** WACC is frequently used in the discounted cash flow (DCF) method as an estimate of the rate of return or discount rate that market participants would require to acquire the cash flows for an enterprise, as discussed in paragraphs 5.59–.61.
- **B.06.03** When the purpose of a valuation is to estimate the fair value or fair market value of the enterprise as a whole, assuming a change of control for the enterprise on the valuation date, WACC used in the DCF method should reflect market participant assumptions regarding the leverage of the enterprise. That is, it can be assumed that a market participant acquiring the enterprise would put into place a capital structure that is more typical for the industry, irrespective of the actual capital structure in place at the time of the transaction.
- **B.06.04** Because the objective of this guide is to provide guidance on valuation of privately issued equity interests, the relevant cash flows are those expected by the holders of the instrument, not the cash flows of the enterprise as a whole. Thus, in theory, over the time horizon of the investment, WACC should thus be calculated based upon the actual capital structure of the enterprise, not a hypothetical third party capital structure, through the expected liquidity event, if any. The cost of capital may change following a liquidity event.
- **B.06.05** Under certain assumptions, the Modigliani and Miller theorem<sup>9</sup> shows that WACC for an enterprise is independent of capital structure. That is, even though the cost of debt is lower than the cost of equity, higher leverage increases both the cost of debt and cost of equity such that the overall cost of capital remains unchanged. When these assumptions are relaxed to include the tax benefits of debt (which decrease the cost of capital for levered companies) and bankruptcy costs and agency costs related to suboptimal risk management (which increase the cost of capital for levered companies), WACC can be modeled as a wide U-shaped curve that remains relatively constant across a range of capital structures but increases at the extremes. Therefore, it is most important to consider company-specific WACC for companies with leverage that differs significantly from industry norms.<sup>10</sup> In addition, in situations where the investors' interests are aligned or a when valuing an investment where the fund has control over the entity, most market

<sup>&</sup>lt;sup>9</sup> Franco Modigliani and Merton H. Miller, "The Cost of Capital, Corporation Finance and the Theory of Investment," *The American Economic Review* 48, no. 3 (1958): 261–97, <u>www.jstor.org/stable/1809766</u>.

Franco Modigliani and Merton H. Miller, "Corporate Income Taxes and the Cost of Capital: A Correction," *The American Economic Review* 53, no. 3 (1963): 433–43, <u>www.jstor.org/stable/1809167</u>.

<sup>&</sup>lt;sup>10</sup> In particular, for highly levered companies in which the fair value of debt is significantly less than par, reflecting a high market rate of return for the debt, the fund should consider whether this high cost of debt and corresponding cost of equity is appropriately captured in the weighted average cost of capital used in the overall enterprise valuation, or alternatively, consider the negotiated value of debt for the purpose of valuing equity, before concluding on the fair value of equity.

participants will consider the overall WACC using a normalized (third party) capital structure, assuming that any benefits that may accrue from higher leverage would inure to the investors as a higher rate of return for equity (cost of equity). See paragraph 7.06 for additional discussion.

#### **Rights Associated With Preferred Stock**

- **B.07.01** As discussed in chapter 8, "Valuation of Equity Interests in Complex Capital Structures," preferred stock has characteristics that allow preferred stockholders to exercise various economic and non-economic rights. Each of those rights is described in this appendix.
- **B.07.02** Note that different classes of preferred stock typically have different rights and preferences. Typically, the latest round of preferred stock has superior features because the new investors and existing investors who are willing to continue funding the company require such features. In an *up round*, the new round may be pari passu (of equal seniority) with previous rounds, but it will have a higher price and, therefore, a higher total liquidation preference. In other situations, the latest round may be senior to previous rounds, have a liquidation preference greater than its purchase price, or have other economic and noneconomic rights. Therefore, it is important to consider the rights and preferences of the various rounds of preferred stock when estimating the total equity value and its allocation to the various equity interests. It is not appropriate to assume that the previous rounds of preferred stock have the same value as the latest round.

#### **Economic Rights**

Preferred liquidation preferences. Preference in liquidation generally is considered **B.07.03** one of the key differentiating factors between preferred and common stock because it gives first priority rights to preferred stockholders over any equity proceeds available to common stockholders resulting from a liquidation of the portfolio company. Liquidation preference distributions are meaningful and substantive because they apply not only in the event of dissolution of the portfolio company but also in the event of a merger, sale, change of control, or sale of substantially all assets of a portfolio company. A merger, sale, change of control, sale of substantially all assets, and dissolution are collectively referred to as a liquidation (which differs from a liquidity event in that a liquidity event also includes an initial public offering [IPO]). No portion of the proceeds resulting from a liquidation may be distributed to the common stockholders unless a specified portion of the liquidation preference has been satisfied. Liquidation preferences not only grant preference in distribution to holders of preferred stock but also quantify the amount of returns or distributions that preferred stockholders are entitled to receive before any distribution may be made to common stockholders. As a consequence, liquidation preference rights often result in distributions between preferred and common stockholders that disproportionately benefit preferred stockholders relative to their percentage ownership of the portfolio company.

**B.07.04** Liquidation preferences may be broadly divided into two categories:

- *a. Nonparticipating preferred.* In a liquidation, the holder of nonparticipating preferred stock is entitled only to receive the fixed liquidation preference amount and does not share any upside beyond that preference. Alternatively, the preferred stockholder may give up liquidation preference and convert into common stock if such a conversion will provide higher proceeds.
- b. Participating preferred. In a liquidation, the holder of participating preferred stock is entitled to receive its liquidation preference first and then share pro rata with the common stock in any remaining liquidation proceeds without requiring the conversion of such preferred stock into common stock. The total return to preferred stock in this scenario may be limited (for example, three times the original purchase price of the preferred stock) or unlimited. If the upside is unlimited, the preferred stockholder will not have an incentive to voluntarily convert to common stock. If the upside is limited, the preferred stock to common stock if such conversion would result in a higher total return to the stockholder.
- **B.07.05** Liquidation preferences are most commonly equal to the initial cost of the preferred stock (a 1x liquidation preference). However, in cases in which the issuer has raised several rounds of financing, when the investor is uneasy regarding the valuation of the financing round, or when the investor otherwise has significant leverage in the transaction, the liquidation preference may equal a multiple of the purchase price (commonly 2x to 4x). Such a feature can result in a dramatically improved return for holders of preferred stock relative to the common stock in outcomes in which the preferred stock does not convert to common stock.
- **B.07.06** Liquidation preferences are particularly important in a non-IPO situation, such as an acquisition or a sale of all or substantially all of a portfolio company's assets. This is because provisions relating to the conversion of preferred stock to common stock typically require that all outstanding preferred stock automatically convert to common stock in the event of a qualified IPO. Such conversion is typically a prerequisite for an investment banker to market the IPO. A consequence of such conversion is that the liquidation preferences and most other special rights associated with preferred stock, with the exception of registration rights, are eliminated. Accordingly, the value of liquidation preferences and other preferred stock rights often diminishes as the likelihood of a qualified IPO increases. Generally, if a proposed IPO does not meet the requirements of a qualified IPO, the consent of at least a majority of the holders of preferred stock is required to convert all preferred stock to common stock and permit the IPO to proceed.
- **B.07.07** In evaluating the likelihood of a qualified IPO and the resulting effect of such IPO on the value of the preferred stock preferences, however, the economic and non-economic rights of preferred stockholders should be considered carefully. If preferred stock liquidation preferences significantly exceed the return that preferred stockholders would receive on conversion to common stock, preferred stockholders will have an incentive to exert their control features toward consummation of an acquisition of the portfolio company rather than an IPO. Accordingly, even in circumstances in which an IPO may appear feasible for an enterprise in view of its stage of development, the value of

liquidation preferences and other preferred stock rights often does not diminish if the preferred stockholders have the incentive and ability to steer the portfolio company toward an acquisition. In such cases, the value of preferred rights and liquidation preferences typically remains at a high level until a qualified IPO actually occurs.

**B.07.08** The following example illustrates the effect of liquidation preference rights in disproportionate value sharing between preferred and common stockholders:

Company A has 3 million shares of Series A preferred stock and 7 million shares of common stock outstanding. The Series A preferred stock was issued for \$20 million and carries participating liquidation preference rights with a total liquidation preference of two times the original issuance price. That is, upon a liquidation of Company A, Series A preferred shares would initially receive \$40 million of the sales proceeds before any amount of money could be distributed to common stockholders. After the payout of the initial preference, the Series A preferred and common stockholders participate ratably in the remaining proceeds of the liquidation. Assuming three different scenarios in which Company A is acquired for a purchase price of \$50 million, \$75 million, and \$200 million, respectively, the following would be the payoffs to Series A preferred stockholders and common stockholders:

	Scenario I	Scenario II	Scenario III
Sales proceeds (A)	\$50,000,000	\$75,000,000	\$200,000,000
Liquidation preference of Series A preferred stockholders	\$40,000,000	\$40,000,000	\$40,000,000
Initial distribution of liquidation preference of Series A stockholders (B)	\$40,000,000	\$40,000,000	\$40,000,000
Balance available for ratable allocation to preferred and common stockholders in the ratio of their ownership interests (30% and 70%) [(C) = (A) - (B)]	\$10,000,000	\$35,000,000	\$160,000,000
Allocation of balance to preferred shareholders	\$3,000,000	\$10,500,000	\$48,000,000
$[(D) = (C) \times 30\%]$			
Allocation of balance to common stockholders	\$7,000,000	\$24,500,000	\$112,000,000
$[(E) = (C) \times 70\%]$			
Total proceeds to:			
Preferred stockholders	\$43,000,000	\$50,500,000	\$88,000,000
[(B) + (D)]			
Common stockholders (E)	\$7,000,000	\$24,500,000	\$112,000,000
Relative allocation of enterprise value to:			
Preferred	86%	67%	44%
Common	14%	33%	56%

- Preferred dividends. Preferred dividends or preferred stockholder rights to dividends **B.07.09** may be classified according to priority, level of board of directors' discretion, and whether they are cumulative. Preferred stock dividends generally are set at a percentage of the preferred stock purchase price, such as 10 percent. Preferred stockholders generally are entitled to dividends in priority to common stockholders. Typically, preferred stockholders are entitled to payment of dividends only if and when they are declared by the board. After payment of percentage-based dividends, as described previously (also known as initial dividends), holders of preferred stock also may be entitled to participate in any dividends to be paid to the holders of common stock. Noncumulative dividends that are not declared or paid in a given year do not carry forward into or become payable in subsequent years. Accordingly, if a portfolio company operates in an industry in which it is not the practice to declare or distribute dividends to preferred or common stockholders, noncumulative preferred dividend rights typically are not meaningful or substantive. In some financings, preferred dividends are cumulative, which means that if initial dividends are not declared and paid in one year, the amount of such initial dividends is added to the initial dividends for the following year, and so on.
- **B.07.10** The existence of unpaid cumulative dividends becomes more relevant upon the payment of dividends or the liquidation of a portfolio company and, in some cases, may be relevant to the conversion of preferred stock into common stock and the voting of a portfolio company's outstanding stock. If a portfolio company wishes to pay dividends to its stockholders, the application of first priority cumulative dividends is clear. In the event of a liquidation, cumulative dividends generally are treated as additional investment by preferred stockholders in the portfolio company, such that each preferred stockholder receives additional liquidation proceeds if cumulative dividends have not been paid in prior periods. Similarly, if the conversion or voting of the preferred stock is calculated to include accrued but unpaid dividends, this will result in a greater than one-for-one ratio for purposes of conversion or voting of the preferred stock in the form of a higher rate of return to preferred stock on payment of dividends or a liquidation and, in some cases, an increased preferred-to-common conversion ratio and enhanced voting power.
- **B.07.11** *Redemption rights.* A redemption right is, in substance, a put provision and allows an investor to redeem its investment; typically, it is designed to allow an investor to exit from an investment in a portfolio company before the occurrence of a liquidity event. As a result, such rights serve as a tool for preferred stockholders to motivate the portfolio company to explore various liquidity alternatives on an ongoing basis. Enforcement mechanisms that accompany these rights are important. For instance, a right to elect a majority of the board of directors will give an investor the ability to compel the sale of the portfolio company. In practice, an investor will not be able to redeem the investment if such redemption leads the portfolio company to lose significant liquidity.
- **B.07.12** *Conversion rights.* These rights allow preferred stockholders to convert their shares into common stock at their discretion. Preferred stockholders will choose to convert to common stock if such conversion produces better economic results for them. The

conversion ratio may be fixed or variable. Variable conversion rights are more powerful than fixed rights because variable rights often are structured to allow a better payoff to preferred stockholders. Conversion rights often are subject to adjustment by operation of the antidilution rights described subsequently and, in some cases, are also subject to adjustment for unpaid cumulative dividends, as described previously, or failure by the portfolio company to achieve certain milestones.

- **B.07.13** *Participation rights.* After the holders of preferred stock receive their full liquidation preference (as noted in paragraph B.07.04), their participation rights entitle them to share with the holders of common stock in the remaining amount being paid for the company. For example, if a company is sold for \$100 million, the preferred stock has a liquidation preference of \$20 million, and the preferred stock represents 40 percent of the total number of outstanding shares of the company, then the \$100 million would be distributed among stockholders as follows:
  - *a.* The first \$20 million is paid to the preferred shareholders per the stated liquidation preference.
  - *b*. The remaining \$80 million is split as follows:
    - i. Preferred stockholders receive their 40 percent pro rata share (\$32 million) per their participation rights.
    - ii. Common stockholders receive the remaining 60 percent (\$48 million).

Participation rights are described as capped when the participation rights of the preferred stock are limited so that the preferred stock stops participating in the proceeds of a sale after it has received back a predetermined dollar amount, usually expressed as "X" times the liquidation preference. For example, a three times participation right in the forgoing example would cap the amount the preferred shareholders could receive at \$60 million. So, if the company were sold for \$200 million, then the preferred shareholders would only receive \$60 million, not \$72 million based on a 40 percent participatory right.

- **B.07.14** Antidilution rights. These rights are designed to prevent or reduce dilution of the holdings of preferred stockholders in the event of subsequent *down rounds* of financing. Antidilution rights are powerful rights providing downside economic protection to preferred stockholders. These rights result in an automatic adjustment of the original conversion ratio of preferred stock to common stock in the event that a portfolio company subsequently issues stock at a price per share below the original issue price of the existing preferred stock. Antidilution rights may be broadly divided into three categories, *full ratchet* and two types of *partial ratchet*:
  - *a. Full ratchet.* The conversion price of the previously issued preferred stock is adjusted to the new round price, regardless of the dilutive effect of a new issuance. Full ratchet antidilution rights tend to become increasingly prevalent in difficult financing environments when investors have increased leverage, and there is increased uncertainty about a company's valuation and prospects. For example, if 10,000 shares of preferred stock are outstanding with a \$10

conversion price and \$10 original issuance price, and a subsequent round of 1,000 shares is issued at a \$5 conversion price, the conversion price of the original 10,000 shares will be adjusted to \$5. Accordingly, the conversion ratio, which is the original purchase price divided by the conversion price, will now equal 2 (\$10 divided by \$5), and the same 10,000 originally issued shares of preferred stock will now convert into twice as many shares of common stock.

*b. Partial ratchet: narrow-based weighted average.* This alternative is less onerous than full ratchet and takes into account both the lower issuance price of new stock and the size of the new issuance relative to the portfolio company's outstanding preferred stock. The formula for calculating the new conversion price of the old preferred shares is as follows:

Original issue price of old preferred shares  $\times$  (A + B) / (A + C)

A = outstanding preferred capitalization (number of shares)

B = total dollar amount paid for new shares divided by the price per share paid for old preferred shares

C = number of new shares actually issued at new price

Assuming the same facts as in item (a), the conversion price of the old shares would be adjusted to

 $10 \times [10,000 + (5,000 / 10)] / [10,000 + (5,000 / 5)]$ 

= \$10 × (10,500 / 11,000) = \$9.55

Therefore, 1 share of old preferred stock will now convert into 10 / 9.55, or 1.047 shares of common stock.

c. Partial ratchet: broad-based weighted average. This is the most common alternative and is less onerous than either the full ratchet or narrow-based weighted average alternatives and further takes into account the size of the new issuance relative to the portfolio company's entire capital base, instead of just the outstanding preferred stock. Although there is no single definition of broad based, the most common formulation is to take into account the effect of the new issuance on the total capitalization of the portfolio company, including common stock, preferred stock, and outstanding options and warrants (and, in rare cases, the pool of options reserved for future grants). The formula for calculating the new conversion price of the old preferred shares is as follows:

Original issue price of old preferred shares  $\times$  (A + B) / (A + C)

A = outstanding common stock, preferred stock, options, and warrants (number of shares)

B = total dollar amount paid for new shares divided by the price per share paid for old preferred shares

C = number of new shares actually issued at new price

In item (*a*), assuming that the portfolio company's outstanding capitalization includes 9,000 shares of common stock, 1,000 additional shares of common stock subject to outstanding options or warrants, and 10,000 shares of preferred stock, the conversion price of the old shares would be adjusted to

 $10 \times [20,000 + (5,000 / 10)] / [20,000 + (5,000 / 5)]$ 

= \$10 × (20,500 / 21,000) = \$9.76

Therefore, 1 share of old preferred stock will now convert into 10 / 9.76, or 1.024 shares of common stock.

**B.07.15** *Registration rights.* Registration rights come into play when a portfolio company does not complete an IPO within a specified period, at which time the holders of a specified percentage of preferred stock are generally entitled to demand that the portfolio company exercise its best efforts to complete an IPO. Furthermore, if a portfolio company has completed an IPO, the outstanding preferred stock generally converts into common stock, and the holders of a specified percentage of such converted stock are entitled to demand that the portfolio company use its best efforts to complete a secondary public offering of their converted shares or otherwise register their shares for public trading within a certain period. These registration rights survive the portfolio company's IPO and continue to add value in the form of enhanced liquidity to preferred stockholders whose shares have converted to common stock.

### Non-economic Rights

- **B.07.16** *Voting rights.* These are rights of preferred stockholders to vote together with common stockholders on matters requiring a stockholder vote and, in addition, to vote on certain matters as a separate class. Each share of preferred stock generally has votes equal to the number of shares of common stock then issuable upon conversion of preferred to common. As described under the descriptions in this appendix of preferred dividends, conversion rights, and antidilution rights, the rate of conversion of preferred stock to common stock and the resulting number of votes per share of preferred stock are subject to adjustment.
- **B.07.17** *Protective provisions and veto rights.*<sup>11</sup> These rights give preferred stockholders the ability to veto major actions of a portfolio company in a manner disproportionate to their percentage ownership. These provisions and rights require that the portfolio company obtain the consent of at least a fixed percentage of preferred stockholders prior to taking significant actions. Investors also may require and receive individual series-based protective provisions, in addition to the protective provisions that apply to all preferred

<sup>&</sup>lt;sup>11</sup> This discussion is not intended to cover protective or veto rights addressed in FASB ASC 810-10-25.

stock. As a result, portfolio companies may be required to obtain the consent of a specified percentage of all preferred stock, as well as specified percentages of certain series of preferred stock, prior to taking significant corporate actions. Through such series-based distinctions, protective provisions have become an even more powerful tool for certain preferred stock investors to exercise veto rights well in excess of their rights based on percentage ownership alone. Examples of the significant corporate actions that require the consent of a specified percentage of preferred stock and, in many cases, specified percentages of particular series of preferred stock are as follows:

- Changes in the rights of preferred stockholders
- Increases or decreases in the number of shares of preferred stock or creation of any new class or series of stock having rights senior to, or on par with, existing preferred stock
- Declaration of dividends or any other distribution to stockholders or repurchase of outstanding stock
- Merger, acquisition, corporate reorganization, change of control, or any transaction in which all or substantially all of the portfolio company's assets are sold
- Amendments or waivers of any provision of the portfolio company's certificate of incorporation or bylaws that would change the rights of preferred stockholders
- Increase or decrease in the authorized size of the board of directors
- Appointment of a new CEO

In some cases, the protective provisions include additional matters that are typical covenants in debt transactions, such as

- any material change in the nature of the portfolio company's business.
- any transfer or exclusive license of the portfolio company's technology or intellectual property, other than such transfers or licenses that are incidental to the sale of the portfolio company's products in the ordinary course of business.
- the incurrence of indebtedness in excess of a prespecified amount (for example, \$1 million).
- any material change in the portfolio company's accounting practices or any change in the portfolio company's external auditors.

**B.07.18** *Board composition rights.* Preferred stockholders with these rights have the ability to control the board composition in a manner that is disproportionate to their share ownership. The holders of each class of stock are entitled to elect a fixed number of

directors, regardless of the holders' respective ownership. Generally, board composition rights lead to control of the portfolio company. Typically, investors in earlier rounds insist on board representation. In some cases, when investors purchase a significant percentage of the company or otherwise have significant leverage in the financing, investors in the latest series of preferred stock may insist on the right to appoint a majority of the board. This results in a further concentration of control in a single series of preferred stock well in excess of that series' percentage ownership of the portfolio company.

- **B.07.19** *Drag-along rights.* These rights allow majority of one class of shareholders to compel the holders of one or more other classes of shares to vote their shares as directed in matters relating to the sale of the portfolio company.
- **B.07.20** *Right to participate in future rounds.* Each preferred stockholder with this right is allowed to purchase a portion of any offering of new instruments of the portfolio company based on the proportion that the number of shares of preferred stock held by such holder (on an as-converted basis) bears to the portfolio company's fully diluted capitalization or to the portfolio company's total preferred equity. The right to participate in future rounds gives the preferred stockholders the ability to maintain their respective ownership percentages and restrict the ability of common stockholders to diversify the shareholdings of the portfolio company.
- **B.07.21** *First refusal rights and tag-along rights.* Preferred stockholders with these rights may effectively limit the sale of common stock held by the portfolio company's founders and other key members of management by allowing the preferred stockholders the right to purchase such shares from the founders at the price offered by a third party (first refusal) and requiring that the founders allow preferred shareholders to substitute their shares for shares to be sold by the founders in proportion to those shareholders' percentage ownership of the sales price (tag along). Generally, these are designed to reduce the liquidity of common stock held by founders and thereby enhance the value of the preferred stock.
- **B.07.22** *Management rights.* These rights entitle preferred stockholders to standard inspection rights (rights to inspect in detail the portfolio company's books and accounts), as well as rights to visit board meetings. These rights may be in place of rights to nominate directors or may be available if, for some reason, the preferred stockholders do not want to exercise their rights to nominate a director.
- **B.07.23** Information rights. Preferred stockholders with information rights have the ability to be granted access to prespecified information, such as monthly financial statements within a specified period following each month end, the annual operating plan within a specified period prior to the beginning of the fiscal year, and audited financial statements within a specified period following the portfolio company's fiscal year-end. These rights provide preferred stockholders timely access to vital information that may not be available to common stockholders.
**B.07.24** In summary, preferred stock rights not only offer the holders the opportunity for disproportionate returns on their investments but also may provide downside protection. In addition, preferred stock rights may provide investors with degrees of control over the portfolio company that are disproportionate to their ownership percentages. The valuation challenge is to identify objective methods of quantifying premiums attributable to those rights.

#### Models Used in Calculating Discounts for Lack of Marketability

- B.08.01 As discussed in chapter 9, "Control and Marketability," a *discount for lack of marketability* may apply to certain interests in a portfolio company in certain circumstances. If a discount for lack of marketability would be applicable in valuing the Fund's interest, a number of factors may be considered in estimating the size of such a discount. For example, these include<sup>12</sup>
  - prospects for liquidity (that is, expectations of a market in the future. The greater the prospects, the lower the discount would tend to be).
  - number, extent, and terms of existing contractual or customary arrangements requiring the portfolio company to purchase or sell its equity interests. Impact on the size and direction of any marketability adjustment will vary, depending on the nature of the arrangements.
  - pool of potential buyers. The larger the pool, the lower the discount would tend to be.
  - risk or volatility. The lower the perceived risk of the interests or the lower the volatility of the value of the interests, the lower the discount would tend to be.
  - size and timing of distributions. The greater the amount of dividends paid to the interests, the lower the discount would tend to be (typically not a factor for early-stage portfolio companies but possibly a factor for more mature portfolio companies).
  - concentration of ownership. The higher the concentration of ownership (for example, among founders or one or two investors), the higher the discount would tend to be.
- **B.08.02** One source of empirical data that can be helpful in understanding the nature of the potential adjustment attributable to a lack of marketability is transactions in the restricted stock of publicly traded companies. *Restricted stock* is the stock of a public company that is identical in all aspects to the freely traded stock of the company, except that it is restricted from trading on the open market for a certain period of time. The duration of the restrictions varies, but most restrictions typically lapse after 12 months, or 24 months in older studies. The median discount observed in these studies ranges from 13 percent to

<sup>&</sup>lt;sup>12</sup> A number of studies have been conducted on factors influencing marketability discounts. See footnotes 3 and 4 in paragraph B.03.04.

45 percent.<sup>13</sup> The factors that appear to be most significantly correlated with observed discounts in restricted stock transactions are the underlying volatility of the stock, the restriction period of the stock in the transactions, and the size of the block being sold as a percentage of shares outstanding. The task force does not endorse applying discounts for lack of marketability based solely on references to studies; rather, each situation should be evaluated based on its individual facts and circumstances.

- **B.08.03** Another set of empirical data that is used to estimate implied discounts for lack of marketability is the price a stock exhibited in private transactions prior to an IPO when compared to the publicly traded price subsequent to the public offering. Studies using this data have indicated an average downward adjustment of between 21 percent and 66 percent from 1980 to 2002.<sup>14</sup> However, because only successful IPOs are tracked in the study, this data may reflect a sample bias. Furthermore, because much of the underlying "transaction" data is based on stock option grants rather than actual sales of stock, the data may not accurately reflect arm's-length prices. Finally, even the most recent studies are based on transactions and IPOs that are at least several years old. Therefore, reliance on these studies has diminished in current valuation practice. Furthermore, as noted previously, when applying discounts for lack of marketability, it is important to evaluate individual facts and circumstances and not rely solely on references to studies.
- **B.08.04** Several quantitative methods have been developed to estimate the discount for lack of marketability for privately held interests. The following list contains descriptions of the three foundational methods:
  - a. Protective put.<sup>15</sup> The protective put method for estimating a discount for lack of marketability was first described by David Chaffe in 1993, and it serves as the foundation for other option-based methods. In this method, the discount is estimated as the value of an at-the-money put with a life equal to the period of the restriction, divided by the marketable stock value. Thus, the estimated discount depends on the volatility, as a measure of risk, and the duration of the restriction. Intuitively, by purchasing an at the-money put option, the buyer guarantees a price at least equal to today's stock price, thus creating liquidity. However, as Aswath Damodaran points out, "liquidity does not give you the right to sell a stock at today's market price anytime over the next 2 years. What it does give you is the right to sell at the prevailing market price anytime over the next 2 years."<sup>16</sup> In practice, because it is not possible to hedge illiquid instruments, the protective

<sup>&</sup>lt;sup>13</sup> Independent studies of restricted stock transactions are reported in Shannon P. Pratt's *Valuing a Business: The Analysis and Appraisal of Closely Held Companies*, 5th ed. (New York: McGraw-Hill, 2007), and Shannon P. Pratt's *Business Valuation Discounts and Premiums* (Hoboken, NJ: John Wiley & Sons, Inc., 2009). Additional articles on the restricted stock studies are found in the September 2001, December 2001, and December 2002 editions of *Business Valuation Review*.

<sup>&</sup>lt;sup>14</sup> Atulya Sarin, Sanjiv R. Das, and Murali Jagannathan, "The Private Equity Discount: An Empirical Examination of the Exit of Venture Backed Companies" (working paper, Santa Clara University—Department of Finance, January 2002).

<sup>&</sup>lt;sup>15</sup> David B. Chaffe, "Option Pricing as a Proxy for Discount for Lack of Marketability in Private Company Valuations," *Business Valuation Review* 12 (December 1993): 182–88.

<sup>&</sup>lt;sup>16</sup> Aswath Damodaran, "Marketability and Value: Measuring the Illiquidity Discount," *Stern School of Business* (July 2005): 41.

put method should not be considered to represent an actual transaction but rather, to represent a reasonable regression-based fit to the discounts observed in restricted stock data. To validate the model, Chaffe evaluated the results by calculating the discounts for volatilities in a range of 60 percent to 90 percent.<sup>17</sup> For a holding period of two years and volatilities of 60 percent to 90 percent, the protective put method gives discounts comparable to those cited in restricted stock studies. This method is still widely used.

- b. Longstaff.<sup>18</sup> In 1995, Francis Longstaff published an article in the Journal of Finance that describes an upper bound on the discount for lack of marketability based on a "look back" option. Intuitively, in a liquid instrument, an investor with perfect market timing ability would sell the interest when the value is highest. Longstaff also correlated his results to restricted stock studies using a volatility input of 10 percent for low volatility companies and 30 percent for high volatility companies. The Longstaff model provides a wide upper bound because an average investor will possess imperfect market timing ability; therefore, the investor is unlikely to attain the maximum value of the interests. Thus, the task force believes it is generally not a reasonable method for estimating discounts when used with observed market volatilities because the upper bounds do not correlate well with observed market discounts and, in fact, rise in excess of 100 percent for high volatility instruments with long restriction periods.
- c. Quantitative marketability discount model (QDRM).<sup>19</sup> The QMDM, developed by Chris Mercer, is an income approach technique for estimating discounts for lack of marketability that assumes that investors in illiquid instruments require higher rates of return than investors in liquid instruments. The discounts derived from the QMDM are driven by the inputs to the model; thus, there is no typical range of discounts observed using this model. The QMDM is most appropriate for directly valuing a nonmarketable minority interest in an entity with a simple capital structure. (See paragraph 9.28.) Accordingly, alternative methods may be better suited for entities with complex capital structures. In addition, because the discounts estimated by QMDM increase approximately linearly with time, caution should be exercised in applying QMDM when long holding periods are assumed.
- **B.08.05** Because the Longstaff method generally does not provide a reasonable estimate for the discount for lack of marketability, and the QMDM is more applicable for directly valuing the Fund's interest in an entity with a simple capital structure, the most widely accepted of these methods is the protective put method. This method has also spawned a

<sup>&</sup>lt;sup>17</sup> The majority of companies have volatilities in the 30 percent to 50 percent range. Companies with volatilities of 60 percent to 90 percent or higher tend to be smaller, less diversified portfolio companies or in riskier industries, such as high tech and biotech. Highly levered companies or the common stock in companies with high liquidation preferences will also have high volatilities, often exceeding 100 percent.

<sup>&</sup>lt;sup>18</sup> Francis A. Longstaff, "How Much Can Marketability Affect Security Values," *The Journal of Finance* 50 (December 1995): 1767–74.

<sup>&</sup>lt;sup>19</sup> Z. Christopher Mercer and Travis W. Harms, *Business Valuation: An Integrated Theory*, 2nd ed. (Hoboken, NJ: John Wiley & Sons, Inc., 2008).

plethora of successors, of which the most popular are the Finnerty method and the Asian protective put method:

- a. Finnerty.<sup>20</sup> Building on these previous models, in 2001 with subsequent updates, John Finnerty proposed a model that assumes the investor does not possess special market timing ability and would be equally likely to exercise the hypothetical liquid instrument at any given point of time. The value of marketability is modeled as the present value of cash flows, similar to an averagestrike put option. The Finnerty method addresses the issue of assuming perfect market timing in the Longstaff method and the issue of assuming protection on the downside while still realizing appreciation on the upside in the protective put method. Finnerty also performed a regression analysis to restricted stock studies, adjusting to remove other significant factors, such as concentration of ownership and information effects, and found that after isolating the marketability-related factors, the discounts predicted by his method are consistent with the data. As with other option-based methods, the estimated discount depends on the volatility, as a measure of risk, and the duration of the restriction. For a given volatility, the discounts in the Finnerty model increase roughly proportionately to the square root of the duration of the restriction, which provides a useful proxy for calibrating to an observed discount from a transaction.
- b. Asian protective put.<sup>21</sup> The Asian protective put is a variant of the protective put method that estimates the discount based on the average price over the restriction period rather than based on the final price. This method is conceptually similar to the Finnerty method but is estimated as an average price Asian put (which measures the difference between the current price and average price over the holding period) rather than an average strike Asian put (which measures the difference between the average price over the holding period and the final price). As with other option-based methods, the estimated discount depends on the volatility, as a measure of risk, and the duration of the restriction. The discounts predicted by this method are uniformly lower than those for the protective put, are lower than the Finnerty method for low volatility stocks, and are higher than the Finnerty method for high volatility stocks.

<sup>&</sup>lt;sup>20</sup> John D. Finnerty, "An Average-Strike Put Option Model of the Marketability Discount," *The Journal of Derivatives* 19 (Summer 2012): 53–69. Note that previous versions of this paper include an error in the formula for the discount and should not be relied on. Also, note that Finnerty is continuing to refine and adapt his model, conducting further research to address some of the shortcomings mentioned in this chapter. Please check for the latest updates before using this method.

<sup>&</sup>lt;sup>21</sup> Although several practitioners have adopted this method, the PE/VC Task Force (task force) is not aware of any formal research to explore the relationship between the Asian put and restricted stock studies. The following papers provide an explanation of Levy's method for approximating the Asian put discount in closed form and an overview of the Asian put more generally:

<sup>•</sup> David LeRay, "Efficient Pricing of an Asian Put Option Using Stiff ODE Methods" (master's project, Worcester Polytechnic Institute, May 2007).

<sup>•</sup> John C. Hull, *Options, Futures and Other Derivatives*, 7th ed. (Upper Saddle River, NJ: Pearson Prentice Hall, 2009), 556–58.

- **B.08.06** Estimating a discount for lack of marketability is challenging, and none of these methods is completely satisfactory in all respects. All put-based methods share the conceptual shortcoming that purchasing a put is not equivalent to purchasing marketability alone because it also limits the downside risk while leaving the upside potential. That is, these methods focus on the cost of buying a put without capturing the fact that to lock in today's price, the interest holder would also have to sell a call. If it were feasible to hedge the nonmarketable instrument, a more appropriate hedge might be to sell a forward contract, which might imply a discount for lack of marketability closer to the risk-free rate.<sup>22</sup> In addition, none of the models consider that even with such a hedge, the interest may still be illiquid. The strength of these put-based methods is that they appropriately capture the relationship between the duration of the restriction (time) and risk (volatility), and they have been correlated with the limited observable market data.
- **B.08.07** A key input into all these methods is the volatility of the instrument. In cases in which the senior classes of equity are entitled to a liquidation preference before the junior classes of equity begin participating, the junior classes of equity are more leveraged and, hence, have higher volatility than the overall equity volatility. Following Merton's formulation, the relationship between equity volatility and asset volatility can be written as follows:

Equity Volatility = Asset Volatility × (Asset Value × N(d1)) / Equity Value

Therefore, the volatility for each class of equity<sup>23</sup> is estimated as follows:

Class Volatility = Equity Volatility × (Equity Value × Class N(d1)) / Class Value

where

Class N(d1) = Sum (Incremental N(d1) Value by Breakpoint × Class Allocation by Breakpoint)

For example, in a situation with one class of convertible preferred stock with a liquidation preference of \$20 million and 40 percent ownership on an as-converted basis

Common N(d1) =  $100\% \times (N(d1 @ \$20 million) - N(d1 @ \$50 million)) + 60\% \times (N(d1 @ 50 million))$ 

It is theoretically appropriate to use the levered volatility for each class of instruments in estimating the discount for lack of marketability for that class.

**B.08.08** Because the data used in Chaffe's analysis was not adjusted for effects unrelated to marketability, such as concentration of ownership and information access, discounts estimated using the protective put method may be regarded as capturing the discount

<sup>&</sup>lt;sup>22</sup> Empirically, observed discounts for lack of marketability are higher than the risk-free rate, so the fact that it is not feasible to hedge a nonmarketable instrument suggests that a forward contract is generally not the right model for these discounts.

<sup>&</sup>lt;sup>23</sup> Neil J. Beaton, Stillian Ghaidarov, and William Brigida, "Option Pricing Model," *Valuation Strategies*, November–December 2009.

applicable to both lack of marketability as well as lack of control or other factors. Other put-based methods, such as the Finnerty method and Asian protective put method, attempt to isolate the "pure" discount for lack of marketability, which may be regarded as incremental to the degree of illiquidity for the controlling investors' interests.

#### Valuation Issues – Stand-alone Option-like Instruments

- **B.09.01** As mentioned previously, the value of option-like instruments depends upon the future value of an underlying asset. At the exercise of the option, if the option is "in the money" (that is, if the value of the underlying asset, or UA, exceeds the exercise price, X, of a call option, or if the value of the underlying asset is below the exercise price of a put option) then the option will have a positive payoff. On the other hand, if the option is "at-the-money" (underlying value equals exercise price) or "out-of-the-money" (exercise price exceeds the underlying value for a call option or is lower than the underlying value for a put option), then the option will expire worthless. The potential payoffs of a call option at maturity can be summarized symbolically:
  - If UA > X, value = UA X
  - If  $UA \le X$ , value = \$0
- **B.09.02** At any time prior to expiry, the value of the option has two components: the intrinsic value (the payoff as if immediately exercised; expressed using the terminology above, the greater of UA X or \$0), and the time value. The time value is a complex component that depends on a number of factors, the most significant of which are the volatility of the underlying asset and the time to expiry. Options can range from the simplest structure, often referred to as "plain vanilla" options that are relatively straightforward to value, to instruments with very complex terms and conditions requiring the use of sophisticated, tailored models. Valuation of plain vanilla options is typically performed using the Black-Scholes model, which requires the following inputs:
  - Value of the underlying asset, usually a share of common stock
  - Exercise price, the fixed price at which the underlying asset may be purchased
  - Expected time to exercise (expected term), considering the contractual expiration or maturity date as well as any events that might trigger early exercise
  - Volatility of the underlying asset over the expected time to exercise
  - Risk-free rate over the expected time to exercise
  - Expected dividends on the underlying
- **B.09.03** In general, the value of a call option at any point in time prior to expiry is affected by these factors in the following ways:

Factor	Impact on option value of an increase
Underlying asset	Increase
Exercise price	Decrease
Expected time to exercise	Increase
Volatility	Increase
Risk-free rate	Increase

Expected dividends Decrease

**B.09.04** The following example of a plain vanilla option illustrates the use of two common valuation techniques:

Stock price	\$25.00
Strike price	\$25.00
Term – years	1.00
Volatility	50.00%
Annual dividend rate	0.00%
Risk-free rate	3.00%

**B.09.05** First, the value of this option is estimated using a simple twelve-period (monthly time intervals) binomial lattice model. For illustrative purposes, we present an example using one of the most commonly-used lattice models, but please note that there are many other variations that are also reasonable and may be more appropriate than this particular model in certain circumstances. We begin by generating an "asset tree" that assumes in each time interval, moving from left to right, the stock will move either up, with a probability "p" or down, with a probability (1 - p).

Period	0	1	2	3	4	5	6	7	8	9	10	11	12
Value of underlying equity	25.00	28.88	33.37	38.55	44.53	51.45	59.44	68.66	79.33	91.64	105.87	122.31	141.31
		21.64	25.00	28.88	33.37	38.55	44.53	51.45	59.44	68.66	79.33	91.64	105.87
			18.73	21.64	25.00	28.88	33.37	38.55	44.53	51.45	59.44	68.66	79.33
				16.21	18.73	21.64	25.00	28.88	33.37	38.55	44.53	51.45	59.44
					14.03	16.21	18.73	21.64	25.00	28.88	33.37	38.55	44.53
						12.15	14.03	16.21	18.73	21.64	25.00	28.88	33.37
							10.52	12.15	14.03	16.21	18.73	21.64	25.00
								9.10	10.52	12.15	14.03	16.21	18.73
									7.88	9.10	10.52	12.15	14.03
										6.82	7.88	9.10	10.52
											5.90	6.82	7.88
												5.11	5.90
													4.42

- **B.09.06** The magnitude of the up and down moves is based on the length of the time interval and the stock's estimated volatility:
  - Volatility varies with the square root of time. In this case, the time interval is one month, or 1/12 of a year, so the annual volatility estimate of 50% is multiplied by 0.2887 (square root of 1/12), which equals 0.1443
  - The up move (lateral as presented in this example) in any time interval is the previous stock price multiplied by the exponential ("exp") of this result, 1.1553. For example, the first up move is \$25.00 x 1.1553 = \$28.88
  - The down move (diagonally downward as presented in this example) in any time interval is previous stock price multiplied by the inverse of the up move; in this case, it is 1/1.1553, or 0.8656. For example, the first down move is \$25.00 x (1/1.1553) = \$21.64

- **B.09.07** The probability of an up move in any time interval depends on the volatility and the risk-free rate applicable to the time interval. The interval risk free rate factor is the exponential of the interval rate. In this case, the interval rate is 3%/12 or 0.25%, and exp(0.0025) = 1.0025. Putting all of these factors together, the probability of an up move is:
  - [exp(Rf) Down]/[Up Down]
  - [1.0025 0.8656]/[1.1553 0.8656] = 0.4726

Since a binomial lattice model assumes that the value will move discretely either up or down at each time interval, the probability of a down move is 100% less the probability of an up move. Therefore, the probability of a down move = (1 - 0.4726), or 0.5274.

**B.09.08** This simplified asset tree has the following characteristics:

- There are n=12 time intervals in this example, which produced n+1=13 discrete stock prices at the end of period 12
- Of these ending stock prices, the top 6 exceed the \$25.00 strike price and are in-themoney; the bottom 7 are at- or out-of-the-money
- There is only one path to the highest stock price of \$141.31, and the probability of reaching this price is very small; the probability of 12 consecutive up moves is only 0.4726^12
- Likewise, there is only one path and a very low probability of reaching the lowest stock price of \$4.42.
- The ending stock price distribution is approximately lognormal
- **B.09.09** The next step in applying the binomial lattice model to value the option is to evaluate the payoff to the option at maturity, and then probability-weight and discount these values to the measurement date:

Period	0	1	2	3	4	5	6	7	8	9	10	11	12
Value of European option	5.14	7.52	10.74	14.98	20.36	26.95	34.81	43.98	54.58	66.83	81.00	97.38	116.31
		3.03	4.66	7.00	10.23	14.54	20.04	26.76	34.68	43.85	54.45	66.71	80.87
			1.59	2.59	4.13	6.42	9.69	14.11	19.78	26.63	34.56	43.73	54.33
				0.70	1.22	2.10	3.53	5.77	9.10	13.73	19.66	26.51	34.44
					0.23	0.44	0.83	1.54	2.81	4.98	8.49	13.61	19.53
						0.04	0.09	0.19	0.41	0.88	1.86	3.94	8.37
							0.00	0.00	0.00	0.00	0.00	0.00	0.00
								0.00	0.00	0.00	0.00	0.00	0.00
									0.00	0.00	0.00	0.00	0.00
										0.00	0.00	0.00	0.00
											0.00	0.00	0.00
												0.00	0.00
													0.00

B.09.10 As shown in the previous lattice, the final Period 12 payoff for the option has been calculated by subtracting the \$25.00 exercise price from each ending stock price. For example, the highest option payoff is \$141.31 stock price less the \$25.00 strike price, or \$116.31. As mentioned previously, the probability of this highest option payoff is very

small. As is also shown in the previous lattice, slightly fewer than half of the ending values result in a positive payoff.

- **B.09.11** The final step in estimating the option value is to probability-weight and discount each value back to the measurement date, Period 0, moving from right to left. A sample calculation for the highest value in Period 11 is as follows:
  - Value of up move to Period 12 = \$116.31 times probability of up move (0.4726) = \$54.97
  - Value of down move to Period 12 = \$80.87 times probability of down move (0.5274) = \$42.65
  - Weighted Period 12 values = \$97.62, discounted for one month at the monthly Rf factor of 1.0025 = \$97.38

This weighting and discounting process is repeated until Period 0 is reached, resulting in a value of \$5.14 for this option.

- **B.09.12** Using these same assumptions, the Black-Scholes model returns a value of \$5.24. The lattice model is a numerical integration method, while the Black-Scholes model is a closed form solution for the same distribution; therefore, the Black-Scholes model provides the theoretically correct value for options that can be modeled in closed form. In this example, the simple 12-interval lattice model produced a value within 2.0 percent of the Black-Scholes value. In general, the more "granular" (the more time intervals per year) the model contains, the more precise the results will be.
- **B.09.13** Another question in valuing options is how sensitive is the model to the inputs, and how great is the inherent estimation uncertainty? For this example, the sensitivity of the resulting value to certain inputs (using the Black-Scholes model) is as follows:

Scenario	Value
Base case	\$5.24
Volatility decreases from 50% to 30%	\$3.32
Term increases from 1 year to 2 years	\$7.46
Exercise price is reduced to \$20	\$7.71

It is useful to group these inputs into three categories:

- Contractual inputs: The exercise price and expiry date are stated explicitly in the option contract. (Note: For ESOs, the contractual expiry date is usually replaced with an estimated expected life.)
- Market inputs: The value of the underlying asset (stock price) for publicly traded firms, and the risk-free rate are directly observed in the market. (Note: For non-public issuers, the stock price must be estimated; as mentioned, the valuation should reflect the impact of expected dilution due to current and future options and warrants, analogous to market adjustments in the price for traded stock.)
- Estimated inputs: Volatility and dividend inputs are based on measurement date expectations over the remaining contractual or expected life of the option. For publicly-traded common stock, historical volatility can be observed; for issuers with

publicly-traded options, implied forward volatility can be observed. In either case, professional judgment must be applied in the selection of the appropriate volatility estimate. For non-public issuers, volatility estimates are based on the observed historical and forward volatility of guideline public companies.

In general, the level of complexity and the inherent estimation uncertainty increase with the number of inputs that require estimation.

- **B.09.14** The value of share-based awards under FASB ASC 718 would typically not be the right estimate for valuing the dilution impact on the fund's interest. For a portfolio company with a simple capital structure, the most widely-used approach for capturing this impact is to value the enterprise considering the value that a new third-party buyer would pay for the business, then subtract out only the intrinsic value of the share-based awards. The additional time value that these share-based awards would have for FASB ASC 718 purposes represents the executives' "investment" in the business the executives are investing their time in exchange for the potential upside from the stock-based compensation, knowing that they have the opportunity to earn a high payoff if the business is successful, but will receive nothing if it is not. The vesting of the awards typically may be ignored for this purpose, since the portfolio company would most likely replace any executives who leave and would need to replace the corresponding awards.
- **B.09.15** A key assumption needed to estimate the fair value of options and warrants is the volatility of the underlying asset. It is therefore critical that the volatility estimate be developed appropriately, considering the expected term of the options and the nature of the underlying asset. The potential choices for the underlying include:
  - Enterprise: The volatility of the enterprise is sometimes utilized for purposes of allocating the value of components of the capital structure using an OPM technique, but it would typically not be a relevant input for valuing an option or warrant on a particular class of equity.
  - Equity: Common equity is the contractual underlying for most options. For companies with simple capital structures, the volatility of equity (either observed or based upon guideline public company data) is therefore the correct input.
  - Different equity tranches: If the company has a complex capital structure, and the underlying asset is common stock, the estimation of volatility becomes more difficult, because the debt-like features of preferred stock increase the leverage on the common stock and thus its volatility, as discussed in paragraphs 8.48(b) and B.08.07. If the contractual underlying asset is convertible preferred, the choice of appropriate volatility input is more complicated. There are ranges of values of aggregate equity in which the preferred payoff will be debt-like (i.e., the preferred may be in-the-money but will not convert to common) and its volatility will be relatively low. Higher ranges of aggregate equity value will imply conversion to common upon exercise and/or at exit, and higher relative volatility. Selection of an appropriate measure of volatility depends on first identifying the "true" underlying (preferred versus common or some combination).

- **B.09.16** Estimating volatility, especially for privately-held companies, may be challenging. The volatility estimate should take into consideration the differences in features between the instruments used to derive observed market indications of volatility and the instrument to be valued, such as:
  - Differences between historical and measurement date capital structures, stage of business development, or changes in corporate structure (acquisitions, divestitures) that render historical observations less relevant, when using historical volatility.
  - Differences between the expected life of the option to be valued (typically longer) and the tenor of the available market data for traded options (typically at most 6 months or possibly a year), when using the implied volatility from traded options.
  - Marketability: The options and warrants held by funds are usually not marketable; and frequently, the underlying asset is also not marketable. To the extent that marketability adjustments on the underlying are appropriate, this non-marketable stock value may be an appropriate input into an option pricing model.
  - Exercise proceeds: A distinguishing feature of warrants, as opposed to options, is that they are transactions between the issuing company and the warrant holder. New shares are created at time of exercise, and exercise proceeds are often received by the company at time of exercise, or netted from the shares issued in the case of a cashless exercise. Care must be taken to ensure that exercise proceeds are handled correctly. In a scenario analysis, for example, it may be appropriate to factor in the proceeds, while in an OPM, it may not be appropriate.
  - Dilution: Dilution arising from issuance of warrants has been discussed herein. To recap, if the stock price does not reflect the impact of the warrants, then a dilution-adjusted Black-Scholes or other technique should be employed.
  - Other complex features: The variety of terms and conditions that option contracts may contain is extensive. A partial list of frequently encountered features includes:
    - a) Variable strike prices
    - b) Performance conditions
    - c) Market conditions
    - d) Price reset features
    - e) Ratchets
    - f) Many others
- **B.09.17** Note that when stand-alone instruments such as call options and warrants contain complex features such as those described in the last bullet of paragraph B.09.16, the Black-Scholes model may not be able to capture these features. In these cases, the fund will need to select a model that can capture the complexity of the payoff function, such as a binomial lattice model, a Monte Carlo model, or other techniques.

#### Valuation Issues – Convertible Instruments

**B.10.01** Convertible instruments include convertible notes and convertible preferred stock. While the conversion terms will vary, a typical convertible instrument is redeemable on

or before maturity at a preset capital amount (face value) or liquidation preference, plus any accrued or accumulated interest or dividends, and may be converted into the common stock or another instrument of the company at a preset conversion price or conversion ratio. Convertible instruments with a specified conversion price may be considered as equivalent to a debt-like instruments plus an additional call option to buy the common equity of the issuer, except that there is an interaction between the credit risk and the stock price. Typically, the primary difference between convertible debt and convertible preferred equity instruments is the finite life of the former, while the latter tends to be perpetual or at least remain outstanding until the company is acquired or the instrument is converted. Convertible bridge notes or preferred that converts at a price that depends on a future financing are effectively equity-settled debt instruments. Please see chapter 13, paragraphs 13.77–.82, "Options and Warrants, Convertible Notes, and Related Instruments", for a discussion of these instruments.

- **B.10.02** The value of convertible instruments, like other financial instruments, is essentially a function of the rights and benefits granted to the holder of the interest by the legal terms or claims provided in the contractual agreement. Key characteristics of convertible instruments that affect valuation include:
  - Face value: price used as the base for calculating coupon and repayment amounts. The face value may include accrued interest or dividends, and these accruals may also be convertible into additional shares at the holders' option.
  - Redemption date: maturity date for debt instruments, or expected maturity or redemption date for preferred stock.
  - Conversion date(s): certain specified periods during which conversion can take place.
  - Conversion ratio: number of shares received upon conversion. The conversion ratio is typically constant, but may also vary over time. Additionally, the ratio may be adjusted for issuance of other instruments and other rights issues.
  - Conversion price: the price at which the convertible instrument may be converted into shares. The conversion ratio may be calculated as the face value divided by the conversion price.
  - Coupon or dividend rate: coupon rate or dividend paid to the interest holder or accrued periodically for periods prior to conversion or maturity.
  - Paid-in-kind 'PIK' interest: interest that accrues in the form of the same instrument issued. A convertible instrument that has PIK interest ultimately will be convertible into a larger number of shares than the original face value would imply.
  - Call feature: the option for the issuer to call the instrument before maturity, at specified points in time or if certain conditions are met. A call feature limits the upside of the convertible instrument by granting the issuer the ability to repay the instrument, which typically will force the holder to convert early.
  - Put feature: the option for the holder to put the instrument before maturity, at specified points in time or if certain conditions are met. A put feature limits the downside risk of the convertible instrument by granting the holder the ability to force redemption of the instrument, which may allow the holder to receive repayment (if the portfolio company has cash or is able to raise new capital), to renegotiate terms, or to force a liquidity event or bankruptcy.

#### **B.10.03** Company and economic factors that affect value of convertible instruments include:

- Market yields: the current yield required by the market for instruments of similar benefit and risk. Like other debt and debt-like instruments, the value of convertible instruments is inverse to market rates.
- Credit quality and level of seniority: the credit quality of the instrument, considering the creditworthiness of the issuer and the seniority of the instrument. Convertible notes and preferred stock are generally unsecured and often junior to other debt instruments, such as lines of credit or term loans. As a result, the value of these instruments may vary significantly if the issuer's creditworthiness changes.
- Volatility of the underlying asset: for convertible instruments with a specified conversion price, as for other options, the higher the volatility of the underlying asset, the higher the value of the conversion option.

The initial market yield and volatility should generally be measured using calibration, so that the assumptions are internally consistent given the valuation model selected. Note that market yields for convertible instruments may be toward the higher end of the range of observed yields for bonds of similar credit quality, and that the volatilities used in measuring the value of convertible notes may be lower than the observed historical or implied volatility for the portfolio company or its peers. These differences reflect the higher rates of return that private equity and venture capital investors typically demand.

- **B.10.04** Valuing convertible instruments with a specified conversion price involves assessing the holders' optimal strategy between redemption and conversion. If the as-converted value is higher than the face value, the value of the convertible instrument tends to be most correlated with the price of the common stock or other underlying instrument. The higher the price of the underlying instrument relative to the conversion price, the more closely the convertible instrument will mirror the as-converted value; however, the convertible instrument typically would trade at a premium to the underlying instrument since the convertible instrument benefits from the time value of the option, and typically also receives interest or dividends that exceed the dividends paid on the underlying. When the price of the underlying instrument is significantly below the conversion price, the value will depend on the coupon or dividend rate relative to the market yield. Convertible instruments typically have a coupon or dividend yield that is below the market yield, since they also benefit from the conversion option.
- **B.10.05** The value of a convertible instrument with a specified conversion price is essentially equal to the value of the debt-like host instrument based on market participants' current required yield for debt-like instruments with similar credit quality and terms (excluding the conversion option), plus the value of the option to convert, except that there is an interaction between the credit risk and the stock price. The value of the option embedded in a convertible instrument is similar to other options and is affected by the same factors:
  - Value of the underlying alternative asset (stock price)
  - Strike price (redemption value if the holder chooses not to convert)
  - Term (typically the time remaining until the redemption date)

- Risk-free rate (risk-free rate of interest appropriate for the term)
- Volatility of the underlying asset (expected annual standard deviation of stock or comparable company stocks).
- **B.10.06** One basic model for valuing a convertible instrument with a fixed conversion price and maturity such as a typical convertible note involves modeling the issuer's stock price using a binomial lattice. The term of the lattice is set to the maturity of the convertible instrument and the end points of the lattice calculate value based on the conversion options available to the holder at that time. The rollback amount at a given node is the expected value across the two subsequent nodes, discounted for one timestep. At each node, the issuer will choose whether to call or continue, and the holder will choose whether to convert. Thus, the value of each node is set to the maximum of the minimum of the rollback amount or the call price, or the value if conversion were to take place.
- **B.10.07** The following example will employ a binomial lattice that has many features in common with the previous stock option lattice example. For illustrative purposes, we present an example using one of the most commonly used lattice models, but please note that there are many other variations that are also reasonable and may be more appropriate than this particular model in certain circumstances. The hypothetical instrument to be valued will be assumed to have the following terms:
  - Face amount of debt \$100.00
  - Issuer risky debt rate 10.0%
  - Coupon \$0.00 (zero-coupon)
    - Maturity 1 year

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- Conversion option At maturity, into 10 shares of common stock
- Stock price \$10.00
- Volatility 40% (annual)
- Risk-free rate 3.0% (annual)
- Dividends None
- **B.10.08** To illustrate how to use a binomial lattice to solve for the value of this hybrid instrument, we will construct a very simple, four-interval (three-month time steps) tree to model the underlying common stock price over this one-year period:
  - Up move per interval 1.2214
  - Down move 0.8187
  - Up probability per interval 0.4689
  - Down probability 0.5311

The resulting stock price tree is as follows:

Period	0	1	2	3	4
Stock price	10.00	12.21	14.92	18.22	22.26
		8.19	10.00	12.21	14.92
			6.70	8.19	10.00
				5.49	6.70
					4.49

**B.10.09** In the previous illustration, note that only the top two final values will be in-themoney. For it to be optimal for the holder to convert, the value of converting to common stock must exceed the bond payoff amount of \$100. Since the bond allows conversion into 10 shares of stock, conversion will be rational only if the stock price exceeds \$10 per share, or a total value of \$100 per bond. The highest two Period 4 (final) values will result in conversion payoffs of \$223 and \$149 (rounded); all the others will be \$100 or less. Therefore, we know that the solution will involve both equity and debt payoffs. Consistent with option pricing methodology, in this approach, the probability-weighted equity payoffs will be discounted at a risk-free rate, while the probability-weighted debt payoffs will be discounted at a risky rate. Note that there are other valuation models for valuing convertible notes that use alternative approaches for capturing credit risk, and thus may better capture the interaction between stock price and credit risk.

Period	0	1	2	3		4	
Value of convertible	108.44	124.24	148.23	182	.21	222.55	Convert to equity (E)
	34.21	56.49	84.79	102	.57		
	7.93	17.03	36.60	78	.64		
	23.19	12.27	0.00	0	.00		
	43.11	38.44	26.83	0	.00		
		98.25	106.52	121	23	149 18	Convert to equity (F)
		15.03	32.31	69	42	14).10	Convert to equity (L)
		0.00	0.00		.00		
		33.94	23.69	0	.00		
		49.28	50.52	51	.80		
			95.12	97	.53	100.00	Receive principal (D)
			0.00	0	.00		
			0.00	0	.00		
			44.60	45	.73		
			50.52	51	.80		
				97	.53	100.00	Receive principal (D)
Weighted amount, source	E up			0	.00		
	E down			0	.00		
	D up			45	.73		
	D down			51	.80		
						100.00	Receive principal (D)

**B.10.10** This analysis results in the following valuation for the convertible note:

- **B.10.11** This expanded presentation shows the source of each component of value, moving from right to left. The calculations for the top value in Period 2, (\$148.23) are described below:
  - The probability of an up move (0.4689) times the value of an up move (\$182.21), is \$85.43. Note that the value of an up move in Period 3 (\$182.21) is composed 100% of equity payoffs; there is no "debt source" of this value. Thus, the entire weighted value of \$85.43 is discounted at the interval risk free rate factor of 1.0075, producing a value of **\$84.79**
  - The value of a down move to Period 3, (\$121.23) is more complicated, because this Period 3 value is composed of an equity component (\$69.42) and a debt component (\$51.80). Although each of these two components will be weighted by the same down move probability (0.5311), the equity component is discounted at the interval risk free rate factor of 1.0075, resulting in a value of **\$36.60**, while the debt component is discounted at the interval risky rate factor of 1.0253, resulting in a discounted value of **\$26.83**
  - The sum of the four components (one of which is \$0) is **\$148.23** (rounded)
- **B.10.12** This simple model produces an estimated convertible bond value of \$108.44. As discussed in the stock option lattice example above, a four-interval-per-year model would not be appropriate; three-month time steps are too large, and could produce a large

estimation error. Regardless of the number of intervals selected, however, it is often useful to perform a reasonableness test when using this model. In this case, the subject instrument is effectively composed of a zero-coupon bond and 10 at-the-money call options on the underlying common stock. The equivalent "straight-bond" value is 100/1.10 = 90.91.

**B.10.13** The option component of value is calculated as follows:

- Stock price \$10.00
- Strike price \$10.00
- Term years 1.00
- Volatility 40%
- Annual dividend rate 0.00%
- Risk-free rate 3.00%
- Call Option Value \$1.714
- Conversion factor 10 shares
- "Option value" \$17.14

This reasonableness test suggests a total convertible bond value of 90.91 + 17.14 = 108.05, ignoring the interaction between credit risk and the stock price, compared with the binomial lattice result of 108.44.

- **B.10.14** The value generated from the method discussed in the previous paragraph leads to an approximate value, since it ignores the interaction between the credit risk and the stock price as the stock price increases, the credit risk declines, all else equal. Effectively, the true strike price of the conversion option is variable, as it equals the market value, not the face value of the bond. Even if the instrument is issued at par, treating the face amount as the aggregate strike price incorporates a portion of the market value of the embedded option into the strike price. This simplification results in overstating the strike price, thus understating the value of the conversion option.
- **B.10.15** Many other factors can complicate the modeling of convertible instrument, but the flexibility inherent in the binomial model allows for various adjustments to be incorporated into the valuation of the instrument. These adjustments are typically made by layering in other trees to account for the ultimate impact on value depending upon time, stock price and the implied value of the instrument. For example, valuation models may incorporate the following terms or features of convertible instruments, among others:
  - Adjustable rights, such as variable coupon rates, call price adjustments, and resetting strike price terms
  - Correlation between bond and stock prices
  - Credit spreads
  - Dilution
  - Dividends

- Embedded put rights
- Forced conversions
- Restricted dates where timing of conversion is prohibited
- Soft calls
- Stochastic nature of interest rates

**B.10.16** The purpose of modeling these features is to estimate the fair value of the convertible instrument – that is, the price at which market participants would transact for the instrument. The impact of these features affects the ultimate cash flows to the instrument and thus, market participants would consider this impact in deciding what to pay when buying the instrument or what price to accept when selling the instrument. The model approach provides a basis for determining how much impact these features would have on the value of the instrument.

## **Appendix C**

### Valuation Case Studies

*Note:* The examples in this appendix are provided only to demonstrate concepts discussed in the preceding chapters of this guide and are not intended to establish requirements. Furthermore, the assumptions and inputs used in these examples are illustrative only and are not intended to serve as guidelines.

The specific facts and circumstances of each individual situation should be carefully considered when performing an actual valuation, and professional judgment should be exercised in evaluating those facts and weighing various alternatives. Each case study summarizes the key considerations that were encountered by the fund manager(s) described in the example. The judgments that were made in each case were specific to those facts, not all of which are highlighted in the case descriptions.

- **C.00.01** The following case studies are presented to provide readers with a broad context for the types of fact patterns that are experienced in practice, examples of judgment that can be applied and the diversity of situations referenced in the topics presented in the earlier chapters. The case studies should be read in conjunction with the chapters that present the relevant guidance from FASB ASC 820 and discuss the concepts illustrated in greater detail.
- **C.00.02** These fifteen case studies have been selected from a number of different industries, showing companies at different stages of development under varied economic conditions, as a way of demonstrating that a fair value assessment starts with a solid understanding of the pertinent factors that impact a market participant's view of value at each measurement date. Thus, these case studies seek to focus the reader's attention on the description of the key facts and circumstances that are considered to be significant in each specific case. It is important to recognize that different market participants could interpret the same key facts and circumstances differently, which in turn could result in a range of values.
- **C.00.03** These case studies are based on real-world situations, which are generally complex and involve numerous nuances that need to be evaluated when estimating the fair value of the investment. The task force intentionally did not overly simplify these case studies by selecting only a single factor to consider. Instead, the task force wanted these case studies to reflect realistic situations that are encountered in practice. However, by design, these case studies do not present all the facts at issue (for example, for simplicity purposes, some of these case studies disregard transaction costs). None of the case studies provide a complete set of charts, tables, or valuation templates that could support the detailed calculation and documentation of fair value. These case studies are not intended to provide "how to" guidance with respect to calculating fair value for each industry, type of instrument or fact pattern presented. The purpose of these case studies is to highlight examples of the exercise

of informed judgment and to help users of the guide understand the factors that market participants may consider in making valuation estimates.

- **C.00.04** As discussed in FASB ASC 820-10-35-24, "[a] reporting entity shall use valuation techniques that are appropriate in the circumstances and for which sufficient data are available." Therefore, a fund may utilize multiple valuation approaches to estimate fair value to the extent applicable. For simplicity, each case study focuses only on one or two valuation methods. For example, when estimating the total enterprise value as an input to valuing an interest in a business, a fund may consider an income approach (discounted cash flow method), guideline public company method, guideline company transactions method, or other methods. In a given case study, only one method may be presented when a single method sufficiently illustrates the concepts shown.
- **C.00.05** It has been said by some that valuation is more art than science. In fact, it is both art and science. The mix of how much is art, or judgment, and how much is science, or calculations, depends on the specific facts and circumstances and the perspectives of market participants. The science of valuation involves assessing observable and unobservable factors (or inputs) which may significantly affect value, identifying the extent to which these inputs are similar to the subject of the valuation, and calculating a value based on these inputs. The art of valuation is the exercise of judgment in evaluating how market participants would evaluate potentially conflicting factors or assessing the impact of new information as the situation evolves over time. In applying judgment, it is important to recognize that there may be a range of reasonable valuation determinations. It is also necessary to reevaluate changes in facts and circumstances and market participant assumptions at each measurement date. For this reason, this appendix examines case studies over a period of time, as opposed to merely at a single point in time.
- **C.00.06** The case studies are meant to show from the perspective of the reporting entity how it would evaluate information when exercising valuation judgment, even if the information available is incomplete, inconclusive or not fully reliable. The goal is to provide examples of the information that is taken into account when making judgments regarding how market participants would estimate value in a hypothetical transaction at the measurement date.
- **C.00.07** Presenting the way in which each case study evolved over time also permits an assessment with hindsight as to what actually transpired in various circumstances and shows how actual events can deviate significantly from what was known or knowable at earlier dates. These differences do not invalidate the judgments made at earlier measurement dates. External and company specific factors change and evolve over the life of an investment. Markets can change rapidly and companies can change and adapt to those changes. Over the life of an investment, an investee company may revamp its entire business plan, change its product strategies, and sometimes turn what had seemed like a sure thing into a complete disaster (and vice versa). A company may be developing a product for a market that does not exist yet, or it can be selling a product in an established market that is about to become obsolete but where market participants have not yet recognized that fact.

- **C.00.08** These case studies are by no means an exhaustive look at the situations that practitioners might encounter in the course of making valuation judgments. Nor do the approaches presented in the case studies necessarily represent the only possible means by which to evaluate the circumstances in each illustration. In each case study, the task force believes that the reporting entity exercised reasonable judgment in coming to the valuation conclusions that each case study illustrates. However, as indicated previously, different market participants could interpret the same information differently, which in turn could result in different valuation conclusions.
- **C.00.09** The presentations of the case studies are not intended to suggest that the information provided in the case study would, on its own, represent adequate documentation of the judgments and calculations made in each circumstance. These case studies are intended to illustrate the thought process described in the preceding chapters as opposed to laying out documentation requirements. Facts and circumstances in each specific situation should be considered when determining the extent of documentation needed. The task force believes that the extent of documentation should be commensurate with the level of judgment involved in estimating the fair value.
- C.00.10 This appendix includes the following case studies:
  - 1. Equity Investment in a Leveraged Buyout (LBO)
  - 2. Late Stage "Carve-Out" Investment When Third-Party Debt Financing Was Not Readily Available
  - 3. Volatility of Equity Values in Highly Levered Companies
  - 4. Value Accretion in a Real Estate Development Project
  - 5. Oil & Gas Exploration Investment where Values Change Based on Results from the Company's Drilling Program
  - 6. Impact on Value of Senior Equity Interests when Junior Equity Interests have Control
  - 7. Reliability of Financial Information for an Emerging Market Investment
  - 8. Evaluating Opportunities for a Strategic Exit "Last Man Standing"
  - 9. Biotech Investment with a Complex Capital Structure Multiple Investors' Perspectives
  - 10. Early Stage Software as a Service Startup with Binary Expected Outcomes
  - 11. Clean-tech Startup with Significant Exposure to Regulatory Factors
  - 12. High Value Early Stage e Commerce Startup in a High-Risk, High-Opportunity Market
  - 13. Business Development Company with Various Debt Investments
  - 14. Private Investment in Traded Public Company Stock
  - 15. Investment in Related Instruments in an Entity with Publicly-Traded Securities

## Case Study 1 – Equity Investment in a Leveraged Buyout (LBO)

*Note:* This case study is provided to demonstrate concepts discussed in the preceding chapters of this guide and is not intended to establish requirements, best practices or safe harbors. It was developed from a real-world situation, which was complex and involved numerous nuances that needed to be evaluated when estimating the fair value of the investment. However, this case study reflects only the high level approach that the fund would have considered in reaching its valuation conclusions and does not show the calculations or the support for each assumption.

The specific facts and circumstances of each individual situation should be carefully considered when performing an actual valuation, and professional judgment should be exercised in evaluating those facts and weighing various alternatives. This case study summarizes the key considerations that were encountered by the fund manager(s) described in the example. The judgments that were made in this case were specific to those facts, not all of which are highlighted herein. See the preamble for a more detailed description of the purpose of the case studies and factors to consider when reading the case studies.

Case Study 1 – <b>Caedor</b> – Equity investment in a leveraged buyout (LBO) Type of Security – Equity Industry – Aerospace/industrial products	<ul> <li>Primary Concepts Illustrated</li> <li>Various considerations around off-market debt when measuring the fair value of equity (chapter 4, chapter 6)</li> <li>Comparison of the enterprise value approach (discounting enterprise cash flows at the WACC and subtracting the value of debt) to a direct-to-equity valuation approach (discounting equity cash flows at the cost of equity) (chapter 5)</li> </ul>
	<ul> <li>Additional Concepts Illustrated</li> <li>Debt and equity valuation in a simple capital structure (chapter 5)</li> <li>Considerations relating to estimating the WACC considering the company-specific capital structure and corresponding cost of debt vs. the typical industry capital structure and corresponding cost of debt (chapter 7)</li> </ul>

## The primary purpose of this case study is to illustrate the way that changes in the value of debt would be incorporated in estimating the fair value of an equity investment.

Specifically, this example illustrates the considerations around the valuation of equity in a simple capital structure, and in particular the treatment of debt for the purposes of valuing equity, as discussed in detail in chapter 6, "Valuation of Debt Instruments."

In determining its estimate of the fair value of its investment, the fund uses a discounted cash flow (DCF) method to determine the enterprise value. The weighted average cost of capital (WACC) used for purposes of discounting the projected cash flows is determined by looking to both company-specific factors, such as its capital structure, and assessing relative credit profiles in comparison to observed costs of capital for other companies in the industry, with appropriate adjustments. At various measurement dates, the fund also looks to guideline public company multiples in order to corroborate the value it has determined through the DCF method. As there is only one class of equity, the fund then subtracts the value of debt from the enterprise value and uses its pro rata share of the equity value as the fair value of its investment.

Although there is general agreement among valuation practitioners and market participants that the value of debt be subtracted from enterprise value when estimating the fair value of equity in a business, diversity exists around how this value of debt is estimated. Various situations could affect a fund's assessment of the value to ascribe to debt when estimating the value of equity. Ultimately, the example will illustrate that this assessment will depend on how market participants view the degree to which equity holders might benefit when the business holds off-market debt (that is, debt with coupon rates that are lower than prevailing market rates).

The example distinguishes between changes in the fair value of debt resulting from (1) a pure movement in interest rates or spreads (i.e., no deterioration in the credit quality of the company) versus (2) an increase in the overall risk of the underlying obligor (i.e., poor performance of the issuer implying higher execution risk and credit risk), when measuring the fair value of equity of a business.

- In the former, the value of the equity increases because the company is able to take advantage of "cheap financing" (i.e., the coupon payments on the debt are lower than prevailing market rates), providing a benefit that inures directly to the equity holders.
- In the latter, the decrease in the value of the debt resulting from higher credit risk does not necessarily translate to an increase in the value of equity. In fact, because of the higher risk in the business, the value of the assets of the business and/or enterprise value diminishes by a greater amount than the amount of impairment on the debt.

Finally, the example illustrates that when the debtholders have the ability to negotiate a higher payoff amount when the equity holders decide to sell the business (for example, if the debt has a pre-payment penalty), the equity holders usually would not be able to reap the full

benefits of the off-market nature of the debt, and the value of the debt for the purposes of valuing the equity would typically be higher than the theoretical exit price (or fair value) of the debt on a standalone basis.

For simplicity, this example ignores the impact of transaction costs relative to the purchase and the sale transactions.

#### **Company Background**

- C.01.01 Caedor Holdings (Caedor or the company) is a leading global designer, producer and supplier of highly-engineered aircraft components for use on nearly all commercial and military aircraft in service today. The company was formed in 2X00. Over the next ten years, the company made seven other tuck-in and bolt-on acquisitions. The company went public in 2X13. For the last twelve months (LTM) ended September 30, 2X16, Caedor generated LTM revenue of \$375.2 million and EBITDA of \$95.6 million.
- **C.01.02** Caedor's customers include worldwide national and regional commercial airlines, aerospace component distributors, large commercial transport and regional and business aircraft original equipment manufacturers (OEMs), military and government entities, defense OEMs, system suppliers, and various other industrial customers. Approximately 70 percent of Caedor's revenues were derived from the global commercial aerospace industry and the rest of the revenues were derived from the military-related aerospace market.

#### **The Transaction**

**C.01.03** In October 2X16, RLA Opportunities Fund (the fund) led the leveraged buyout of Caedor for a purchase price of \$500 million, representing a purchase multiple of 5.15x pro forma LTM EBITDA of \$97.2 million. The purchase of Caedor was financed by a \$300 million issuance of 7.25 percent senior unsecured notes (maturing in December 31, 2X23) and \$200 million of common equity from Ajax Acquisition Corp. (Ajax), a newly formed acquisition vehicle of the fund. The debt included a change of control provision with a 10% prepayment penalty in year one, 5% in year two, 3% in year three, 2% in year 4, 1% in year five, and 0% thereafter. The \$200 million of Ajax equity consisted of \$120 million from the fund (60 percent), \$60 million from selected fund limited partners (30 percent) and \$20 million (10 percent) from senior management. All equity investors paid the same pro-rata price at the initial investment date. RLA noted a number of key factors in evaluating its initial investment decision:

#### **Investment Thesis and Exit Strategy**

- Highly attractive and resilient business model
- Outstanding management team with a track record of optimizing costs and delivering strong performance in a leveraged environment

- High free cash flow generation driven by high margins and low capital requirements
- Exit through a public market offering following additional acquisitions financed by the company's cash flow generation

#### Key Risks

- Given the diversity of Caedor's product offering, there was no clear strategic buyer for the business
- Overall uncertainty around market recovery and impact on the aerospace industry

#### Valuation at December 31, 2X16 and Calibration

- **C.01.04** Given the short timeframe that passed between the initial transaction date (i.e., October 23, 2X16) and the first measurement date (i.e., December 31, 2X16) and the fact that there were no significant events for the company and the market over this timeframe, the fund estimated the fair value of the equity of Caedor as of December 31, 2X16 at \$200 million. In addition, the fund assumed that the fair value of the senior unsecured notes would be approximately equal to par value due to the limited time that had elapsed between the transaction date and the measurement date, and since the credit market was generally stable between those dates. The fund valued its investment as its pro-rata interest in the equity.
- **C.01.05** To assess the reasonableness of the mark at December 31, 2X16, the fund performed a benchmarking analysis of the implied multiple from the concluded mark to historical and forecast EBITDA multiples in the industry. The fund estimated an implied LTM EBITDA multiple, 2X17 forecast EBITDA multiple and 2X18 forecast EBITDA multiple of 5.15x, 5.05x and 4.95x, respectively. The fund estimated EBITDA multiples based on the guideline public company method (discussed in chapter 5) and noted that the range of multiples observed for guideline public companies and the fund's experience with similar deals in the same industry generally corroborated the multiples implied by the fair value estimate as of December 31, 2X16.
- **C.01.06** Additionally, the fund prepared a discounted cash flow (DCF) analysis calibrated to the \$500 million enterprise value estimate, considering the following cash flow assumptions:<sup>1</sup>

Selected assumptions	2X17	2X18	2X19	2x20	2X21
Revenue growth rate	2%	2%	2%	2%	2%
Gross margin	40%	40%	40%	40%	40%
EBITDA margin	25%	25%	25%	25%	25%

C.01.07 Based on these cash flow estimates, the fund calculated an implied discount rate (or WACC) of approximately 13 percent. Assuming a 7.25 percent cost of debt—

<sup>&</sup>lt;sup>1</sup> The numbers in this table have been simplified for illustration purposes. The task force acknowledges that in typical LBOs, these growth and margin estimates would not be constant over time.

consistent with the rate at which the senior unsecured notes were issued as part of the transaction—the 12.8 percent WACC implied a cost of equity of 25 percent, which the fund's management deemed supportable given the high leverage in the business. Management compared these assumptions (see following table) relative to what they considered to be the third-party cost of equity and cost of debt, given the typical capital structure of companies in the industry, and concluded that the implied WACC was supportable.

Discount rate assumptions	Actual capital structure	Typical industry capital structure
Cost of equity	25.0%	20.0%
Cost of debt (pre-tax)	7.25%	5.0%
After-tax cost of debt	4.6%	3.6%
Equity (%)	40.0%	60.0%
Debt (%)	60.0%	40.0%
WACC (rounded)	13.0%	13.0%

#### Valuation at December 31, 2X17

- **C.01.08** The company's performance in 2X17 was generally in line with the fund's expectations. Although there still remained some uncertainty in the market due to the significant volatility in oil prices, the company's performance tracked to budget very closely. Despite some softness in demand for both domestic and international travel caused by economic and political unrest in certain countries, the company achieved 2 percent growth in revenues compared to the prior year which was consistent with its assumptions.
- **C.01.09** Furthermore, despite some slight overruns due to higher-than-expected maintenance costs, Caedor's EBITDA margins also closely tracked management's expectations. Although there was some variability in EBITDA margins throughout the year resulting from: (1) dilution from acquired businesses with lower-than-average margins, and; (2) shifts in product mix between higher-margin aftermarket and lower-margin OEM products, the overall margins for the business at the end of 2X17 quickly approached the company average, allowing management to preserve a 25% EBITDA margin during the year.
- **C.01.10** As part of its valuation procedures at year end, the fund updated its DCF analysis. In updating its DCF analysis, the fund continued to forecast a 2 percent revenue growth and a 25 percent EBITDA margin throughout the five-year discrete period ending in 2X22. Yet, although most of the current assumptions in the DCF remained the same as in the prior year, the fund updated certain inputs to reflect current market data as of December 31, 2X17. In particular, the fund considered the higher interest rate environment in the third and fourth quarters of 2X17 in estimating the cost of equity as well as the cost of debt. Because of the higher yield on 20-year US Treasury notes, the fund adjusted its cost of equity assumption upward by 100 basis points from 25 percent to 26 percent. Furthermore, the fund also increased its cost of debt assumption by 25 basis points from 7.25 percent to 7.50 percent to reflect the market yield on instruments similar to the note they issued a year ago. The effect of these two changes

increased Caedor's WACC by 50 basis points from 12.8 percent to 13.3 percent, as illustrated in the discount rate analysis performed by the fund in the following.

Discount rate assumptions	Actual capital structure	Typical industry capital structure
Cost of equity	26.0%	20.0%
Cost of debt (pre-tax)	7.50%	5.20%
After-tax cost of debt	4.84%	3.38%
Equity (%)	40.0%	60.0%
Debt (%)	60.0%	40.0%
WACC (rounded)	13.3%	13.4%

- **C.01.11** Based on these considerations, the fund estimated an enterprise value of \$497.1 million as of December 31, 2X17, representing a nominal decrease of .59 percent from the original transaction price. The fund noted that the modest decrease was not unexpected given the higher interest rate rates.
- **C.01.12** The fund benchmarked the results of its DCF analysis using forecast EBITDA multiples of similar companies in the industry and observed a range of multiples from 4.68x to 9.12x, with a median of 6.62x and a first quartile of 5.23x. The fund noted that the estimated enterprise value of \$497.1 million implied a multiple of 4.92x of 2X18 EBITDA, between the low end and the first quartile of the observed trading multiples. Compared to the calibrated multiple (relative to the first forecast year EBITDA) on the investment date of 5.05x and given the inherent risks that remained in the business, the fund concluded that the estimated enterprise value derived from the DCF analysis was supportable.
- **C.01.13** To arrive at the fair value of equity, the fund estimated the value of debt for the purpose of valuing equity by considering the fair value of debt based on the coupon and the market yield. Given the increase in interest rates, the fund applied a market yield of 7.50 percent to estimate the fair value for the debt. The resulting fair value of the debt was approximately 98.8 percent of par, or roughly \$296.4 million (compared to a notional amount of \$300 million). The fund noted that the benefit of the lower value of debt (below-market yield) would result in increased value for the equity holders; however, the fund concluded that given that the difference from the face value was small, market participants would value the equity considering the face value of debt rather than the calculated DCF value. (This approach illustrates the process of using market participant assumptions to estimate the value of debt for purposes of valuing equity, as discussed in chapter 6.)
- **C.01.14** The fund noted that the payoff amount for the debt given the change of control provision at December 31, 2X17 was 105% of face, or \$315 million. The fund therefore considered whether market participants would value the equity by subtracting this full payoff amount from the total enterprise value. Because the expected time to liquidity for the company was still three to four years away, and it would not be in an investors' economic best interest to sell the company in a manner that would trigger the change of control provision at this measurement date, the fund

determined that market participants would not expect that they would have to pay the 5% penalty at exit. Furthermore, the fund instead considered the assumed transaction for valuing the investment under FASB ASC 820 to be a transfer of the interest to another market participant who would realize value over the expected time horizon for the investment. (This approach illustrates the process of using market participant assumptions to evaluate the time horizon of the investment in assessing the value of debt with prepayment provisions when valuing an equity interest in the company, as discussed in paragraphs 4.17–.24.)

**C.01.15** The fund subtracted the face amount of the debt from the \$497.1 million enterprise value derived from the DCF analysis to arrive at an estimated fair value for the equity of \$197.0 million. Finally, the fund added the value of the \$51.3 million of excess cash held by the portfolio company as of the measurement date that resulted in a concluded mark for the equity of \$248.4 million as of December 31, 2X17. The fund valued its investment as its pro-rata interest in the equity.

(in \$ millions)	December 31, 2X16	December 31, 2X17
Enterprise value without cash	\$500.0	\$497.1
Value of debt for valuing equity	\$300.0	\$300.0
Add: excess cash		\$51.3
Fair value of equity	\$200.0	\$248.4

#### Valuation at December 31, 2X18

- **C.01.16** Compared to 2X17, 2X18 was an entirely different story as the company struggled to sustain its strong revenue growth performance in the first quarter of 2X18 throughout the rest of the year. The overall uncertainty in the global economy exacerbated by economic stagnation in several Eurozone countries, the prolonged sluggish recovery in the US market brought about by weak economic data and natural calamities, and the continued volatility in oil prices dampened the revenue performance of Caedor during the year. Instead of a 2.0 percent revenue growth from the prior year, the company's revenues declined by approximately 3.3 percent, to \$383.3 million at the end of 2X18, from \$396.4 million at the end of 2X17.
- **C.01.17** In addition, cost overruns at one of the company's largest manufacturing facilities eroded the relatively stable margins that the company achieved in the last three to four years despite the less than ideal economic environment. At the end of the year, the company's EBITDA was only \$76.2 million compared to \$99.1 million in the prior year, representing a substantial 23.1 percent decrease from 2X17.

- **C.01.18** To address both the growth and margin challenges of the business, management developed a rehabilitation plan that would use all of the company's excess cash balances to bolster revenues and improve margins back to historical levels. From a revenue and growth perspective, management's plan centered around refocusing their efforts to target the supply of components for OEMs which catered to business travelers who are less price sensitive and are less affected by economic downturns. While this involved some increased marketing costs, management viewed that over time this change would be a net positive from a cash flow perspective. Moreover, to improve margins, the company decided to cut headcount by 15 percent to 20 percent through the third quarter of 2X20.
- **C.01.19** As a result of these changes, the fund prepared new prospective financial information for the five-year period from 2X19 to 2X23 using the following assumptions:

Selected assumptions	2X18a	2X19e	2X20e	2X21e	2X22e	2X23e
Revenue growth rate						
Original projections	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Revised plan	-3.3%	-2.0%	-2.0%	-1.5%	0.0%	2.0%
EBITDA margin						
Original projections	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Revised plan	19.9%	20.0%	22.5%	25.0%	25.0%	25.0%

- **C.01.20** The fund noted that the revenue and margin improvements from management's new plan would start to take effect after 18 24 months, and that the full benefit from the plan (i.e., return to historical growth and margin levels) would be fully achieved in four to five years. In addition to updating the assumptions in its DCF, the fund increased its cost of equity assumption from 26 percent to 28 percent. Although the risk-free rate had remained stable and betas of guideline public companies had not changed significantly compared to the prior measurement date, the fund considered a 200 bps premium for the additional risk in the business (i.e., an increase of 2 percent in the company-specific risk premium) based on its judgment about the incremental rate of return market participants would require for bearing the increased risk.
- **C.01.21** Furthermore, the fund applied a higher cost of debt in estimating the WACC due to the increased credit risk in the company. The fund applied a cost of debt of 11.0 percent, based on the market yields on comparable bonds. This increase in spreads was directionally consistent with the recent underperformance of the business as well as the significantly higher spreads observed in the market for the comparable bonds. Furthermore, as an additional data point in arriving at an appropriate discount rate, the fund estimated the WACC using typical industry debt-to-equity levels and borrowing rates. The following table summarizes the fund's discount rate assumptions.

Discount rate assumptions	Actual capital structure	Typical industry capital structure
Cost of equity	28.0%	22.0%
Cost of debt (pre-tax)	11.0%	7.1%
After-tax cost of debt	7.3%	4.6%
Equity (%)	40.0%	60.0%
Debt (%)	60.0%	40.0%
WACC (rounded)	15.5%	15.0%

- **C.01.22** Based on these factors, the fund estimated an updated WACC for the company of 15.5 percent compared to 13.3 percent in the prior year. The fund considered the 2.2 percent increase in the discount rate to be reasonable given the increased risks in the business. Moreover, the fund concluded that the selected WACC was reasonably consistent with the typical cost of capital for the industry, and appeared directionally consistent with the downturn in the market.
- **C.01.23** Based on the new prospective financial information and the updated WACC, the fund calculated an enterprise value of \$342.9 million compared to \$497.1 million in the prior year, or a 31.8% decrease. Although the fund expected the enterprise value to decrease significantly from the prior year due to the lower prospective cash flows, higher interest rates and for reasons described previously, the fund decided to further assess the magnitude of the decline in the enterprise value considering guideline public company multiples. The fund analyzed the forecast EBITDA multiples of companies in the industry and observed a range of multiples from 4.12x to 8.45x, with a median of 6.33x and a first quartile of 5.51x. The fund noted that the estimated enterprise value of \$342.9 million implied a forecast multiple of 4.56x, which fell between the low end and the first quartile of the observed trading multiples. Based on this analysis, the fund concluded that the estimated enterprise value derived from the DCF analysis was supportable.
- **C.01.24** As a starting point in estimating the fair value of equity, the fund reassessed the fair value of the debt, consistent with its methodology in the prior year. Due to the fact that the market yield on the debt had significantly increased since 2X18, the fund estimated that the fair value of the debt on a standalone basis would be approximately 85.7 percent of par (or \$257.2 million) based on a discounted cash flow analysis.
- **C.01.25** The fund noted that market participants transacting in the equity would most likely not ascribe value to the full benefit of the off-market debt, since the debt holders would likely negotiate a higher payoff if the fund decided to sell the entire business on the measurement date. Due to such negotiation dynamics, the fund estimated that market participants would pay a lower value than the enterprise value (\$342.9 million) less the fair value of the debt (\$257.2 million, indicating a net equity position of \$85.8 million), or equivalently, that market participants transacting in the equity would require a higher rate of return for the additional illiquidity of their position. As a result of these considerations, the fund estimated that the value of the debt for the purposes of valuing the equity would be higher than 85.7 percent of par or \$257.2 million. The fund estimated that the renegotiations for a theoretical payment of the debt would be settled at 90 percent of par, or \$270.0 million, reflecting

a negotiated outcome between the fair value of the debt and par. The fund concluded on 90 percent of par for the expected settlement amount of the debt based on the observed price for the debt, the fund's past history in negotiating with debt holders in such situations, and a judgmental assessment of the impact of the current market environment on the likely outcome of the negotiations. The fund subtracted \$270 million from the estimated business enterprise value of \$342.9 million which resulted in a fair value of equity of \$73.0 million. The fund noted that this equity value was approximately a 15% discount to the net equity value of \$85.8 million that would have resulted from considering the fair value of debt (using 85.7% of par). The 15% discount was deemed to be reasonable given the illiquidity of the position. (This situation illustrates the many factors that are relevant in assessing the value of debt for the purpose of valuing equity, including adjustments for differing assumptions market participants would make depending upon whether viewing the potential negotiating dynamics from the perspective of the borrower or the lenders in more challenged situations. See paragraphs 4.51 and 6.19-.31.) The fund valued its investment as its pro-rata interest in the equity.

(in \$ millions)	December 31, 2X16	December 31, 2X17	December 31, 2X18
Enterprise value without cash	\$500.0	\$497.1	\$342.9
Value of debt for valuing equity	\$300.0	\$300.0	\$270.0
Add: Excess Cash		\$51.3	
Fair value of equity	\$200.0	\$248.4	\$73.0

**C.01.26** To assess the reasonableness of the \$73.0 million mark for the equity, in particular the adjustment made to the value of the debt, the fund performed a valuation of the equity using a DCF analysis with cash flows to equity and a range of costs of equity, as a sensitivity analysis. Based on this supplementary analysis, the fund estimated a corroborative range of equity values from \$73.8 million to \$93.2 million using a cost of equity range of 28% to 35%. This supplementary analysis provided reasonable support for the concluded mark as of December 31, 2X18.<sup>2</sup> The fund noted that the cost of equity included the impact of the overleverage of the business, which would require market participants to accept the additional illiquidity and risks associated with holding equity in this situation.

 $<sup>^{2}</sup>$  Although the capital structure at inception was 60% debt and 40% equity, at an enterprise value of \$342.9 million, at the end of 2X18, the capital structure at fair value has moved closer to 80% debt. This high level of indebtedness would generally be consistent with a higher risk profile, consistent with a higher required rate of return on equity.

#### **Task Force Observations**

- **C.01.27** When estimating the fair value of an equity interest, common practice is to use an "indirect method" of the income approach or market approach. An indirect method using enterprise-level cash flows, also referred to as a debt-free method, considers cash flows available to all stakeholders (i.e., equity and debt holders). A DCF analysis using unlevered or debt-free cash flows (i.e., cash flows before debt payments) or a market approach using multiples based on pre-interest expense performance metrics such as revenue or EBITDA are the most common indirect methods. As illustrated in this example, under an indirect method, the value of debt is subtracted from the resulting enterprise value to derive the fair value of the equity interest; and in particular, the fair value of debt should generally be considered.
- **C.01.28** This last point is crucial in any fair value measurement of equity in a business. While general agreement may exist that the value of debt should be subtracted from enterprise value when estimating equity, diversity exists about what that amount might specifically be. For example, one can think about subtracting the par value (i.e., principal amount owed), the payoff value (e.g. 102 percent of par if there is a 2 percent prepayment penalty), book value (e.g., 97 percent of par, accreting toward par, if there was a 3 percent OID) or fair value. The Task Force believes that while the fair value of debt is always a good starting point when estimating the fair value of equity, the value of debt for the purpose of valuing equity may be different from all of these measures.
- C.01.29 As illustrated in this example, the standalone fair value of debt (i.e., the price at which the debt would transact between market participants entering into a transaction for the debt) may not always be the appropriate amount to subtract from enterprise value. For example, in instances where debt holders have the ability to negotiate a higher payoff when the entire business is sold—such as might be the case when the debt has a significant prepayment penalty-the full benefit of the off-market debt (when compared to current market rates) may not inure entirely to the equity holders. Said another way, the value of the debt that market participants would consider for the purposes of valuing equity could be higher than the theoretical standalone exit price, or fair value, of the debt. When using the indirect method, we believe the facts and circumstances surrounding the unit of account and the impact of any change in control provisions given the time horizon of the investment and the corresponding required rate of return will dictate whether subtracting the fair value, face value, payoff value or other value for the debt is appropriate. For further discussion about these concepts, please refer to paragraphs 6.19–.31.
- **C.01.30** In contrast, the question of what debt amount to subtract becomes moot or less relevant when a "direct method" using cash flows to equity, also referred to as a levered method, is employed. Under such a method, interest expense, debt repayments and the change in the amount of debt are explicitly incorporated in the cash flows, thereby resulting in a direct indication of the equity value, and thus requiring no further adjustment. Although this method is not as commonly used in practice, the direct method reflects the conceptual basis for the measurement,

considering the cash flows to equity and market participants' required rate of return. Therefore, this method can be used to provide conceptual support or corroboration for the value of debt used for valuing equity under the indirect method.

**C.01.31** Considering market participant assumptions regarding the expected time horizon of the investment when estimating the fair value of an equity investment, and using this time horizon when estimating the value of debt for the purpose of valuing equity, are important concepts for valuing venture capital and private equity investments. Please see chapter 4 and chapter 6 for further discussion.

# Case Study 2 – Late Stage "Carve-Out" Investment When Third-Party Debt Financing Was Not Readily Available

*Note:* This case study is provided to demonstrate concepts discussed in the preceding chapters of this guide and is not intended to establish requirements, best practices or safe harbors. It was developed from a real-world situation, which was complex and involved numerous nuances that needed to be evaluated when estimating the fair value of the investment. However, this case study reflects only the high level approach that the fund would have considered in reaching its valuation conclusions and does not show the calculations or the support for each assumption.

The specific facts and circumstances of each individual situation should be carefully considered when performing an actual valuation, and professional judgment should be exercised in evaluating those facts and weighing various alternatives. This case study summarizes the key considerations that were encountered by the fund manager(s) described in the example. The judgments that were made in this case were specific to those facts, not all of which are highlighted herein. See the preamble for a more detailed description of the purpose of the case studies and factors to consider when reading the case studies.

Case Study 2 – Nala Ricky	Primary Concepts Illustrated
Industries – Debt/equity in	• Initial calibration to purchase price in an auction
leveraged buyout (LBO) in a	with an aggressive timetable, in a carve-out
market when third-party debt	transaction driven by regulatory requirement
was not readily available	(chapter 10)
Type of Security – Common	• Consideration of whether a "day one" gain was applicable when the fund was not the highest bidder
stock and debt	in the auction (chapter 10)
Industry – Manufacturing	• Rapid increase in value as risks are resolved
HVAC	(chapter 5, chapter 11)
	Additional Concepts Illustrated
	• Market approach for an LBO (chapter 5)
	• Impact of pro forma adjustments to normalized
	EBITDA and LTM EBITDA (chapter 5)
	• Valuation considering combined interest of equity
	and debt held by the fund (together) when the
	initial investment was in both debt and equity
	(since third-party debt was not readily available)
	(chapter 4)
	• The impact of a leveraged recapitalization.

The primary purpose of this case study is to illustrate the fund's considerations regarding whether the transaction price represented fair value at initial recognition and the fund's subsequent valuations of its investment at rapidly increasing values due to resolution of risk, improving performance and improving market conditions.

Specifically, the following example illustrates a rapid increase in the value of an investment driven by the fund's ability to complete a transaction without third-party debt in adverse market conditions, accompanied by recovering economic conditions and strong company performance. A table at the end of the example shows the LTM and normalized EBITDA at the initial transaction date and at relevant illustrated measurement dates thereafter to show the progression of the results throughout the investment period.

Although the fund believed that the initial purchase price was attractive, since the seller was under a regulatory obligation to dispose of the business in an adverse market, the fund did not take a day one gain because the acquisition was completed in an orderly transaction, through an auction process. The fund was not the highest bidder in the auction, but offered the seller the certainty that was required to complete the transaction. Therefore, the fund calibrated the valuation model to the initial transaction price. The fund then wrote up the investment as EBITDA improved and guideline public company multiples improved, completing a recapitalization into third party debt when the markets allowed. Ultimately, the company was sold in a private transaction which took place at a valuation that implied a multiple considerably higher than the nearest guideline public company.

For simplicity, this example ignores the impact of transaction costs relative to the purchase and the sale transactions.

#### Initial Transaction and Calibration on March 31, 2X09

- **C.02.01** Rose, Grace and Michael Capital (RGM) purchased common stock for \$54.9 million and shareholder debt for \$117.6 million in Nala Ricky Industries (Nala Ricky or the company) on March 15, 2X09. The shareholder debt was structured in three tranches with an average interest rate of approximately 12 percent and the option to pay interest in cash or in-kind. RGM's equity investment represented a primary and fully diluted common equity ownership of 92.4 percent and 83.2 percent respectively.
- C.02.02 Nala Ricky was a leading global manufacturer of commercial, industrial and highend residential and commercial heating, ventilation and air conditioning (HVAC) units and related products sold primarily through distributors to real estate developers, hotels, supermarkets, health care facilities and other customers around the world. The company's products were marketed under two global brands, Nala Ricky and Goldendoodle, and five regional non-US brands. Nala Ricky held the #1 global market share in commercial HVAC systems and in FY 2X08 generated 62 percent of revenues in North America, 24 percent of revenues in Europe and 14 percent of revenues in the rest of the world. Nala Ricky recorded revenues and pro forma EBITDA of \$269.7 million and \$33.6 million, respectively, during the latest twelve month (LTM) period ended January 2X09. However, due to the recent

economic downturn, the company had experienced declining revenues. RGM believed that this decline was temporary as customers had been deferring maintenance and replacement of their equipment, which they would be unable to continue doing for an extended period of time.

C.02.03 Other elements of RGM's investment thesis included the following:

- Acquisition of a market-leading business at an attractive valuation
- Well positioned company
- Attractive product dynamics and industry
- Diversified revenue base
- Strong and experienced management team
- Investment with favorable risk-reward profile
- C.02.04 After a holding period of approximately three years, RGM expected the investment to yield an unlevered IRR in the mid to high 20 percent range, assuming it was able to exit the investment at range of 7.0x to 7.5x normalized EBITDA of \$43-\$48 million, which was based on the average industry units for the projected period and Nala Ricky's estimated EBITDA at that level of market activity. RGM calculated its normalized EBITDA based upon improved EBITDA margins from identified cost savings as a standalone business and a recovery in unit volumes to the run rate that it experienced twelve months earlier – before the economic downturn. The identified cost savings were related to a reduction in management and manufacturing overhead, relative to what it was bearing as part of SJS, former parent of Nala Ricky. The expected exit multiple was significantly above the entry multiple due the expectation that the capital markets would have returned to normal and Nala Ricky would return to a stable growth profile with improving unit volumes and better margins. RGM expected to repay and replace the shareholder loans with third-party leverage in the capital structure as soon as practical, though this expectation was not factored into the initial return calculation.

#### C.02.05 RGM's analysis identified the following key risks as of the initial investment date:

- Downturn in industry volumes
- Customer base was a higher percentage of independent companies than chains
- Competitive environment
- Management succession- many of the senior managers were in their 60's and above
- Carve-out process and cost Nala Ricky, previously a division of SJS Enterprises, needed to be self-sufficient in executive supervision and certain administration services
- **C.02.06** Although RGM was not the highest bidder in the auction process, it was able to secure the transaction based upon the certainty it provided to the sellers to close within the relevant timeframe and without a financing contingency. SJS was under a regulatory obligation to sell Nala Ricky under an aggressive timetable and it, therefore, valued the certainty afforded by RGM's terms. Believing in the long term stability of the business and with conviction in its investment thesis, RGM had agreed to finance the
entire purchase through equity and shareholder debt. Due to the severe recession and financial crisis that dried up liquidity in the leveraged loan market, many financial buyers submitted bids that were either heavily conditioned and subject to financing contingencies or were at much lower valuations than would have been available 6 months earlier. These conditions and the uncertain near term outlook also dissuaded strategic buyers from aggressively pursuing the opportunity. As a result of the substantial conditions associated with the competing bids, it is unclear whether those transactions could ever have been completed at the higher headline prices and, therefore, in comparison to the terms provided by RGM, the competitors' bids were merely indicative offers which would necessarily carry less weight. The package of terms RGM provided to the seller were the ones that cleared the market and, therefore, RGM viewed the price it paid as being consistent with the fair market value as of the transaction date.

- C.02.07 RGM realized that the transaction dynamics had allowed it to acquire a solid business at an attractive multiple and believed that the business had the potential to rapidly appreciate in value as the economy recovered. But RGM also recognized the substantial risks of separating the business, reversing the recent revenue declines, and normalizing the company's capital structure. In addition, the discount to the guideline public company multiples reflected the risks inherent in management's ability to successfully execute on the business plan, including establishment of an independent infrastructure and development of a succession plan. Ultimately, the fund believed that the mere fact that the seller was under regulatory pressure to sell the business did not equate to a distressed position for the seller, because it was afforded the time necessary to conduct a full auction process. Notwithstanding the fact that market conditions were challenging due to the recent recession and financial crisis, RGM believed the auction process was orderly and accurately reflected the market conditions at that time. Thus, the fund determined that the transaction price represented fair value at initial recognition (and, therefore, calibrating to the transaction price was required) and did not recognize a "day one" gain. (This analysis illustrates the determination of whether a transaction price represents fair value, as discussed in chapter 10.)
- **C.02.08** For purposes of calibration at RGM's initial investment, the implied enterprise value represented a 5.3x multiple of LTM EBITDA, which represented a discount to the multiple of 6.0x LTM EBITDA of Nala Ricky's most comparable guideline public company and to the multiple at which RGM expected to exit. It was anticipated that as these risks were mitigated, the discount relative to the closest guideline public companies would narrow. (The fund's calculation of the EBITDA multiple paid in the initial transaction and consideration of the observed EBITDA multiples for

guideline public companies at the transaction date illustrates the concept of calibration, as discussed in chapter 10.)

#### Valuation at March 31, 2X09

- **C.02.09** As of March 31, 2X09, the first measurement date following the closing of the transaction, RGM valued its \$172.5 million investment in Nala Ricky's debt and equity interests at a valuation equal to their \$172.5 million cost. Given RGM's conclusion that the transaction price represented fair value, the proximity to the transaction date, and the lack of any significant change in the company's position, the outlook or market conditions, RGM concluded that there was no change in the fair value of its investment.
- **C.02.10** Because the debt and equity interests together entitled RGM to substantially all of the enterprise value and a sale of their position at the measurement date likely would involve a sale of their entire position, RGM determined that it would be in the fund's economic best interest to transact in the debt and equity interests together, and valued the positions in aggregate. RGM allocated \$117.6 million of the value to the debt position and \$54.9 million to the equity position.

- **C.02.11** Seven months into the investment in Nala Ricky, RGM believed the company was well positioned to resume its historical long-term growth rate once the HVAC industry recovered from the deferred equipment replacement in the recent downturn. Further, volume was expected to grow as the global economy recovered and new development accelerated. The company's business plan did not entail any major shifts in strategy, but rather a continuation of incremental growth and profit improvement initiatives already in place. To date, management had done a good job managing costs and cash flow enabling the company to exceed original revenue and earnings forecasts. As volumes began to recover, the company's margins were expected to have stabilized, conditions remained challenging, so management focused on continuing to explore cost reductions and increasing cash generation. These initiatives were expected to remain the company's priority until business conditions improved on a more sustainable basis.
- **C.02.12** The process to establish Nala Ricky as a stand-alone entity remained on schedule. Key functions were in place, and the company generally was performing the transition at or below cost expectations. The last remaining item to complete the separation from SJS was adoption of a new carrier for the company's medical benefits, which was expected to be in place by the start of calendar year 2X10.
- **C.02.13** RGM valued its investment based primarily on the market approach at \$205 million reflecting a write-up of \$32.5 million since the initial investment. The valuation reflected a multiple of approximately 4.4x normalized EBITDA and 5.4x LTM

EBITDA, which represented a discount to the multiple of 6.0x LTM EBITDA of Nala Ricky's most comparable guideline public company and to the multiple at which RGM expected to exit. For purposes of determining its normalized EBITDA, RGM adjusted the LTM EBITDA multiple upward slightly relative to the prior period given the progress in executing on the business plan and establishing Nala Ricky as a standalone company – steps that were expected to help narrow the discount between Nala Ricky and the guideline public companies. (This approach illustrates the application of the guideline public company method under the market approach and consideration of the initial calibrated multiple and subsequent changes in company specific and market conditions, as discussed in chapter 10, and consideration of guideline public companies, as discussed in chapter 5.) RGM allocated \$128.9 million of the \$205 million of combined value to its debt position (based upon the 12% accrued interest to date) and the remaining \$76.1 million to its equity position.

#### Valuation at June 30, 2X10

- C.02.14 Nala Ricky was well positioned to resume its historical long-term growth rate once the HVAC industry recovered from the deferred equipment replacement in the recent downturn. Further, volume was expected to grow as the global economy recovered and new real estate development accelerated. The industry continued to show signs of stabilization and recovering replacement demand, with industry volumes in the US up approximately 7 percent for the fiscal year-to-date period through March 2X10 compared to the same period in 2X09. To date, management had done a good job managing costs and cash flow and enabling the company to exceed original revenue and earnings forecasts. The company had reduced its cost structure by \$8 million on an annualized basis, principally through a reduction in excess capacity through consolidation of manufacturing facilities and improved efficiency in procurement. As a result of the successful transition to a stand-alone company, Nala Ricky had also reduced its corporate overhead and management costs by 50 percent through a leaner management structure relative to the management costs under the larger SJS umbrella. As volumes continued to recover, the company's margins would further benefit from the recent cost-reduction actions. While the market had stabilized, the demand outlook in certain segments and geographies remained below normalized levels. In addition, the recent exchange rate movements would have a negative impact on the company's sales and earnings given the significant size of Nala Ricky's international operations. As a result, management remained focused on cost reductions and continuing to de-risk the business through increasing cash generation.
- C.02.15 On April 30, 2X10, Nala Ricky completed a third-party debt refinancing, putting in place a \$30 million revolver (\$10.4 million drawn at close) and a \$115 million term loan. Proceeds from the refinancing, along with excess cash generated through the company's earnings, were used to repay the debt held by RGM in full, including the interest payable, as well as to return capital in the form of a dividend to RGM and to management shareholders. As a result of the recapitalization, RGM received a total

of \$156.8 million in cash, of which \$131.1 million was related to the debt position and the remainder was related to the dividend. Management shareholders received \$2.1 million, representing their pro rata share of the dividend proceeds. Following closing of the refinancing, cash and long-term debt balances were \$13 million and \$125.4 million, respectively. The resulting leverage was approximately 3.3x LTM EBITDA.

- C.02.16 As of June 30, 2X10, Nala Ricky's LTM EBITDA was approximately \$38.7 million. After adjusting for the \$8 million in run rate savings from the cost structure improvements and the corporate overhead savings following the separation from SJS, the company's normalized LTM EBITDA was estimated to be approximately \$48.3 million.
- C.02.17 RGM valued its investment in the common equity of Nala Ricky at \$130 million as of June 30, 2X10. This valuation was consistent with multiples of approximately 5.6x normalized EBITDA and 7.0x LTM EBITDA, which represented a discount to the multiple of 7.5x LTM EBITDA of Nala Ricky's most comparable guideline public company and to the normalized EBITDA multiple at which RGM expected to exit. RGM noted that given the company's recent performance, Nala Ricky had achieved normalized EBITDA in one year what the fund had originally anticipated might take three years. The company's improved financial performance and successful transition to being a stand-alone company supported the further decrease in the implied discount to the LTM EBITDA multiple of the Nala Ricky's closest guideline public company. (Again, this approach illustrates the application of the guideline public company method under the market approach and consideration of guideline public company multiples adjusted for differences between the subject company and the guideline public companies, as discussed in chapter 5.) At this valuation date, the fund determined that initial calibrated multiple required significant adjustment based on the company's improved operating performance and outlook, as well as increases in the observable guideline public company multiples. (This approach illustrates the concept of updating calibrated inputs, as discussed in chapter 10.)
- **C.02.18** The following table summarizes the change from December 31, 2X09 to June 30, 2X10 based upon RGM's accounting for the recapitalization and the increase in the valuation of its investment (in \$ millions):

RGM Valuation Summary	December 31, 2X09	Valuation Change	Recapitalization	June 30, 2X10
Debt Position	117.6		(117.6)	
Unrealized Appreciation- Debt	8.9	4.6	(13.5)	
Equity Position	54.9			54.9
Unrealized Appreciation - Equity	23.6	77.2	(25.7)	75.1
Total Fair Value	205.0	81.8	(156.8)	130.0
Cost	172.5		(117.6)	54.9
Unrealized Appreciation	32.5	81.8	(39.2)	75.1
Total	205.0	81.8	(156.8)	130.0

#### Valuation at December 31, 2X10

- C.02.19 The HVAC industry saw a recovery in demand in the fiscal year ended September 30, 2X10, with industry volumes up approximately 11 percent in North America. A key driver of this growth was the recovery of deferred HVAC system replacement. Going forward, RGM expected growth rates for Nala Ricky would return to more normalized levels (mid-single digits) and would be driven primarily by the return of real estate development in developed markets as well as the continued adoption of HVAC systems in emerging markets.
- C.02.20 As of December 31, 2X10, Nala Ricky's LTM EBITDA had increased to approximately \$46.9 million and its normalized EBITDA was approximately \$49.0 million. RGM also noted that guideline public company multiples had increased, and adjusted its expected exit multiple for the business accordingly. Given the company's performance and the increases in guideline public company multiples, RGM estimated the value of its position in Nala Ricky based upon an enterprise value consistent with a multiple of 7.7x normalized EBITDA and a multiple of 8.0x LTM EBITDA, which represented a discount to the multiple of 8.5x LTM EBITDA of Nala Ricky's most comparable guideline public company and to the normalized EBITDA multiple at which RGM expected to exit. This valuation resulted in a value of RGM's interest in the common equity of \$217 million reflecting a write-up of \$87 million from the June 2X10 carrying value.

# Valuation at September 30, 2X12

- **C.02.21** The HVAC industry experienced a strong recovery in demand during 2X10 and the first half of 2X11.
- C.02.22 On May 20, 2X11, Nala Ricky increased the amount of its term loan by \$70 million through an amendment to its existing credit facility. Proceeds from the term loan amendment were used to return capital to the fund and management shareholders. Following closing of the term loan amendment, cash and long-term debt balances were \$25 million and \$187 million, respectively, with net leverage of 3.5x LTM EBITDA.
- **C.02.23** During the first quarter of fiscal 2X12, the industry outlook softened due to slowing growth and economic pressures, leading management to focus on continuing to manage its cost structure, particularly in relation to the slower growing markets, and increasing its penetration in faster growing emerging markets. Although the slowing growth signals pointed to some near term challenges for a potential acquirer, RGM engaged an investment bank to test the market for an exit transaction.
- C.02.24 As of September 30, 2X12, without yet having any feedback from the M&A process, RGM estimated the value of Nala Ricky at a 10.0x multiple of LTM EBITDA, which represented a discount to the multiple of 10.25x LTM EBITDA of Nala Ricky's most

comparable guideline public company and to the multiple at which RGM expected to exit, which had again been adjusted upward. The fund estimated that Nala Ricky's multiple was closer to the multiple for the selected competitor than it had been in previous periods, given the company's execution history to date. This valuation resulted in a value of RGM's interest in the common equity of \$320 million.

# Exit Transaction on December 31, 2X12

- C.02.25 On December 12, 2X12, the fund completed the sale of Nala Ricky to JenSarm Industries for \$560 million plus anticipated tax benefits of \$12 million, for total proceeds of \$572 million, representing a multiple of 10.8x LTM EBITDA. JenSarm Industries is a privately held HVAC equipment company headquartered in Boulder, Colorado, with global operations and \$1.8 billion in revenue. The fund received proceeds of \$335 million at closing plus additional escrow and tax refund proceeds of up to \$22 million and \$11 million, respectively.
- C.02.26 Having received the cash consideration of \$335 million on December 31, 2X12, RGM valued the additional potential proceeds from the escrow and the expected tax refund of \$33 million at \$27.5 million as of December 31, 2X12, considering the probability-weighted cash flows expected to be received sometime in the next year. (Please see paragraphs 13.83–.87.)
- C.02.27 After the final proceeds were received on September 30, 2X13, including previously received distributions of \$222 million, the \$335 million exit transaction, and the escrow and tax payments, RGM's total proceeds were \$590 million. These proceeds represented a gain of \$417.5 million, a multiple of investment of 3.4x and an internal rate of return of 61 percent on RGM's original investment of \$172.5 million in March 2X09.

	Transaction Date	Investments	Realized Proceeds
Investment	3/15/2X09	172.5	
Recapitalization #1	4/30/2X10		156.8
Recapitalization #2	5/20/2X11		65.2
Exit	12/31/2X12		335.0
Tax Refund and Escrow	9/30/2X13		33.0
Total		172.5	590.0

**C.02.28** In this case, the investment thesis played out somewhat better than planned. EBITDA grew by more and at a faster pace than expected, the carve-out process was completed smoothly, third party credit became available relatively early into the investment period and the relevant market multiples expanded well beyond what RGM originally anticipated. The following table shows the relevant metrics as they investment progressed.

	LTM EBITDA	''Normalized EBITDA''	EV/LTM EBITDA	EV/ ''Normalized EBITDA''	Enterprise Value	Debt (+ accrued interest)	Total Equity	RGM Equity Value
At Acquisition	33.6	45.0	5.3	3.9	177.0	*117.6	59.4	54.9
December 31 2X09	39.6	48.6	5.4	4.4	213.8	*128.9	85.0	76.1
June 30, 2X10	38.7	48.3	7.0	5.6	270.6	125.4	145.2	130.0
December 31, 2X10	46.9	49.0	8.0	7.7	375.1	125.4	249.7	217.0
September 30, 2X12	52.9	52.9	10.0	10.0	528.5	155.0	373.5	320.0
December 31 2X12	53.0	53.0	10.8	10.8	572.0	180.4	391.6	335.0

\*Debt balances at inception and at December 31, 2X09 were held by RGM.

#### **Task Force Observations**

- C.02.29 The task force considered whether the initial transaction price reflected fair value at initial recognition, or whether it would be appropriate to recognize a day one gain, as discussed in chapter 10. Although the sale that led to RGM's investment was driven by regulatory requirements, which is ordinarily one indication that a transaction might not be fair value at initial recognition, the fund carefully assessed whether the transaction would be considered to be distressed. The transaction was completed in an orderly auction process and also involved significant execution risk relating to putting new systems in place following the carve-out, as well as risks related to the timing of economic recovery and the availability of third party debt. Therefore, based upon the facts and circumstances as described, the task force believes that it was reasonable to consider the initial transaction to reflect fair value. The gains that the fund recognized over time reflected the company's successful execution and the improvements in the overall economy. (The fund's approach to valuation at each date illustrates the application of the guideline public company method under the market approach and consideration of guideline public company multiples adjusted for differences between the subject company the guideline public companies, as discussed in chapter 5, as well as updating calibrated inputs, as discussed in chapter 10.)
- **C.02.30** Also note that although the company completed two leveraged recapitalizations during RGM's ownership, RGM's estimation of the enterprise value at subsequent measurement dates relied upon market based multiples, not on any metrics attributable to the debt financing, because the third party debt the company put in place did not directly value the enterprise or the equity. The most that could be inferred from the recapitalization transactions is that as of April 30, 2X10 lenders believed that the company's enterprise value was a reasonable margin higher than 3.3X LTM EBITDA and that as of May 11, 2X11, the third party lenders believed that the enterprise value was a reasonable margin higher than 3.5X LTM EBITDA.

**C.02.31** Calibration is an important principle for applying FASB ASC 820 in this industry. Please see chapter 10 for further discussion.

# Case Study 3 – Volatility of Equity Values in Highly Levered Companies

*Note:* This case study is provided to demonstrate concepts discussed in the preceding chapters of this guide and is not intended to establish requirements, best practices or safe harbors. It was developed from a real-world situation, which was complex and involved numerous nuances that needed to be evaluated when estimating the fair value of the investment. However, this case study reflects only the high level approach that the fund would have considered in reaching its valuation conclusions and does not show the calculations or the support for each assumption.

The specific facts and circumstances of each individual situation should be carefully considered when performing an actual valuation, and professional judgment should be exercised in evaluating those facts and weighing various alternatives. This case study summarizes the key considerations that were encountered by the fund manager(s) described in the example. The judgments that were made in this case were specific to those facts, not all of which are highlighted herein. See the preamble for a more detailed description of the purpose of the case studies and factors to consider when reading the case studies.

Case Study 3 – <b>Danira Senior Living</b> – highly levered real-estate intensive business Type of Security – Equity interest	<ul> <li>Primary Concepts Illustrated</li> <li>Impact of leverage on equity values (chapter 7)</li> <li>Volatility of fair value of equity for highly leveraged equity positions (chapter 7)</li> <li>Backtesting (chapter 11)</li> </ul>
Industry – Assisted Living	<ul> <li>Additional Concepts Illustrated</li> <li>Challenging economic environment (chapter 5)</li> <li>Changing financial performance (chapter 5)</li> <li>Value of debt for the purpose of valuing equity (chapter 6)</li> <li>Application of pro forma adjustments to LTM net operating income in estimating enterprise value (chapter 5)</li> <li>Financial restructuring and the impact of cross-collateralization on the debt (chapter 5, chapter 6)</li> <li>The importance of considering market participants' specific facts and circumstances in negotiating an exit transaction, and that some of these facts may not be known or knowable as of the measurement date (chapter 3, chapter 5, chapter 11)</li> </ul>

	• Impact of transaction costs on fair value first measurement date after the transacti close (chapter 12)	at the
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# The primary purpose of this case study is to illustrate the sensitivity of the fair value of equity to small changes in enterprise value for highly levered businesses.

Specifically, the following example shows a controlling investment in a capital-intensive rollup. The fund expected that the business would serve as a platform to build a best-in-class assisted living company and had high hopes for the management team. Unfortunately, after investing heavily using a highly leveraged strategy, the company faced challenges in meeting their debt covenants due to a downturn in the overall economy. Ultimately, while on the brink of a covenant default which would have forced the company into bankruptcy, the company identified a buyer. The buyer was unaware of the urgency of the company's situation and perceived that the company had time to negotiate among several competing alternatives and, thus, the company was able to negotiate a price that was sufficient to pay off the debt with a significant return for the equity investors.

The example illustrates the impact of leverage on the fair value of equity. In addition, the example shows that the negotiation dynamics with a single buyer may have a significant impact on the value of equity. Even only a month or two prior to the exit, market participants considering an investment in the company could not have predicted the outcome.

# Initial Transaction and Calibration on June 18, 2X06

- C.03.01 Danira Senior Living (Danira or the company) was founded in March 19X6 by two lead investors and several other individual investors. Danira is the owner and operator of nine assisted living and Alzheimer's facilities in Arizona, New Mexico and Texas, with approximately 1,000 active beds.
- **C.03.02** On June 18, 2X06, Fund A (the fund) completed the acquisition of Danira Senior Living. The fund expected to make future investments in the company to finance additional acquisitions and developments of assisted living properties in the southwest region of the United States. The fund expected that Danira would serve as a platform to build a best-in-class regional assisted living company by capitalizing on i) favorable demographic trends in the company's target markets, and ii) the company's existing pipeline of expansions, acquisitions and developments.
- **C.03.03** At closing, the fund invested \$49.2 million for a 97 percent of the equity ownership of Danira. In addition, the fund incurred \$5.8 million of transaction costs for total cost of \$55 million. The remaining equity was owned by the current management team, led by CEO Amy Lou. Danira was structured in a way that was tax efficient and intended to be attractive to a subsequent buyer, including a real estate investment

trust (REIT), a type of entity which was becoming a more prevalent acquirer of assisted living facilities.

- **C.03.04** In addition to the fund's investment of \$55 million, the remainder of the total invested capital was as follows:
  - \$1.5 million from management's rollover;
  - \$97.7 million mortgage (net of fees) with interest set at one-month LIBOR + 200 basis points, 25-year amortization, 3 years of interest-only, and a repayment requirement upon a change of control; and
  - \$10.4 million assumed debt

C.03.05 The fund expected to maximize its return on the investment through:

- Leveraging an experienced management team that had built a strong regional franchise;
- Investing in high quality properties in good locations with favorable demographics and high barriers to entry;
- Realizing favorable supply and demand characteristics for the industry; and
- Capitalizing on growth opportunities from identified pipeline of expansions of current facilities, acquisitions, and new developments.
- C.03.06 The fund assessed that the key risks included:
  - Purchase price above replacement cost of the facilities
  - Need to augment management team
  - New supply
  - Transaction structure
- **C.03.07** The fund concluded that the transaction price excluding transaction costs, \$ 49.2 million, represented fair value of the investment at closing. The enterprise value of \$158.8 represented a calibrated 7.3 percent capitalization rate on May YTD annualized net operating income of \$11.5 million. An analysis of operating guideline public companies indicated a capitalization rate of 7.5 8.0 percent and capitalization rates of 5.0 5.5 percent for REITs with stabilized properties.

Initial Transaction Summary		<u>June 18, 2X06</u> (Millions)				<u>-</u>
		Cost			Fa	ir Value
Enterprise Value	-	\$	158.80		\$	158.80
Debt		\$	(108.10)		\$	(108.10)
Total		\$	50.70		\$	50.70
Ownership %	-		97%			97%
Equity Interest		\$	49.20			
Transaction Costs		\$	5.80			
Total		\$	55.00		\$	49.20
MOIC	=					0.89

#### Valuation at June 30, 2X06

C.03.08 Given the proximity of the initial transaction at June 18 to the June 30 valuation date, and given that no significant changes were noted in the overall market or Danira's performance, the fund concluded that the fair value of the investment at June 30, 2X06, has not changed from the transaction date and, therefore, determined it to be \$49.2 million or 0.89 multiple on invested capital (MOIC). The decrease in value from cost of \$55 million was due to the exclusion of transaction costs.

(This situation illustrates the impact of transaction costs on fair value at the first measurement date after the transaction close, which is discussed in further detail in chapter 12.)

#### Valuation at March 31, 2X07

- C.03.09 In late March 2X07, Danira closed on eight additional facilities totaling \$225 million representing a 7.0 percent capitalization rate on LTM net operating income of \$15.75 million. Additionally, expansions had started on two of the original nine facilities and Danira was seeking approval for a third. They also had two ground-up development projects underway and several other projects under review. Danira was evaluating several potential property and portfolio acquisitions in its core markets.
- **C.03.10** The nine original properties were valued by applying a 7.0 percent capitalization rate to LTM net operating income of \$12.0 million. A 7.0 percent capitalization rate was used as the market of operating guideline public companies moved from 7.5 8.0 percent to 7.3 7.7 percent and because of the recent transaction for eight additional facilities with an indicated capitalization rate of 7.0 percent. This resulted in an enterprise value of \$171.4 for the original facilities. This valuation used a consistent approach with the approach used at the initial measurement date, but considered the new calibrated capitalization rate of 7.0 percent as well as the change in market capitalization rates observed over the period since the initial transaction.
- **C.03.11** The two projects under development were valued based on their cost of \$85.6 million. The fund noted that it was appropriate to use a cost approach for valuing the projects under development, consistent with market participant assumptions.
- **C.03.12** As indicated in the following table, the total value across all the properties was \$482 million. After factoring in total third party debt of \$318 million (including the debt associated with the new facilities) and the management allocated portion of the total value, the fair value of the fund's interest was estimated to be \$159.15 million.

# Fair Value Build Up:

Fair Value Summary	<u>June 18, 2X06</u>		March 31, 2		
(Amounts in Millions)					
Original Facilities	\$	158.80	\$	171.40	
Eight newly purchased facilities			\$	225.00	
Development projects			\$	85.60	
Total Enterprise Value	\$	158.80	\$	482.00	
Mortgage & Construction Debt @ expected payoff amount	\$	(108.10)	\$	(318.00)	
Total	\$	50.70	\$	164.00	
Ownership %		97%		97%	
Fair Value of Equity Interest	\$	49.20	\$	159.15	

**C.03.13** In order to determine the fair value of equity, the fund subtracted the value of debt for the purpose of valuing equity from the total enterprise value, both of which were determined using market participant assumptions. In this case, the coupon on the debt was slightly below current market rates; however, it was determined that market participants would expect the debt to be repaid upon a change of control and, therefore, would derive limited value, if any, from potential below market interest rates associated with the debt. Therefore, the value of debt used to determine the fair value of equity was its face/payoff amount. The fund concluded that market participants would not attribute much value to the below market debt because the debt was not significantly below market and was issued by a number of individual lenders on a property by property basis and, as such, it would be difficult to negotiate a debt payoff below face value.

(This analysis illustrates how leverage can impact equity values [as discussed in chapter 7] as well as the concepts of valuing debt for the purposes of valuing equity [as discussed in chapter 6].)

- C.03.14 The senior housing market weakened in the first half of 2X08 along with the broader economy, which resulted in a widespread and significant reduction in assisted living occupancy. The shares of publicly traded senior operators declined by 68 percent in 2X08 on an equity market capitalization weighted average basis.
- C.03.15 The operating performance of the nine properties from the fund's initial investment continued to run behind plan through October 2X08. The occupancy rate dropped to 89.4 percent driven by softening macroeconomic environment and increased competition in certain markets. In addition, the eight properties acquired in March

2X08 performed significantly below expectations during the last three quarters of 2X08. This was due, in part, to the softening senior housing market as well as detrimental internal operating factors (for example, failed unionization at two locations, poor budgeting, disruptive impact of renovation work, and below optimal resident payer mix). Finally, the occupancy rates at the two newly completed facilities were also falling behind plan. As a result of the current macroeconomic and operational challenges, Danira postponed future construction and expansions.

- **C.03.16** The company managed 19 properties with a high degree of leverage and challenges with controlling costs. While most third party operators in this sector charged 5-6 percent of revenue to manage a facility, the company's selling, general and administration expenses (SG&A) had accounted for more than 10 percent of revenue since the closing of the initial transaction in June 2X06. The fund noted that market participants would assume that Danira would be able to operate more efficiently and, therefore, used adjusted net operating income considering SG&A at the standard 5–6 percent of revenue in the valuation as of December 31, 2X08.
- **C.03.17** The 2X09 net operating income (approximated by adjusted net operating income) was expected to be \$32.7 million, which included the contribution from development properties that were in lease-up. In light of the macroeconomic uncertainty, the fund adjusted management's prospective financial information by reducing the anticipated cash flows by 10% to account for the risk in achieving projections, resulting in an adjusted net operating income for use in the analysis. The macroeconomic environment for similar operators indicated capitalization rates of 9.0 to 9.5 percent. Previously, the fund had used a capitalization rate slightly lower than the other operators, consistent with the calibrated transaction prices but also considering Danira's actual net operating income rather than adjusted net operating income. Since Danira's operating costs had remained significantly higher than other similar companies, and the fund chose to use adjusted net operating income at this measurement date to reflect market participant assumptions, the fund also considered it appropriate to use a slightly higher capitalization rate.
- **C.03.18** Applying a 9.5 percent capitalization rate to the adjusted 2X09 net operating income, discounting the projected value of the development properties in 2X11 at an 11 percent discount rate and assuming that underperforming assets would be sold at 50 percent of cost, the fund derived a total enterprise value of \$345 million. Debt had increased to \$348 million. Therefore, at an enterprise value of \$345 million, the fund would not receive any proceeds after paying off debt and transaction related costs.
- **C.03.19** Enterprise value calculated using a capitalization rate of 9%, rather than 9.5%, would result in a fair value of equity of \$15.46 million, therefore providing some value to the equity holders. The fund believed that this lower capitalization rate could be obtained from market participants if the real estate was sold separately from the operating company. Previously, only market participants willing to purchase the entire operating business including real estate had been considered, consistent with the assumption that value would be maximized as a combined entity. Given Danira's

inability to reduce its ongoing higher than anticipated operating costs combined with the deteriorating macroeconomic conditions, the fund assessed that the optimal exit strategy had changed. Based on consideration of market participants who would be willing to purchase real estate separately from the operating company, the fund calculated total enterprise value to be \$363.46 million and valued its equity interest at \$15 million (as summarized in the table in paragraph C.03.25).

- **C.03.20** The fund also considered whether it might be able to negotiate a payoff for the debt lower than the face amount of \$348 million, but noted that:
  - the vast majority of the company's debt was mortgage debt secured by the properties
  - the loans were cross-collateralized so that a default on any one of the loans would allow the lenders to make claims on all of the properties, and
  - the lenders included several different parties whose interests were not aligned, making it nearly impossible to start productive restructuring discussions.

Therefore, the fund deemed that market participants would not consider incremental value to equity resulting from a lower value of debt.

(This measurement date illustrates the application of pro forma adjustments to historical results in estimating enterprise value, as discussed in chapter 5. This measurement date also illustrates how a challenging economic environment and changing financial performance can, individually and collectively, have a broad impact on the inputs and assumptions used in determining fair value, as discussed in chapter 5.)

#### Valuation at December 31, 2X09

The company again performed significantly below expectations in 2X09 and still had C.03.21 a high degree of leverage, as well as challenges with controlling costs. A new CFO was hired to better manage costs and allow the rest of senior management to focus on operations. The fund was concerned with the risk of the highly leveraged capital structure, macroeconomic environment and upcoming lender discussions on loans that were not in compliance with covenants. The fund's concerns were focused primarily on the fact that because of cross collateralization related to individual facility loans, a covenant breach at one facility had the potential to destabilize the entire capital structure of the company. Had the debt not been cross-collateralized, so that the liability for property-level debt had recourse only to the specific properties financed by that debt, a few of the properties would have fallen into default, but other properties would have remained solvent. Given the actual structure of the debt, the company could not withstand a drop in occupancy rates. As a result, the company proactively engaged bankruptcy counsel and began discussions with lenders about a possible restructuring. A restructuring was expected to retain some value to equity holders because the lenders would need experienced management to navigate the regulatory environment and the operations of assisted living facilities.

C.03.22 Based on management's budget, 2X10 adjusted net operating income was expected to be \$30.1 million. Capitalization rates obtained from providers of market intelligence ranged from 8 to 9 percent. In its valuation, the fund applied a 9 percent capitalization rate to the adjusted net operating income of \$30.1 million and discounted the projected value of the development properties in 2X11 using a 14 percent discount rate. This resulted in a fair value of the total enterprise of \$378.88 million (increased slightly over the previous period due to improvements in the cash flows and progress toward completion on the development properties). The outstanding debt at December 31, 2X09 totaled \$349 million. The fund's fair value estimate for the total equity was \$29.88 million (calculated as the total enterprise value of \$378.88 million less \$349 million in debt; see the table in paragraph C.03.25). The same methodology with a capitalization rate of 8.5 percent on stabilized cash flow would increase the total estimated equity value to \$49.55 million. Given the ongoing performance struggles, the fund concluded on a \$29 million value for its investment, near the lower end of the range.

(This analysis illustrates some of the considerations the fund used when evaluating the need for financial restructuring and the potential impact of cross-collateralization on the debt, as discussed in chapters 5 and 6.)

#### Exit Transaction on December 31, 2X10

- **C.03.23** Starting early in 2X10, the fund began to receive inquiries regarding plans for the sale of Danira from potential buyers. Due to historically low interest rates, increasing valuation multiples within the REIT sector, and greater institutional appetite for senior housing assets, in the third quarter, the fund decided to meet with several of the most qualified potential acquirers of the business on a confidential basis. In mid-October, the fund entered into exclusive negotiations with Healthcare Investors, a large publicly traded REIT specializing in the ownership, financing, development, and management of healthcare real estate. Healthcare Investors was the only potential buyer that submitted a credible bid that was sufficient to pay off the outstanding debt in a reasonable timeframe, making the success of these negotiations critical for Danira. Healthcare Investors had just raised \$1.5 billion of new capital, and had a mandate to quickly deploy that capital in the assisted living sector. Furthermore, this transaction was a good fit both in scale and geography, assisting with its strategy to expand into the southwest.
- **C.03.24** On November 3, 2X10, the fund and certain of its affiliates executed definitive agreements to sell Danira for a total price of \$600 million in cash (not including adjustments and expenses). The transaction price of \$600 million implied a multiple of 20x estimated 2X10 net operating income of \$30 million (5 percent capitalization rate), a multiple of 17x estimated 2X11 net operating income of \$35 million (5.8 percent capitalization rate). Market capitalization rates were in the 7.0 to 7.5 percent range, a significant improvement from the 8.0 to 9.0 percent observed at the end of 2X09, but still much higher than the implied rate in the proposed transaction.

**C.03.25** On December 29, 2X10, the transaction closed after the satisfaction of customary closing conditions, including state healthcare regulatory approvals. The transaction price of \$600 million, less transaction costs of \$10.49 million, and outstanding debt at its payoff amount of \$380 million (including accrued interest for 2X10) provided the fund with total net proceeds of \$203 million which translated into a multiple of investment of 1.9x and an internal rate of return of 20.1% over a weighted average holding period of 3.5 years.

Fair Value Summary by period	Jun	e 18, 2X06	Mare	<u>ch 31, 2X07</u>	Dec 31, 2X08	D	ec 31, 2X09	De	.c 31, 2X10
(Amounts in Millions)									exit
Total Enterprise Value	\$	158.80	\$	482.00	\$ 363.46	\$	378.88	\$	600.00
Mortgage & Construction Debt @ expected payoff amount	\$	(108.10)	\$	(318.00)	\$ (348.00)	\$	(349.00)	\$	(380.00)
Total	\$	50.70	\$	164.00	\$ 15.46	\$	29.88	\$	220.00
Ownership %	_	97%		97%	 97%		97%		97%
Fair Value of Equity Interest	\$	49.20	\$	159.15	\$ 15.00	\$	29.00	\$	213.49
Less exit cash flows								\$	(10.49)
Net Proceeds to the Fund								\$	203.00
Invested Capital	\$	55.00	\$	55.00	\$ 55.00	\$	55.00	\$	55.00
MOIC		0.89		2.89	0.27		0.53		3.69

**C.03.26** From a backtesting perspective, the fund considered whether it was reasonable for the value of the investment to move from \$29 million at December 2X09 to sales proceeds of \$213.49 million in December 2X10. Given the highly leveraged nature of the business and the volatility of the underlying performance, the fair value of the equity interest was expected to vary widely based on market conditions and company performance. In 2X09, based on what was known or knowable at the time, the \$29 million valuation was deemed appropriate. Given the improvement in market conditions combined with identifying a buyer willing to pay for potential upside, the fund concluded that the difference between the 2X09 fair value estimate and the exit value was justifiable.

(This situation illustrates the importance and benefits of backtesting as it relates to evaluating the processes that go into developing a fair value estimate. It also highlights the importance of considering market participants' specific facts and circumstances, and that some of those facts may not be known or knowable as of the measurement date [as discussed in chapters 3, 5, and 11].)

#### **Task Force Observations**

**C.03.27** In a highly leveraged entity, macro-economic factors can lead to large swings in the equity value. With leverage of 8x net operating income, a change in market multiples from 7.9x net operating income to 10x net operating income can make the difference

Exit with net operating income = $100 \text{ m}/\text{L}$ everage 8x	7.9x	8.5x	10x
Exit with let operating mean $= 0.00007$ Leverage ox	(no equity)	(\$50m equity)	(\$200m equity)
Entry with net operating income = $$50m$ at a multiple of:			
8.5x (\$25m invested)	0	2x MOIC	8x MOIC
9.5x (\$75m invested)	0	0.67x MOIC	2.67x MOIC
10x (\$100m invested)	0	0.5x MOIC	2x MOIC

between bankruptcy and a remarkable success. Consider the following returns, assuming 8x net operating income leverage:

- **C.03.28** In this example, to accelerate growth in a strong economy, the company put in place a complex debt structure with cross-collateralization, which then became a threat to the company's solvency in the subsequent economic downturn. At the exit, the success of the investment depended on a single buyer's willingness to pay a price that was sufficient to cover the outstanding debt. These factors led to significant changes in the fair value of the investment at different points in time.
- **C.03.29** In a highly levered business, the fair value of equity will be highly sensitive to small changes in the total enterprise value and, therefore, the actual value realized in an exit transaction may differ significantly from the fund's estimated fair value at the previous measurement date. Understanding and evaluating these differences in order to improve the fund's valuation process is an important practice. Please see chapter 11 for further discussion.

# Case Study 4 – Value Accretion in a Real Estate Development Project

*Note:* This case study is provided to demonstrate concepts discussed in the preceding chapters of this guide and is not intended to establish requirements, best practices or safe harbors. It was developed from a real-world situation, which was complex and involved numerous nuances that needed to be evaluated when estimating the fair value of the investment. However, this case study reflects only the high level approach that the fund would have considered in reaching its valuation conclusions and does not show the calculations or the support for each assumption.

The specific facts and circumstances of each individual situation should be carefully considered when performing an actual valuation, and professional judgment should be exercised in evaluating those facts and weighing various alternatives. This case study summarizes the key considerations that were encountered by the fund manager(s) described in the example. The judgments that were made in this case were specific to those facts, not all of which are highlighted herein. See the preamble for a more detailed description of the purpose of the case studies and factors to consider when reading the case studies.

Case Study 4 – Real Estate	Primary Concepts Illustrated
<b>Developers LLP</b> – real	• Value accretion and other adjustments for in-progress
estate development	development projects (chapter 5)
company	• Market participant assumptions considered in
Type of Security – Fauity	evaluating real estate projects (chapter 3)
Interest	Additional Concepts Illustrated
Interest	• Value of debt for the purpose of valuing equity
Industry – Real Estate	(chapter 6)
Development	• Subsequent events (from government agency actions)
-	and backtesting in connection with liquidity events
	after the measurement date (chapter 11)
	• Transaction costs (chapter 12)

# The primary purpose of this case study is to illustrate the need to assess market participant assumptions in estimating the value in development stage projects.

Specifically, the following example shows an investment in a real estate development project, from the initial project conception through the sale of the property after the initial lease-up period (that is, upon reaching stabilization).

The example illustrates the way that value changes given ongoing expenditures when a project is only partially completed and discusses the factors that market participants would consider in valuing these investments. In addition, the example highlights the way that value can change due to external factors outside management's control, such as zoning

approvals or changes in zoning requirements. Finally, the example shows the impact of transaction costs on the realized value at exit.

# Initial Transaction and Calibration on June 5, 2X07

- C.04.01 Real Estate Developers LLP (RED) is a \$500 million alternative investment fund focused on investing in developmental real estate projects. RED is part of a family of funds managed by Great Big Manager (GBM). GBM manages funds with strategies including developmental real estate, early stage venture capital, leveraged buyout, etc. All GBM funds are considered investment companies and accounted for under FASB ASC 946, *Financial Services Investment Companies*.
- C.04.02 RED's investments consist of equity interests in various real estate development projects. RED generally invests during the concept phase and seeks to exit at attractive *capitalization rates* when construction is complete and either the entire project can be sold, or leasing has stabilized.
- C.04.03 During early 2X07, RED identified a parcel of land available for purchase near an emerging technology corridor. The land was zoned for agricultural use, but RED anticipated that given the growth in the nearby technology corridor, they would be able to work with the local county planning board to obtain permission for a mixed use development. RED purchased the land for \$4.5 million dollars and incurred transaction costs (brokers and attorney's fees) of \$500,000 on June 5, 2X07.
- C.04.04 RED's plan for developing the mixed use property anticipated a total cost of approximately \$82.6 million of which \$45 million will be funded by a construction loan and the remaining \$37.6 representing the equity interest from RED. RED expected a 20% IRR on the project net of construction costs, cost of carry<sup>1</sup>, and transaction costs. To reach the 20% target, RED would need to sell the project for approximately \$105 million within two years.
- C.04.05 As of June 30, 2X07 RED valued the investment in the project's equity at \$4.5 million under the assumption that a market participant would pay the same amount that RED paid in its recent transaction, excluding transaction costs. This price was consistent with the per-acre price for other agricultural land in the area. Planning board permission was not assured, though RED estimated that market participants would assess the probability of obtaining zoning approval at greater than 60%. RED noted that although the property would be more valuable if zoned for mixed-use, the price per-acre of agricultural land in the area already included the value of the opportunity to apply for such zoning; therefore, it was not necessary to explicitly incorporate the probability of obtaining the zoning approvals into the analysis.

<sup>&</sup>lt;sup>1</sup> Financing costs and return on equity calculated as a percentage of costs incurred. See paragraph 5.107 for discussion.

Initial Transaction Summary		<u>June 5, 2X07</u>					
		(Millions)					
	(	Cost F		Value			
Land	\$	4.50	\$	4.50			
Other Costs	\$	0.50					
Total	\$	5.00	\$	4.50			

#### Valuation at September 30, 2X07

- C.04.06 During the third quarter of 2X07, RED negotiated with the local county and obtained provisional zoning approval (subject to an October county commission meeting) for a mixed use development consisting of retail and office space. At September 30, 2X07, planning commission approval again was not assured. Based on past history with the local county planning board, similar projects had been approved approximately 60% of the time. RED had no control over whether or not approval would be granted.
- **C.04.07** Because zoning approval had not been received at September 30, 2X07, RED valued the investment as an agricultural zoned parcel. A review of similarly zoned agricultural plots of land in the area and discussions with brokers indicated that prices had increased approximately 1.33% since June. Therefore, RED determined the fair value at September 30, 2X07 to be \$4.56 million. RED did not include any premium for the likelihood of receiving planning board permission, noting that its assessment of the probability of approval was unchanged from the purchase date, that the price paid was consistent with the price per acre of other agricultural land in the area, and that market participants buying into the project at this stage of the approval process would face the same risks that RED faced on the initial measurement date. (This fact pattern illustrates some of the factors that market participants would and would not consider in estimating fair value as of a particular measurement date. See chapter 3.)
- C.04.08 Zoning approval was formally granted at the county commission meeting on October 27, three days before RED released its third quarter results to its LPs. Based on a review of transaction prices of properties purchased in the surrounding area over the previous year, RED determined that properties of similar size and location that already had mixed use zoning approval sold at approximately a 20% premium to land parcels zoned for agricultural use, indicating a fair value of \$5.4 million for RED's investment (\$4.56 million times 1.2 = approximately \$5.4 million). RED disclosed this increase in value in the notes to the financial statements as a subsequent event, indicating that the increase was not known or knowable at September 30, 2X07, but instead became effective after the measurement date. (The zoning approval was a subsequent event which the fund considered in accordance with the guidance in FASB ASC 855, *Subsequent Events*. See chapter 11 for further discussion.)

Cost & Fair Value Summary		<u>Sept 30, 2X07</u>			
		(Millions)			
	(	Cost	Fair Val		
Land	\$	4.50	\$	4.56	
Other Costs	\$	0.50			
Total	\$	5.00	\$	4.56	

#### Valuation at December 31, 2X07

**C.04.09** During the 4<sup>th</sup> quarter of 2X07, RED spent \$1.6 million on architectural drawings for the development and submitted the drawings to the county for planning commission approval. At December 31, RED valued the equity at \$7 million (\$5.4 million of land value, given the mixed use zoning approval received in October, plus \$1.6 million for architectural drawings). RED concluded that a potential investor in the project would pay a mixed use price for the land plus would be willing to pay for architectural drawings completed to date.<sup>2</sup>

Cost & Fair Value Summary	<u>Dec 31</u> (Mill	<u>ec 31, 2X07</u> ( <u>Millions)</u>		
	Cost	Fair	Value	
Land	\$ 4.50	\$	5.40	
Architectural drawings	\$ 1.60	\$	1.60	
Other Costs	\$ 0.50			
Total	\$ 6.60	\$	7.00	

#### Valuation at March 31, 2X08

C.04.10 During the first quarter of 2X08, RED completed all pre construction design work (incremental cost of \$1 million) and obtained permission to commence construction. RED obtained a construction loan facility in the amount of \$45 million (repayable upon construction completion, 12% fixed annual interest rate, interest paid monthly). RED estimated that construction would take one year to complete. At March 31, 2X08, RED valued the equity at \$8 million (\$7 million prior quarter valuation plus additional \$1 million of development costs). RED concluded that \$8 million was the appropriate fair value based on its assumption

<sup>&</sup>lt;sup>2</sup> In observed transactions where land is sold after the design work is completed but before construction has begun, market participants typically do not pay a premium for the pre-construction design work. However, such transactions are rare and often reflect situations where the original developer was not able to obtain financing or otherwise was forced to abandon the project, and therefore the transaction prices incorporate some degree of distress. To estimate fair value in an unforced transaction, RED considered the perspective of a market participant who was investing in the project, assuming that the project would be developed as planned.

that land values (zoned for mixed use development) had not changed significantly over the prior quarter and that an investor in the project would pay for the cost of architectural plans and pre-construction design work at their cost. Although the receipt of the construction loan commitment helped to increase the certainty that the project would be able to proceed according to plan, given that the loan terms were no more favorable than market terms, leasing activities had not yet commenced and some of construction contracts remained to be signed, RED's estimation of the project's value did not yet reflect the receipt of the loan commitment as a value creation milestone and, therefore, did not take into account any future cash flows from the potential success of the project.

Cost & Fair Value Summary		<u>March 31, 2X08</u>			
		(Millions)			
	_	(	Cost	Fair Value	
Land	_	\$	4.50	\$	5.40
Architectural drawings		\$	1.60	\$	1.60
Design		\$	1.00	\$	1.00
Other Costs		\$	0.50		
Total		\$	7.60	\$	8.00

#### Valuation at June 30, 2X08

- **C.04.11** During the 2<sup>nd</sup> quarter, RED commenced construction, and completed all grading, utility, site infrastructure and foundation work for a cost of \$20 million (\$10 million from the construction loan facility and \$10 million from fund equity). On June 28, 2X08, RED received notice from the county that the newly elected county planning board had modified their approval and was now requiring low cost housing to be included in the development alongside the office and retail space. RED had not anticipated this requirement and estimated that incremental architectural costs would be required and that a development with low cost housing would reduce the overall expected return on the project by 10% (due to lower rents from low cost housing than that received from office space alone or from market rate housing units).
- C.04.12 At June 30, 2X08, the cost of RED's total equity investment was \$17.8 million (\$4.5 million land purchase, + \$20 million construction costs, + \$1.6 million of architect costs, + \$1 million of design costs less \$10 million of construction loan financing + \$700,000 of cost of carry and other costs). To determine the fair value of the investment at June 30, 2X08, RED considered the fact that the new county planning board mandate to include affordable housing in all similar projects appeared to have an immediate market impact, decreasing land prices by 5%. Further, had RED been aware of the new requirement it would have been reflected in architectural drawings at no additional cost. However, RED expects \$330,000 in

costs to update drawings to reflect the new requirement and further does not believe that such costs could be recouped from a likely buyer of the property.

C.04.13 Therefore, RED valued its investment at \$17.6 million, estimated as \$5.4 million prior land value minus 5% decrease in market value (resulting in a subtotal of \$5.13 million), plus \$2.6 million in architectural costs and pre-construction design work minus \$330,000 in planning rework expected costs, plus \$20 million in construction costs, plus \$200,000 of cost of carry, minus \$10 million of construction loan.

**NOTE**: Given the short term nature of the construction loan, RED determined for the purpose of valuing its equity investment that the face value of the loan was the most appropriate value to deduct to determine the value of RED's equity, as the face value reflected the perspective that a potential market participant would use in valuing the equity.

Cost & Fair Value Summary	<u>June 30, 2X08</u> (Millions)			
	Cost		Cost Fai	
Land	\$	4.50	\$	5.13
Architectural drawings	\$	1.60	\$	1.60
Design	\$	1.00	\$	1.00
Construction	\$	20.00	\$	20.00
Other Costs	\$	0.50		
Rework (expected)			\$	(0.33)
Cost of Carry	\$	0.20	\$	0.20
Debt	\$	(10.00)	\$	(10.00)
Total	\$	17.80	\$	17.60

- C.04.14 At December 31, 2X08, RED had made significant progress on construction of all retail space (approximately 60% complete and had begun leasing) and was making expected progress with the affordable housing units and the office space of the development. Total construction costs incurred to date were \$50 million (\$30 million debt and \$20 million of equity; \$15 million of total construction costs related to the retail portion of the development). RED noted that there had been no change in the land value since the previous measurement date.
- C.04.15 At December 31, 2X08, the retail space was 20% leased. RED expected stabilization of the retail space to be achieved by June 2X10. Based on expected cash flows from the retail space, discounted at an assumed market participant discount rate of 18%, the fair value of the retail space was deemed to be \$26 million. RED valued the equity investment at \$28.9 million, estimated as the land

value of \$5.13 million plus 60% of \$26 million (to account for the construction being 60% complete), plus the construction cost in process of \$35 million (\$50 million total minus \$15 million for the retail space), minus debt at its expected repayment amount of \$30 million.<sup>3</sup> (This situation illustrates that as facts change and the certain risks and uncertainties in a development project are resolved, the valuation approaches used may need to change to the extent that market participants would evaluate the project or various components of the project differently, based upon the facts as of the measurement date. See chapters 3 and 5.)

Cost & Fair Value Summary	<u>Dec 31, 2X08</u>			
		<u>(Mill</u>	<u>ions)</u>	
		Cost	Fai	r Value
Land	\$	4.50	\$	5.13
Architectural drawings	\$	1.60	\$	1.60
Design	\$	1.00	\$	1.00
Housing/Office Construction	\$	35.00	\$	35.00
Rework & Other Costs (incurred, but not				
contributing to fair value)	\$	0.90		
Cost of Carry	\$	0.57	\$	0.57
Retail Space	\$	15.00	\$	15.60
Debt	\$	(30.00)	\$	(30.00)
Total	\$	28.57	\$	28.90

- C.04.16 At December 31, 2X09, construction had been completed, with total construction costs of \$85 million including \$45 million in debt and \$40 million of equity, \$10 million higher than expectations. The retail space had reached stabilization, while the affordable housing and the office space were in the process of being leased, with 30% and 20% leased, respectively. Further, the construction loan of \$45 million (including accrued interest) was refinanced with a \$45 million, 30 year mortgage on the development (which was transferable to a new owner) at a fixed interest rate of 6%.
- C.04.17 RED determined fair value for the retail space via the direct capitalization method using a 5% overall capitalization rate (since the retail space was stabilized), indicating a value of \$35 million. RED determined fair value for the housing and office spaces using the DCF method, discounting the expected affordable housing cash flows at 12% (expected market participant discount rate for fairly stable cash flows) resulting in a fair value of \$12 million, and estimating the value of the office

<sup>&</sup>lt;sup>3</sup> See chapter 6, "Valuation of Debt Instruments" for a discussion of the value of debt for purposes of determining the value of equity.

space using a discount rate of 17% applied to expected cash flows resulting in a fair value of \$63 million.

**C.04.18** The total value of the project was thus estimated at \$110 million (\$35 + 12 + 63), from which debt of \$45 million was deducted, resulting in a fair value of the fund's equity interest of \$65 million. (This situation illustrates that as facts change and the certain risks and uncertainties in a development project are resolved, the valuation approaches used may need to change to the extent that market participants would evaluate the project or various components of the project differently, based upon the facts as of the measurement date. See chapters 3 and 5.)

Cost & Fair Value Summary	<u>Dec 31, 2X09</u> ( <u>Millions)</u>						
		Cost		Cost		Fair	Value
Land	\$	4.50					
Architectural drawings	\$	1.60					
Design	\$	1.00					
Housing/Office Construction	\$	85.00		\$	110.00		
Rework & Other Costs (incurred, but not							
contributing to fair value)	\$	0.90					
Cost of Carry	\$	0.57					
Debt	\$	(45.00)		\$	(45.00)		
Total	\$	48.57		\$	65.00		
			_				

- **C.04.19** At December 31, 2X10, the affordable housing and the office space had stabilized. Therefore, all three components were valued on a direct capitalization basis, resulting in a total value for the project of \$125 million. RED observed capitalization rates for comparable mixed use properties in the range of 4.5% to 5.25%, and selected a rate of 5%, toward the higher end of the range. RED indicated that the selected capitalization rate reflected the characteristics of the property, which included certain restrictions on rental prices for the affordable housing component, as well as the limited acquisition activity in this locality.
- C.04.20 At December 31, 2X10, the market interest rate for a similar mortgage had increased, resulting in the fair value of the debt being \$42 million. Because the debt was transferable upon a change in control, RED considered that a market participant would ascribe value to the below market mortgage. The value of debt that a market participant would use in determining the value of equity<sup>4</sup> would be in the range of \$42 million (fair value of debt—a 6.75% yield) to \$45 million (redemption value of debt—a 6.04% yield). RED judgmentally determined that negotiations would be

<sup>&</sup>lt;sup>4</sup> See chapter 6, "Valuation of Debt Instruments."

expected to increase the overall value of the equity by \$1 million with respect to the favorable mortgage based on its assessment of the degree to which market participants would value the below-market interest rate considering the strength of the debt covenants, the expected ease of negotiating with the debt holders, and the expected time to liquidity. Therefore, RED estimated the fair value of equity as \$81 million (\$125 million – \$44 million). (This situation illustrates that as facts change and the risks and uncertainties in a development project are resolved, the valuation approaches used may need to change consistent with the approaches that market participants would use. At this measurement date in particular, this would include an assessment of the value of debt for the purpose of valuing equity, where market factors indicate that a long-term financing may have value. See chapters 3 and 5 and the discussions in paragraphs 4.51 and 6.19–.31.)

Cost & Fair Value Summary	<u>Dec 31, 2X10</u> <u>(Millions)</u>				
	_	Cost		Fair	Value
Land	\$	4.50			
Architectural drawings	\$	1.60			
Design	\$	1.00			
Housing/Office Construction	\$	85.00		\$	125.00
Rework & Other Costs (incurred, but					
not contributing to fair value)	\$	0.90			
Cost of Carry	\$	0.57			
Debt	\$	(45.00)		\$	(44.00)
		\$			
Total		48.57		\$	81.00

# Exit Transaction on January 31, 2X11

- **C.04.21** Given that the property had reached stabilization, on January 31, 2X11, RED sold the development to a publicly traded REIT for an equity price of \$95 million, with net proceeds to the fund of \$86 million after paying \$9 million in transaction related costs, including real estate broker fees. RED was able to achieve a price that exceeded its earlier expectations as a result of favorable negotiating dynamics that developed during the bidding process, based upon the buyer's desire for assets that complimented their portfolio in advance of its upcoming equity offering.
- C.04.22 As was standard practice, RED performed a backtesting analysis using the exit price as a basis to enhance its fair value process. RED considered the exit price of \$95 million (the \$86 million net proceeds realized plus the \$9 million transaction costs) compared to the previous fair value estimate of \$81 million.

- C.04.23 While RED felt that it had a good understanding of the overall market, RED realized that the REIT underwrote its purchase using a 4.5% capitalization rate for the project, whereas RED had used a 5% capitalization rate. Further, with respect to the favorable interest rate associated with the projects debt, the REIT attributed a value of \$43 million to the assumed mortgage, giving \$1 million more value to the equity than RED had estimated at the previous measurement date.
- C.04.24 Based on the preceding analysis, RED determined that its prior valuation of the property was reasonable, relative to a total property value at exit of \$138 million and corresponding equity value of \$95 million, at a capitalization rate of 4.5%, compared with its estimate in the previous month of \$125 million and corresponding equity value of \$81 million at a capitalization rate of 5%. The 4.5% capitalization rate was at the low (most optimistic) end of the observed range at December 31, 2X10, representing a successful exit for RED. (This situation illustrates how one evaluates facts that become known through subsequent liquidity events and looks at their valuation processes through the use of backtesting and how the transaction costs necessary to complete a transaction are treated in that analysis. See chapters 11 and 12.)

Cost & Fair Value Summary	<u>Jan 31, 2X11</u> ( <u>Millions)</u>			
	-	- oct	Fair	r Value
		2051	(a	t exit)
Land	\$	4.50		
Architectural drawings	\$	1.60		
Design	\$	1.00		
Housing/Office Construction	\$	85.00	\$	138.00
Rework & Other Costs (incurred, but				
not contributing to fair value)	\$	0.90		
Cost of Carry	\$	0.57		
Debt	\$	(45.00)	\$	(43.00)
Total	\$	48.57	\$	95.00
Gross MOIC				1.97
Net MOIC				1.79

# **Task Force Observations**

C.04.25 Value in a development project is most often driven by the achievement of milestones, rather than accreting smoothly over time or changing as the probability of success changes. (See paragraphs 5.92–.94.) Before the project is substantially complete, market participants typically value the position based on the replacement cost, considering the actual costs incurred to date adjusted for any milestones met (such as zoning approvals) offset by any wasted expenses (such as architectural plans that require significant revisions), and adjusted for market conditions (such as

changes in the regulatory environment or market conditions). If market conditions change adversely, value may decline even as additional costs are incurred.

- **C.04.26** The risks that market participants face include the imposition by the government authority of additional conditions or requirements to expend costs on further analysis for example, requirements to complete environmental impact studies, requirements to build sidewalks and other infrastructure, or limitations on size and design of improvements. The soft costs of working through the pre-construction process can be significant, and market participants generally would not begin accreting incremental value for the project until all approvals are in hand and construction is well underway. Once the project approaches completion and the execution risks of the construction and lease-up begin to reduce uncertainties of the project, market participants typically value projects based on the expected cash flows, moving to a direct capitalization method once the project reaches stabilization. (See chapters 3 and 5.)
- C.04.27 Transaction costs may have a significant impact on net proceeds at exit. Fair value excludes transaction costs. Therefore, if the fund uses a valuation at the high end of the reasonable range when approaching an exit, the net proceeds may well be lower than the fair value estimate at previous measurement dates. (See chapter 12 for a discussion of these factors.)
- C.04.28 Finally, subsequent to an exit or other liquidity event that provides a direct indication of fair value, it is a best practice for a fund to perform a backtesting of its earlier fair value estimate in order to determine whether its valuation process reasonably considers relevant observable inputs as of the measurement date. (See chapter 11 for a discussion of backtesting.)

# Case Study 5 – Oil & Gas Exploration Investment where Values Change Based on Results from the Company's Drilling Program

*Note:* This case study is provided to demonstrate concepts discussed in the preceding chapters of this guide and is not intended to establish requirements, best practices or safe harbors. It was developed from a real-world situation, which was complex and involved numerous nuances that needed to be evaluated when estimating the fair value of the investment. However, this case study reflects only the high level approach that the fund would have considered in reaching its valuation conclusions and does not show the calculations or the support for each assumption.

The specific facts and circumstances of each individual situation should be carefully considered when performing an actual valuation, and professional judgment should be exercised in evaluating those facts and weighing various alternatives. This case study summarizes the key considerations that were encountered by the fund manager(s) described in the example. The judgments that were made in this case were specific to those facts, not all of which are highlighted herein. See the preamble for a more detailed description of the purpose of the case studies and factors to consider when reading the case studies.

Case Study 5 – Rocky	Primary Concepts Illustrated
Mountain E&P – Upstream	• Impact of new facts on fair value estimates (chapter 5)
Oil & Gas Exploration Equity Financing where values change based on the success and failures in the company's drilling program	<ul> <li>Additional Concepts Illustrated</li> <li>Application of estimates in determining fair value (chapter 5)</li> <li>Industry specific (Exploration &amp; Production) considerations (chapter 5)</li> </ul>
Type of Security – Equity Interest	• Corroborating primary valuation techniques with supporting analysis (chapter 5)
	• Initial transaction calibration support (chapter 10)
Industry – Oil & Gas — Exploration and Production	• Applying the unit of account guidance to agreements with future pro-rata capital calls (chapter 4, chapter 13, "Equity Commitments", paragraphs 13.55–.60)

# The primary purpose of this case study is to illustrate how new information, including company specific and market information, should be assessed and incorporated in management's estimate of fair value.

Specifically, this case study shows an investment in an oil and gas exploration and production (E&P) company from inception through production. The fund invested in an E&P company, providing capital for the company to develop acreage in an oil-producing area. Company management expected to identify hydrocarbon reserves on the property, but as with all E&P companies, knew that substantial capital investment would be required for exploration and

development to verify the reserves and drill producing wells. Initial capital investment included creating infrastructure to allow access to the property and geological surveys to identify the most promising areas to drill. The company then selected locations for the initial 10 wells, and drilled the first well, turning up dry. This result was disappointing, but not unusual for E&P companies. Based on the information obtained from this first exploration, the fund needed to decide how much further to invest and how to value the investment.

The example illustrates the way that value changes given ongoing expenditures when a project is only partially completed, discussing the factors that market participants would consider in valuing these investments. In addition, the example highlights the way that value can change due to positive and negative information obtained throughout the process.

# The Transaction

- C.05.01 Oil Investment Fund ("OIF") invested \$50.0 million in exchange for 38.5 percent of the common equity shares in Rocky Mountain E&P Company ("Rocky Mountain E&P" or the "company"), an early stage, private exploration and production company that was controlled by a Brownstone Private Equity Fund. After the transaction, Brownstone owned 48.5 percent, OIF owned 38.5 percent, and Management held the residual 13 percent ownership interest. Rocky Mountain E&P's initial asset base comprised solely of owned, undeveloped acreage positions targeted areas in the Rocky Mountains.
- **C.05.02** As a component of the transaction, the investors received the right, but not the obligation, to invest an additional \$50.0 million in equity on a pro-rata basis alongside Brownstone, to support development and future acreage acquisitions. Under the terms of the investment agreement, the right to invest in additional equity was not transferrable, and therefore was considered with the original equity investment as one unit of account.
- **C.05.03** The company's stated strategic objective was to initiate an active drilling program targeting horizontal drilling development in the region. In addition, to finance the acquisition of core reserve positions and future drilling prospects, the company planned to issue \$230.0 million in high yield debt and obtain up to \$160.0 million of additional equity investment.

#### **Investment Thesis**

- The company had an experienced management team, with a successful track record of projects in targeted areas.
- As an early investor in the project, OIF obtained a significant minority position in the company for a relatively low initial investment.
- The company had raised sufficient capital to develop the reserves, giving the company the opportunity to raise additional equity at a more favorable valuation if drilling was successful.

# Key Risks

- Although the acreage to be developed was in a known oil-producing area, the property did not have any proven reserves, and substantial capital investment would be required for exploration and development to verify the reserves and drill producing wells.
- As with all E&P investments, the company would face significant asset-level risk – the absence of hydrocarbons, sub-economic flow rates, unexpectedly high operating costs and other exogenous factors, which could impair expected returns.
- Volatility in oil and gas prices in the E&P industry made cash flows from the project uncertain, and the property's field-level returns might be unattractive if oil and gas prices fell below the cost of production, considering both the operating costs and the flow rates for any developed wells.
- The company planned to raise additional debt and equity, leading to possible dilution of OIF's position.
- As a minority investor in the company, OIF did not have control over the development decisions, additional financing, or the ultimate exit but did have board representation and considered its investment objectives to be aligned with Brownstone.

# Initial Calibration on May 29, 2X14

C.05.04 Given the developmental nature of the investment and the lack of historical operating results, OIF used the value of the undeveloped acreage as a calibration reference point. The \$50 million invested for 38.5 percent of the equity implied an overall net value of approximately \$130 million for the company as a whole. OIF noted that both PE investors and the management team held the same class of equity (that is, the company had a simple capital structure), and that all investors' interests were aligned. The assets held by the company consisted of the following:

Field	Net Acres	Value Per Acre	Total Value
Washington	4,000	\$ 5,500	\$ 22,000,000
Madison	3,000	\$ 5,300	\$ 15,900,000
Jefferson	2,000	\$ 14,250	\$ 28,500,000
Adams	3,000	\$ 4,700	\$ 14,100,000
Undeveloped			
Acreage (Total)	12,000	\$ 6,708	\$ 80,500,000
Cash			\$ 50,000,000
			\$ 130,500,000

The preceding analysis provides a reference point when determining fair value at future measurement dates.

#### Valuation at June 30, 2X14

- **C.05.05** As of the June 30<sup>th</sup> Valuation Date, the company held approximately 4,000 acres in the Washington Field, with 3,000 acres in the Madison area, 2,000 acres in the Jefferson area, and 3,000 acres in the Adams area. Given the proximity of the close of the transaction and the Valuation Date, OIF determined that the fair value of its position in the company was best represented by the transaction price, reported as 1.0x Multiple of Invested Capital ("MOIC") (\$50 million). The fund also considered the value of the right to invest in additional equity, but noted that this value was included with the original equity investment in calibrating the valuation model at entry, and that it was not necessary to allocate a separate value to this option since it was included as one unit of account. In addition, the fund noted that the option was pro-rata alongside Brownstone, and thus would dilute the investors equally. The primary purpose of the option was to ensure the company has sufficient capital to complete its drilling program. (See chapter 4 for a discussion of unit of account considerations, including specifically paragraphs 4.11–.14.)
- C.05.06 To ensure that the initial transaction price remained an appropriate indicator of fair value and to account for potential changes in the economic forecast between the Transaction Date and the Valuation Date, OIF also performed a transaction approach analysis to confirm that the value of the acreage position associated with Rocky Mountain E&P supported the concluded Value.
- C.05.07 OIF's analysis found that acquisitions within the reserve basins in which Rocky Mountain E&P operated demonstrated multiples of approximately \$4,700 per net acre to approximately \$14,250 per net acre, with an average of \$6,708 per net acre, supporting OIF's conclusion that value had not significantly changed. In addition, OIF compared the forward oil and natural gas strip against its base economic forecast used in the transaction, finding that, as of June 30, 2X14, oil prices were slightly higher than in late May, and generally flat with regard to natural gas prices.
- **C.05.08** OIF also noted that over the month since the initial investment, the company spent approximately \$600,000 to prepare for drilling activities, reducing cash on the balance sheet to \$49.4 million. This expenditure of cash was on budget and the fund deemed that a market participant would be willing to pay for these expenditures based on their replacement costs.

#### Valuation at December 31, 2X14

C.05.09 In late November 2X14, the macro global oil market saw a significant decline in oil prices related to an announcement by the Organization of the Petroleum Exporting Countries ("OPEC") that these countries would be increasing their aggregate production as additional supply became available. As a result, the price per barrel of crude oil declined from approximately \$93.21 per barrel at the May 2X14 investment date (Cushing – West Texas Intermediate) to \$47.22 per barrel at December 31, 2X14. Prices also declined sharply for natural gas, although not as significantly.

- **C.05.10** Given the early stage of development of Rocky Mountain E&P's hydrocarbon reserve assets, OIF maintained that the investment thesis was unchanged, and that the invested capital was the best indicator of fair value. In addition, OIF noted that results from a third party reserve report which would allow for the use of a discounted cash flow valuation technique would be available in the first quarter of 2X15.
- C.05.11 OIF considered the potentially contrary evidence that might indicate that the decline in the fair value of the investment should be commensurate with the severe decline in oil prices. At December 31, 2X14, however, OIF indicated that the majority of market participants considered the spot price to reflect a temporary dislocation in the market, which was supported by the 3-year forward price per barrel of crude oil declining only modestly. Management also performed a market approach analysis, noting that multiples of forecasted EBITDAX actually increased as of December 31, 2X14. Given the early stage of development, current EBITDAX was negative, however Management considered a market approach analysis using a revised pricing case to estimate projected EBITDAX based upon the observed fourth quarter market strip for oil and gas prices, and considered that the cost of drilling had declined by approximately 25 percent given the overall market conditions. This analysis supported a fair value of 0.8x to 0.9x invested capital. (This situation illustrates the consideration of multiple valuation approaches as discussed in paragraphs 5.01–.04.)
- **C.05.12** OIF also considered changes to the value of the undeveloped acreage given the decreased price of oil. OIF's analysis of the value of the drilling fields highlighted the following:

Field	Net Acres V		lue Per Acre	<b>Total Value</b>	
Washington	4,000	\$	5,000	\$ 20,000,000	
Madison	3,000	\$	4,700	\$ 14,100,000	
Jefferson	2,000	\$	14,000	\$ 28,000,000	
Adams	3,000	\$	4,000	\$ 12,000,000	
	12,000	\$	6,175	\$ 74,100,000	

**C.05.13** Given the market approach results and the 8 percent decline in the values of undeveloped acreage, and considering that reserve reports would be available in the next quarter, OIF concluded that a fair value range of 0.8x to 0.9x MOIC was supportable. OIF marked the investment at 0.9x MOIC (\$45 million) as they placed more weight on the analysis of the comparable values of undeveloped acreage than the value based on a multiple of forecasted EBITDAX.

# Valuation at March 31, 2X15

C.05.14 OIF received the completed third party reserve report in the first quarter, which contained robust estimates of expected proved ("P1") and probable ("P2," and collectively with P1, "2P") reserves. The basis of the expected reserves and production were verified by the engineer, including expected Estimated Ultimate Recovery ("EUR"), well spacing, gas/oil mix, etc. Market participants in this

industry place a great deal of reliance on such reserve reports, combined with actual experience, if any.

- **C.05.15** Given the availability of the reserve reports, OIF estimated the fair value of the investment as of March 31, 2X15 using a detailed discounted cash flow valuation analysis<sup>1</sup> of risk-adjusted 2P reserves, by well. The current forward oil and gas strip prices (approximately \$49.72 in 2X16 for oil and \$3.53 for gas) were applied against expected oil and gas production, netting against forecasted expenses (both operating and capital expenses) and then discounted at 11.0 percent (OIF's estimate of the company's weighted average cost of capital over the forecasted period). Based upon the enterprise value implied by the discounted cash flow calculations, the concluded fair value for OIF's Rocky Mountain E&P investment increased to approximately 1.3x MOIC (\$65 million) based on this analysis.
- **C.05.16** OIF also considered the underlying value of undeveloped acreage at March 31 as one indication of fair value, but noted that because the company had completed the additional development work needed to obtain the reserve reports and the well design, market participants would typically place more reliance on the discounted cash flow analysis. Therefore, OIF considered the discounted cash flow analysis based on the reserve reports, appropriately risk-adjusted, to provide the best indication of fair value at this point in time. (This situation illustrates the consideration of multiple valuation approaches as discussed in paragraphs 5.01–.04.)

# Valuation at June 30, 2X15

- **C.05.17** In the second quarter of 2X15, Brownstone and OIF invested half of the capital committed in the second tranche of equity on a pro-rata basis as originally agreed, bringing OIF's total investment to \$75 million. The company used this capital to acquire additional acreage.
- **C.05.18** The macro environment experienced a slight recovery as oil prices rebounded to the mid-\$60s; however, actual drilling results for the company, in certain areas, did not meet expectations. The company successfully identified proven reserves within the Adams and Jefferson acreage. Preliminary exploratory drilling results in the probable and possible reserves within the company's Madison acreage, however, resulted in dry holes, which caused concern about the probable and possible reserves that were included in the reserve report received in the first quarter of 2X15.
- **C.05.19** In the March fair value analysis, OIF had applied a 50 percent discount to risk-adjust the probable reserves and a 90 percent discount to risk-adjust the possible reserves. In the second quarter analysis, given the preliminary drilling results, OIF estimated that market participants would apply a higher discount to the probable reserves and exclude the possible reserves from the same reserve report used in March (Note: generally reserve reports are updated annually). As a result of these changes to

<sup>&</sup>lt;sup>1</sup> A detailed cash flow analysis includes identifying most likely cash flows which are then discounted at a market participant discount rate. Some market participants consider a short cut approach, known as PV-10, which is an E&P industry valuation convention, where cash flows from probable reserves are discounted at a 10 percent discount rate. PV-10 is not considered an appropriate fair value measurement technique.

expected production, and including the changes in oil prices and expected costs, OIF reduced the concluded MOIC to 1.05x (\$78.75 million), based on OIF's pro rata share of the equity value of \$195.7 million.

**C.05.20** Further, OIF considered the underlying values of the undeveloped acreage as additional support to the concluded fair value. The company had increased its drillable acreage by purchasing an additional 6,000 acres, 4,000 acres in the Washington at \$ 7,000 per acre, and 2,000 acres at \$6,500 per acre in the Adams fields, and also took into account the impact of the dry holes experienced in the Madison field, by excluding the value of 1,000 acres from the analysis. OIF concluded that eliminating 1,000 acres of the Madison field from their analysis reflected the risk associated with no production in the areas surrounding the dry holes. The updated value of underlying undeveloped acreage was determined to be as follows:

Field	Net Acres	Va	lue Per Acre	 Total Value
Washington	8,000	\$	6,000	\$ 48,000,000
Madison	2,000	\$	5,000	\$ 10,000,000
Madison – Dry Holes	1,000	\$	0	\$ 0
Jefferson	2,000	\$	15,500	\$ 31,000,000
Adams	5,000	\$	5,000	\$ 25,000,000
	18,000	\$	6,333	\$ 114,000,000
Infrastructure and exploration investments (excluding dry hole				
costs)				\$ 25,300,000
Cash				\$ 42,300,000
Total				\$ 181,600,000

C.05.21 The \$195.7 million equity value determined through the updated DCF analysis described above represents a 7.8 percent premium over the asset value of \$181.6 million, which OIF concluded was reasonable considering the company's stage of development and most recent reserve report. OIF's concluded fair value estimate was 1.05x MOIC (\$78.75 million).

#### Valuation at September 30, 2X15

- **C.05.22** OIF noted that after nine months of continued low oil prices, market participants had changed their expectations for a quick recovery to historical levels, and were beginning to consider how a long-term shift to a lower price environment would impact the economics of the industry.
- C.05.23 Drilling results for the third quarter in the Adams field underperformed the base case projections, leading to uneconomic production profiles for the producing wells. Material drilling and completion cost reductions were not achieved, and in light of
the continued depressed commodity price environment, current well economics appeared unfavorable.

- C.05.24 Based on these economics, OIF expected that at its next board meeting, the company would make the decision to discontinue development of the specific uneconomic wells and incur a net liability of approximately \$250,000 for expected plugging and abandonment costs. OIF included these expectations in the valuation analysis. The remaining inventory (proven, probable and possible reserves) was also marked down reflecting the most recent hydrocarbon forward prices, which projected the remainder of 2X15 to average approximately \$44.75 per barrel of oil and \$2.45 per million cubic feet ("mcf") of gas.
- **C.05.25** In response to the weaker than expected drilling results, the company applied an additional 20 percent adjustment to proved undeveloped reserves and continued to exclude possible reserves to account for /production risk, and reflect an estimate of the percentage of wells that were included in the original reserve study that were no longer economic at the more recent oil strip prices. The 20 percent adjustment was judgmentally determined, based on the underperformance of the nearby uneconomic wells compared to the original reserve study. After excluding the uneconomic wells, including abandonment costs and taking into account the 20 percent downward adjustment to expected reserves, OIF estimated the fair value at a MOIC of 0.8x (\$60 million).
- **C.05.26** Management also commissioned a new reserve study to be completed as of year-end to reflect a revised expected well count and acreage spacing, given the recent results of the Adams development activities.
- C.05.27 OIF also considered that the value of the undeveloped acreage (after excluding the non-productive Adams wells) would indicate a \$9.5 million decline in the value of OIF's investment, compared with the \$18.75 million decline estimated using the discounted cash flow analysis.

Field	Net Acres	Va	lue Per Acre	Total Value
Washington	8,000	\$	5,500	\$ 44,000,000
Madison	2,000	\$	4,700	\$ 9,400,000
Madison – Dry Holes	1,000	\$	0	\$ 0
Jefferson	2,000	\$	14,500	\$ 29,000,000
Adams	2,000	\$	4,000	\$ 8,000,000
Adams – Dry Holes	3,000	\$	0	\$ 0
	18,000	\$	5,022	\$ 90,400,000

**C.05.28** Because of the overall uncertainty, OIF's fair value conclusion of 0.8x MOIC, was based on their discounted cash flow analysis and did not reflect the slightly higher value attributable to undeveloped acreage, infrastructure and cash.

### Valuation at December 31, 2X16

- **C.05.29** Drilling results in the Washington fields far exceed the base case scenario, and the company experienced a significant economic turnaround. Complementing the favorable drilling results was a rebounding commodity price environment driven by political unrest in the Middle East and North Africa region. WTI crude oil traded up 25 percent since September 30, 2X15 and forward curves approached levels last witnessed in mid 2X14. This resurgence in pricing spurred significant drilling and capital commitments across North America.
- C.05.30 The value of the newly found reserves were expected to far exceed the existing reserve base, and position the company to make a compelling investment case to both third party investors and the banks that supported its credit facility. As such, the updated discounted cash flow analysis supported a value for the assets of 1.4x MOIC (\$105 million).

### **Task Force Observations**

C.05.31 The following table shows the evolution of the estimated fair values and the methodologies used in this case, reflecting the typical information that an upstream exploration and production company might utilize to assess the value of its hydrocarbon reserves at various stages of development.

<u>Date</u>	<u>DCF Technique</u>	Indicative Value of Underlying Assets	Concluded <u>FV</u> Estimate	<u>New Information</u> <u>Impacting the FV</u> <u>Estimate</u>
May 29, 2X14	NA	\$50.0 million (Initial Investment )	\$50.0 million	Initial Transaction at Fair Value
June 30, 2X14	NA	\$50.0 million	\$50.0 million	No new significant information
Dec. 31, 2X14	\$40.0-\$45.0 million	\$46.0 million	\$45.0 million	Significant decline in spot oil prices and a modest decline in 3 year forward oil prices
Mar. 31, 2X15	\$65.0 million	\$ 70.0 million	\$65.0 million	Completed reserve report Slight increase in oil prices from the prior quarter
June 30, 2X15	\$78.75 million	\$73.0 million	\$78.75 million	Slight recovery in oil prices

				Exploratory drilling results in the Madison acreage that did not meet expectations Identified proven reserves within the Adams and Jefferson acreage Costs incurred to prepare for drilling activities
September 30, 2X15	\$60.0 million	\$63.5 million	\$60.0 million	Continued depressed commodity price environment Drilling in the Adams acreage underperformed expectations Expected decision to plug and abandon specific uneconomic wells
December 31, 2X16	\$105.0 million	\$110 million	\$105.0 million	Drilling results in Washington acreage far exceeded expectations Rebounding commodity prices Newly found reserves Credit facility financing

**C.05.32** The volatility in the macro oil market and transaction related market participant considerations are key factors in deriving the fair value estimate for the Rocky Mountain E&P equity held by OIF. As detailed in the example, as Rocky Mountain E&P began experiencing dry holes in June and September of 2X15, the company effectively wrote down these values by heavily discounting the probable reserves and excluding the possible reserves from its analysis, and by excluding the value of the

undeveloped acreage surrounding the dry holes in their corroborating valuation of the undeveloped acreage.

- **C.05.33** In the last year of the case study, Rocky Mountain E&P Company drilling results exceeded expectations in one of the fields and oil prices recovered, leading to a significant increase in value. Because OIF ensured that the company was well capitalized, and the board encouraged the company to manage its resources carefully through the downturn and to invest in additional undeveloped acreage when prices were low, the company was positioned to provide a successful exit for the investors despite the volatility indicated by different valuation techniques in the interim periods. Best practice is to use market observable values to the extent possible to corroborate values derived using reserve studies.
- C.05.34 In estimating fair value, management needs to assess and use market and companyspecific information that would be meaningful to market participants as of the measurement date. When that information is based on significant results (e.g., drilling progress and reserve reports) or volatile inputs (e.g., commodity pricing) the resulting changes in value between reporting periods may be significant. See chapter 5 "Overview of Valuation Approaches" for further information.

# Case Study 6 – Impact on Value of Senior Equity Interests when Junior Equity Interests have Control

*Note:* This case study is provided to demonstrate concepts discussed in the preceding chapters of this guide and is not intended to establish requirements, best practices or safe harbors. It was developed from a real-world situation, which was complex and involved numerous nuances that needed to be evaluated when estimating the fair value of the investment. However, this case study reflects only the high level approach that the fund would have considered in reaching its valuation conclusions and does not show the calculations or the support for each assumption.

The specific facts and circumstances of each individual situation should be carefully considered when performing an actual valuation, and professional judgment should be exercised in evaluating those facts and weighing various alternatives. This case study summarizes the key considerations that were encountered by the fund manager(s) described in the example. The judgments that were made in this case were specific to those facts, not all of which are highlighted herein. See the preamble for a more detailed description of the purpose of the case studies and factors to consider when reading the case studies.

Case Study 6 – Vidastent –	Primary Concepts Illustrated
joint venture where the fund	• Complex capital structure where the control
holds senior equity interests but	sits with the junior equity interests (common
the strategic partner has control	units) held by the strategic partner, while the
Type of Security Complex	fund holds participating preferred with
Copital Structure	downside protection as well as upside
Capital Structure	participation (chapter 8 and chapter 9)
Industry – Medical Instruments	Additional Concepts Illustrated
	• Expansion capital to grow a business in a new
	geography – initial financing expected to cover all
	losses in the initial growth period (chapter 1)
	• Company experiences high growth then declines
	due to economic and local market conditions
	(chapter 5)
	• Calibration (chapter 10)
	• Participating preferred considered as a debt-like
	preferred plus common, using the yield method to
	assess the value of the downside protection given
	the required rate of return (chapter 8, chapter 6)
	• Dilutive financing when the company needed more
	capital to achieve its goals (chapter 8, chapter 13,
	"Dilution", paragraphs 13.65–.76)
	• Scenario analysis approach to assess value of
	investment after new senior capital comes in -

changed methodologies given changed
circumstances (chapter 8)
• Use of a third party valuation specialist to support
the fund's conclusions (appendix A)

### The primary purpose of this case study is to illustrate the way that control influences the value of an equity investment when the investors hold equity interests with different rights and their interests are not aligned.

Specifically, this example illustrates the considerations around the valuation of equity in a joint venture where the fund invested cash and received the senior equity interests, but the strategic partner retained control of the enterprise. The fund's investment was negotiated on a fully-diluted basis, but the fund received senior equity interests that not only were entitled to receive a liquidation preference equal to their initial capital plus 8% PIK dividends before the junior equity interests began participating, but also had the right to participate pro-rata in any further appreciation in value beyond the liquidation preference. In addition, the fund negotiated a put right as well as veto rights over certain transactions, providing an exit strategy and a certain amount of protection against changes in the deal. These rights implied that the fund's position had significantly more value than the strategic partner's interest. The terms reflected the fund's negotiating leverage in the transaction, and the required rate of return for the investment given the risks.

Because the transaction price was deemed to reflect fair value at initial recognition, calibration was required. Although the fund considered the calibrated enterprise value on a fully-diluted basis and assessed the required rate of return for the investment on this basis, the fund also engaged a third party valuation specialist to support the fund's conclusions using an alternative methodology that took the superior rights associated with the fund's position into account.

Finally, the example illustrates that when the joint venture was not able to achieve its objectives within the timeframe and level of investment originally planned and the business needed to raise more capital, the fund faced a difficult decision:

- Refuse to allow the company to raise new capital, resulting in liquidation, a low value sale, or severe cuts in operations, realizing whatever value was available at the put date
- Provide additional capital, taking a larger stake in the business
- Permit the company to raise funds from a new investor, accepting a subordinated position

In this situation, the fund agreed to let the company raise funds from a new investor, accepting the subordinated position and the risk that the fund would receive no value from the investment but allowing for the possibility of a recovery in value that would provide a much higher return. Ultimately, however, the company was not successful and the fund did not receive a payoff

For simplicity, this example ignores the impact of transaction costs relative to the purchase and the sale transactions.

### **Company Background**

C.06.01 Vidastent, LLC was a joint venture between CardioMax Fund and Trenton Stents. Trenton Stents, a publicly traded company, was an established \$800 million US-based manufacturer and distributor of stents. The joint venture was established to facilitate Trenton's expansion into the growing South American markets.

### **The Transaction**

**C.06.02** On November 30, 2X01, the fund made an initial investment of \$40 million in Vidastent in the form of Class A units (i.e., 40,000 Class A units at \$1,000 per unit) for a 40% interest in the equity of the joint venture. Trenton Stents received a 60% interest in the equity of the joint venture, in the form of Class B units (i.e., 60,000 Class B units), in exchange for Trenton's contribution of its international operations, a royalty-free license to Trenton's portfolio of products and access to certain manufacturing facilities.

	Fund	<b>Trenton Stents</b>	Total
Class A units	40,000		40,000
Class B units		60,000	60,000
Total units	40,000	60,000	100,000
% ownership, fully diluted	40.0%	60.0%	

C.06.03 The fund negotiated that in exchange for the cash contribution, at a liquidity event, the fund would receive a priority return of its invested capital for the Class A units plus 8% cumulative PIK dividends. The Class B units would not receive a return of their implied contribution, but instead would share only in the upside after the Class A units receive their return. Any residual value beyond the Class A return would share pro-rata based on the number of units outstanding (including the accumulated PIK units). That is, since the Class A units accumulate PIK dividends, the fund not only would receive the return on its invested capital, but also would receive a greater percentage of the upside, reaching 49.5% of the total units outstanding by the end of the 5 year expected time horizon for the investment. Since joint ventures can be difficult to sell and the fund did not have control, the fund also negotiated the right to put its units to Vidastent after 5 years based on the fair market value of the business at that time, with its share of the fair market value determined based upon its right to receive its invested capital plus accrued dividends and a pro-rata share of the remaining equity value. The put right provided the fund with an important path to liquidity for the investment.

### **Valuation Approaches**

**C.06.04** Simplistically, in these types of transactions, market participants look at the value of the overall company to be used in estimating the value of the Class A units as \$100 million, calibrating to the transaction by dividing by the number of units. However, from a valuation perspective, because the Class A units have superior rights compared with the Class B units, the fund's investment in 40% of the fully diluted equity interests did not imply that the entire company could be sold at \$100 million as of the transaction date. This example shows the fund's approach for calibrating to the transaction as well as the third-party valuation specialist's more formal approach.

### **Investment Thesis**

- Trenton Stents was one of the strongest stand-alone players in this market, with excellent operational performance and an experienced management team.
- The industry was poised for growth, with low market penetration and little competition in Vidastent's target markets.
- Vidastent is one of only a few companies with regulatory approvals to sell products in this category within the target markets.
- The investment structure provided significant downside protection and increasing upside participation for the fund, as well as providing a path to liquidity even if the business did not grow as quickly as anticipated.

### Key Risks

- *Expansion of sales team.* The joint venture needed to develop a local sales force in new markets and expand its sales force in its existing international footprint.
- *Negative margins.* The South American business had only modest success to date, reaching breakeven in its initial target markets but operating at a loss overall. Vidastent was projecting that they would reach breakeven over the next 12 months, but would likely require additional capital if the joint venture experienced any setbacks.
- *Uncertain market opportunity.* Pricing in new markets was unproven, and rampup in demand might be slower than anticipated.
- *Transaction structure*. Although the fund had the standard protections (e.g., two board seats, veto power over certain transactions or changes to the capital structure, tag-along rights, put rights, etc.) the fund had no affirmative control over the joint venture over the next five years. Trenton agreed to the CardioMax investment structure and its put right because it wanted to avoid selling the joint venture lest they would lose control of Vidastent's intellectual property ("IP").

### Initial Calibration on December 31, 2X01

**C.06.05** The fund selected a set of guideline public companies representing a range of medical product companies with significant South American business and observed an interquartile range of LTM revenue multiples of 2.78x to 4.11x as of the November

30, 2X01 entry date and 2.72x to 4.05x as of December 31, 2X01, with a median LTM revenue multiple of 3.42x between the two periods.

- C.06.06 The transaction implied a fully-diluted equity value of \$100 million (\$40 million invested in Class A plus \$60 million pro-rata value for Class B), or approximately 3.0x LTM revenues for the business of \$20.0 million, plus the \$40 million in cash. However, the fund noted the Class B units in this example did not have the same rights as the Class A units. In particular, the Class A units were entitled to a liquidation preference that would increase their senior claim on the business, as well as PIK dividends that would increase the percentage of the upside the Class A units would share depending on the timing of exit. Furthermore, although the Class B units were entitled to 60% of the upside at the transaction date, they would be diluted by the PIK dividends on the Class A units. Therefore, even though the fully-diluted equity value was \$100 million, the transaction implied a fair value for the business lower than \$100 million, since the Class B units did not have the same economic rights as the Class A units. Note that market participants typically negotiate transactions by reference to the fully-diluted value, and then separately negotiate the additional rights and protections for their investments. Market participants are primarily focused on their potential exit and their ultimate multiple of invested capital (MOIC) and internal rate of return (IRR); they are generally not focused on what the Class B units or the overall business are worth.<sup>1</sup>
- C.06.07 Assuming a 5-year time to exit, consistent with the fund's contractual put timeframe, the fund would be entitled to a return of par + accrued (\$58.8 million) plus 49.5% of the upside (based on the additional PIK shares expected to be accrued through the liquidity event). At a \$176 million exit value (12% growth over 5 years from the \$100 million fully-diluted value, or 3.0x the expected revenues of approximately \$60 million, reflecting three-fold growth in the current revenues over 5 years), the fund would receive a payoff of \$116.9 million.
- C.06.08 The fund calibrated this value to the \$40 million transaction price, which resulted in a discount rate of 23.9%. (This approach illustrates a simplified scenario analysis as discussed in chapter 8, calibrating to the transaction price as discussed in chapter 10.) The fund noted the Class B investors would receive approximately \$60 million in this scenario, indicating that a 12% return for the business was Trenton's breakeven point. By raising growth capital through Vidastent's joint venture structure, Trenton hoped to achieve higher performance for the joint venture and improve its reported revenues and cash flows, increasing its own market cap.
- **C.06.09** In addition to performing an internal analysis, the fund engaged a third-party valuation specialist, Seal of Approval, LLC ("SOA"), to perform corroborative

<sup>&</sup>lt;sup>1</sup> In this fact pattern, assume Trenton would continue to consolidate the joint venture for accounting purposes, and would not be required to report the fair value of the business in its financial statements. As a result, unless the transaction were to imply an impairment, Trenton also would not need to estimate the value of the Class B units implied by the transaction. Instead, Trenton management would be focused on how best to obtain the additional capital needed to fund the expansion plans.

calculations to confirm the reasonableness of the fund's overall valuation approach and concluded fair value estimate.

- C.06.10 SOA performed an independent calibration to the transaction using a forward-looking valuation approach, in particular the yield method, as discussed in paragraph 8.76. In this approach, SOA considered the Class A priority return as a debt-like component and the upside participation as the residual equity component. Given the risks associated with the venture, SOA estimated the market yield for the debt-like component of the investment would be 25% based on a selected venture debt rate, indicating a fair value of the debt-like component of \$19.3 million (\$58.8 million payoff discounted at 25% for five years). Calibrating to the transaction, SOA estimated the fair value of the equity component for the Class A units as \$20.7 million (\$40 million less the \$19.3 million value of the debt-like component) for the 49.5% expected pro-rata interest including the PIK dividends (58.8 million Class A units compared with 60 million Class B units).
- C.06.11 The corroborative approach by SOA implied a total equity value for the joint venture of \$61.2 million (\$19.3 million debt-like component for the Class A units plus \$41.9 million of equity for the Class A and Class B units upside participation after grossing up the \$20.7 million value of the equity component, that is, \$20.7 million / 49.5% expected pro-rata interest for the Class A considering the expected time horizon of the investment). SOA noted that although Trenton contributed assets that generated \$20 million in LTM revenue, the business was embarking on a significantly riskier strategy and Trenton effectively agreed to accept a much lower valuation for these assets to obtain the cash needed to fund growth. In addition, the fund and SOA agreed that Trenton might have other indirect objectives for completing the transaction, such that their required rate of return on the assets contributed to the business was lower than that for market participants for the Class A units.
- **C.06.12** SOA's analysis implied a pre-money LTM revenue multiple of 1.06x. This implied multiple was below the low end of the range of the observed multiples, which SOA considered reasonable given Vidastent's unproven business plan. SOA planned to use these calibrated assumptions to corroborate the fund's estimates at future measurement dates. (This approach illustrates the yield method as discussed in paragraph 8.76, calibrating to the transaction price as discussed in chapter 10.)

### <u>Summary</u>

Fund's approachSOA approach				
Revenue multiple	3.0x (calibrated, relative to median of 3.42x)	1.06x (calibrated)		
LTM revenues	\$20 million	\$20 million		
Cash	\$40 million	\$40 million		
Equity value input	\$100 million (fully-diluted)	\$61.2 million (calibrated, considering different rights of Class A and Class B)		
Time horizon	5 years 5 years			
Expected growth in total equity value	12% per year beginning from fully-diluted value	not used		
Expected future exit value	\$176 million	not used		
Payoff to the Class A	\$116.9 million	not used		
Discount rate	23.9% (calibrated)	not used		
Market yield for debt-like component of Class A	not used	25%		
Value of debt-like component of Class A	not used \$19.3 million			
Value of equity component of Class A	not used \$20.7 million (calibrate			
Series A Fair Value	\$40 million	\$40 million		

### Valuation at December 31, 2X02

**C.06.13** Throughout 2X02, the joint venture focused substantial time and resources on expanding its sales force, both in existing South American markets and in new South American markets generally untapped by Trenton and other industry players. As a result of this rapid expansion in the sales force over the course of the year, the joint

venture generated \$23.0 million of revenues by the end of 2X02, a 15% increase from the prior year. However, operating expenses were significantly higher than anticipated due to the costs associated with the aggressive training and development of the sales force. Production costs exceeded initial estimates, resulting in negative EBITDA of \$12.6 million in 2X02 (compared to negative \$28.4 million in 2X01). The unanticipated expenses, which the fund believed were non-recurring, totaled \$7.5 million.

- **C.06.14** Given the recent positive sales momentum for the business, the joint venture increased its revenue growth projections for 2X03 and 2X04 to 5.0% (from 4.0%) and 6.5% (from 5.0%), respectively. Management indicated they expected growth would be fueled by increased penetration and cross-selling in the new markets and robust international demand for their products. Management indicated they would have assumed even higher growth projections (possibly in the low double digits in the near term) had it not been for the lack of clear regulatory safeguards in some of their key markets. Management believed that the uncertain regulatory environment in those markets might not prevent local competitors from infringing on their patented technology.
- **C.06.15** Revenue multiples in the industry increased since the last measurement date. Based on the same guideline public companies, the fund observed that revenue multiples ranged from 2.95x to 4.38x with a median multiple of 3.66x (i.e., approximately 6.0% higher than the median revenue multiple a year ago). Given these positive developments, the fund was confident that if the company chose to raise more funds, they would be able to raise additional capital on the same terms or better, offering additional Class A units to new investors.
- **C.06.16** Considering these factors, as of December 31, 2X02, the fund considered the value of its investment at the original transaction price of \$1,000 per Class A unit, resulting in an aggregate estimated fair value of \$43.5 million including the 8% PIK accruals over the previous 13 months. The fund considered this valuation to be a reasonable lower bound considering the positive revenue growth trends and increase in market multiples, but also considering the higher expenses than anticipated, and the uncertainty around the projections given the regulatory risks described previously.
- **C.06.17** The fund also calculated the value of the business considering the 12% expected return on the business and the four year remaining time to exit consistent with the initial calibration. The fund assumed that they would not achieve any return on the \$7.5 million of unanticipated expenses, and therefore estimated a future business value of \$163.0 million net of dilution (\$92.5 million = \$100 million less \$7.5 million, grown at 12% for the 5 years from the original investment date). The payoff from this exit would be \$110.4 million, resulting in a present value of \$46.1 million considering the 3.92 years remaining time to exit and a 25% discount rate, a slight increase from the 23.9% calibrated discount rate from the initial transaction given the increased regulatory risks.

- **C.06.18** Finally, the fund provided additional qualitative support indicating that since Vidastent had not yet reached breakeven, they considered the company's stage of development to be consistent with the initial measurement date. The fund also noted there were generally no significant changes in the private capital markets over this period. Considering all these factors and noting the passage of time relative to the possible liquidity event through the exercise of a put right, the fund marked the investment at \$46 million, a 15% increase from the original transaction cost of \$40 million. (This approach illustrates the process of updating the valuation analysis for a later measurement date from the calibrated assumptions at the original transaction date, considering changes in the company and changes in the market, as discussed in chapter 10.)
- C.06.19 Similar to 2X01, SOA confirmed the reasonableness of the fund's approach given the facts and circumstances, and assessed the reasonableness of preferred yield implied by the fund's fair value estimate. Since Vidastent had not yet reached breakeven and might require more capital, SOA viewed the risk associated with the repayment at maturity (the date the put right may be exercised) to have slightly increased, since in many cases new investors will require seniority or might require the fund to accept a later put date. SOA estimated that the market yield for the debt-like component had increased to 30% (from 25% in the prior year), but that the fund's fair value estimate implied a total equity value for the joint venture of \$71.5 million.

Fund's fair value estimate	\$46.0	
Less: Value of Debt-Like Component	\$21.0	[\$58.8 million accrued including 8%
	dividends, disc	counted at 30% for 3.92 remaining years]
Net Value of Equity Component	\$25.0	
Divided by fund's Interest	49.5%	
Total Value of Equity Component	\$50.5	
SOA estimated Total Equity Value	\$71.5	[\$21.0 million plus \$50.5 million]

**C.06.20** This equity value was approximately \$10 million higher than the prior year given the overall positive outlook for the business partially offset by the increased risk. After subtracting \$25 million of remaining cash, this equity value implied a cash-free multiple of 2.02x LTM revenues, an increase relative to the calibrated multiple in the prior period but still below the low end of the selected guideline public companies. SOA considered this multiple to be appropriate given the company's success in penetrating the market, offset by the higher expenses, delays in execution and the increased risks in the growth plans for the business. Based on these procedures, SOA concluded that the fund's concluded fair value estimate was within a reasonable range.

### <u>Summary</u>

	Fund's approach	SOA approach
Revenue multiple	3.18x (6% increase over prior period, relative to 3.66x median)	2.02x (implied by valuation, low, given risks => reasonable)
LTM revenues	\$23 million	\$23 million
Cash	\$25 million	\$25 million
Equity value input	\$92.5 million (\$100 million less \$7.5 million in unanticipated expenses)	\$71.5 million (implied by valuation, considering different rights of Class A and Class B)
Time horizon	3.92 years	3.92 years
Expected growth in total equity value	12% per year beginning from fully-diluted value	not used
Expected future exit value	\$163 million	not used
Payoff to the Class A	\$110.4 million	not used
Discount rate	25% (slight increase from previous period of 23.9%)	not used
Market yield for debt-like component of Class A	not used	30% (increase from previous period of 25%)
Value of debt-like component of Class A	not used	\$21.0 million
Value of equity component of Class A	not used	\$25 million (implied by valuation)
Series A Fair Value	\$46.0 million	\$46.0 million

### Valuation at December 31, 2X03

**C.06.21** In 2X03, many of the economies in the South American region suffered several severe shocks, beginning with the devaluation of the Brazilian currency and

Argentinian debt restructuring rippling throughout the entire region. Revenues for Vidastent declined dramatically, and as of December 31, 2X03, the business had realized only \$19.6 million in revenues (a 15% drop from the prior year) with negative \$15.6 million in EBITDA. Nevertheless, economists were optimistic that the economy of the South American region would recover in 2X04. The range of LTM revenue multiples for the selected guideline public companies had widened, reflecting the uncertainty in the markets, with multiples from 2.54x to 4.64x with a median multiple of 3.13x (i.e., approximately 14.5% lower than the median revenue multiple a year ago).

- **C.06.22** Based on this analysis, the fund estimated that the value of the business had declined approximately 40% relative to the initial transaction (due to the lower remaining cash reserves, 15% decline in revenues relative to the previous year (flat from inception) and 15% decline in multiples relative to the previous year (10% decline from inception), from a post-money value of \$100 million to approximately \$60 million on a fully-diluted basis. Considering the PIK accruals through the measurement date, the fund held 47.0 million Class A units, representing 43.9% of the outstanding units, or \$26.3 million on a fully-diluted basis. The fund noted the accrued liquidation preference for the Class A units was \$47.0 million, and the business value would be sufficient to cover this liquidation preference.
- **C.06.23** Assuming the business could achieve 12% returns relative to the current input equity value of \$60 million, the fund estimated that the exit value would be approximately \$83.53 million, with a payoff to the Class A units of \$71.03 million in 2.92 years, with a corresponding payoff to the Class B units of \$12.51 million. The fund noted that the negative events of the prior periods had already been taken into account in assessing the input equity value, and that market participants would still expect that on average, the business value would grow going forward.
- **C.06.24** To estimate the fair value of the Class A units given the payoff of \$71.03 million, the fund discounted at a 30% required rate of return, implying a value of \$33.02 million. The 30% discount rate reflected the increased risk profile given the performance risks in the region and the increase in the risk profile for the fund's investment given the shorter time to exit, the lower starting equity value, and the fund's lack of control over the company's operations. Specifically, in order for the controlling shareholder to achieve a non-zero payoff, Trenton would require Vidastent to grow at a much higher rate of return, making it likely that Vidastent will take more risks, burning cash more rapidly and managing the business more aggressively. (This situation illustrates the "agency effect", which is one of the key risks associated with a minority position where the investors' interests are not aligned.)
- **C.06.25** Given the lower bound estimate of value based on the fully-diluted value of \$26.3 million (60% of face), the upper bound estimate of value based on the accrued liquidation preference of \$47.0 million (100% of face), and the forward looking analysis indicating a value of \$33.02 million considering the potential payoff of \$71.03 million discounted at a 30% rate of return, the fund marked the investment at 70% of face, or \$32.9 million. (This approach illustrates the process of updating the valuation analysis for a later measurement date from the assumptions used in the previous period, stepping the valuation forward from the original transaction date

considering changes in the company and changes in the market, as discussed in chapter 10.)

C.06.26 To confirm the reasonableness of the fund's fair value estimate of \$32.9 million, SOA analyzed the implied yield on the preferred. Given the turmoil in the South American markets, SOA estimated that the market yield for the debt-like component had increased to 45%, reflecting the high risk that Vidastent would not repay the full amount owed at the end of the 2.92 year term. The fund's fair value estimate implied a total equity value for the equity component of the joint venture of \$46.1 million implying a 1.8x multiple of LTM revenues. This multiple was below the low-end of the selected guideline public companies, and reflected a 10% decline relative to the previous period, when the median multiple declined by 15% over that same period. SOA considered this decline to be reasonable given the company's dependence on the South American business. This focus on the South American market increased the risk of the investment, but also resulted in a greater impact on LTM revenues and thus promised greater prospects for recovery than the more diversified peers. Based on these procedures, SOA concluded that the fund's concluded fair value estimate was within a reasonable range.

	Fund's approach	SOA approach
Revenue multiple	2.7x (15% decline from prior period, relative to 3.13x median)	1.8x (implied by valuation, low, given risks => reasonable)
LTM revenues	\$19.6 million	\$19.6 million
Cash	\$10 million	\$10 million
Equity value input	\$60 million (\$100 million less 40% based on lower multiples, revenues and cash)	\$46.2 million (implied by valuation, considering different rights of Class A and Class B)
Time horizon	2.92 years	2.92 years
Expected growth in total equity value	12% per year beginning from fully-diluted value	not used
Expected future exit value	\$83.53 million	not used
Payoff to the Class A	\$71.0 million	not used

Summary

	Fund's approach	SOA approach
Discount rate	30% (increase from previous period of 25%)	not used
Market yield for debt-like component of Class A	not used	45% (increase from previous period of 30%)
Value of debt-like component of Class A	not used	\$19.9 million
Value of equity component of Class A	not used	\$26.3 million (implied by valuation)
Series A Fair Value	\$32.9 million	\$32.9 million

### Valuation at December 31, 2X04

- **C.06.27** In 2X04, economies of the countries in the South American region had recovered as expected, and Vidastent established operations in several countries throughout the region. However, demand had been significantly lower than expected, and cost overruns outpaced revenue growth. In addition, local competitors gained significant traction in the joint venture's target markets, making it more difficult for the joint venture to differentiate itself from the pack.
- **C.06.28** As a result of these financial and operational difficulties, but believing they could improve their marketing efforts and reach profitability with an additional capital infusion, management decided to seek additional financing in the form of Class AA units. Management reached an agreement with HCX fund ("HCX"), another PE fund that wanted exposure in the medical devices space. HCX, a first-time fund formed by a former CEO of a Healthcare company, a former partner at a technology based venture capital fund and a former investment banker, thought that co-investing alongside Cardio-Max fund and Trenton (both among the most respected constituents among their peers) would help "put them on the map" in the medical devices space.
- C.06.29 HCX invested \$20 million for 40,000 units of Class AA units (i.e., \$500 per Class AA unit) for a 26.5% stake as of the investment date, considering the 40,000 new units, the 50,710 accrued Class A units and the 60,000 original Class B units. This investment implied a fully-diluted equity value of \$75.5 million for the business at \$500 per unit, as follows:

	Fund	Trenton Stents	HCX	Total
Class AA units			40,000	40,000
Class A units	50,710			50,710
Class B units		60,000		60,000
Total units	50,710	60,000	40,000	150,710
% ownership, fully diluted	33.65%	39.81%	26.54%	

- C.06.30 The Class AA units were senior to the Class A and Class B units, and had a right to put the units back to the business in 2 years (consistent with the timing of the Class A put right). At a liquidity event, the Class AA unitholders would receive their initial invested capital for the Class AA units plus 10% PIK cumulative dividends (compared to 8% for the Class A holders), after which the units would share pro-rata.
- C.06.31 Although the transaction would be dilutive, the fund agreed to HCX's investment because it was clear that the joint venture required additional capital to continue operations in the near term, and was not willing to provide the cash itself. Moreover, the fund was of the view that beyond the cash provided by HCX, HCX could potentially provide much needed industry expertise that could help the joint venture achieve its future plans. The fund knew it still had the put right that could allow it to force the sale of the business or require the company to buy them out in two years, but it was unclear what the value of the business would be two years hence without the capital necessary for the joint venture to pursue its business plan. Trenton was not willing to invest additional cash since they did not want the additional exposure, nor did they have the time, energy or expertise to pursue the Latin America strategy on their own. Trenton was not in a position to sell the business, or pursue a joint venture with a local company with the expertise, because then they would lose control of their IP to a competitor. So, by allowing HCX to invest in the company, the fund retained some downside protection and some potential upside.
- **C.06.32** Vidastent planned to use the \$20 million of new capital to fund operating expenses and focus on two of the higher revenue countries within the region, attempting to achieve scale to reach profitability within the two year timeframe. At that time, the company targeted run rate revenues of \$40 million, implying an equity value at exit of \$100 million to \$140 million at a multiple of 2.5x to 3.5x revenues.
- **C.06.33** Because the Class A units were now a junior equity interest in a much riskier business, the fund determined that a scenario analysis approach was needed to capture the upside potential and downside risks for the investment. (This situation illustrates the need to use an appropriate valuation methodology considering the facts and circumstances as of the measurement date, as discussed in chapter 8, and to calibrate to the new transaction considering these facts and circumstances, as discussed in chapter 10.)

**C.06.34** Based on the factors considered in deciding whether to accept the HCX capital, the fund used the following scenarios and weightings as of December 31, 2X04 in valuing its Class A units:

	Scenario	Weight	Estimated Fund Value ( <b>\$ in millions</b> )	Weighted Present Value <sup>1</sup> ( <b>\$ in millions</b> )
1	Vidastent recovers; the company is sold for \$120 million and the fund receives its initial investment and accrued interest plus 33.6% of the upside in <b>2 years (5</b> <b>years from entry)</b>	40%	\$70.4	\$15.45
2	HCX or Trenton buys out the fund's 33.6% stake in <b>2 years</b> at a valuation of \$300 per unit (40% lower than the Class AA price)	50%	\$15.21	\$4.18
3	Vidastent continues to underperform and folds within 12 to 18 months; the Class AA investors receive all residual value and the fund gets nothing	10%	\$0.00	\$0.00
	Total			\$19.63

<sup>1</sup> Discounted at 35.0%, a 5% increase relative to the previous period considering the increased risk.

Based on these scenarios, the fund's concluded fair value estimate was \$19.63 million or \$387.10 per unit.

### Valuation at December 31, 2X05

- **C.06.35** A year after HCX's investment, Vidastent continued to underperform and burn cash. The fund believed that Trenton's overall strategy was no longer viable and that the business was unable to compete effectively with the local players, who not only were more knowledgeable about their respective regional markets but also had closer ties with the local government. While the joint venture still was considered one of the highest quality providers of stents, the technology around stent production had become widely accessible to their competitors, leading to a commoditization of the product. Since the joint venture had a higher fixed-cost structure than most of its competitors, the fund determined the joint venture's business model was no longer sustainable on a standalone basis.
- **C.06.36** As of December 31, 2X05, the fund estimated the fair value of the overall business was \$60 million, 25.8% lower than the implied fully-diluted valuation paid by HCX in 2X04, and 40% lower than the fully-diluted value at the time of the original investment four years ago. The fund also considered the universe of market participants that might ultimately acquire the business to have narrowed significantly since the initial investment, due to lower revenue growth than initially anticipated. The fund believed management's plan to achieve profitability was not feasible in the

short term due to the ballooning costs of its large-scale production facilities and expensive sales force; in the long run, the fund was not confident that the joint venture would be able to compete effectively against the local players in each of their respective markets.

**C.06.37** Based on these factors, the fund considered the following scenarios as of December 31, 2X04 in valuing its Class A units:

	Scenario	Weight	Estimated Fund Value ( <b>\$ in millions</b> )	Weighted Present Value <sup>2</sup> (\$ in millions)
1	Company recovers and the fund receives its initial investment and accrued interest in one year	0%	\$59.17	\$0.00
2	HCX or Trenton buys the fund's 33.6% stake in one year at a low valuation of \$200 per share (60% lower than the Class AA price)	50%	\$10.14	\$3.76
3	The Company continues to underperform and folds within a year; the Class AA investors receive all residual value and the fund gets nothing	50%	\$0.00	\$0.00
	Total			\$3.76
	<sup>2</sup> Discounted at 35%, consistent with the previous period.			

The fund estimated that the expected value from the first scenario would be \$0. In the second scenario, the fund assumed that the HCX or Trenton would purchase the fund's Class A units at \$200 per unit, resulting in a value of \$10.1 million and would be received in 1 year. The fund assigned equal weighting to the two scenarios and concluded on a fair value estimate of \$3.76 million.

### **Task Force Observations**

- **C.06.38** Typically, transactions of this nature are negotiated on a fully-diluted basis, and that basis is how market participants think about value for the purpose of valuing the investment in the Class A units. But in this example, considering that the investor gets back \$58.8 million plus 49.5% of the upside at exit, it looks like Trenton gave up \$38.8 million in value on day one, accepting Class B units worth only \$21.2 million per SOA's analysis, relative to the nominal \$60 million in assets they contributed. Why would a company seeking capital to fund a joint venture accept such terms?
  - Trenton needed additional capital and operational support on the board to help execute an overseas expansion strategy; they lacked sufficient experience in these markets, and believed that the fund would help them navigate the hazards.

- Trenton's breakeven return on its equity was 12%. They believed the new capital infusion would fuel faster growth given the size of the opportunity.
- In this example, Trenton maintained control. The investor's required rate of return considered the risks of not having control (and in fact, the lack of control had significant ramifications when additional capital was needed).
- Trenton was consolidating the joint venture for financial reporting. Trenton's share price traded on the basis of a revenue multiple that was generally in line with guideline public companies in its sector. Accordingly, Trenton's market capitalization (and its publicly traded share price) would benefit from the high revenue growth, via its own multiple. Therefore, from the perspective of Trenton, as a continuing controlling shareholder, the initial investment by CardioMax was structured in a way that was more comparable to a financing event than a sale of the business.

The task force believes that it is important to understand transaction dynamics such as those referenced above, whether they are made explicit by the parties or simply inferred from the facts, particularly when calibrating to the initial transaction, so that the impact of changes in the factors that existed at the initial transaction date can be considered at subsequent measurement dates.

- **C.06.39** Using a yield method to estimate the value of the debt-like component of a participating preferred equity interest and then treating the residual as pro-rata common units can be an effective method for calibrating the total equity value of a business to a transaction, allowing for future updates. In estimating fair value of any financial instruments, you must consider the rights and preferences of the other claims on the enterprise within the entire capital structure.
- **C.06.40** For the controlling shareholder to achieve a non-zero payoff when the business value began to decline, Trenton needed the company to grow at a much faster rate, making it likely that they would take more risks, burning cash more rapidly and managing the business more aggressively. This "agency effect" is one of the key risks associated with a minority position where the investors' interests are not aligned.
- **C.06.41** It is important to carefully consider the facts and circumstances and remain flexible in selecting an appropriate valuation methodology. Even though a certain approach may have been appropriate in the previous period, the same approach may not be appropriate in the next period if the facts and circumstances change. In this case, when the Class A was senior, it was reasonable to use a single exit scenario to estimate the expected payoff and the corresponding present value of the Class A units. When the Class AA financing was raised, it became necessary to move to a scenario analysis approach.
- **C.06.42** Considering the ramifications of control on the value of the minority position when the investors' interests are not aligned and allocating value appropriately among the senior and junior classes of equity are important concepts for valuing venture capital and private equity investments. Please see chapter 9 and chapter 8 for further discussion.

### Case Study 7 – Reliability of Financial Information for an Emerging Market Investment

*Note:* This case study is provided to demonstrate concepts discussed in the preceding chapters of this guide and is not intended to establish requirements, best practices or safe harbors. It was developed from a real-world situation, which was complex and involved numerous nuances that needed to be evaluated when estimating the fair value of the investment. However, this case study reflects only the high level approach that the fund would have considered in reaching its valuation conclusions and does not show the calculations or the support for each assumption.

The specific facts and circumstances of each individual situation should be carefully considered when performing an actual valuation, and professional judgment should be exercised in evaluating those facts and weighing various alternatives. This case study summarizes the key considerations that were encountered by the fund manager(s) described in the example. The judgments that were made in this case were specific to those facts, not all of which are highlighted herein. See the preamble for a more detailed description of the purpose of the case studies and factors to consider when reading the case studies.

Case Study 7 – Retail de	etail de Primary Concepts Illustrated		
Mexico, S.A. – retailer in an	• Impact of incomplete or unreliable valuation inputs		
emerging market where	on calibration (chapter 10) and market participant		
financial information provided	assumptions (chapter 3)		
to support the transaction was			
later discovered to be incorrect	Additional Concepts Illustrated		
	• Subsequent purchase price adjustment (chapter 3)		
Type of Security – Minority	• Considering the appropriate unit of account		
Common Equity Investment	(chapter 4)		
	• Minority interest (chapter 9)		
Industry – Retail, Apparel	• Impact of exchange rates		

# The primary purpose of this case study is to illustrate the exercise of judgment with respect to market participant assumptions in estimating fair value when information is incomplete or unreliable.

Specifically, the following example shows a minority investment in a foreign, family-owned business where the business was subsequently discovered to have misreported EBITDA. The fund was required to perform a valuation at a measurement date when the accounting irregularities had been discovered but not yet resolved, and when the fund was in negotiations to obtain compensation for the breach in the agreement. Ultimately, the fund negotiated a higher ownership percentage due to the EBITDA shortfall. The business corrected the accounting weaknesses and performance continued in line with expectations.

The example illustrates exercising judgment with respect to determining fair value when information is incomplete or unreliable. Further, the example highlights calibration and market participant assumptions with respect to known and knowable information.

### Initial Transaction and Calibration on November 30, 2X12

- C.07.01 Retail de Mexico S.A. (RM or the company), one of Mexico's largest diversified retail companies, was founded in 1977 as a general apparel retail store in the region of Monterrey and employed approximately 4,300 people as of September 30, 2X12. In the 1980's, the founder was considered a pioneer in the retail space and since had expanded to become one of the largest retail apparel providers in Mexico. RM provided a full range of apparel options for both children and adults. The company supported multiple branded clothing labels, plus had established its own RM brand.
- C.07.02 The Mexican retail apparel market was estimated at MXN 38 billion in turnover during 2X12 and was estimated to grow 20 percent faster than the Mexican economy. The Mexican retail market was still a very fragmented industry, with over 2,000 active retail companies, most of them local operators with a limited number of stores. RM, the 3rd largest player, had approximately 2.5 percent market share. RM differentiated itself by having the most extensive geographic presence among all competitors, with 85 stores in 11 regions.
- C.07.03 RM was vertically integrated for some of its products. It manufactured the majority of its RM branded product through domestic and global suppliers. The company's investment plan for the next few years was largely focused on expanding the RM brand and expanding the retail store footprint to 100 stores.
- **C.07.04** Given the Fund's retail experience, the Fund planned to guide RM as it executed its growth strategy. Growth was expected by increasing market share in the fragmented market. The Fund planned to exit by selling its stake to one of the other large strategic competitors, as the overall market consolidated.
- C.07.05 On November 30, 2X12, the Fund completed a transaction to acquire a minority stake in RM for MXN 165 million to support the company's store expansion and its RM branding program. The Fund valued the company at an enterprise value of MXN 600 million, reflecting a multiple of 7.9 times Trailing Twelve Months (TTM) EBITDA as of September 30, 2X12 of MXN 75.95 million. As part of its due diligence, the Fund identified possible weaknesses in the company's internal controls, but concluded that they had sufficient protections to consummate the transaction.

Initial Transaction Summary	Nov 30, 2X12	
	(Millions)	
Concluded Enterprise Value	MXN 600.0	
(TTM EBITDA 75.95 X 7.9 multiple)		
Minus Debt	MXN 50.0	
Equity Value	MXN 550.0	
Ownership Percentage	30.0%	
Fund's Equity Value	MXN 165.0	
Exchange Rate (MXN to USD)	12.94x	
Fund's Equity Value (initial fair value)	\$ 12.8	
Transaction Costs	\$ 1.2	
Fund's Cost	\$ 14.0	
MOIC	0.91	

**C.07.06** The median EBITDA multiple of Mexican guideline public companies was 10.53 using market capitalizations as of the November 30, 2X12 transaction date and EBITDA data as of September 30, 2X12 (the latest information available). Therefore, the 7.9x EBITDA multiple paid by the Fund implied a 25 percent difference to the median of the guideline public companies. The Fund attributed the calibration difference to various factors, such as the risks associated with the company's growth plans, the weaknesses in the company's accounting systems, characteristics of the Fund's position, etc.<sup>1</sup>

C.07.07 The Fund had secured strong governance rights for their first minority investment in Mexico. The Fund secured the following key rights and terms:

- i. two of five board seats;
- ii. the right to appoint the CFO;
- iii. veto over change of CEO;
- iv. right to appoint a COO who would respond directly to the Board in case of operational underperformance;
- v. veto over the budget, sizable issuance of equity and debt, issuance of stock options, acquisitions, mergers, and divestitures;
- vi. veto over change of control if the proposed valuation was below a predetermined threshold;
- vii. 100 percent tag along right;

<sup>&</sup>lt;sup>1</sup> There are always differences between a target company and the selected guideline public companies, and in some cases these differences may imply that the target company would command a premium to the metrics for the guideline public companies, and in other cases would only merit a discount to the metrics of the guideline public companies. Please see chapter 10, "Calibration," for further discussion.

- viii. registration rights for an IPO after three years;
- ix. drag along rights for the shares of the controlling shareholders after five years at a minimum valuation with an implied EV/EBITDA LTM multiple equal to the Fund's entry LTM multiple, and;
- x. Other standard representations and warranties.
- **C.07.08** The Fund used an enterprise value approach to value its minority interest because the Fund was entitled to a pro-rata share of the equity upon an exit, and the Fund believed that the protections included in its agreement were sufficient to offset any concern that market participants might have about being in a minority position. In particular, the Fund's rights included information rights, the right to initiate an IPO after three years, and the right to force a sale of the company via its drag-along rights after five years. Therefore, the Fund had a path to liquidity, and would be able to participate in a pro-rata share of the total equity value upon any exit. Furthermore, the Fund's calibrated multiple reflected the characteristics of its position. (This analysis illustrates the application of calibration in valuing a minority interest, as discussed in chapter 9 and chapter 10.)

### Valuation at December 31, 2X12

C.07.09 As of December 31, 2X12, the guideline public company median EBITDA multiple had increased from 10.53 to 11.05x. As updated EBITDA information for RM was not available (pending completion of the annual audit), the Fund determined enterprise value based on the last reported EBITDA. Even though the multiple of guideline public companies increased from September 30, 2X12 to December 31, 2X12, the Fund noted that the transaction was only one month prior to the measurement date and decided to place more weight on the recent transaction. Further the Fund considered the volatility of the market in the context of the expectations for RM's performance. The Fund Manager noted that given the illiquidity of the position combined with the volatility in the guideline public companies, it was uncertain whether the Fund could capture the value associated with the increase in multiples for guideline public companies. Therefore, the Fund concluded that a market participant would not pay significantly more than the 7.9x transaction multiple. Furthermore, notwithstanding the increase in the multiples for the guideline public companies, the Fund noted that updated EBITDA information for the business was not yet available, and that market participants might still have some concern about the company's accounting systems. The Fund therefore used a range of 7.5x to 8.0x EBITDA to determine fair value. (This situation illustrates the importance of considering market participant assumptions, as discussed in chapter 3.)

Valuation Summary	<u>December 31, 2X12</u>	
	(Millions)	
Concluded Enterprise Value Range	MXN 569.6	MXN 607.6
Concluded Enterprise Value	MXN 600.0	
Minus Debt	MXN 50.0	
Equity Value	MXN 550.0	
Ownership Percentage	30.0%	
Fund's Equity Value	MXN 165.0	
Exchange Rate (MXN to USD)	12.84x	
Fund's Estimated Fair Value	\$ 12.9	
Fund's Cost	\$ 14.0	
MOIC	0.92	

**C.07.10** As of December 31, the Fund valued its investment in RM at USD 12.9 million (up from 12.8 million) or 0.92x the initial investment (cost). The initial transaction fair value was below the original invested capital due to transaction expenses<sup>2</sup>, but the fair value increased slightly from November 30 due to changes in the exchange rate.

### Valuation at June 30, 2X13

- **C.07.11** The company implemented a new cost accounting system in early 2X13. During this implementation, the company realized the previous cost accounting system was not completely accurate and realized the necessity of revising previously reported expenses.
- C.07.12 During the December 31, 2X12 audit completed in May 2X13, it was determined that significant inventory shortages occurred or that the past cost accounting systems were inaccurate resulting in the historical EBITDA being overstated by MXN 18 million, slightly less than 24% of the EBITDA used to determine the purchase price. As this was a breach of a representation under the purchase agreement, the Fund was in negotiations with the family majority owners, to enforce its rights. As of June 30, the outcome of such negotiations was unclear. Although these separate negotiations ultimately might result in some restitution, most likely in the form of an increased ownership interest, because the amount of the potential increased ownership interest was in dispute the Fund would not recognize the contingent gain until the settlement was agreed (consistent with applicable accounting requirements). That is, under the gain contingency guidance, the additional equity that might be issued as a result of

<sup>&</sup>lt;sup>2</sup> Please see chapter 12, "Factors to be Considered At or Near a Transaction Date," for further discussion.

the negotiations is not considered to be part of the "investment" even though it would arise pursuant to the enforcement of rights under an existing contract; instead, any additional shares that would be received as a result of a settlement would not be recorded at fair value until the contingency is resolved. (This analysis illustrates the importance of considering the appropriate unit of account (the investment), as discussed in chapter 4.)

- **C.07.13** For the June 30, 2X13 valuation, the Fund considered the impact of the EBITDA shortfall on market participant assumptions with respect to RM's value. Given the uncertainty, significant judgment was required to determine what a market participant would pay for the company and how much to adjust expected cash flows, multiples, and discount rates. It was unclear how much of the MXN 18 million EBITDA adjustment pertained to 2012 and how much pertained to previous accounting periods. Under the assumption that the accounting irregularities had been identified and corrected, there may not have been a need to consider additional risk in expected recurring EBITDA. However, human nature would indicate that given the past problems, even if corrected, a market participant may have considered the investment more risky, especially if the company was being run by the same management team. (This situation illustrates the importance of considering market participant assumptions, as discussed in chapter 3.)
- C.07.14 At June 30, 2X13, the EBITDA multiple for guideline public companies had increased slightly to 11.25x. However, the Fund concluded that market participants would pay a similar 7.5 to 8.0 times "clean" EBITDA given the increased perceived risk. Because the MXN 18 million adjustment pertained to 2X12 and earlier periods, the Fund determined that they would use MXN 65 million as the adjusted EBITDA (approximately 10 million of the MXN 18 million adjustment, assuming that market participants would estimate that slightly less than half of the adjustment applied to prior periods). In effect, the Fund used a 32% discount to the median multiple for guideline public companies, versus the 25% discount at entry, as a result of the increased perceived risk from the past accounting irregularities. This analysis resulted in a fair value estimate of USD 10.4 million (adjusted for the current exchange rate):

Valuation Summary	<u>June 30, 2X13</u>	
	(Millions)	
Concluded Enterprise Value Range	MXN 487.5	MXN 520.0
Concluded Enterprise Value	MXN 500.0	
Minus Debt	50.0	
Equity Value	MXN 450.0	
Ownership Percentage	30.0%	
Fund's Equity Value	MXN 135.0	
Exchange Rate (MXN to USD)	12.98x	
Fund's Estimated Fair Value	\$ 10.4	
Fund's Cost	\$ 14.0	
MOIC	0.74	

### Valuation at December 31, 2X13

- **C.07.15** RM had made significant progress correcting its cost accounting problems. The Fund was able to negotiate an increase in their equity stake from 30 percent to 33 percent to resolve the misrepresentation in EBITDA. Therefore, now that the dispute was resolved and the agreement for the additional equity issuance was final, the Fund measured the value of its investment including the additional equity.
- **C.07.16** As of December 31, 2X13, adjusted LTM EBITDA had increased to MXN 85 million, and the Fund had confidence in the accuracy of the reported results. The guideline public companies' median EBITDA multiple had increased from 11.25 times EBITDA to 11.5 times EBITDA (10.53 at entry). Using the market approach, the Fund applied a multiple of 8.25 to 8.75 x adjusted LTM EBITDA. The Fund selected the 8.25 to 8.75 range after considering the entry multiple of 7.9 adjusted for the relative increase in guideline public companies. In effect, the Fund reduced its discount from the median guideline public company multiples from 32% at June 30, 2X13 to 25% at December 31, 2X13, given the greater confidence in the accuracy of its results. (This situation illustrates the importance of considering updated market participant assumptions as discussed in chapter 3 and calibration as discussed in chapter 10.) The value was estimated as follows:

Initial Transaction Summary	<u>December 31, 2X13</u>	
	(Millions)	
Concluded Enterprise Value Range	MXN 701.3 MXN 743.8	
Concluded Enterprise Value	MXN 725.0	
Minus Debt	75.0	
Equity Value	MXN 650.0	
Ownership Percentage	33.0%	
Fund's Equity Value	MXN 214.5	
Exchange Rate (MXN to USD)	13.06x	
Fund's Equity Value (initil fair value)	\$ 16.4	
Fund's Cost	\$ 14.0	
MOIC	1.17	

**C.07.17** The significant increase in value from June 30 2X13 was a result of several factors, including: the negotiated 10% increase in ownership, increased EBITDA, de-risking given market participants' greater confidence in the reliability of the company's EBITDA reporting, and the increase in guideline public company multiples. The resultant local currency value was adjusted for the period end exchange rate.

### **Task Force Observations**

C.07.18 This case study illustrates the exercise of judgment with respect to market participant assumptions in estimating fair value when information is incomplete or unreliable. Investing in businesses that have less reliable accounting controls carries additional risk. Similar risks exist in situations where investors have limited or no information rights relative to the operations or financial performance of the portfolio company. Market participants take these risks into account and generally use the best available information when estimating relevant financial metrics (e.g., normalized cash flow) and the appropriate multiple or discount rate used to determine the amount that would be paid for these businesses. In making assessments at interim dates, changes in the facts and risk assumptions are also included in adjusting the calibration from the initial investment transaction. In addition, this case study highlights the need to consider other applicable accounting requirements that may apply. In particular, gain contingency accounting (which under these facts would determine when an asset may be recognized for accounting purposes) should be considered when a potential settlement is being negotiated, since the claim for the breach of representation is a separate unit of account from the investment being valued. Finally, the fair value of the investment as estimated in local currency is converted to the Fund's functional

currency based upon the currency exchange rate observed as of the measurement date.

# Case Study 8 – Evaluating Opportunities for a Strategic Exit – "Last Man Standing"

*Note:* This case study is provided to demonstrate concepts discussed in the preceding chapters of this guide and is not intended to establish requirements, best practices or safe harbors. It was developed from a real-world situation, which was complex and involved numerous nuances that needed to be evaluated when estimating the fair value of the investment. However, this case study reflects only the high level approach that the fund would have considered in reaching its valuation conclusions and does not show the calculations or the support for each assumption.

The specific facts and circumstances of each individual situation should be carefully considered when performing an actual valuation, and professional judgment should be exercised in evaluating those facts and weighing various alternatives. This case study summarizes the key considerations that were encountered by the fund manager(s) described in the example. The judgments that were made in this case were specific to those facts, not all of which are highlighted herein. See the preamble for a more detailed description of the purpose of the case studies and factors to consider when reading the case studies.

Case Study 8 – <b>TKO</b>	Primary Concepts Illustrated
<b>Technologies</b> – Early stage VC backed company where other peer companies were acquired at high valuations Type of Security – common stock	<ul> <li>The importance of identifying the attributes and possible strategic objectives of potential buyers and the way those factors impact market participant assumptions in a changing competitive landscape (chapter 3, chapter 5)</li> <li>Calibration (chapter 10)</li> </ul>
Industry – Software	<ul> <li>Additional Concepts Illustrated</li> <li>Valuing minority positions (chapter 9)</li> <li>Comparability of guideline public companies (chapter 5)</li> </ul>

The primary purpose of this example is to illustrate how changes in the external environment can significantly influence an investment's value, even when the underlying business performs well and other observable factors provide contrary evidence. Specifically, the following case study shows the potential ebb and flow of an investment in an early stage company and the challenges in assessing value relative to the impact of competition and the ability to achieve performance milestones along the way.

- At the initial investment date, the fund considered TKO to be a promising, innovative company developing an entirely new category of enterprise software, with the potential for high returns but a correspondingly high risk of failure.
- Over the first two years, the company appeared to be realizing its potential, as it continued to meet investor expectations and started to increase revenues. The fund and its co-investor decided to invest additional capital to enable the company to grow more rapidly.
- A critical inflection point for the company was the improvement in its competitor's enterprise collaborative software offering that created market challenges for TKO and made the company relatively less attractive to investors
- During this period, two large enterprise software companies, Ali Services and Frazier Software, decided to enter the company's business segment by acquiring three of TKO's competitors at high multiples. Although these transactions might imply that TKO would command a similar multiple, the reluctance of other potential buyers to enter a space now dominated by large competitors meant that TKO no longer had a viable exit path.
- Although the company managed to raise a new round of financing, the pool of potential buyers decreased which, in turn, had a negative impact on valuation.
- After initially growing revenue and briefly turning cash flow breakeven, the company began to lose market share due to competitive pressures and ultimately returned to negative EBITDA and cash burn and was not successful in attracting a buyer. The fund decided not to participate in the final financing round and the fund's co-investor took control of the company.

The case study illustrates, among other things, the challenges in determining the fair value of an investment when there has been a recent positive transaction, but the transaction impacts the competitive landscape in a way that may limit the potential exit value. Even for companies with superior product offerings, there is a specific challenge in discerning the uncertain second order implications of market participant behavior in a niche product category when large competitors enter the arena.

### Initial Transaction and Calibration on October 31, 2X11

C.08.01 TKO Technologies (TKO or the company) was an early-stage software as a service (SaaS) company focused on providing enterprise customers with collaborative, cloud-based social networking tools for project management and knowledge sharing.

### **Company Capital Structure**

C.08.02 On October 31, 2X11, SRF Fund invested \$10 million in exchange for 10 percent ownership in common equity, which implied an enterprise value of \$100 million. TKO has a simple capital structure with only a single class of common equity.

### **Investment Thesis**

- C.08.03 In making the investment, the fund considered the following:
  - Early category leader with significant momentum in an emerging sector
  - Attractive market opportunity in enterprise collaboration software, with the potential to consolidate the industry and move into adjacent markets
  - Sales-oriented team with a proven ability to execute
  - Limited need for future capital infusions because the business had low operating costs and could scale profitably

C.08.04 Key risks included the following:

- Limited revenue traction
- Generally unproven market
- Low barriers to entry
- Early-stage company requires wide-spread adoption to be successful
- Founder was a repeat entrepreneur but lacked the track record for growing businesses to significant scale
- **C.08.05** SRF Fund's exit strategy included the possibility of either a sale to a strategic investor, likely a larger, more diversified software provider, or an IPO. SRF also considered the possibility that after a considerable period of growth to profitability and acquisitions in adjacent spaces, it could be an attractive investment for another growth equity financial investor; however, this scenario was not considered to be a sufficiently likely outcome to be included in its valuation analysis.

### **Initial Investment Considerations and Calibration**

**C.08.06** As required by FASB ASC Topic 820-10-35-24C, the fund calibrated valuation inputs with the \$100 million valuation implied by the transaction price at entry. Given the limited revenues at the time of the investment, the fund did not believe it could credibly apply a revenue multiple to highly theoretical revenue potential, but did believe that the company had the potential to have a billion-dollar exit. Guideline public companies were trading at 3.0x to 5.2x forward revenues, or roughly 4.0x revenues, reflecting the multiples that might be achievable once the company becomes more established. SRF believed that eventually the company could reach \$250 million in revenues, supporting a \$1 billion exit value, and a 10x return to the fund. In addition, the fund knew there were multiple competing term sheets to participate in this initial funding, and that for them to prevail in the bidding, this valuation was what the founders were likely to accept as the winning bid.

C.08.07 As an early stage company, TKO's biggest challenge was managing and prioritizing its growth initiatives in a market that was evolving rapidly. The company had filled critical senior management roles and had adequate cash to support investment in its technology, products, sales and marketing to achieve its growth targets. The next 12 to 18 months were expected to be an important period for the company as it scaled its sales force and completed several product initiatives.

### Valuation at December 31, 2X12

**C.08.08** Over the 14 months since the initial investment date, TKO had strengthened its position as one of the leading players in the enterprise collaboration space and continued to add to its impressive blue-chip customer base, with nearly 100 percent renewal rates. TKO performed in-line with the fund's expectations and continued to meet targeted milestones (i.e. customer base, R&D, etc.). TKO also continued investing in product development, sales and marketing to differentiate itself from other new entry competitors, most of which were not able to expand or diversify due to capital constraints. In addition, the company continued to focus on several key projects that would provide additional growth upside.

### C.08.09 To estimate fair value at December 31, 2X12, SRF considered:

- 1. the extent to which there had been any significant changes in the external environment,
- 2. the value indicated by the previous round of financing,
- 3. progress made by the company since the financing,
- 4. the fact that the more established guideline public companies continued to trade at revenue multiples similar to those of the initial investment, and
- 5. the fact that one of TKO's two new emerging competitors had been acquired by Ali Services at a price representing what market commentators estimated was a 3.0x 5.0x forward revenue multiple.
- **C.08.10** The Ali Services transaction established an M&A benchmark for private collaborative enterprise software companies. TKO's management believed that the positive traction they were experiencing would position them for an IPO in the future. Along with these factors, the fund considered forward revenue multiples for selected guideline public companies in the SaaS industry and noted they ranged from 2.8x to 5.5x with a median multiple of 3.8x.
- **C.08.11** During 2X12, TKO started to gain revenue traction. TKO's 2X13 forward revenue expectations were \$50 million, based on current and expected bookings. As TKO had started to generate revenue, SRF considered valuing TKO based on a forward revenue multiple near the low end of the range, at 3.0x. Although TKO had started to demonstrate stronger percentage revenue growth relative to the guideline public companies and had made progress toward meeting milestones, the fund considered that market participants would be reluctant to pay a higher price at the measurement date given the short track record. The lack of specific information about the merger

multiple in the recent transaction led the fund to conclude it could not apply significant weight to that specific information in its valuation assessment as such multiples were only speculative. Applying the chosen forward 3.0x revenue multiple to TKO's \$50 million revenue forecast yielded a value of \$150 million. SRF concluded on an enterprise value of \$150 million and valued its 10 percent interest at \$15 million. (This analysis illustrates the application of the market approach and consideration of guideline public company multiples adjusted for differences between the subject company and the guideline public companies along with consideration of guideline company transactions, as discussed in chapter 5.)

### Valuation at June 30, 2X13

- C.08.12 TKO continued to show strong sales momentum as it added new accounts to its customer base. The company had 200 active customers at June 30, 2X13, up from 43 in early 2X12. Furthermore, the company had record bookings of \$28.7 million in the first half of 2X13, bringing the total revenue forecast for 2X13 to \$60 million. With such strong sales momentum, the company forecast 2X14 revenue to increase almost 50 percent over 2X13 bookings to \$90 million.
- C.08.13 TKO had been successfully growing the team and, in the first quarter of 2X13, hired a SVP of Development with over 30 years of software development experience. In addition, the company expanded its core sales, customer support and development organizations. TKO had 84 employees and expected to further scale the organization in 2X13 and 2X14. TKO management believed that they were on track to complete an IPO in approximately 18 to 24 months.
- **C.08.14** Although the company demonstrated strong financial performance and felt they were leading their niche in the market, Frazier Software, a large enterprise software provider competing with Ali Services, acquired one of TKO's other direct competitors at a forward revenue multiple similar to what investment bankers had represented to the be the multiple for the previous Ali Services acquisition multiple without approaching TKO. In addition, Ali Services acquired another TKO competitor in the same indicated range. The acquisitions by Ali and Frazier and the earlier acquisition by Ali at favorable multiples caused the fund to consider selling in an M&A transaction.
- **C.08.15** Although the investment bankers that the fund consulted represented that they were fairly confident that the transaction multiples were in the 4.5x to 5.5x range, SRF was unable to obtain solid documentation of the actual transaction multiples. SRF therefore considered these transaction multiple range estimates, but did not place significant reliance on them. SRF augmented its analysis considering selected guideline public company revenue multiples, which had now increased to a range of 4.0x to 6.0x. SRF selected a multiple of approximately 4.2x, at the lower end of the guideline public company multiples and slightly below the range of the indicated transaction multiples. While the company continued to scale quickly on a percent basis, it was still relatively new and given that the transaction multiples were not able

to be independently validated, SRF did not believe that market participants would yet pay a significantly higher multiple. SRF applied the selected multiple to forward revenue of \$60 million, resulting in an enterprise value of \$250 million, or \$25 million for the fund's interest. The \$250 million enterprise value was also in line with the valuation expected to be received in connection with a financing event planned during the next 6 to 12 months. (This analysis further illustrates the application of the market approach and consideration of guideline public company and transaction multiples, with adjustments for differences between the company and the guideline public companies and transactions, as discussed in chapter 5.)

### Valuation at March 31, 2X14

- **C.08.16** During the first quarter of 2X14, TKO raised an additional \$20 million in capital from existing shareholders. As the company approached break even in its cash flow, it planned to use the financing proceeds to bridge its cash flow needs through its expected cash flow breakeven point to expand its product suite, marketing and product development efforts, as well as for general corporate purposes.
- C.08.17 TKO continued to invest and scale its operations in various parts of the organization. The company hired five new employees in the first quarter of 2X14, bringing the total number of employees to 119. The company also made investments in key areas including sales, engineering and product development. TKO had actively expanded its product suite over the past few quarters.
- **C.08.18** TKO continued to show strong sales momentum. The company had bookings of \$15 million in the first quarter of 2X14. Management and the co-investors were of the opinion that the company continued to be a strong IPO or M&A candidate.
- **C.08.19** The fund compared the value indicated by the recent financing (\$300 million value in an all inside round) with the value indicated by using a revenue multiple. The forward revenue had increased to \$73 million from \$60 million. There had not been any significant change to guideline public company multiples, and there had been no new transactions.
- **C.08.20** While the financing was an all inside round, SRF concluded that the pricing was at fair value, as the price was a negotiated price between the company, the investors and the existing investors who chose not to participate in the financing. SRF ultimately decided not to participate, and was diluted to an 8.5 percent ownership stake. The fund calibrated its revenue multiple based on the recent financing to 4.1x (\$300 million value / \$73 million forward revenue = 4.1).
- **C.08.21** SRF further supported this conclusion by noting that the valuation was at the lower end of the 4.0x to 6.0x forward revenue multiple range for the guideline public companies, consistent with the fund's expectations for the company given the opportunity and risks. SRF therefore used an enterprise value of \$300 million, which corresponded to a \$25.5 million value for the fund's 8.5 percent interest. (The fund's
consideration of the implied value from financing round as an indication of value illustrates the concept of inferring value from transactions in a company's instruments, as discussed in chapter 10.)

# Valuation at December 31, 2X14

- C.08.22 In October, an investment bank was engaged to shop the company to potential strategic buyers. Although SRF's co-investor and the founders remained optimistic about the company's prospects, no indications of interest from any potential buyer were received.
- **C.08.23** During the fourth quarter of 2X14, TKO turned EBITDA positive. For the fourth quarter, the company was slightly behind budgeted bookings, but had reached cash flow breakeven. However, TKO's competitors, with the assistance of their new parent companies, were beginning to capture market share from the company. The company concluded that up to 50 percent of its potential future customer base would gravitate to one of the big two competitors. If the company did not find a strategic acquirer, it would require additional funding and significant cost reductions to remain a going concern. While management and the co-investors were still optimistic, the fund believed the company's IPO and M&A windows had closed.
- **C.08.24** Because of the disappointing indications from the M&A process which indicated there was no interest from strategic buyers, the fund decided to value its investment in TKO based on a scenario analysis. The fund believed the concluded value must reflect the risk inherent in the current stage of the business and more importantly the specific business challenges faced by the company. SRF believed there was a 50 percent chance it would lose all its money on this investment and a 50 percent chance it would recover \$10 million principally from the sale of developed technology to a competitor, and therefore concluded on a fair value of \$5.0 million. (This approach illustrates the concept of applying a scenario-based method, as discussed in chapter 8.)

#### Valuation at March 31, 2X15

**C.08.25** During the quarter, the company continued to lose market share and turned EBITDA negative. Management and the co-investors remained optimistic. The co-investors decided to provide bridge financing by investing additional capital in a senior instrument with a 2.5x liquidation preference. As a result of the substantial dilution from the bridge financing and the fund's less optimistic perspective of how other market participants would view the company, SRF concluded that the potential to lose all of their investment had increased to 90 percent, and the chance to recover \$10 million had declined to 10 percent. The fund, therefore, concluded on a fair value of \$1 million, reflecting the substantial uncertainty related to realizing any returns, albeit with some potential for a modest recovery from the potential sale of intellectual property and other salable assets.

#### **Task Force Observations**

- **C.08.26** The fund made its investment in TKO as a promising, innovative, early-stage company that was developing an entirely new category of enterprise software. In doing so, the fund looked to a range of possible future scenarios in assessing the likelihood of successful outcomes, knowing that the risk was high. Even though TKO was an early entrant into the market and had a leading market position, the competitive dynamics and low barriers to entry resulted in the entrance of three competitors who ultimately were successful M&A targets, and who were able to make significant inroads into the category that TKO had created. The success of these competitors made them attractive targets for the larger diversified enterprise software providers.
- C.08.27 TKO sought an exit to a strategic buyer but missed the opportunity to be acquired by one of the two major contenders in the enterprise software industry. Initially positive information supported increasing the value of the investment based on sales growth and market indications of value. Ultimately, the dramatic change to the competitive landscape and the lack of a potential buyer impaired the fund's investment that resulted in a significant write down of its investment. The case study highlights that whether there has been a recent round of financing or not, GAAP requires increases or decreases in value to be reflected in fair value based on market participant perspectives when facts and circumstances demonstrate that fair value has changed. Notably, as of March 31, 2X14, with the benefit of hindsight, SRF had correctly recognized that the two main strategic investors already had acquired competitors, and TKO had lost its opportunity to gain the scale and name recognition associated with being part of one of these larger entities. Nevertheless, other market participants, namely other existing TKO shareholders, continued to value the company highly, and invested additional capital to continue the company's growth strategy. These other market participants assumed that there was room for another competitor in this space. Therefore, it is important to note that market participants do not always evaluate a subject company's performance or prospects in the same way. Fair value reflects the

fund's best estimate of the point at which the asset would transact, within this potentially wide range of market participant views.

**C.08.28** Changes in the competitive landscape and other externalities can have a significant impact on the value of a portfolio company and the ability to achieve a successful exit event. Monitoring these events and incorporating market participant assumptions about them is an important component of an overall valuation analysis. Please see chapters 3 and 5 for further discussion.

# Case Study 9 – Biotech Investment with a Complex Capital Structure – Multiple Investors' Perspectives

*Note:* This case study is provided to demonstrate concepts discussed in the preceding chapters of this guide and is not intended to establish requirements, best practices or safe harbors. It was developed from a real-world situation, which was complex and involved numerous nuances that needed to be evaluated when estimating the fair value of the investment. However, this case study reflects only the high level approach that the fund would have considered in reaching its valuation conclusions and does not show the calculations or the support for each assumption.

The specific facts and circumstances of each individual situation should be carefully considered when performing an actual valuation, and professional judgment should be exercised in evaluating those facts and weighing various alternatives. This case study summarizes the key considerations that were encountered by the fund manager(s) described in the example. The judgments that were made in this case were specific to those facts, not all of which are highlighted herein. See the preamble for a more detailed description of the purpose of the case studies and factors to consider when reading the case studies.

Case Study 9 – <b>Lotus</b>	Primary Concepts Illustrated
Analgesics – Clinical stage biotech with a downround and a later strategic exit with an earnout Type of Security – Convertible Preferred (Non Participating)	<ul> <li>Multiple preferred investors with different perspectives on value, reflecting their views of market participant assumptions considering the importance of liquidation preferences in complex capital structures (chapter 3, chapter 8)</li> <li>Calibration using an internally consistent model and assumptions, addressing the challenges of unobservable market inputs (chapter 10)</li> </ul>
Industry – bio/pharma	<ul> <li>Inherent estimation uncertainty (Q&amp;A 14.11 and Q&amp;A 14.53)</li> <li>Value accretion in early stage investing (sidebar "Resolution of Uncertainties Over Time," following paragraph 5.93)</li> </ul>
	Additional Concepts Illustrated
	<ul> <li>Pre-revenue valuation and calibration (chapter 10)</li> <li>Differences between the total equity value used in calibrating to a transaction using scenario-based methods when compared with option pricing methods (chapter 8)</li> </ul>
	• Illustration of need for post-exit date valuation for valuing the remaining earn-out asset (chapter 13, "Contractual Rights (Contingent Consideration)", paragraphs 13.83–.87)

Illustration of an explicit adjustment for expected dilution (chapter 13, "Dilution", paragraphs 13.65–.76)
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# The primary purpose of this example is to illustrate alternative approaches for estimating the fair value of a preferred stock investment in a complex capital structure, and how these alternative approaches may all result in reasonable fair value estimates if the assumptions are calibrated appropriately.

Specifically, this example shows an investment in an early-stage company in the biotechnology industry. Three funds each invested in a minority position in Lotus Analgesics' Series A convertible preferred shares. Each fund selected a different valuation methodology, and calibrated the valuation model at the initial investment date to reflect their estimates of market participant assumptions, consistent with the transaction. The example shows that various scenario-based methods and option-based methods can be appropriate for valuing equity interests in companies with complex capital structures. Both scenario-based and option-based methodologies are forward-looking, and capture the possible distribution of future exit values and the implications for the relative values of the various classes of equity.

Based on the facts at the initial measurement date, this example demonstrates the qualitative factors considered by each fund. Each qualitative valuation assessment was supported to varying degrees by a methodology to document value quantitatively.

- One fund (the lead investor) initially assumed that the outcomes would be trimodal (a) a high value at exit scenario with all classes converting to common, (b) a liquidation scenario with all classes receiving *de minimis* returns, or (c) a low-value sale scenario where some classes receive more value than others based on their liquidation preferences. At earlier measurement dates, the fund considered the low value sale scenario to have minimal probability. As a result, no weight was initially given to the relative contractual preferences and all shares are valued equally on an as-converted basis.
- Another fund noted that future outcomes will be subject to significant uncertainty and the likelihood of accurately identifying potential outcomes and probabilities is low, and thus selected an option-pricing framework to calibrate the value of Lotus with its investment.
- A third fund initially employed a scenario approach similar to the lead investor's, but was more qualitative and more pessimistic.

Ultimately, the company was sold to a strategic investor with an up-front cash payment that covered the liquidation preferences for only the senior preferred stock, providing Series A and the other equity interests with potential payoffs in the form of an earn-out based upon specified milestones.

In this example, the three unrelated funds that invested as of the initial financing date had a shared perspective on the potential for the investment, including a shared perspective on both the near term strategy and longer term exit planning. Nevertheless, even at the initial financing date, each fund had a slightly different perspective on how to consider the value of the early stage company. As circumstances changed, these different perspectives led the three funds to

make differing assumptions about how market participants would price additional investments in the company, contributing to the funds making different decisions about whether to participate in future financings and different valuation estimates. These different perspectives and the different resulting fair value estimates demonstrate the inherent estimation uncertainty for investments in early stage companies. In fact, because this company had a number of recent rounds of financing upon which subsequent valuations could be based, the three perspectives resulted in relatively similar estimates in the facts presented; in situations where financing rounds are less frequent, the inherent estimation uncertainty would increase.

Over the timeframe discussed in the case study, Lotus raised the following rounds of financing:

- Initial A financing round (calibration using different methodologies; relationship between fully-diluted equity value and OPM-implied equity value)
- Follow-on A financing round (assessing whether the transaction price for a followon round reflects fair value)
- Series B financing round (calibration using different methodologies; assessment of differences in the implied fair value for the Series A preferred when only the Series B preferred stock price is observable)
- Series C financing round (downround with 2x liquidation preference; assessment of differences in the implied fair value for the Series A and Series B preferred when only the Series C preferred stock price is observable)
- Convertible Bridge Note and Warrants (challenges in raising financing rounds between major milestones; implications for valuation of equity interests)
- Series D financing round (upround with 2x liquidation preference; assessment of differences in the implied fair value for the Series A, Series B and Series C preferred when only the Series D preferred stock price is observable)
- Structured exit transaction with a contingent consideration

Throughout the life of the investment, although each fund utilized different approaches to determining and documenting their valuation conclusions, each fund appropriately considered market participant assumptions, including the market environment and company-specific progress. The funds independently reconciled their analyses to each new financing round. The uncertainty in the valuations for the Series A investments was driven by different qualitative perspectives on value and the lack of observable market prices. In a hypothetical transaction for the Series A at an interim measurement date, the price would result from negotiations between two specific parties and would be driven by the supply and demand dynamics (which party is more eager to buy or sell). The various valuation methodologies were all reasonable attempts to approximate fair value as of the measurement dates.

# **Company Background**

C.09.01 Lotus Analgesics, Inc. (Lotus) is a clinical-stage biotechnology company focused on novel treatments for the pain associated with inflammatory arthritis and related diseases. Existing pain medications, including non-steroidal anti-inflammatory drugs (NSAIDs), selective cyclo-oxygenase inhibitors (COX inhibitors), and the currently available opioid analgesics, may not be adequate for treating severe pain, or have significant side effects that may limit broader adoption. Addressing the significant unmet patient need for pain and inflammation therapies offered a significant market opportunity and will dramatically improve quality of life.

- C.09.02 Lotus' founders were Dr. Eli Max (CEO) and Dr. Olivia Sequoia (CTO). Dr. Max had over 20 years of experience in the industry and previously co-founded Amyrika Pharma, which was sold for \$400 million in 2X10, and Brynn Mark Industries, which completed a successful IPO in 2X05. Dr. Sequoia had over 15 years of experience in the biopharmaceuticals industry; she was responsible for the original breakthroughs in this therapeutic area and had led successful, cost-effective clinical programs bringing several innovative products to market. She co-founded MJKC Biotech (NASDAQ: MJKC) in 2X02.
- **C.09.03** Lotus agreed to obtain licenses to a class of therapeutic compounds from a major pharmaceutical company. The company's plan for the next two years was focused on advancing these compounds through Phase 2, with the goal of taking the company public after demonstrating the safety and efficacy of these products.

# **The Transaction**

C.09.04 The company raised \$10 million in Series A preferred stock at \$1 per share at a valuation of \$15 million post-money, from three investors: \$4 million from Renowned Ventures (Renowned) and \$3 million each from Steady Growth Capital Management (SGCM) and Thundercloud Investments (Thundercloud). The Series A investment has standard terms, including economic rights such as a 1x liquidation preference and 1x conversion option, and control features, such as the right for each investor to appoint a board member as long as they hold at least 20 percent of the outstanding stock, the right to participate pro-rata in any future financings, and other information rights. The investment was to be used to acquire the licenses and to fund operations for the first year of clinical testing.

# **Investment Thesis**

- C.09.05 The funds considered the following investment thesis:
  - Novel treatment to address significant unmet need.
  - Opportunity to license the class of therapeutic compounds for an attractive price.
  - Ability to leverage recent academic research showing a promising alternative pathway for this class of compounds.
  - If all compounds are successfully commercialized for their target applications, the potential opportunity would be for Lotus to capture a market share which could represent in excess of \$5.0 billion in potential annual revenues.

• Strong and experienced management team with a track record of success in advancing drug candidates fully through the regulatory approval and commercialization process necessary to capture the market opportunity in the upside cases.

# Valuation Calibration at Entry on July 19, 2X11

- **C.09.06** Each fund estimated the fair value of its initial investment in the Series A round at cost, \$1.00 per share. As described above, each then calibrated the respective valuation model they planned to use for future measurement dates, as described in the following paragraphs.
- Renowned (the lead investor) calibrated its valuation model using a simple two-C.09.07 scenario analysis. In the upside scenario, they assumed that the company could complete an IPO at a valuation of \$325 million in three years (based upon an assumed forward multiple of projected revenues), with an associated probability of 30 percent. The amount, timing, and probability were based on Renowned's experience with early-stage biotechnology companies, considering input regarding the science for this specific product. In the downside scenario, they assumed that the Series A investment would receive no value from its liquidation preference, because: (a) given the nature of the company, the outcomes would likely be bimodal, hinging on technical success, and; (b) the company would need more funding to reach the ultimate liquidity event, with any additional funding likely to have seniority over the Series A and, therefore, first claim to any residual value. A potential third (tri-modal) scenario in which the company would be sold at an intermediate value that would provide some return for Series A investors but none for common shareholders was considered but not evaluated due to its perceived low likelihood of occurrence. Renowned estimated that the initial investment would be diluted by 60% to 80% by the time of the IPO, given the estimated range of capital that the company would need to raise, and the estimated average pricing over the period considering the milestones the company was expected to achieve between financings.
- C.09.08 Renowned noted that the probability-adjusted estimated internal rate of return of 25% through this first three year holding period in its initial valuation model was below its target return for an investment with such a high risk profile. However, Renowned believed that the size of the potential long term revenue opportunity following full commercialization justified the investment at the initial pricing. Renowned quantified the calibration of its \$4 million investment in the following way:

•	Value of company at time of potential early exit	\$325 million
•	Number of shares at IPO	50.0 million
•	Pre-IPO dilution due to future financing	70 percent (35 million additional shares, relative to 15 million fully diluted shares as of initial investment date)
•	Exit value, Series A per share	\$6.50
•	Probability of successful IPO	30 percent
•	Adjusted future value	\$1.95
•	Present value, 3 years @ 25%	\$1.00 (transaction price)

**C.09.09** SGCM, like the other funds, estimated the fair value of the investment at inception based on its cost of \$3 million, \$1.00 per share. SGCM calibrated its investment using the Option Pricing Method ("OPM") to backsolve to an initial aggregate equity value which would serve as the basis for evaluating future company developments. At the initial transaction date, SGCM used an expected time to an exit event of three years. SGCM selected a volatility estimate of 100 percent reflecting the early-stage nature of the company. This volatility estimate was generally consistent with the third quartile to the high end of the range of volatilities observed from a selected group of peer companies in the biotech industry, while noting that no public companies are truly comparable. The aggregate equity value of the company using an OPM with these input assumptions was \$13.9 million:

Series A preferred	\$10 million	\$1.00/share
Common stock	\$3.9 million	\$0.77/share (before any Discount for Lack of Marketability)

- **C.09.10** SGCM's estimated equity value from this framework differed from the "postmoney value" used for negotiation, because the OPM assumes that the common stock has less value per share than the preferred stock, whereas the post-money value assumes that common and preferred have the same value. Both models indicated the same calibrated value for the Series A preferred, consistent with the transaction price.
- **C.09.11** Thundercloud also selected a scenario framework. Thundercloud utilized the following assumptions:
  - A sale of the company was more likely than an IPO
  - It would take approximately 3-4 years to achieve an exit
  - The best case would be an early sale, at the three-year point, indicative that testing was proceeding according to the company's strategic plan

- A delayed sale (year 4) would result in more dilution, and be less likely to provide a meaningful return to current common stockholders
- C.09.12 Thundercloud developed a model based on these assumptions, using a relative value scenario analysis approach. At the initial investment date, Thundercloud estimated that the liquidation preferences for the Series A would be unlikely to provide any economic protection on the downside. Instead, similar to Renowned, Thundercloud assumed that the future exit would either be at a high value where the Series A would convert, or at a low value where the Series A would not receive any return (zero value or value lower than the liquidation preferences for future rounds). Unlike Renowned, however, rather than using specific quantitative assumptions about future exit values, market participant required rates of return and future dilution, Thundercloud focused on the fully-diluted value of the company as of the measurement date, calibrating to the \$1 per share price to estimate the current total equity value. The fund planned to use the calibrated model to evaluate changes in total equity value and the value of specific classes of equity at subsequent measurement dates, considering the difference in liquidation preferences and the likelihood that the difference in liquidation preferences would matter.
- **C.09.13** Given the short timeframe that passed between the initial entry date (i.e., July 19, 2X11) and the first quarterly measurement date (i.e., September 30, 2X11) and the fact that there were no significant events for the company and the market over this timeframe, none of the three funds updated its model or revised its initial estimate of fair value as of September 30, 2X11.

	Renowned	SGCM	Thundercloud
Future Exit Value	\$97.5m (\$29.25m for current shares)	N/A	N/A
Present Value of Equity	\$15.0m	\$13.9m	\$15.0m
Latest Round Value	\$1.00	\$1.00	\$1.00
Change since latest round	N/A	N/A	N/A
Series A Fair Value	\$1.00	\$1.00	\$1.00

# Comparison of the Funds' Approaches: July 19, 2X11 Valuation

# Task Force Observations – July 19, 2X11 Valuation

C.09.14 At this date, despite the difference in three funds' valuation methodologies, all three funds estimated the same value for the Series A preferred stock, consistent with the transaction price. Note, however, that the estimated total equity value used by SGCM differed from the total equity values used by Renowned and Thundercloud, because Renowned and Thundercloud considered the outcomes to be bimodal and

therefore relied on the as-converted value for the company, whereas SGCM used an OPM and estimated that the common stock had less value per share than the preferred stock. From a calibration perspective, it is important to use the models consistently and consider the movements in the total equity value from period to period, rather than to consider whether \$15 million or \$13.9 million is the "correct" total equity value for the company. That is, it would not be appropriate to use a \$15 million equity value in an OPM model, nor to use a \$13.9 million equity value in a simplified scenario-based analysis; however, using the calibrated equity value within the corresponding valuation framework can yield reasonable estimates for the subject equity interests under either approach. Please see Q&A 14.52 for a discussion regarding the application of the OPM. (This example illustrates the different ways that market participants consider value in venture capital investing, and shows that no one approach is uniformly superior, as discussed in chapter 8.)

#### Valuation at December 31, 2X11

- **C.09.15** As of year-end, approximately 5.5 months had passed since the initial investment date, and each of the funds considered whether any events, internal to the company or externally in the market, require either:
  - Revisions to key inputs and assumptions (e.g., probability, timing, nature of exit event)
  - Revisions to the selected model itself (e.g., from OPM to scenario analysis)

#### Renowned

- **C.09.16** Consistent with market participant assumptions, Renowned first considered the qualitative impacts on value. Discussions with management indicated that clinical trials were proceeding as expected. Given the absence of revenues and lack of resolution of uncertainty regarding clinical trials, no traditional financial metrics were yet available. The competitive and industry landscape had not changed and the general outlook was viewed as similar to that at the transaction date.
- **C.09.17** Although the time to the expected exit had decreased between the transaction date and the measurement date, Renowned believed the absence of material value events at Lotus or within the industry and the significant uncertainties that remained, suggested no material change in the value of the fund's investment. In parallel with the commencement of clinical trials, and consistent with the strategic plan, the company had continued its research efforts to evaluate additional applications for the compounds it had licensed. The company had not yet received any information regarding safety and efficacy from the clinical trials, so there was not yet any evidence sufficient to indicate that the initial estimate of value should be revised. Renowned management also noted that there were no preliminary price indications with respect to a subsequent financing round, and, therefore, the company's fundraising activities did not provide any meaningful evidence of a change in value.

C.09.18 Further, to assess the value from a quantitative perspective, Renowned considered updating the scenario assessment shown above. Using a discount rate-based scenario model implies that when the subject company is progressing as planned and there has been no delay in the expected timing of the liquidity event, the value of the investment could potentially be thought to increase based on the reduction of the time until value might be realized. In practice, however, a market participant's view of the value of preferred stock in an early-stage company may not change until the company reaches recognizable milestones that demonstrate success or failure of a specific initiative. Mathematically, this result implies that either market participants' view of the expected time to a liquidity event does not change until a milestone is reached (e.g., it was three years at the initial investment and it is still three years six months later), or that the rate of return is not upward-sloping between milestones, but rather is achieved only as significant risks are resolved. Therefore, Renowned concluded that the value was not changed and valued its investment in Lotus at \$1.00 per share.

# <u>SGCM</u>

**C.09.19** Similar to Renowned, SGCM considered the company's progress since inception and concluded that the value was not likely to have changed. The fund updated its OPM, employing the following assumptions:

• Aggregate equity value (rounded)	\$14.0 million
• Time to exit (expected)	2.5 years
• Volatility (same stage of development, no significant change in the market)	100%

**C.09.20** This analysis produced a value for the Series A shares of \$1.02, similar to the original transaction date, so SGCM left its value unchanged, at \$1.00 per share.

# Thundercloud

C.09.21 Thundercloud considered, but did not update any inputs to its original relative value scenario analysis. The fund believed that any potential value increase due to the company's progress over the previous six months would be offset by market participants requiring a higher rate of return to invest when no new information was available, given the uncertainty as to whether the capital the company had expended in the intervening six months had been effectively deployed. And thus, Thundercloud retained its previous Series A estimate of \$1.00 per share.

#### Summary

**C.09.22** As of this measurement date, each of the three funds valued its Series A shares at an identical price of \$1.00 per share.

	Renowned	SGCM	Thundercloud
Future Exit Value	\$97.5m (\$29.25m for current shares – no change)	N/A	N/A
Present Value of Equity	\$15.0m	\$14.0m	\$15.0m
Latest Round Value	\$1.00	\$1.00	\$1.00
Change since latest round	0%	0%	0%
Series A Fair Value	\$1.00	\$1.00 (rounded)	\$1.00

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# Task Force Observations – December 31, 2X11 Valuation

C.09.23 At this date, the company had not reached any significant milestones and no significant changes had occurred in the markets, and therefore all three funds estimated that the prior financing still represented the best estimate of the fair value of the Series A preferred stock. The company had performed as expected over the six months since the initial financing, without any major setbacks that would indicate a decline in value. The company was on track to reach the next milestone on schedule, implying that the remaining time to reach this milestone was shorter than at the July 19, 2X11 transaction date, which might indicate an increase in value. However, market participants would typically not pay more for an investment in this type of company before key uncertainties were resolved. (This situation illustrates the way that value accretes in early stage biotech investing. The existence of identifiable milestones in the process of drug development, much like with drilling wells in oil and gas exploration, may cause investors to increase their required rate of return due to the possibility of discovering an unfavorable result (or a "dry hole") very soon after their investment decision, since the appearance of making a "bad bet" can be costly to one's reputation. Please see the sidebar following paragraph 5.91, "Certainty-Equivalent Techniques," for a discussion of the way that risks may be resolved over time and the corresponding impact on valuation.)

# June 30, 2X12 – Additional Series A funding

**C.09.24** To acquire additional licenses and to fund further clinical trials and research efforts as planned, the company raised an additional \$10 million in Series A preferred

stock on May 15, 2X12. At the time of this follow-on financing, the company informed the funds that the clinical trials were progressing at a slower pace than initially planned, such that the original time to exit was now expected to be delayed by one year. There were no other changes to key management assumptions or expectations. A prominent academic paper had recently been published which suggested the possibility that compounds like those the company was targeting might have wider application than the company had initially identified. As a result, there were a number of potential investors who were seeking to be included in the next round of financing. Therefore, despite the delay in the clinical trials, the company was determined to maintain the pricing of the additional Series A round at \$1.00 per share. All three existing funds were given the opportunity to maintain their pro rata ownership shares in Series A, but only Renowned elected to participate in this additional round of financing by investing \$5 million, while a new third-party investor, Opportunity Ventures (Opportunity), contributed the other \$5 million.

#### Renowned

- **C.09.25** Given the proximity of the financing round to the upcoming quarter-end, Renowned performed its analysis as of June 30, 2X12. Renowned evaluated its investment in Series A using two different methods:
  - Subject company transaction (primary)
  - Scenario analysis (corroborative)
- **C.09.26** Due to the fact that a new third-party investor participated at the same price as Renowned's original (and follow-on) investment, Renowned believed this provided evidence that Series A shares continued to have a value equal to their original cost of \$1 per share. This view was further supported by the fact that a new investor had paid the same entry price, suggesting that \$1 was a potential minimum value; it was further supported by the fact that the \$1 price could represent a maximum value as well. So based solely on the behavior of the original funds and the new investor, Renowned believed its follow-on investment was properly valued at its \$1 per share cost.
- **C.09.27** In addition, Renowned's initial investment (transaction date of July 19, 2X11) was also valued at \$1. Although Series A shares had dividend rights, they accumulated only if declared, and Lotus had declared no dividends as of June 30, 2X12. Thus, there was no basis for valuing the initial tranche, which ranked pari-passu with the second tranche, at a higher value.
- **C.09.28** To corroborate its concluded value of \$1 per share, and to provide a basis for future updates, Renowned also updated its scenario methodology:

• Value of company at time of exit	\$325 million
• Pre-IPO dilution due to future financing	50% (adjusted given the financing received)
• Number of shares at IPO	50.0 million
• Exit value, Series A per share	\$6.50
Probability of successful IPO	30 percent
Adjusted future value	\$1.95
• Present value, 3 years @ 25%	\$1.00

# <u>SGCM</u>

- C.09.29 Although SGCM elected not to participate in the new Series A financing, its management team generally agreed that the presence of a new investor provided evidence that the value of the Series A investment was still \$1 per share as of May 15, 2X12. As of June 30, 2X12, nothing had changed, and SGCM continued to mark its Series A shares at a value of \$1.00 per share.
- C.09.30 To calibrate its model for future measurement dates, SGCM updated its model to include the new transaction. Given the delay already observed, SGCM qualitatively adjusted its expectations around the expected exit date to June 2X16, an additional year beyond the company's estimate. Although this had no impact on the May/June 2X12 measurements, this revision in expectations would likely affect future updates. Based on an updated analysis of the guideline public companies, SGCM applied a volatility assumption of 110% reflecting the increased risk in the investment and increased volatility in the market. The implied aggregate value as of May 15, 2X12 was \$24.3 million, an increase of \$10.4 million, approximately equivalent to the new investment. The increase did not exactly match the \$10 million investment due to changes in the expected timing of exit and volatility.

# **Thundercloud**

- **C.09.31** Thundercloud concluded that, given the recent arms-length investment and the fact that no significant milestones had been achieved to date, their investment remained at the original cost of \$1.00 per share. However, this fund remained the most pessimistic in terms of exit values, timing, and other key inputs:
  - A sale of the company was more likely than an IPO.
  - It would take approximately 4-5 years to achieve an exit; an increase relative to initial expectations, consistent with the update provided by management.
  - The best case would be an earlier sale, now reset to the four-year point.
  - A delayed sale (year 5) would result in more dilution, and be less likely to provide a return to common stockholders.

**C.09.32** Thundercloud indicated that it would develop a quantitative calibrated model for valuing its investment if it became necessary at future measurement dates when a new round of financing was not available.

# Summary

**C.09.33** As of this measurement date, each of the three funds valued its Series A shares at an identical price of \$1.00 per share.

	<u>Renowned</u>	<u>SGCM</u>	Thundercloud
Future Exit Value	\$97.5m (\$48.75m for current shares)	N/A	N/A
Present Value of Equity	\$25.0m	\$24.3m	\$25.0m
Latest Round Value	\$1.00	\$1.00	\$1.00
Change since latest round	N/A	N/A	N/A
Series A Fair Value	\$1.00	\$1.00	\$1.00

# Comparison of the Funds' Approaches: June 30, 2X12 Valuation

# Task Force Observations – June 30, 2X12 Valuation

**C.09.34** A follow-on round among existing investors may or may not represent fair value, as investors and the company have less incentive to negotiate aggressively when the new financing impacts only the same investors. See paragraph 10.31 for a discussion regarding calibration to insider financing rounds. In this case, however, a new investor participated in the financing, while certain of the previous investors did not participate, and thus, the transaction reflected an arm's-length price. All three funds calibrated their valuation models to the new financing, resulting in the same estimated fair value for the Series A.

# June 30, 2X13 – Series B Financing

- C.09.35 The company's clinical trials had produced results in line with expectations to date. The company sought to implement an accelerated strategy and, therefore, decided to build an ancillary R&D facility to supplement the number of tests it could run in parallel on its lead product. In order to fund these initiatives, the company raised another \$10 million in a new Series B round on June 1, 2X13. The Series B round included Renowned (\$5 million), Opportunity, and other new investors, but did not include SGCM or Thundercloud.
- **C.09.36** The Series B shares were issued at \$1.50 per share and had standard terms, including economic rights such as a 1x liquidation preference and a 1x conversion

option, as well as control features similar to those granted the Series A shares. The Series B shares were pari passu with Series A.

# Renowned

**C.09.37** Renowned updated its scenario analysis to reflect the new facts and circumstances as of the measurement date, all calibrated to its investment in the new B round. In particular, for the upside scenario, they assumed that the company could complete an IPO or sale at a valuation of \$350 million (compared to \$325 million in their original model) in two years, with a 20 percent probability, and a second scenario in which the company could complete an IPO at a valuation of \$300 million in three years, with a similar 20 percent probability. As at the initial transaction date, Renowned estimated the total shares at exit using the estimated remaining capital needed and the estimated average pricing over the period. In the downside scenario, they assumed that neither their Series A nor B investment would receive value from its liquidation preference, but due to the company's progress, the probability of this scenario was now reduced from 70 percent to 60 percent. The three scenarios were as follows:

• Value at exit	\$350 million	\$300 million	N/A
Pre-exit dilution	35%	40%	
Shares at exit	48.7 million	52.8 million	
• B Value per share	\$7.18	\$5.68	
• Time to exit	2 years	3 years	
• PV @ 25%	\$4.60	\$2.91	
Scenario probability	20%	20%	60%
• Weighted PV (rounded)	\$0.92	\$0.58	\$0.00

**C.09.38** Since the future exit value per share exceeds both the Series A and Series B preferences, both classes would receive identical values in these two success scenarios, and neither would receive any value in a downside scenario. The calibrated scenario analysis, therefore, resulted in an identical revised value of \$1.50 per share for Renowned's Series A shares (\$0.92 + \$0.58 from the preceding table).

#### SGCM

**C.09.39** Although the fund again declined to participate in the new round, SGCM updated its OPM model, once again calibrating, this time, to the new B round value. Consistent with its previous model, SGCM used an expected time to liquidity of three years. Given the company's apparent progress toward its objectives, the fund reduced the volatility assumption to 100 percent. This approach resulted in an implied value for its Series A shares of \$1.38, considering the difference in rights

between the Series A preferred and the Series B preferred stock. SGM used this value at both June 1 and June 30, 2X13.

# Thundercloud

- **C.09.40** This fund, like SGCM, did not participate in the Series B round, and updated its scenario analysis utilizing Series B round pricing information, along with its more conservative (pessimistic) assumptions with respect to exit values, timing, probability and dilution:
  - A sale of the company was more likely than an IPO
  - It would take approximately 3-4 years to achieve an exit
  - The best case would be an earlier sale, now reset to the three-year point
  - A delayed sale (year 4) would result in more dilution, and be less likely to provide a return to common stockholders
- C.09.41 Since the Series B investors will control the decisions regarding future financings, and the Series B shares have a higher liquidation preference, Thundercloud concluded that the Series A would be priced at a discount to the Series B. Thundercloud judgmentally applied a discount of 10%, consistent with their view of market participants' assumptions, marking Series A at \$1.35 per share, based on the fund's assessment of the price at which market participants would transact considering the impact of the difference in liquidation preferences and risk profile between the Series A and Series B preferred. Thundercloud performed a reasonableness test to provide additional documentation supporting the 10% judgmental discount, as follows:
  - With a 40% success scenario (all convert) and 60% failure scenario, Series A and Series B would have the same value
  - With a 30% success scenario (all convert) and 70% failure scenario, Series A and Series B would both have 25% less value. This outcome reflected the fund's internal perspective that other companies were pursuing this indication and might get to market more quickly, and is why Thundercloud chose not to invest.
  - With a 10% success scenario (all convert), 30% delayed exit scenario (low value sale in which Series A and Series B each receive their liquidation preference), and 60% failure scenario, Series A would have the same value as Series B in every scenario except the delayed exit, in which case the Series A would receive 33% less value than Series B.

**C.09.42** Thus, weighting this difference by the 30% probability of a delayed exit, the fund arrived at a weighted exit value 10% less than Series B. Thundercloud, therefore, concluded that the value of its Series A shares was \$0.15 less (a 10% discount) than the newly issued Series B shares, or \$1.35, as follows:

• Probability	70% (success	or failure)	30% (delayed exit)
Series A discourse Series B	nt to 0%		33%
Weighted avera discount to Seri	nge Series A es B	10%	
• A Value per sha	are	\$1.35	

#### <u>Summary</u>

C.09.43 As of this measurement date, Renowned's scenario analysis resulted in an increase in the value of its Series A shares from \$1.00 to \$1.50 per share. SGCM's OPM model resulted in an increase from \$1.00 to \$1.38 per share. Thundercloud's scenario analysis included a low exit value resulted in an increase from \$1.00 to \$1.35 per share.

	Renowned	SGCM	Thundercloud
Future Exit Value	\$130m (\$81.5m for current shares)	N/A	N/A
Present Value of Equity	\$47.5m	\$43.4m	\$47.5m
Latest Round Value	\$1.50	\$1.50	\$1.50
Change since latest round	N/A	N/A	N/A
Series B Fair Value	\$1.50	\$1.50	\$1.50
Series A Fair Value	\$1.50	\$1.38	\$1.35

# Comparison of the Funds' Approaches: June 30, 2X13 Valuation

# Task Force Observations – June 30, 2X13 Valuation

C.09.44 At this valuation date, all three funds calibrated to the Series B financing. However, Renowned still assumed that if the company was successful, the future exit values would be high enough that the Series A and Series B would both convert, and that if the company was not successful, the value for both classes of preferred stock would be zero. SGCM used an OPM approach to estimate a lognormal distribution of outcomes, where the higher liquidation preference for the Series B preferred indicated that this class had a slightly higher value than the Series A preferred. Thundercloud used a relative value scenario analysis approach, considering a probability of a low value exit where both classes would receive their liquidation preference, as well as a probability that all classes would receive the same value at exit. The differences in the assumed future distribution of outcomes resulted in slightly different estimates of the fair value of the Series A preferred. (The three different analyses illustrate the different perspectives that market participants have regarding the importance of liquidation preferences and the range of values reflecting the inherent estimation uncertainty for illiquid investments when there are no observable market prices, as discussed in chapter 8, Q&A 14.11 and Q&A 14.53.)

**C.09.45** Market participants in the private equity and venture capital industry include funds that have a range of viewpoints on the value of different portfolio companies, with some funds taking a more optimistic view for certain companies and less optimistic view of others, and vice versa. The range of views reflects the inherent estimation uncertainty for these illiquid investments. Calibration helps to reduce the estimation uncertainty, but in most cases involving early stage companies, absent a sale of the entire company, funds would not have an opportunity to sell equity interests acquired in a prior financing round, so only the latest round price is observable. In this example, all three funds calibrated to the latest round using assumptions that were within a reasonable range, consistent with the range of market participant assumptions.

#### Delays Relative to Initial Milestones - June 30, 2X14

**C.09.46** The company experienced setbacks in achievement of established milestones throughout the twelve months ending June 30, 2X14, spending more cash than it had anticipated in advancing its lead product. In addition, preliminary tests indicated that the lead product candidate was at least 8 to 12 months behind schedule. Notwithstanding the potential delays, the company believed that its preliminary test and findings indicate an unchanged likelihood of technical success. Lotus reached out to its existing investors at the beginning of the year to seek additional financing of \$5 million in the form of a Series C round. However, given the challenges in raising capital between milestones, the investors were able to negotiate both seniority and a 2x liquidation preference. On April 25, 2X14, two of the original Series A investors (Renowned and SGCM) agreed to invest; Thundercloud and the other previous investors did not. The Series C shares were issued at \$0.50 per share.

#### Renowned

**C.09.47** Renowned updated its scenario analysis to reflect the new Series C price of \$0.50 per share. To calibrate its model to the new round, Renowned first adjusted the estimated time to exit based on its assessment of new company and industry information, and reduced the amount of expected pre-exit dilution to account for the shares issued in the C round. Although based on the fund's evaluation of the science and the rationale for the delay, Renowned considered the probability of technical

success to be unchanged, Renowned also noted that the delay made it more likely that a competitor would get to market first, resulting in a lower expected value at exit. Renowned's updated analysis was as follows:

•	Value at exit	\$150 million	\$100 million	N/A
٠	Pre-exit dilution	30%	35%	
•	Shares at exit	59.5 million	64.1 million	
٠	C Value per share	\$2.52	\$1.56	
•	Time to exit	2 years	3 years	
٠	PV @ 25%	\$1.61	\$0.80	
٠	Scenario probability	20%	20%	60%
٠	Weighted PV (rounded)	\$0.32	\$0.16	\$0.00

**C.09.48** This analysis indicated a significant decline in the value of both Series A and B shares, which would receive identical values to the Series C shares in all exit scenarios. Renowned noted that the Series C shares had an aggregate liquidation preference of \$10 million, as compared to the "as converted" value of \$25,200,000 or \$15,600,000 in the two scenarios above where there was any value to the equity, calculated based upon the price per share referenced above applied to the 10.0 million common shares issuable upon conversion of the Series C shares. At this time, Renowned also considered revising its discount rates for the now junior Series A and B shares, to reflect their increased risk. However, given the ongoing requirement for future financing, the fund elected to utilize the same required rate of return for all classes of equity, concluding that the values of its Series A and B shares should each be marked down to \$0.50 per share (rounded from \$0.32 + \$0.16 per share from the preceding table).

#### **SGCM**

- **C.09.49** SGCM continued to employ its OPM methodology, but noted that a known issue with the OPM is that it may overstate the difference in value between senior and junior liquidation preferences, due to the "sandwich" problem as discussed in paragraph 8.48c. Therefore, SGCM considered the 2x liquidation preference and seniority to be a negotiation discount, reflecting the company's need for investment to survive, and solved for the total equity value as though Series C was *pari passu* with the earlier rounds and had a 1x liquidation preference. This approach, which adjusted the inputs to the model to eliminate the potential impact of the "sandwich" problem, discounted the seniority and 2x liquidation preference, consistent with market participant expectations that these features would rarely come into play at the ultimate exit, given the fact that the Series A and Series B still have significant influence over the timing of exit and would not have any incentive to exit at a low valuation, and considering the additional financing required to reach the exit event.
- **C.09.50** Using this approach, SGCM backsolved to the new Series C price assuming standard rights as discussed above to estimate the total equity value, utilizing the

new, extended estimated time to exit, and then reallocated that equity value incorporating the actual rights for the Series C shares. The fund's key model inputs were as follows:

- Series C terms
  - value \$0.50; liquidation preference \$0.50; pari passu with A, B (to solve for the equity value)
  - liquidation preference \$1.00, senior to A, B (to allocate)
- Time to liquidity event: 3 years
- Volatility: 100%
- C.09.51 SGCM's model indicated a total equity value of \$23.6 million, compared with the total invested capital of \$35.0 million (\$20 million Series A, \$10 million Series B, \$5 million Series C). After reallocating including the seniority, SGCM's model indicated a value for Series C of \$0.83 per share, less a calibrated negotiation discount of 40%, concluding on \$0.50 per share matching the transaction price, and a value for Series A of \$0.49 per share, without a negotiation discount since Series A and Series B are junior and in aggregate have control of the exit.
- C.09.52 For comparison, SGCM also calculated the total equity value and Series A value using the OPM backsolve model considering the full Series C rights, noting that with this approach, the indicated total equity value was \$11.5 million and the Series A value declined to \$0.21 per share. Given the factors that led to the delay and the company's potential, SGCM concluded that the higher equity value and resulting Series C and Series A values were more reasonable, and marked the investment at \$0.50 per share for the Series C and \$0.49 for the Series A.

#### **Thundercloud**

- C.09.53 As discussed above, this fund elected not to participate in the new Series C financing. Thundercloud did not believe the company's prospects supported the \$0.50 per share price. Thundercloud judgmentally applied a discount of 15%, marking Series A at \$0.43 per share. Thundercloud indicated that this discount was consistent with their sensitivity analysis, as follows:
  - With a 40% success scenario (all convert) and 60% failure scenario, Series A and Series C would have the same value.
  - With a 20% success scenario (all convert) and 80% failure scenario, Series A and Series C would both have 50% less value. This outcome reflected the fund's internal perspective regarding the competitive market, considering the additional delays.

- With a 10% success scenario (all convert), 30% delayed exit scenario (low value sale in which Series C receives its liquidation preference but Series A and Series B receive only half their liquidation preference), and 60% failure scenario, Series A would have 50% less value than Series C in 30% of the outcomes, indicating a value 15% less than Series C.
- **C.09.54** The fund concluded that the value of its Series A shares was \$0.43 per share.

•	Probability	70% (success or failure)	30% (delayed exit)
•	Series A discount to Series C	0%	50%
•	Weighted average Series A discount to Series B	15%	
٠	A Value per share	\$0.43	

# <u>Summary</u>

**C.09.55** As of this measurement date, Renowned had invested in all three Series; SGCM had invested in Series A and C; Thundercloud had invested only in Series A. The various methods and assumptions employed by each fund to value Series A, B and C shares produced the following fair value estimates:

	A	В	С
Renowned	\$0.50	\$0.50	\$0.50
SGCM	\$0.49	N/A	\$0.50
Thundercloud	\$0.43	N/A	N/A

	Renowned	SGCM	Thundercloud	
Future Exit Value	\$50.0m (\$34.0m for current shares)	N/A	N/A	
Present Value of Equity	\$20.8m	\$23.6m	N/A	
Latest Round Value	\$0.50	\$0.50	\$0.50	
Change since latest round	N/A	N/A	N/A	
Series C Fair Value	\$0.50	\$0.50	N/A	
Series B Fair Value	\$0.50	N/A	N/A	
Series A Fair Value	\$0.50	\$0.49	\$0.43	

# Comparison of the Funds' Approaches: June 30, 2X14 Valuation

# Task Force Observations – June 30, 2X14 Valuation

# Bridge Note – December 31, 2X14

C.09.57 The company made progress on its clinical trials, but continued to experience increased levels of working capital and cash flow requirements throughout 2X14. On December 31, 2X14, Lotus issued \$10 million in bridge notes to Renowned. The bridge notes carried an 8 percent paid-in-kind (PIK) interest rate and have a 1-year maturity. The bridge notes are convertible (principal plus accrued interest) to the next round at a 25 percent discount if a qualified financing occurs or into Series C at \$0.50 if no qualified financing occurs. The agreement between Renowned and the company defined a qualified financing as being one that raised at least \$50 million in equity capital, which was deemed sufficient funding to get the company through to its next significant milestone in advancing the product. In addition, the

**C.09.56** At this valuation date, all three funds calibrated to the Series C financing. Given the company's continued need for capital, Renowned still considered it to be unlikely that the superior liquidation preference would provide a different payoff for the Series C when compared with the Series A and Series B preferred, and therefore estimated the same fair value for all three classes. SGCM and Thundercloud continued to employ their selected methodologies and estimated a slight difference between the fair value of the Series A and the Series C price. As discussed previously, all three funds selected assumptions that were within a reasonable range, consistent with the range of market participant assumptions, reflecting the inherent estimation uncertainty, as discussed in chapter 8, Q&A 14.11 and Q&A 14.53.

holders of the bridge notes received 20 percent warrant coverage (on either the next round or on Series C), independent of whether the qualified financing occurs.

# Renowned

- C.09.58 The bridge note transaction did not provide any information about the company's enterprise or equity value, and there were no internal or external developments that would cause the fund to revise its previous estimates of fair value for its preferred stock holdings. To calibrate to the \$10 million investment, Renowned developed a two-scenario framework. Observing that:
  - a successful Series D round provides a 1.333x return on the note principal (1 / 0.75, reflecting the 25% discount on the conversion price relative to the next round price), plus potential upside for the warrants
  - failure to obtain a Series D round is effectively a liquidation scenario in which the note would be in a senior position and the warrants would likely be worthless
- C.09.59 Renowned then assessed the probability of a successful Series D round at 50%, approximately consistent with previous probabilities of successful exit scenarios. The fund then valued the warrants using a forward Black-Scholes model with the following inputs:
  - Underlying asset Series D preferred with a one-year forward value equal to \$2.88 million
    - Note value in one year: \$10.8 million x 1.333 = \$14.4 million
    - Warrant coverage: \$14.4 million x 20% = \$2.88 million underlying
  - Time to liquidity event
    - 1.5 years from issue date of Series D preferred and warrants
    - 2.5 years from measurement date
  - Volatility 75% (lower than forward enterprise volatility of 90% since preferred stock is less volatile than the overall equity)
  - Strike price at-the-money, \$2.88 million
- C.09.60 This analysis resulted in an aggregate warrant value of \$1.044 million; when weighted by the 50% probability of a successful Series D round, the warrants were allocated a value of \$522,000, resulting in an implied value of \$9.478 million for the note principal.
- **C.09.61** Consistent with this framework, the note principal would have a value at the time of a Series D issuance (one year in the future) of \$10.8 million x 1.333 = \$14.4 million, with a probability of 50%. If no Series D round is obtained, the note would have a contractual payoff of \$10.8 million in one year. The expected return on investment for the bridge note of 33% based on the cash flows considering the contractual payoff upon conversion or at maturity, was calculated as the implicit

risk-adjusted discount rate that resulted in a value of \$9.478 million. Renowned considered this required rate of return to be reasonable given the risk that the company might not obtain the Series D financing.

# <u>SGCM</u>

- C.09.62 Before performing any analysis, SGCM considered the appropriate methodology. Since the new bridge financing did not provide information about the company's valuation, SGCM chose to consider the bridge note outside the OPM. SGCM considered the bridge note impact on the volatility of the other equity. In light of the company's progress but considering the delays in reaching the next milestone, SGCM considered the total equity value to be unchanged from the previous valuation date.
- C.09.63 The following inputs were employed:

•	Aggregate equity value	\$23.6 million
•	Volatility	Increased to account for bridge note leverage
•	Time to exit	2.5 years (June 2017)

This methodology produced estimates of value that were approximately equivalent to the June 30, 2X14 results.

# Thundercloud

**C.09.64** Thundercloud updated its scenario and sensitivity analysis, using a similar methodology as at previous measurement dates.

	Renowned	SGCM	Thundercloud
Future Exit Value	\$50.0m (\$34.0m for current shares)	N/A	N/A
Present Value of Equity	\$20.8m	\$23.6m	N/A
Latest Round Value	\$0.50	\$0.50	\$0.50
Change since latest round	N/A	N/A	N/A
Note	\$9.5m	N/A	N/A
Warrants	\$0.5m	N/A	N/A
Series C Fair Value	\$0.50	\$0.50	N/A
Series B Fair Value	\$0.50	N/A	N/A
Series A Fair Value	\$0.50	\$0.49	\$0.43

# Comparison of the Funds' Approaches: December 31, 2X14 Valuation

# Task Force Observations – December 31, 2X14 Valuation

**C.09.65** Because it is so difficult to raise capital between major milestones, funds typically plan ahead to avoid such financings, and orderly third-party transactions between milestones are rare. When the company needs to raise capital between milestones, funding is most often provided by one or more of the existing investors, and may be in the form of a convertible bridge note as shown in this example. Since such notes typically convert into the next round of financing at a discount to the next round price, they are a form of share-settled debt, and do not provide an indication of the fair value of the equity interests. The estimation uncertainty in valuing the equity interests at such measurement dates will be higher than at dates when there is a recent equity financing round. It is important to assess the change in fair value relative to the previous measurement date, given the lack of new information about the company's progress toward meeting its milestones, as discussed in the sidebar following paragraph 5.91, but also considering the investors' willingness to provide additional funding at a price to be determined at the next financing round.

# Positive Clinical Trial Results - September 30, 2X15

**C.09.66** After years of delays and disappointments, the company announced that tests were showing promising results, and the company had received significant interest from a strategic investor. Management represented that the expected time to Phase 2 approval was on track for June 2X17, with a probability of 60 percent. The funds

revised their target value at exit upward to a range of \$400 to \$450 million. All three funds updated their models:

- Renowned recalibrated its scenario model to the new assumptions, assigning a 40% chance to a value of \$450 million, a 20% probability of an exit value of \$400 million and a 40% probability of failure, resulting in zero value.
- SGCM developed a revised estimate of aggregate equity value based on market and income approaches.
- Thundercloud made adjustments to its analysis to consider the higher potential exit values.

# Series D Financing - November 15, 2X15

C.09.67 Reflecting the positive, although still preliminary, indications, the company and the strategic investor agreed to enter into a Series D round at \$3.00 per share for an aggregate amount of \$60 million. The Series D shares are pari passu with Series C, and senior to the Series A and B; like the Series C, they are entitled to a 2.0x liquidation preference. This structure was considered a qualified financing, and triggered the conversion of Renowned's bridge notes:

Accrued balance	\$10.7 million
Conversion price per D share	\$2.25 (a 25% discount to the \$3 price)
Number of D shares	4,755,556
Number of D warrants	951,111
Exercise price	\$3.00

# Renowned

**C.09.68** This fund now held positions in every financing round. Renowned updated its scenario analysis, given the new financing. Since with the new investment, the Series C and Series D would have control over the timing of exit, and since there was a greater likelihood of mid-value exits that would return value to the Series C and Series D, but less value or no value to the junior equity interests, Renowned concluded that the liquidation preferences would have some value, and that the risk profile for the senior equity interests was lower than the risk profile for the junior equity interests. Therefore, in calibrating to the financing, Renowned considered a 20% discount rate for the Series C and Series D, given their seniority, and a 25% discount rate for Series A and Series B. Renowned considered the following scenarios:

	High sale	Mid sale	Low sale	Dissolution
Value at exit	\$450 million	\$400 million	\$25 million	\$0 million
Pre-exit dilution	0%	0%	N/A	
<b>Residual Shares at exit</b>	68 million	68 million	N/A	
D Value per share	\$6.62	\$6.00	\$0.95	
Time to exit	1.75 years	1.75 years	1 year	
PV @ 20%	\$4.81	\$4.36	\$0.79	
Scenario probability	40%	20%	25%	15%
Weighted PV (rounded)	\$1.92	\$0.87	\$0.20	\$0.00

C.09.69 The Series D warrants, which would not be expected to survive a sale of the company, were initially valued with a Black-Scholes model assuming a 1.75 year time to exit. The resulting value was then multiplied by the 60% probability of a successful exit, i.e., a High or Mid sale that would provide a potential payoff given the \$3.00 strike price.

C.09.70 The Series C shares had a value of \$2.80 per share, based on the following payoffs:

C Value per share	\$6.62	\$5.85	\$0.16	\$0.00
Time to exit	1.75 years	1.75 years	1 year	
PV @ 20%	\$4.81	\$4.25	\$0.13	
Scenario probability	40%	20%	25%	15%
Weighted PV (rounded)	\$1.92	\$0.85	\$0.03	\$0.00

C.09.71

The Series A and B shares had a (rounded) value of \$2.60 per share, as follows:

A/B Value per share	\$6.62	\$5.85	NA	NA
Time to exit	1.75 years	1.75 years	1 year	
PV @ 25%	\$4.48	\$3.96	\$0.00	
Scenario probability	40%	20%	25%	15%
Weighted PV	\$1.79	\$0.79	\$0.00	\$0.00

# <u>SGCM</u>

C.09.72 This fund did not participate in the new Series D round, but considered the new transaction to represent an arms-length value, and elected to stay with its OPM methodology. However, since Series D was senior with a 2x liquidation preference, SGCM determined a backsolve approach using the Series D price would understate the equity value, as discussed in paragraphs 8.30 a-g. Key assumptions were as follows:

- Total equity value \$145 million
  - Previous equity value of \$23.6m \* 3x
  - Plus new Series D investment (\$60m + 10.7m \* 1.3333)
- Time to exit 2.0 years
- Volatility 80%
- Terms of C, D Per investor agreement
- **C.09.73** The adjustments above resulted in an implicit negotiation discount of approximately 20% with respect to the Series D round, and produced values for the Series A and C shares of \$1.24 and \$1.54, respectively.

#### Thundercloud

C.09.74 Thundercloud noted that the senior liquidation preference was \$159 million, and thus, in any exits with a value of less than \$159 million, Series A would receive no return. Thundercloud estimated the probability of an exit at or below \$159 million as 40%, considering the competitive environment and the company's operational track record to date. In addition, the company would need to reach an equity value of approximately \$400 million for all shares to convert. Therefore, Thundercloud marked the Series A at a discount of 50% to the Series D price, or \$1.50 per share. Similar to previous measurement dates, Thundercloud performed a calculation supporting this conclusion as follows:

•	Probability	10% (high value exit)	50% (mid value exit)	40% (low value exit)
•	Series A discount to Series D	0%	20%	100%
•	Weighted average Series A discount to Series D		50%	
•	A Value per share		\$1.50	

#### Summary

**C.09.75** As of this measurement date, Renowned had invested in all four Series; SGCM had invested in Series A and C; Thundercloud had invested only in Series A. The various methods and assumptions employed by each fund to value Series A and C shares have produced the following differences:

•	Renowned	(A, B) \$2.60	(C) \$2.80	(D) \$3.00
٠	SGCM	(A) \$1.24	(C) \$1.54	
•	Thundercloud	(A) \$1.50		

	Renowned	SGCM	Thundercloud
Future Exit Value	\$266.3m	N/A	N/A
Present Value of Equity	N/A	\$145.0m	N/A
Latest Round Value	\$3.00	\$3.00	\$3.00
Change since latest round	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Series D Warrants Fair Value	\$0.71	<u>N/A</u>	<u>N/A</u>
Series D Fair Value	\$3.00	<u>N/A</u>	<u>N/A</u>
Series C Fair Value	\$2.80	\$1.54	<u>N/A</u>
Series B Fair Value	\$2.60	<u>N/A</u>	<u>N/A</u>
Series A Fair Value	\$2.60	\$1.24	\$1.50

# Comparison of the Funds' Approaches: November 15, 2X15 Valuation

# Task Force Observations – November 15, 2X15 Valuation

- **C.09.76** The positive clinical trial results and the successful Series D financing indicated a higher value for the company and for the various equity interests as of this date. However, the combined Series C and Series D liquidation preferences were over \$150 million, indicating that a high exit value was needed for the Series A and Series B preferred to have value. Renowned's view was that there was a significant probability of such a high exit value, along with a smaller probability of a low value or zero value at exit, resulting in slight differences in value between the Series D, Series C and Series A and B preferred. Renowned performed a detailed scenario analysis to support its estimates. SGCM and Thundercloud continued to use the OPM and relative value scenario analysis approaches, respectively, placing more weight on the mid-value exits where the liquidation preferences had an impact. This difference in assumptions led to significantly different estimates of the fair value of the Series A and Series B preferred stock.
- **C.09.77** Given the inherent estimation uncertainty, this wide range of estimates for the fair value of these equity interests was still reasonable, reflecting the range of market participant views. In particular, since the company had received positive clinical trial results, a mid-value sale exit would be possible, and as investors in the earlier rounds of financing, SGCM and Thundercloud deemed it appropriate to consider the likelihood of such an exit. This view provided a lower estimate of the fair value for the Series A and the Series B preferred, considering the rights associated with

those investments. Renowned, on the other hand, expected the company to continue to push through the next stage of clinical trials, seeking a higher value exit but accepting the risk of a low or zero outcome, effectively assigning less value to the downside protection for the Series D preferred. Therefore, Renowned's estimate of the fair value of the Series A and the Series B preferred was a higher percentage of the Series D price.

#### Structured Exit – June 30, 2X17

**C.09.78** The company received Phase 2 FDA approval on March 31, 2X17. Subsequent to the receipt of the FDA approval, the Board discussed a structured exit with the strategic investor who led the Series D financing. The agreed exit included an immediate payment of \$150 million and milestone payments of: (a) additional \$100 million if the product receives final FDA approval to go to market, and; (b) additional \$50 million if product reaches \$200 million in sales in any year within five years of launch. In addition, in order to incentivize the Series A and Series B investors to agree to the transaction and to provide an incentive for management to stay with the company to complete the clinical trials as requested by the buyer, the preferred investors agreed to waive their additional liquidation preferences, so that the junior equity interests, including the common stock, would share pro-rata in the earnouts. As part of the structured exit, the acquirer agreed to fund future R&D requirements on the product.

#### Renowned

C.09.79 As discussed above, the immediate payment of \$150.0 million was allocated among the various equity classes, based on their contractual rights and preferences. Based on the size and seniority of the various equity classes' liquidation preferences, the immediate payment was allocated pro-rata amongst the Series C (\$0.93 per share) and D (\$5.58 per share) preferred stock, plus the Series D warrants (\$2.58 per warrant, equal to the D value net of the \$3.00 strike price). The following table details the total amounts allocated to each series.

	\$ Initial 150,000,000 Payment
Series A Preferred	\$ -
Series B Preferred	\$ -
Series C Preferred	\$ 9,306,706
Series D Preferred	\$ 138,235,602
Common Stock	\$ -
Series D Warrants at \$3.00	\$ 2,457,693
Total	\$ 150,000,000

- **C.09.80** To determine the value attributable to each series based on the contingent milestone payments, Renowned developed a two-stage model using the following assumptions:
  - Milestone One: FDA Approval

Management estimated that the company's product will receive FDA approval in approximately 3.0 years with 70 percent certainty. The first milestone payment of \$100.0 million is to be paid immediately upon receiving FDA approval.

• *Milestone Two: Revenue Hurdle* 

Management provided the following revenue forecast for the five years immediately following FDA approval:

Year One	\$20 million
Year Two	\$50 million
Year Three	\$90 million
Year Four	\$135 million
Year Five	\$190 million

The second milestone payment of \$50.0 million will be paid at the end of the first year of the five-year period in which the company's sales exceed \$200 million.

# Methodology

#### Milestone One: FDA Approval

- **C.09.81** The value attributed to the FDA Approval milestone was calculated for each equity class using a probability-adjusted discounted cash flow analysis. First, the future milestone payment of \$100.0 million was allocated across the various equity classes pro rata with fully diluted share ownership, as discussed above.
- **C.09.82** Next, the future payments were risk-adjusted and discounted using an appropriate discount rate. In this case, the funds estimated that the probability of the company's product receiving FDA approval to be 70 percent, based on the typical Phase 2 to final approval rates and considering the specific relative likelihood of approval for this product considering its scientific underpinnings and clinical trial experience to date. Since the FDA Approval milestone is not subject to market correlated (systematic) risk, the appropriate discount rate is the risk-free rate (1.5% for 3 years) plus an estimate of counterparty risk. Given the large pharmaceutical company's credit spread, the estimated credit spread of 100 basis points, for a total discount rate of 2.5%. Next, the probability adjusted cash flows for each equity class were discounted to the measurement date, June 30, 2X17, and are summarized in the following table.

\$100,000,000 Payment - FDA Approval												
	All	ocated Value	Probability	A	Probability Weighted Ilocated Value	Discount Period	Discount Rate		PV			
Series A Preferred	\$	29,685,335	70.0%	\$	20,779,735	3.00	2.5%	\$	19,278,263			
Series B Preferred	\$	9,895,112	70.0%	\$	6,926,579	3.00	2.5%	\$	6,426,088			
Series C Preferred	\$	14,842,668	70.0%	\$	10,389,867	3.00	2.5%	\$	9,639,132			
Series D Preferred	\$	36,743,849	70.0%	\$	25,720,694	3.00	2.5%	\$	23,862,206			
Common Stock	\$	7,421,334	70.0%	\$	5,194,934	3.00	2.5%	\$	4,819,566			
Series D Warrants at \$3.00	\$	1,411,702	70.0%	\$	988,192	3.00	2.5%	\$	916,788			
Total	\$	100,000,000		\$	70,000,000			\$	64,942,044			

# Milestone Two: Revenue Hurdle

**C.09.83** Since the revenue earn-out is path-dependent and reflects market-correlated risk, Renowned engaged a specialist to perform a Monte Carlo simulation model. The Specialist simulated the earn-out payment in a risk-neutral framework to simulate future revenue levels for the company for each of the five years immediately following FDA approval. These simulated revenue levels were used to determine if and when the company's sales exceed \$200 million in any annual period.

# C.09.84 The model utilized the following assumptions:

- The revenue forecast for each post-launch year (see previous table) was discounted to the measurement date at a risk-adjusted discount rate reflecting the risk of the underlying metric, considering the company's cost of capital adjusted for operational leverage
- The measurement date present value of each year's revenue forecast was then simulated forward based on estimated revenue volatility
  - The first year was simulated through year 4 (three years to approval plus the first year of revenues), using a mid-period convention
  - The second year was simulated through year 5, etc.
- **C.09.85** In cases where the revenue hurdle was met, the pro rata payoff to each equity class was determined based on the \$50.0 milestone payment. The simulated payoffs were then discounted to the measurement date using the risk-free rate corresponding to the year in which the revenue milestone was achieved, plus an estimated counterparty spread of 100 basis points, resulting in a valuation of \$1.32 million conditional on success.
- C.09.86 To account for the probability of FDA approval, the present value of the average payoffs to each equity class must be multiplied by 70 percent as the company's product would not generate any sales without FDA approval, resulting in a valuation of \$923,451. The resulting probability-weighted present value of the Revenue Hurdle Milestone for each equity class was as follows:

\$50,000,000 Payment - Revenue Milestone											
	Alle	ocated Value	Probability	W	eighted Allocated Value						
Series A Preferred	\$	391,613	70.0%	\$	274,129						
Series B Preferred	\$	130,538	70.0%	\$	91,376						
Series C Preferred	\$	195,807	70.0%	\$	137,065						
Series D Preferred	\$	484,730	70.0%	\$	339,311						
Common Stock	\$	97,903	70.0%	\$	68,532						
Series D Warrants at \$3.00	\$	18,623	70.0%	\$	13,036						
Total	\$	1,319,215		\$	923,451						

**C.09.87** Finally, to arrive at the total value for each equity class, the allocated values for each component of the structured exit are added, as summarized in the following table.

Allocated Present Value										
	\$	Initial 150,000,000 Payment	P	\$10 Payı A	00,000,000 ment - FDA Approval	\$50,000,000 Payment - Revenue Threshold			tal Allocated Value	Value Per Share
Series A Preferred	\$	_	\$		19,278,263	\$	274,129	\$	19,552,393	\$0.98
Series B Preferred	\$	-	\$		6,426,088	\$	91,376	\$	6,517,465	\$0.98
Series C Preferred	\$	9,306,706	\$		9,639,132	\$	137,065	\$	19,082,902	\$1.91
Series D Preferred	\$	138,235,602	\$		23,862,206	\$	339,311	\$	162,437,119	\$6.56
Common Stock	\$	-	\$		4,819,566	\$	68,532	\$	4,888,098	\$0.98
Series D Warrants at \$3.00	\$	2,457,693	\$		916,788	\$	13,036	\$	3,387,518	\$3.56
Total	\$	150,000,000	\$		64,942,044	\$	923,451	\$	215,865,495	

**C.09.88** Renowned used the preceding table to record its value per share for each Series. However, since the fund had already received payoffs for Series C and D shares and Series D warrants as of the measurement date, it recorded only the present value of additional net amounts expected to be received based on future milestones, \$0.98 per share, pari passu with Series A, B and common shares.

# <u>SGCM</u>

C.09.89 Like Renowned, SGCM developed a two-stage model to estimate the value of future contingent milestone payments for its Series A and C shares. Like Renowned, the fund estimated the probability of final FDA approval to be 70 percent, and calculated similar incremental values for its Series A and C shares. SGCM also obtained the company's revenue forecast. Instead of developing a Monte Carlo model, SGCM estimated the probability of the product reaching \$200 million in annual sales within the five-year post-launch period as follows:

• Year 1	0%
• Year 2	0%
• Year 3	0%
• Year 4	10%
• Year 5	20%

**C.09.90** These future amounts were allocated to each class of preferred, probabilityweighted, and discounted to June 30, 2X17 at a risk-adjusted discount rate of 15%, resulting in a valuation of \$218.5 million. (Compared with Renowned, the concluded values for Series A (\$1.02) and C (\$1.95) were incrementally higher under this simplified methodology.)

Allocated Present Value										
		Initial	\$100,000,000		\$50,000,000		<b>T</b>		Value Den	
	4	Payment	P	Approval	Threshold		Value		Share	
Series A Preferred	\$	-	\$	19,278,263	\$	1,069,887	\$	20,348,150	\$1.02	
Series B Preferred	\$	_	\$	6,426,088	\$	356,629	\$	6,782,717	\$1.02	
Series C Preferred	\$	9,306,706	\$	9,639,132	\$	534,943	\$	19,480,781	\$1.95	
Series D Preferred	\$	138,235,602	\$	23,862,206	\$	1,324,282	\$	163,422,090	\$6.60	
Common Stock	\$	-	\$	4,819,566	\$	267,472	\$	5,087,038	\$1.02	
Series D Warrants at \$3.00	\$	2,457,693	\$	916,788	\$	50,879	\$	3,425,360	\$3.60	
Total	\$	150,000,000	\$	64,942,044	\$	3,604,092	\$	218,546,136		

# Thundercloud

- **C.09.91** Although the fund considered performing an analysis similar to SGCM's, its management instead decided the likelihood that its Series A shares would receive any significant amounts based on the revenue threshold was remote, and elected to value these shares for financial reporting purposes at \$0.96 per share, based solely on the expected present value of the FDA approval milestone payment.
- C.09.92 Thundercloud calculated the expected present value of the Series A based on the FDA approval milestone payment by noting that the Series A investors were entitled to receive \$29,685,335 of the \$100 million FDA milestone payment. With a 70% probability of achieving the FDA approval, the expected future payment to Series A investors was \$20,779,735. The present value of this payment, discounted at 2.5% for a three-year period, was \$19,278,263. Finally, Thundercloud allocated this value to their investment, considering the 20.0 million Series A shares outstanding, 3.0 million of which (15 percent) were owned by Thundercloud. Accordingly, Thundercloud reported the fair value of its Series A shares at 15% of this present value, \$2,891,739.
|                                 | Renowned                    | <u>SGCM</u>                 | Thundercloud |
|---------------------------------|-----------------------------|-----------------------------|--------------|
| Future Exit Value               | N/A                         | N/A                         | N/A          |
| Present Value of Equity         | N/A                         | N/A                         | N/A          |
| Latest Round Value              | N/A                         | N/A                         | N/A          |
|                                 |                             |                             |              |
| Series D Warrants Fair<br>Value | \$0.98 +<br>\$2.58 realized | <u>N/A</u>                  | <u>N/A</u>   |
|                                 |                             |                             |              |
| Series D Fair Value             | \$0.98 +<br>\$5.58 realized |                             |              |
| Series C Fair Value             | \$0.98 +<br>\$0.93 realized | \$1.02 +<br>\$0.93 realized |              |
| Series B Fair Value             | \$0.98                      |                             |              |
| Series A Fair Value             | \$0.98                      | \$1.02                      | \$0.96       |

## Comparison of the Funds' Approaches: June 30, 2X17 Valuation

## **Task Force Observations**

- **C.09.93** The example illustrates the challenges associated with the valuation of early stage venture capital investments using market participant assumptions. Although all three funds had the same information available and considered market participant perspectives, the three different funds used alternative valuation methods and assumptions, leading to differing conclusions of fair value for identical equity interests at the same measurement date. These differing approaches all provided reasonable measures of fair value for financial reporting purposes, reflecting the inherent estimation uncertainty for these illiquid investments.
- **C.09.94** It is important to note that a more quantitative analysis does not necessarily provide a better fair value estimate it is most important to consider market participant assumptions and capture the directional change in value. Investors in early stage businesses often focus more on qualitative factors than on quantitative factors in determining whether and how much they will invest, and therefore, capturing these qualitative factors and the support for these factors is critical to understanding the valuation. These qualitative factors include but are not limited to the quality of the management team and business plan, the probability of technical success, the total addressable market, the competitive environment and who will be first to market, market pricing, short term and long-term cash needs, investor demand, potential

future dilution, the ultimate potential return, etc. See chapter 3, "Market Participant Assumptions" for additional discussion.

- **C.09.95** For early-stage companies, the expected outcomes may often be bimodal and liquidation preferences may have little impact on relative values of the first few rounds of financing. As the company matures, liquidation preferences may have a greater impact. There are many methodologies for capturing the valuation implications related to the rights and preferences associated with each round of financing, which may result in different estimates of value consistent with the inherent estimation uncertainty. See chapter 8, "Valuation of Equity Interests in Complex Capital Structures" for additional discussion.
- **C.09.96** The purpose of this example is to demonstrate that unrelated fund entities investing in the same portfolio company at the same transaction price on day 1, could end up with valuations at subsequent measurement dates that vary significantly based on their own respective views of the portfolio company's prospects as well as their perception of market participants' views of the company's prospects. This example is not meant to suggest that any one methodology outlined here is a better representation of fair value than the other methodologies. Instead, each fund should perform its own analysis of fair value based on information known and or knowable to them as well as what they believe would be known or knowable to market participants at the respective measurement dates, calibrating to the transaction prices from each round of financing.
- **C.09.97** Calibration to the price paid at various financing points is typically the best way to ensure that the quantitative support for the fund's fair value measurements is consistent with market participant pricing and the qualitative factors that drive value. It is often difficult to document quantitatively the specific factors which support the value of an ownership interest in an early stage business at various financing points, and it can be even more difficult to quantitatively demonstrate changes in value between financing points. These difficulties are compounded by the presence of multiple investors with differing views of market participant assumptions regarding the likely exit strategy and values that may be realized, time horizons, and investment philosophies. As illustrated by this example, examining the qualitative factors that drive value and then performing a quantitative assessment consistent with the qualitative analysis can be a reasonable means of documenting a valuation conclusion.

## Case Study 10 – Early Stage Software as a Service Startup with Binary Expected Outcomes

*Note:* This case study is provided to demonstrate concepts discussed in the preceding chapters of this guide and is not intended to establish requirements, best practices or safe harbors. It was developed from a real-world situation, which was complex and involved numerous nuances that needed to be evaluated when estimating the fair value of the investment. However, this case study reflects only the high level approach that the fund would have considered in reaching its valuation conclusions and does not show the calculations or the support for each assumption.

The specific facts and circumstances of each individual situation should be carefully considered when performing an actual valuation, and professional judgment should be exercised in evaluating those facts and weighing various alternatives. This case study summarizes the key considerations that were encountered by the fund manager(s) described in the example. The judgments that were made in this case were specific to those facts, not all of which are highlighted herein. See the preamble for a more detailed description of the purpose of the case studies and factors to consider when reading the case studies.

Case Study 10 — Workforce	Primary Concepts Illustrated
<b>Diagnostics</b> —Pre-Revenue	• Pre-Revenue Valuation and Calibration (chapter 13;
SAAS company with a quick	paragraphs13.39–.43; chapter 10)
ramp, but lots of competition	• Revising calibration assumptions over time (chapter
and uncertainty regarding	10)
product acceptance	• Multiple classes of instruments (chapter 8)
Type of Security Convertible	• Scenario-based valuation method (chapter 8;
Preferred (Non Participating)	paragraphs 8.20–.23)
Treferred (Iton Tarterpainig)	Additional Concepts Illustrated
Industry – Software-as-a-	• Milestone-driven changes in value v. passage of time
Service	and exogenous developments (chapter 5; paragraphs
	5.9092)
	• Anticipated dilution (chapter 13; paragraphs 13.65–
	.73)
	• Backtesting (chapter 11)

# The primary purpose of this case study is to illustrate the evolution of scenario-based valuation methods and assumptions for early-stage companies, both in the presence and absence of arms-length financing events.

Specifically, the following example shows an investment in an early-stage company in the software-as-a-service (SAAS) industry. The fund invested in a minority position in Workforce

Diagnostics (WD) Series A convertible preferred shares, alongside two other funds. It expected a return of 5x to 10x the initial investment, assuming that the company could achieve revenues of \$100 million in 2X14, with a revenue exit multiple in the range of 3x to 7x. As the company progressed, the fund and its co-investors plus a new investor raised the Series B round as an "up round." However, when market adoption was lower than expected, the company was forced to raise its Series C financing as a "down round," leading the company to rethink its strategy. Ultimately, the company was sold to one of its competitors at a price that covered the aggregate liquidation preferences for the preferred stock.

The case study illustrates the challenges associated with the valuation of early stage venture capital investments using market participant assumptions. As described elsewhere in this guide, investors in early stage businesses often focus more on qualitative factors than on quantitative factors in determining whether and how much they will invest. These qualitative factors include but are not limited to the ultimate potential return, the quality of the management team and business plan, short term cash needs, investor demand, potential future dilution, etc. In addition, while a high failure rate with early stage enterprises is well documented, investors do not invest in businesses that they believe will be failures, and they typically evaluate their target returns considering only the success scenarios. Calibration to the price paid at various financing points is the best way to ensure that the quantitative support for the fund's fair value measurements is consistent with market participant pricing. Nevertheless, it is difficult to document quantitatively the specific factors which support the value of an ownership interest in an early stage business at various financing points, and it can be even more difficult to quantitatively demonstrate changes in value between financing points.

Investors in early stage enterprises generally exit their investment in one of three ways:

- 1. The portfolio company succeeds and either IPOs or has some other high value sale, in which case all interests in the portfolio company are converted to public stock in accordance with the conversion rights of each type of instrument so converted;
- 2. The portfolio company achieves some, but perhaps not all, of its target outcomes, in which case it is "liquidated" (typically by a merger / acquisition transaction) and the proceeds from the "liquidation" are allocated according to a negotiated liquidation formula; or
- 3. The portfolio company fails, meaning investors lose all of their money.

Based on the facts at the initial measurement date, this example demonstrates the qualitative factors considered by the fund. The qualitative valuation assessment is supported by a framework to document value quantitatively assuming that the outcomes would be trimodal – (a) a high value at exit scenario (10x return in this example) with all classes converting to common, (b) a liquidation scenario with all classes receiving de minimis returns, or (c) a low-value sale scenario where some classes receive more value than others based on their liquidation preferences.

At the initial measurement dates, the fund considered the low value sale scenario to have minimal probability. This weighting was consistent with market participant assumptions for early stage companies, where the investors expect that the portfolio company will spend all of the capital received to pursue its development efforts, and that the company will have no value upon liquidation if these efforts are unsuccessful. As a result, at the initial measurement dates, no weight was given to the relative contractual preferences, and all shares were valued equally on an as-converted basis. See Q&A 14.46 for a discussion of the way that market participants consider these preferences for preferred stock versus common stock.

At later measurement dates, the middle exit scenario became more relevant. Specifically, after the company reached a point where it had a viable product, but was facing challenges with building scale, it became apparent that the company might exit at a low value that would return value to the senior classes of equity based on their respective liquidation preferences. The fund updated its scenario analysis approach to consider the impact of the liquidation preferences on the values of each class.

## Initial Transaction and Calibration on July 1, 2X10

## **Company Background**

- C.10.01 Workforce Diagnostics, Inc. (WD) was a pre-revenue software-as-a-service (SAAS) company. WD developed applications covering the management and analysis of large volumes of data (i.e., Big Data) pertaining to employee workforces.
- **C.10.02** Big data is the use of large, complex volumes of data to derive insights and identify patterns. The Gartner Group expected the market for big data and analytics to generate \$3.7 trillion in products and services along with 4.4 million new jobs by 2X15. Relating to human resources, big data was expected to provide unique insights into an organization's workforce to help answer questions such as:
  - How do we predict whether a candidate will perform well?
  - What type of training will be most effective for our people?
  - How do we know if someone is at risk to leave our organization?
- **C.10.03** Answers to these questions were expected to enhance the effectiveness of many elements of the employee selection and retention process for a wide range of employers. WD's value proposition for potential customers noted the benefits associated with improved hiring and retention capabilities. The benefits of improved employee work force management could lead to lower hiring, training and separation costs. Improved work force efficiency and reduced work force management could also drive revenue increases at WD's customers.
- C.10.04 Management believed the initial market for WD's offerings would include firms with employee work forces exceeding 1,000 employees. WD's offerings were expected to be attractive to domestic and international firms. Potential future product offerings to firms with lower employee counts were anticipated as well.

- C.10.05 WD was founded in 2X10 by Rennie Sandfield and Avalila Jude. Both Sandfield and Jude previously held senior positions at large public Information Technology consulting firms as well as smaller start-up entities.
- C.10.06 Since inception, WD's investment plan consisted of efforts in two areas: 1) Develop its SAAS product offerings; and 2) Build the market through creating awareness of WD's SAAS offerings among targeted prospective clients.

## **The Transaction**

C.10.07 On July 1, 2X10, AEX Fund IV acquired 1.2 million shares of Series A preferred stock of WD at a cost of \$3.6 million. AEX's investment represented 33.3 percent of the Series A financing round of 3.6 million shares totaling \$10.8 million. Each preferred share had a liquidation preference of \$3.00 per share, and was convertible into one share of common stock if the as-converted value exceeded the liquidation preference. Two other venture capital funds acquired similar interests in WD. The common investors retained an equity stake of 70 percent of the company on an as-converted basis. The \$10.8 million of proceeds from the Series A round were intended primarily for development of the SAAS applications.

Table 1: WD Stock Ownership and Pr	o Forma Valuati	on as of July 1,	2X10				
Investor	Series A Outstanding	Liquidation Preference per Share	Common Shares Outstanding	Fully Converted	Fully Converted as %	Value per Share	Total Value
AEX Fund IV	1,200,000	\$ 3.00	-	1,200,000	10%	\$ 3.00	\$ 3,600,000
Star Fund	1,200,000	\$ 3.00	-	1,200,000	10%	\$ 3.00	\$ 3,600,000
Outlook Fund	1,200,000	\$ 3.00	-	1,200,000	10%	\$ 3.00	\$ 3,600,000
Subtotal	3,600,000			3,600,000	30%		\$10,800,000
Founders/Common Stock Investors			8,400,000	8,400,000	70%	\$ 3.00	\$ 25,200,000
Total				12,000,000	100%		\$36,000,000

- **C.10.08** As WD was a pre-revenue development stage company, WD would be operating with negative cash flows through the development and commercialization of its product offerings. The proceeds from the Series A financing were expected to cover WD's cash burn for about eighteen months at which time a Series B financing round was targeted.
- C.10.09 AEX noted that WD was a high risk, high return investment. While the fund expected that the company had a high likelihood of success in the technical development of the product, the fund viewed the market acceptance of the product offering as highly uncertain at the time of the investment.

## **Investment Thesis and Exit Strategy**

**C.10.10** Given AEX's experience in the SAAS sector, AEX expected to help guide WD as it executed its software development and market development plans. Revenue growth

was expected by building recognition of the benefits of WD's service offerings. Initial revenues were expected with larger employers in the United States. Upon achieving its goals for large customer product acceptance, WD would expand its marketing efforts beyond the Fortune 500 and other companies in the U.S. to intermediate size firms as well as larger firms outside of the U.S.

- **C.10.11** AEX anticipated exiting the investment through an initial public offering or through a sale to a strategic acquirer. As part of its assessment, AEX noted that a high percentage of the successful exits of its portfolio companies occurred through IPOs. The initial expected timing of the IPO was targeted at four to five years after the Series A investment. The majority of unsuccessful exits resulted in a complete loss of the investment by the preferred investors.
- **C.10.12** AEX noted significant risk associated with WD, consistent with other early-stage entities. In particular, the fund noted that it might prove challenging to sell a niche service to entities that already had third-party SAAS solutions.
- **C.10.13** In its planning process, WD management assessed important targeted goals for the firm to be an attractive candidate for an IPO. Several key targeted goals by year 4 included:
  - 1. 10 customer contracts with Fortune 500 firms
  - 2. 100 customer contracts with Wilshire 5000 firms
  - 3. Annual revenues of \$100 million
  - 4. Break-even EBITDA

## Valuation Calibration at Entry

**C.10.14** The \$36 million post-money valuation was a negotiated price between the new investors and the company. The Series A investors made the decision to invest because of the market potential, the track record of the management team, and the unique characteristics of the software design. AEX invested anticipating at least a 5x to 10x return on its investment, incorporating the likelihood of future dilution of up to 67 percent. Ultimately, the pricing of the Series A round was driven by the expected capital needed over the following 18 months, with the new investors wishing to obtain as large an ownership percentage as possible with the smallest investment possible and the existing owners attempting to obtain the largest investment possible while giving up as little ownership of the company as possible.

Therefore, AEX valued its initial investment in WD Series A preferred shares at 1.00x cost.

- **C.10.15** As summarized in Table 1 in the previous section, AEX valued WD at a post-money value of US \$36 million, assuming equivalency of the values of preferred and common shares and based on the qualitative factors described above.
- **C.10.16** While not identified explicitly, from a quantitative perspective, the \$36 million value implicitly reflected the high risk of WD and the expectation of extreme outcomes of

either (a) IPO or sale at a significant multiple of the funds invested with all preferred shares converting to common stock, or (b) liquidation of WD with no proceeds to investors.

- C.10.17 As discussed previously, market participants typically negotiate an investment in an early stage company such as WD based on qualitative factors. As a framework for documenting fair value on a quantitative basis, however, AEX assessed its expectations for WD at the time of the investment to assist in future valuations of its holdings. AEX considered an exit value for the IPO scenario of \$540 to \$960 million based on targeted future revenues in year 2X14 of \$150 million and a revenue multiple of 3.6 to 6.4x revenues. AEX selected the revenue multiple range based on market multiples (ranging from 2.4x to 9.8x forward revenue) for a set of selected guideline companies at the date of the Series A investment. The selected guideline companies included other small, high-growth SAAS companies targeting solutions for large enterprises.
- C.10.18 The expected \$540 to \$960 million IPO value confirmed AEX's 5-10x return expectations after allowing for potential dilution of up to 67 percent. Potential dilution could reduce AEX's ownership to 3.3 percent; meaning AEX's value derived by the IPO would be \$18 million (3.3 percent of \$540 million) or a 5x return on the \$3.6 million initial investment.
- **C.10.19** To quantitatively document value, the fund also considered the implications of an assumed exit in four years. While AEX invested with the expectation of success, historical outcomes for the venture capital industry and the fund's internal data suggested that approximately 10 percent of investments in similar companies returned at least 5x and approximately 35 percent of investments returned more than 1x. Further, historic data indicated that on a portfolio basis, seed investments return around 30 percent, early stage investments around 25 percent and later stage investments in pre-revenue or pre-earnings companies around 20 percent. However, AEX believed its historical ability to generate higher rates of return justified an incrementally lower discount rate for WD. Using this information combined with AEX's expectations and the value of the Series A round, the fund assessed the implicit scenario outcomes for WD as follows:

Table 2: WD Va	luation Calibration as of Jul	y 1, 2X10		
	Scenario		Scenario Probability	Probability Weighted Proceeds
Liquidation			83.5%	
IPO		\$ 750,000,000	16.5%	\$ 123,750,000
Total			100.0%	\$ 123,750,000
		After Dilut	ion Adjustment	\$ 74,300,000
	Discounted at 20%	Venture Capital F	Portfolio Return	\$ 36,000,000

- C.10.20 The probabilities of liquidation and IPO were estimated by calibrating to the transaction, based on the potential estimated future proceeds of an IPO, anticipated time to exit, anticipated future dilution and an industry average discount rate. These assumptions include the expectations at the time of the Series A round, that WD would be generating operating losses and negative operating cash flows in the fouryear period until the targeted IPO. The proceeds from the Series A financing were expected to provide capital to meet WD's requirements for approximately eighteen months. Thus, additional equity financing rounds would be required prior to an IPO. To model this dilution, given that it was not yet possible to estimate the specific characteristics of the future financing rounds, AEX incorporated an adjustment for dilution of 40% (10% per year), based on their historic experience with the expected dilution from subsequent financing rounds. This dilution adjustment reflected the expected cash burn through the IPO and the expected progress that would be made by the time of the future financing rounds. The discount factor of 20%, as discussed, was based on historic portfolio returns for similar venture capital funds, adjusted for AEX's historical experience.
- **C.10.21** Note that all of the assumptions used in the analysis were estimates, and there was a range of inputs for each assumption that would have been reasonable. If the fund had used different reasonable assumptions for the future proceeds, anticipated time to exit, anticipated future dilution or the required rate of return, it would have also estimated a different probability of the liquidation versus IPO scenarios. Because the fund calibrated the valuation model, the fund could document that the assumptions were internally consistent and were also consistent with the observed transaction price. (This analysis illustrates the concept of calibration, as discussed in chapter 10.)

## Valuation at December 31, 2X10

- **C.10.22** Consistent with market participant assumptions, AEX first considered the qualitative impacts on value. Discussions with WD management indicated that development efforts were proceeding as expected. Given the absence of revenues and uncertainty on future financial projections for WD, traditional financial metrics were not relevant as a means of valuation. The competitive and industry landscape had not changed and the general outlook was viewed as similar to that at the July 1, 2X10, entry date.
- **C.10.23** The company had made progress toward developing its software solution in line with projections, but had not yet completed its alpha platform. As such, there was not yet any evidence that the software solution would function as planned. Although the time to the expected exit decreased between the transaction and the measurement date, AEX believed the absence of material value events at WD or within the industry and the significant uncertainties that remained suggested no material change in the value of the fund's investment in WD. AEX also noted that there were no preliminary price indications for the Series B round, and therefore the company's fundraising activities did not provide meaningful evidence of a change in value.

Therefore, AEX valued its investment in WD at 1.00x the original equity cost of \$3.00 per share.

- C.10.24 Further, to assess the value from a quantitative perspective, AEX considered updating the scenario assessment shown in Table 2. Using a discount rate-based model implies that when the company is progressing as planned and there has been no delay in the expected timing of the liquidity event, the value of the investment could potentially be increased based on the reduction of the time until value is realized. In practice, however, a market participant's view of the value of preferred stock in an early-stage company typically will not change until the company reaches recognizable milestones that demonstrate success or failure of a specific initiative. Mathematically, this result implies that either market participants' view of the expected time to a liquidity event does not change until a milestone is reached (e.g. it was four years at the initial investment, and it is still four years six months later), or that the discount rate increases so that later investments made between milestones command a higher rate of return than the initial investments made during that phase. In effect, in the absence of observable achievements, the passage of time resolves none of the inherent risks of the investment. As a result, market participants generally do not view mere expenditures by the company as warranting a change in valuation from the previous round. Therefore, the conclusions shown in Table 2 were not changed. (See the sidebar following paragraph 5.91 for a discussion about why the value had not increased solely due to the passage of time.)
- C.10.25 Finally, to provide corroborating evidence that value had not significantly changed, AEX assessed the general market environment in performing its valuation update. Review of the selected guideline companies indicated a range of stock price performance movements at the individual companies. The average stock price change for the public firms was +6 percent. Public SAAS firms differed from WD as they had completed service offerings and were generating significant revenues. Some of the public firms were profitable while others reported operating losses. For the public SAAS firms with operating losses, many of the firms reported strong gross margins. In several cases, operating losses were a function of significant sales and marketing expenditures intended to expand market shares and grow the businesses. The differences between risk and growth expectations for WD relative to the public SAAS companies were significant. AEX determined that a valuation adjustment based on the movement of the prices of public firms was not appropriate at this measurement date.

Therefore, AEX concluded that the value of WD is still \$36 million and the fair value of its 10% investment in WD is \$3.6 million. (This analysis illustrates the concept of revising calibration assumptions over time, as discussed in chapter 10.)

## Valuation at March 31, 2X11

**C.10.26** Development efforts at WD continued favorably in early 2X11. Consistent with the company's progress and original expectations a Series B financing round was expected to be completed in the near future. The terms and conditions of the Series

B financing round had not been finalized, but indications showed pricing of at least \$4 per share.

- **C.10.27** AEX was highly encouraged by the progress of WD. WD's cash flow burn was 30 percent less than expected because of management's excellent cost control and a new customer contract that included a substantial, \$2.75 million, upfront payment. Given these positive indications of progress, AEX concluded that the value of the investment had increased. Specifically, consistent with a market participant perspective, the fund's deal professionals indicated that because of the current progress of WD, their assessment of management, and the market opportunity being addressed, if they were to have been presented with the opportunity to invest in the series A round "today," they would have been willing to pay in the range of at least \$3.50 to \$3.75 per share or 1.17 to 1.25 times the original \$3.00 pricing.
- **C.10.28** Considering the positive performance of WD, the expectations of pricing the anticipated B round at a minimum of \$4.00, and AEX's deal professionals' reassessment that they would be willing to pay up to 1.25 times more for the series A round were the opportunity presented to them today, AEX concluded on a fair value of \$3.60 per share, or 1.2x the original price at March 31, 2X11. AEX recognized that determining fair value requires incorporating market participant perspectives. AEX concluded, based on the weight of the evidence utilizing market participant perspectives, that an increase in value was warranted.
- **C.10.29** To challenge their pricing assumptions and provide quantitative support for their valuation conclusion, AEX reconsidered their scenario analysis. The potential future proceeds were not changed from the previous assessment, but given the progress, the probability of a successful exit was increased to a one in five chance of success. The one in five chance (20%) was judgmentally determined based on AEX's knowledge of the market. AEX retained the same 10% per year dilution expectation. The time to the IPO was held constant at four years. Table 3 presents the updated scenario analysis as of March 31, 2X11.

Table 3: WD	Valuation Calibration as of	March 31, 2X11		
	Scenario	Future Proceeds	Scenario Probability	Probability Weighted Proceeds
Liquidation			80.0%	
IPO		\$ 750,000,000	20.0%	\$ 150,000,000
Total			100.0%	\$ 150,000,000
		After Dilut	ion Adjustment	\$ 90,000,000
	Discounted at 2	20% Venture Capital P	ortfolio Return	\$ 43,400,000

The resulting valuation was in line with the \$43.2 million implied by the \$3.60 per share that AEX had estimated. As such, AEX valued its 10% interest in WD at \$4.32

million, or 1.2x the original equity cost. (This analysis illustrates the concept of revising calibration assumptions over time, as discussed in chapter 10.)

## Valuation at June 30, 2X11

C.10.30 Development efforts at WD continued favorably in early 2X11. Consistent with the original intent, a Series B financing round was completed. The Series B shares were sold at \$4.00 per share. The B shares had a non-cumulative dividend of 8 percent and a liquidation preference of \$4.00 per share. This round included the three original VC investors, including AEX, as well as a new VC investor. Each of the three original VC fund investors acquired 1 million Series B preferred shares, and the new investor acquired 1.5 million Series B preferred shares. The \$18.0 million of proceeds from this round were primarily focused on supporting marketing and operating requirements to bring WD's SAAS products to market.

Table 4: WD Stock Ownership and Pro Forma Valuation as of June 30, 2X11												
		Li	iquidation			Liquidation			Fully			
	Series A	Pre	ference per	Series B	Pr	eference per	Common Shares	Fully	Converted as	Val	ue per	
Investor	Outstanding		Share	Outstanding		Share	Outstanding	Converted	%	S	hare	Total Value
AEX Fund IV	1,200,000	\$	3.00	1,000,000	\$	4.00	-	2,200,000	13.33%	\$	4.00	\$ 8,800,000
Star Fund	1,200,000	\$	3.00	1,000,000	\$	4.00	-	2,200,000	13.33%	\$	4.00	\$ 8,800,000
Outlook Fund	1,200,000	\$	3.00	1,000,000	\$	4.00	-	2,200,000	13.33%	\$	4.00	\$ 8,800,000
Alpha Fund	-	_		1,500,000	\$	4.00	-	1,500,000	9.10%	\$	4.00	\$ 6,000,000
Subtotal	3,600,000	-		4,500,000	-			8,100,000	49.10%			\$ 32,400,000
Founders/Common Stock Investors							8,400,000	8,400,000	50.90%	\$	4.00	\$ 33,600,000
Total								16,500,000	100.00%			\$ 66,000,000
(For ease of presentation, stock option g	grants to employee	s ha	ave been exclu	ded from this a	naly	vsis)						

- **C.10.31** The increase in the per share price for the Series B round from the Series A round reflected a variety of factors including:
  - Favorable execution of SAAS technical development;
  - Continued execution of WD business plan;
  - Increased recognition of importance of data analytics capabilities (Big Data) in software product offerings; and
  - Pricing multiple expansion as a result of continued economic growth.
- **C.10.32** In assessing the valuation of AEX's existing holding of Series A preferred shares, AEX determined that these shares should be valued at the Series B transaction price of \$4.00 per share. The value of AEX's total interest in WD derived by the recent financing round would be \$8.80 million, which includes both Series A and Series B preferred shares held by AEX. This conclusion reflected the continuing expectation of extreme outcomes of either an IPO for the company or liquidation with little residual value for the company. An IPO would result in the conversion of the preferred to common. A liquidation would result in little residual value for the company, since the commercial viability of a niche offering of this type continued to be uncertain. AEX also considered the possibility that the company could sell the technology and in-place workforce to a strategic investor if commercial adoption proved to be lower than hoped, but deemed this scenario to have minimal

probability since the founders were committed to pursuing an IPO exit. (This analysis illustrates the application of the scenario-based valuation method, as discussed in chapter 8, paragraphs 8.20–.23.)

- **C.10.33** While the primary value drivers of the pricing of the Series B round were the qualitative factors described above, to assess the value from a quantitative perspective, AEX updated the scenario analysis to reflect the new Series B investment. The as-converted value of the equity was \$66.0 million (16.5 million shares \* \$4.00 per share). AEX estimated the total equity value from an IPO of WD as \$775 million, reflecting pricing multiple expansion and investor recognition of the potential benefits of workforce management packages. The expected proceeds in the event WD was not successful and the firm was liquidated were still expected to be essentially nil. In the event of a successful IPO, all Series A and B preferred shares would convert to common stock.
- C.10.34 The range of future IPO prices was based on expected future revenues in year 2X14 valued using a revenue multiple of 5x to 7x revenues, using 6x as a point estimate. The revenue multiple was based on market multiples for the selected guideline companies at the date of the Series B investment. The future sales proceeds were discounted to a present value equivalent as of the valuation date. In the event of failure, AEX continued to expect no proceeds would be available to investors. Using the total equity value of \$66 million and the expected IPO proceeds, adjusted for dilution, the implied probability of success was 21 percent (see Table 5). The probability weighting was inferred based on the potential IPO proceeds, the time to exit and the continued expectation of potential 10% dilution per year (based on their historical dilution experience with early stage investments), totaling approximately 30%. This estimated probability was consistent with the general range of expectations of WD Management and AEX. The increase in the probability of success reflected the technical viability of WD's technology offerings, continued execution of WD's business plan and initial favorable indications from prospective customers. The large probability of unsuccessful future efforts relates to continued uncertainty regarding the commercial acceptance and financial feasibility of WD.

Table 5: V	VD Valuation Calibration a	s of June 30, 2X11		
	Scenario	Future Scenario Proceeds		Probability Weighted Proceeds
Liquidatio	on		79.0%	
IPO		\$ 775,000,000	21.0%	\$ 162,750,000
Total			100.0%	\$ 162,750,000
		After Dilut	ion Adjustment	\$ 113,400,000
	Discounted	at 20% Venture Capital F	Portfolio Return	\$ 66,000,000

(This analysis illustrates the application of the scenario-based valuation method, as discussed in chapter 8.)

#### Valuation at December 31, 2X11

- **C.10.35** AEX's analysis at December 31, 2X11, reflected developments since the June 30, 2X11, Series B transaction. In the second half of 2X11, the company had expanded outreach efforts to potential customers, defined its service offerings, and executed its first customer contracts. The levels of future revenue and profits continued to have a high degree of uncertainty. While the company's product was being received favorably by its prospective clients, it remained unclear whether the company was going to be able to gain enough traction before the competitive landscape became more challenging. Meanwhile, stock prices for the selected guideline public companies performed well in the second half of 2X11 with an average increase of 8 percent.
- **C.10.36** The June 30, 2X11, Series B financing captured value events and overall market conditions through the financing date, as well as investor expectations regarding the company's potential and risks. Given the continuing high degree of risk regarding market adoption, AEX deemed it not appropriate to include an adjustment for the company's progress or for the market stock price movements of guideline public companies from June 30, 2X11, to December 31, 2X11. As such, AEX concluded that the value of WD is still at \$66.0 million and the fair value of its investment in WD is \$8.80 million.
- C.10.37 To provide quantitative support, AEX reconsidered their previous scenario analysis. AEX concluded that no significant milestones had been achieved and no significant market changes were apparent. As such, they concluded that there had not been a significant change in value. Table 6 presents the December 31, 2X11 calibration, which was unchanged from the June 30, 2X11 figures. (See the sidebar following paragraph 5.91 for a discussion about why the value had not increased solely due to the passage of time.)

Table 6: W	D Valuation Calibration as	of December 31, 2X11		
	Scenario	Future Proceeds	Scenario Probability	Probability Weighted Proceeds
Liquidatio	n		79.0%	
IPO		\$ 775,000,000	21.0%	\$ 162,750,000
Total			100.0%	\$ 162,750,000
		After Dilut	ion Adjustment	\$ 113,400,000
	Discounted	at 20% Venture Capital F	Portfolio Return	\$ 66,000,000

(This analysis illustrates the concept of revising calibration assumptions over time, as discussed in chapter 10.)

#### Valuation at September 30, 2X12

- **C.10.38** During 2X12, AEX began to question the likely success of WD. While some new customer contracts were being obtained, the size of and quantity of contracts did not meet expectations. In addition, the contract terms were significantly less favorable than the company had sought, such that customers had significant milestone provisions built into their payment obligations for beta tests, and customer feedback was mixed on the more advanced implementations. Further, it was becoming clear that WD would require additional capital to bring more depth to its implementation team and to bridge the company to cash flow sustainability. While an additional round of financing was not expected until 2X13, AEX was concerned with the situation and questioned whether or not, without an indication of an ability to generate revenue on more favorable terms, they could support participating in the future financing round.
- **C.10.39** AEX considered the qualitative aspects of the investment and contemplated at what level they would consider an additional investment. There was significant discord among AEX's partners as to where the future of WD would be. However, the overall view remained favorable, with many AEX partners noting that many of their most successful investments encountered early setbacks. In addition, several observations were made about the continued enthusiasm from customers for the product's core functionality and their confidence in WD management to make appropriate adjustments based upon customer feedback.
- **C.10.40** To estimate fair value at September 30, 2X12, AEX concluded that value had decreased from their previous assessment. Until better information could be obtained from indications of the value of the next financing round, AEX updated the scenario analysis to provide an indication of value. The macro environment indicated that no change was expected to potential future proceeds. Further, because the perceived capital needs had risen and the price anticipated for the next round was lower (due to the prospect of lower revenues and less profitability), AEX adjusted the anticipated dilution impact by 1/3, to a total of 40 percent, consistent with their expectations based on past history for troubled investments. AEX was much less confident that a potential IPO or high value sale could be achieved, and therefore reduced the probability of a successful exit to 15 percent. Due to the lack of significant progress, AEX retained the assumption of 3 years to exit. Based on these assumptions, AEX concluded on an overall value of \$40.5 million. Table 7 presents the results of the updated analysis.

Table 7: WD Valuation as of	September 30, 2X12		
			Probability
	Future	Scenario	Weighted
Scenario	Proceeds	Probability	Proceeds
Liquidation		85.0%	
Exit (3 years)	\$ 775,000,000	15.0%	\$ 116,250,000
Total		100.0%	\$ 116,250,000
	After Dil	ution Adjustment	\$ 70,000,000
Dis	scounted at 20% Venture Capita	l Portfolio Return	\$40,500,000

Based on its fully-diluted ownership of 13.3 percent, the fair value of AEX's interest in WD is estimated to be \$5.4 million. (This analysis illustrates the application of the scenario-based valuation method, as discussed in chapter 8, paragraphs 8.20–.23.)

## Valuation at June 30, 2X13

- C.10.41 During the first half of 2X13, WD signed additional customer contracts. However, contract momentum was significantly less than expected, as decisions took longer than initially anticipated. A factor contributing to the slower than expected customer uptake was market speculation that existing software providers would integrate big data solutions into their service offerings. Potential customers valued the ease of managing the Information Technology function in a bundled platform, and feedback showed that a "niche" service offering was of limited interest.
- **C.10.42** With increases in expenditures in sales and marketing and lower than expected revenues, WD reported increasing operating losses, and its cash burn rate was higher than expected. To fund ongoing operations, WD raised a Series C financing of \$6.0 million. Three of the four investors from the Series B round acquired 1.0 million Series C preferred shares each, at a price of \$2.00 per share. Although the pricing of this round was at a discount to earlier rounds, it was viewed as fair value (the lower price was attributed to the higher risk and potentially lower returns suggested by the company's recent results). Given its slightly more pessimistic view, AEX declined to participate in the round. The C shares had a non-cumulative dividend of 8 percent and a liquidation preference of \$2.00 per share. The liquidation preference of the Series C preferred shares was senior to the Series A and B shares.
- **C.10.43** Due to the decline in expectations, WD management commenced discussions with several investment banking firms in order to assess strategic alternatives for WD. Preliminary discussions indicated the population of expected buyers included existing Information Technology firms with limited employee workforce oriented Big Data software offerings (strategic buyers). Given the remaining risks and capital requirements, WD expected limited opportunities for an IPO.
- **C.10.44** As a result of the changed expectations, AEX relied more heavily on the quantitative framework, valuing its existing Series A and B preferred share holdings using its

scenario analysis approach, calibrating to the Series C financing. The Series C down round suggested a significant reduction in the value of the Series A and B shares. Moreover, AEX now considered a sale to a strategic buyer a more likely alternative.

- **C.10.45** For its valuation analysis, AEX concluded that WD's key technical employees and SAAS offering were the most attractive assets of the firm.
  - SAAS Offering WD's existing service offering provided two benefits to
    potential strategic buyers. First, a strategic buyer would avoid the development
    cost and execution risk for the SAAS offering. Also, WD's technology could be
    integrated into existing Information Technology offerings much more quickly
    than a new service offering could be developed. An acquisition of WD by a
    strategic buyer would reduce the time to market by approximately two to three
    years.
  - Information Technology Professionals WD had assembled a technical team including some of the leading Big Data professionals in the market. The available supply of qualified Information Technology professionals, much less professionals with expertise in Big Data, continued to fall far short of demand. A team of technical professionals of the caliber of WD's workforce would be difficult and time consuming to assemble.
- **C.10.46** For the strategic sale, AEX estimated that a favorable sale would bring proceeds of \$80 million (reflecting a proxy for the estimated cost to build, with a premium for the decreased time to market and the assembled workforce). A less favorable sale would realize around \$30 million, reflecting the estimated cost to build over a more normalized time frame. The expected proceeds in the event WD was not successful and the firm was liquidated were still expected to be essentially nil. In the event of a successful sale at \$80 million, all Series A, B and C preferred shares would convert to common stock as the fully diluted value per share exceeded the liquidation preferences of each class of preferred. AEX estimated a liquidity event would occur in approximately six months. As existing cash reserves were expected to fund the firm until a liquidity event, a dilution adjustment was not considered necessary.
- C.10.47 AEX estimated the probability of the different events based on their discussions with the various investment banking firms being interviewed to market WD. A favorable sale of WD was assigned a 10 percent probability. This estimate reflected the weak market outlook for a niche product and the limited pool of potential buyers, both of which weakened WD's negotiating position. A less favorable sale of WD was assigned an 80 percent probability, based on discussions with two potential buyers. Liquidation with no proceeds to any investors was assigned a 10 percent probability. The estimated liquidity events, proceeds and probability factors are presented in Table 8. Table 9 presents the valuation of the Series A and B shares using the scenario-based method, estimating the probability-weighted payoff to each class and then discounting at an estimated required rate of return for each class. The Series C share calculation is also presented to compare the result of this analysis to the share

			Fut	ure Proceeds		Scenario Probability		Probability Weighted Proceeds			
			\$	-		10.0%					
			\$	30,000,000		80.0%	\$	24,000,000			
			\$	80,000,000		10.0%	\$	8,000,000			
						100.0%	\$	32,000,000			
				After D	iluti	ion Adjustment	\$	32,000,000			
	Dis	scounted at 2	0%	Venture Capit	al P	ortfolio Return		\$29,211,870			
alues of Series	s A, I	3, and C Prefe	erred	d and Commo	n at	t June 30, 2X13					
		Series A	eus	Series B	<u>ity</u>	Series C		Common	Probability		Probability Weighted Proceeds
	\$	-	\$	-	\$	-	\$	- ·	10.0%	\$	-
										· ·	
2		9,000,000		15,000,000		6,000,000		-	80.0%		24,000,000
		14,769,231		18,461,538		12,307,692		34,461,538	10.0%		8,000,000
	\$	23,769,231	\$	33,461,538	\$	18,307,692	\$	34,461,538	100.0%	\$	32,000,000
per Class	\$	8,676,923	\$	13,846,154	\$	6,030,769	\$	3,446,154		\$	32,000,000
per Class	\$	7,920,911	\$	12,639,751	\$	5,599,429	\$	3,051,780		\$	29,211,870
per Share	\$	2.20	\$	2.81	\$	1.87	\$	0.36			, ,
	/alues of Series	/alues of Series A, E /alues of Series A, E se per Class \$ e per Class \$ e per Share \$	Discounted at 2 Discounted at 2 /alues of Series A, B, and C Prefe Proce Series A \$ - e 9,000,000 14,769,231 \$ 23,769,231 per Class \$ 8,676,923 e per Class \$ 7,920,911 e per Share \$ 2.20	Fut           Series A           Ser	Future Proceeds           \$         -           \$         30,000,000           \$         30,000,000           \$         \$           \$         30,000,000           \$         \$           \$	Future Proceeds         \$       \$         \$ <td>Scenario         Scenario           Future Proceeds         Probability           \$         -           10.0%           \$         -           \$         30,000,000           \$         30,000,000           \$         30,000,000           \$         30,000,000           \$         30,000,000           \$         80,000,000           100.0%           After Dilution Adjustment           Discounted at 20% Venture Capital Portfolio Return           /alues of Series A, B, and C Preferred and Common at June 30, 2X13           Proceeds of Each Security Class           Series A         Series B           Series A         Series B           Series A         Series C           \$         -           \$         -           \$         -           \$         -           \$         -           \$         -           \$         -           \$         -           \$         -           \$         -           \$         -           \$         -           \$         -           \$&lt;</td> <td>Future Proceeds         Scenario Probability           \$         -         10.0%           \$         -         10.0%           \$         30,000,000         80.0%           \$         30,000,000         80.0%           \$         30,000,000         10.0%           \$         80,000,000         10.0%           \$         80,000,000         10.0%           After Dilution Adjustment         \$           Discounted at 20% Venture Capital Portfolio Return         -           /alues of Series A, B, and C Preferred and Common at June 30, 2X13         -           Proceeds of Each Security Class         -           \$         -         \$           \$         -         \$           \$         -         \$           \$         -         \$           \$         -         \$           \$         -         \$           \$         -         \$           \$         -         \$           \$         -         \$           \$         -         \$           \$         \$         \$           \$         \$         \$           \$         \$</td> <td>Future Proceeds         Scenario         Weighted           Future Proceeds         Probability         Proceeds           \$         -         10.0%         \$           \$         -         10.0%         \$         24,000,000           \$         30,000,000         80.0%         \$         24,000,000           \$         80,000,000         100.0%         \$         8,000,000           100.0%         \$         32,000,000         \$         32,000,000           Discounted at 20% Venture Capital Portfolio Return         \$         32,000,000           //alues of Series A, B, and C Preferred and Common at June 30, 2X13         Proceeds of Each Security Class           //alues of Series A, B, and C Preferred and Common at June 30, 2X13         Proceeds of Each Security Class           //alues of Series A         Series B         Series C         Common           \$         -         \$         -         \$           //alues of Series A         Series B         Series C         Common           \$         -         \$         -         \$           //alues of Series A         Series B         Series C         Common           \$         -         \$         -         \$           <td< td=""><td>Future Proceeds         Scenario Probability         Weighted Proceeds           \$         -         10.0%         Proceeds           \$         -         10.0%         \$         24,000,000           \$         30,000,000         80.0%         \$         24,000,000           \$         30,000,000         80.0%         \$         24,000,000           \$         30,000,000         10.0%         \$         32,000,000           Discounted at 20% Venture Capital Portfolio Return         \$29,211,870         -           //alues of Series A, B, and C Preferred and Common at June 30, 2X13         -         -           //alues of Series A, B, and C Preferred and Common at June 30, 2X13         -         -           //alues of Series A, B, and C Preferred and Common at June 30, 2X13         -         -           //alues of Series A         Series B         Series C         Common         Probability           \$         -         \$         -         10.0%         -         80.0%           \$         -         \$         -         \$         -         10.0%           \$         -         \$         -         \$         -         10.0%           \$         -         \$         -</td><td>Future Proceeds         Scenario Probability         Weighted Proceeds           \$         -         10.0%         Proceeds           \$         -         10.0%         \$         24,000,000           \$         30,000,000         80.0%         \$         24,000,000           \$         80,000,000         100.0%         \$         8,000,000           100.0%         \$         32,000,000         \$         32,000,000           After Dilution Adjustment         \$         32,000,000         \$           Discounted at 20% Venture Capital Portfolio Return         \$         32,000,000         \$           /alues of Series A, B, and C Preferred and Common at June 30, 2X13         Proceeds of Each Security Class         \$         \$           \$         -         \$         -         \$         10.0%         \$           \$         -         \$         -         \$         10.0%         \$           \$         -         \$         -         \$         \$         \$           \$         -         \$         -         \$         -         \$           \$         -         \$         -         \$         -         \$           \$         <t< td=""></t<></td></td<></td>	Scenario         Scenario           Future Proceeds         Probability           \$         -           10.0%           \$         -           \$         30,000,000           \$         30,000,000           \$         30,000,000           \$         30,000,000           \$         30,000,000           \$         80,000,000           100.0%           After Dilution Adjustment           Discounted at 20% Venture Capital Portfolio Return           /alues of Series A, B, and C Preferred and Common at June 30, 2X13           Proceeds of Each Security Class           Series A         Series B           Series A         Series B           Series A         Series C           \$         -           \$         -           \$         -           \$         -           \$         -           \$         -           \$         -           \$         -           \$         -           \$         -           \$         -           \$         -           \$         -           \$<	Future Proceeds         Scenario Probability           \$         -         10.0%           \$         -         10.0%           \$         30,000,000         80.0%           \$         30,000,000         80.0%           \$         30,000,000         10.0%           \$         80,000,000         10.0%           \$         80,000,000         10.0%           After Dilution Adjustment         \$           Discounted at 20% Venture Capital Portfolio Return         -           /alues of Series A, B, and C Preferred and Common at June 30, 2X13         -           Proceeds of Each Security Class         -           \$         -         \$           \$         -         \$           \$         -         \$           \$         -         \$           \$         -         \$           \$         -         \$           \$         -         \$           \$         -         \$           \$         -         \$           \$         -         \$           \$         \$         \$           \$         \$         \$           \$         \$	Future Proceeds         Scenario         Weighted           Future Proceeds         Probability         Proceeds           \$         -         10.0%         \$           \$         -         10.0%         \$         24,000,000           \$         30,000,000         80.0%         \$         24,000,000           \$         80,000,000         100.0%         \$         8,000,000           100.0%         \$         32,000,000         \$         32,000,000           Discounted at 20% Venture Capital Portfolio Return         \$         32,000,000           //alues of Series A, B, and C Preferred and Common at June 30, 2X13         Proceeds of Each Security Class           //alues of Series A, B, and C Preferred and Common at June 30, 2X13         Proceeds of Each Security Class           //alues of Series A         Series B         Series C         Common           \$         -         \$         -         \$           //alues of Series A         Series B         Series C         Common           \$         -         \$         -         \$           //alues of Series A         Series B         Series C         Common           \$         -         \$         -         \$ <td< td=""><td>Future Proceeds         Scenario Probability         Weighted Proceeds           \$         -         10.0%         Proceeds           \$         -         10.0%         \$         24,000,000           \$         30,000,000         80.0%         \$         24,000,000           \$         30,000,000         80.0%         \$         24,000,000           \$         30,000,000         10.0%         \$         32,000,000           Discounted at 20% Venture Capital Portfolio Return         \$29,211,870         -           //alues of Series A, B, and C Preferred and Common at June 30, 2X13         -         -           //alues of Series A, B, and C Preferred and Common at June 30, 2X13         -         -           //alues of Series A, B, and C Preferred and Common at June 30, 2X13         -         -           //alues of Series A         Series B         Series C         Common         Probability           \$         -         \$         -         10.0%         -         80.0%           \$         -         \$         -         \$         -         10.0%           \$         -         \$         -         \$         -         10.0%           \$         -         \$         -</td><td>Future Proceeds         Scenario Probability         Weighted Proceeds           \$         -         10.0%         Proceeds           \$         -         10.0%         \$         24,000,000           \$         30,000,000         80.0%         \$         24,000,000           \$         80,000,000         100.0%         \$         8,000,000           100.0%         \$         32,000,000         \$         32,000,000           After Dilution Adjustment         \$         32,000,000         \$           Discounted at 20% Venture Capital Portfolio Return         \$         32,000,000         \$           /alues of Series A, B, and C Preferred and Common at June 30, 2X13         Proceeds of Each Security Class         \$         \$           \$         -         \$         -         \$         10.0%         \$           \$         -         \$         -         \$         10.0%         \$           \$         -         \$         -         \$         \$         \$           \$         -         \$         -         \$         -         \$           \$         -         \$         -         \$         -         \$           \$         <t< td=""></t<></td></td<>	Future Proceeds         Scenario Probability         Weighted Proceeds           \$         -         10.0%         Proceeds           \$         -         10.0%         \$         24,000,000           \$         30,000,000         80.0%         \$         24,000,000           \$         30,000,000         80.0%         \$         24,000,000           \$         30,000,000         10.0%         \$         32,000,000           Discounted at 20% Venture Capital Portfolio Return         \$29,211,870         -           //alues of Series A, B, and C Preferred and Common at June 30, 2X13         -         -           //alues of Series A, B, and C Preferred and Common at June 30, 2X13         -         -           //alues of Series A, B, and C Preferred and Common at June 30, 2X13         -         -           //alues of Series A         Series B         Series C         Common         Probability           \$         -         \$         -         10.0%         -         80.0%           \$         -         \$         -         \$         -         10.0%           \$         -         \$         -         \$         -         10.0%           \$         -         \$         -	Future Proceeds         Scenario Probability         Weighted Proceeds           \$         -         10.0%         Proceeds           \$         -         10.0%         \$         24,000,000           \$         30,000,000         80.0%         \$         24,000,000           \$         80,000,000         100.0%         \$         8,000,000           100.0%         \$         32,000,000         \$         32,000,000           After Dilution Adjustment         \$         32,000,000         \$           Discounted at 20% Venture Capital Portfolio Return         \$         32,000,000         \$           /alues of Series A, B, and C Preferred and Common at June 30, 2X13         Proceeds of Each Security Class         \$         \$           \$         -         \$         -         \$         10.0%         \$           \$         -         \$         -         \$         10.0%         \$           \$         -         \$         -         \$         \$         \$           \$         -         \$         -         \$         -         \$           \$         -         \$         -         \$         -         \$           \$ <t< td=""></t<>

price in the recent round, which AEX viewed as being within a reasonable range relative to its overall valuation.

- C.10.48 The fund estimated the present value of each series using a 16% discount rate for the Series C and a 20% discount rate for the Series A and B, considering the calibrated discount rate used in prior valuation dates and considering overall market participant expected rates of return for venture capital investments. The fund estimated a slightly lower discount rate for Series C than for Series A and Series B, given that the Series C was senior. The fund used a 27.5% discount rate for common considering its higher risk profile.
- C.10.49 Based on the fair value per share presented above in Table 9 and AEX's holdings of 1.2 million Series A preferred shares and 1.0 million Series B preferred shares, it was concluded that the fair value of AEX's overall interest in WD is approximately \$6.15 million. (This analysis illustrates the concept of valuation of multiple classes of instruments, as discussed in chapter 8.)

## Sale of Company in November 2X13

**C.10.50** In November 2X13, WD management announced an agreement for the sale of the company to a publicly traded Information Technology firm, Diverse Information Technology, Inc. The sales price was approximately \$40.0 million. The proceeds

resulted in all preferred investors receiving the return of their original investments of \$34.8 million. The remaining \$5.2 million of purchase price was allocated to the common investors, according to the contractual waterfall. The payment to the common shareholders was significantly below the per share liquidation amounts for the Series A, B and C. Key employees of WD were offered customary "stay bonuses" and other incentives to entice them to continue on with Diverse Information Technology.

AEX received a return of its original investments of \$7.60 million (including 1.2 million Series A preferred shares and 1.0 million Series B shares).

#### Backtesting

- C.10.51 As described in chapter 11, "Backtesting," backtesting is an important process that can help management assess the reasonableness of its portfolio valuation process and estimates. Following any liquidity events or write-offs of portfolio holdings, AEX performed backtesting procedures to assess its valuation process and identify areas for improvement. AEX noted that the sale of WD to a strategic buyer was not initially anticipated, and therefore considered whether this scenario should have been given more weight in the analysis at earlier measurement dates.
- C.10.52 At earlier measurement dates, AEX did not include a strategic sale exit, since (a) the founders had significant ownership percentage and were committed to targeting an IPO exit, and (b) it is unusual for early-stage companies to successfully sell their technology when the company has not been successful in finding a market. As a result of the backtesting process, AEX was comfortable with its prior methodologies and assumptions for the valuation of the fund's investment in WD. (This analysis illustrates the concept of backtesting, as discussed in chapter 11.)

#### **Task Force Observations**

- **C.10.53** The Task Force observes that it is typical for venture capital market participants to reference pre-money equity values that are calculated by taking the most recent round price multiplied by the as-converted share count. This approach implicitly assumes that all of the shares have equal value, which is reasonable in situations where market participants would transact based on the assumption that liquidation preferences will not significantly impact the values that each class of equity will ultimately realize. In many cases, the outcomes for early stage VC-backed entities are bimodal (either de minimis returns to all classes or all shares converting), and therefore, the liquidation preferences provide the investors with some degree of control in negotiating the next round of financing, rather than providing direct economic value. At later stages, a portfolio company may have some residual value even if the company is not completely successful. In this example, the investors and the company were able to find a strategic buyer before all value to current investors was eroded.
- **C.10.54** Further, the example highlights that whether there has been a recent round of financing or not, GAAP requires increases or decreases be reflected in fair value

based on market participant perspectives, when facts and circumstances demonstrate that fair value has changed. In this fact pattern, in the first couple of years following the original investment, significant evidence existed that the valuation had increased materially due to company specific performance factors and supportive market conditions. Subsequently, circumstances changed such that company performance was materially below expectations. In both circumstances, it was appropriate to give effect to those developments in the fund's estimation of fair value.

**C.10.55** In summary, this example illustrates the critical importance of the calibration process for early-stage pre-revenue enterprises, and how even a small number of scenarios and key assumptions, if well-selected, facilitate measurement of fair value at subsequent dates (see chapter 10). In addition, this example highlights important differences in addressing changes due to milestones and other internal events versus changes in external industry and market factors (see chapter 5). Finally, this example illustrates situations in which liquidation and other preferences in complex capital structures are less important, as well as situations in which such differences are significant (see chapter 8).

## Case Study 11 – Clean-tech Startup with Significant Exposure to Regulatory Factors

*Note:* This case study is provided to demonstrate concepts discussed in the preceding chapters of this guide and is not intended to establish requirements, best practices or safe harbors. It was developed from a real-world situation, which was complex and involved numerous nuances that needed to be evaluated when estimating the fair value of the investment. However, this case study reflects only the high level approach that the fund would have considered in reaching its valuation conclusions and does not show the calculations or the support for each assumption.

The specific facts and circumstances of each individual situation should be carefully considered when performing an actual valuation, and professional judgment should be exercised in evaluating those facts and weighing various alternatives. This case study summarizes the key considerations that were encountered by the fund manager(s) described in the example. The judgments that were made in this case were specific to those facts, not all of which are highlighted herein. See the preamble for a more detailed description of the purpose of the case studies and factors to consider when reading the case studies.

Case Study 11 – <b>SJC Solar</b> – Clean- tech startup with capital intensive business model and significant exposure to changes in regulations and the level of government support Type of Security – Common Equity (simple capital structure) Industry – Energy/Utility/Consumer	<ul> <li>Primary Concepts Illustrated</li> <li>Impact of regulatory environment on market participant assessment of risk profile (chapter 3)</li> <li>Use of multiple valuation methodologies (chapter 5)</li> <li>Impact of a non-binding term sheet (chapter 13)</li> <li>Contingent consideration (chapter 13)</li> <li>Transaction costs (chapter 12)</li> </ul>
	<ul> <li>Additional Concepts Illustrated</li> <li>Valuation of equity interests in simple capital structures (chapter 7)</li> <li>Calibration to a planned exit and incorporating changes in company specific or environmental factors (chapter 10)</li> </ul>

The primary purpose of this case study is to illustrate the sensitivity that changes in external factors, such as regulation, as well as changes in company specific factors, such as anticipated transactions, can have on the fair value of equity in growth stage companies with simple capital structures.

Specifically, the following case study illustrates the potential effect of regulatory policies on the demand in the wholesale market for the products of a growth stage company seeking to establish itself as a strong regional player in the design and distribution of technologically advanced solar panels to commercial and residential end markets.

It highlights that even when using a primary valuation approach (i.e., the market approach using guideline public company revenue multiples) there can be other valuation metrics and approaches used to corroborate the estimated value obtained from the primary methodology. The evaluation of the reasonableness of a point estimate within a relevant range is an important step in any valuation process. It also highlights that, where available and particularly for early stage and growth companies, it is important to look not only at last twelve months' ("LTM") financial metrics, but also look to next twelve months' ("NTM") metrics or other forward-looking multiples. It considers the calibration of the valuations to an initial model which contemplates a planned exit in the future and updates to that model as the investment progresses, as well as assessing the metrics that are used in determining the terminal or exit value in the model.

This case study also considers the impact of a non-binding term sheet on the current valuation and illustrates an approach for assessing the value of contingent consideration to be received as part of a sale transaction.

Finally, it illustrates the treatment of potential transaction costs in advance of an anticipated transaction. As discussed further in chapter 12, "Factors to Consider At or Near a Transaction Date" transaction costs, including commissions, are not taken into account in determining the fair value of the investment prior to realization.

## **Company Background**

- C.11.01 SJC, a solar panel technology company with approximately 250 employees, was founded in 2X10 by George Ho. SJC developed a novel method of creating solar panels allowing for industry leading power conversion efficiency. Although it has experienced rapid revenue growth to date, it is not anticipated to achieve cash flow break even for many years.
- C.11.02 To date, the end users of SJC's solar panels have been approximately 72% commercial energy producers and end users and 28% residential users. SJC provides its panels to large and mid-sized regional solar panel installation companies who are responsible for locating interested end users of the panels. SJC has developed tools and materials which help these resellers and installers to navigate the complex sets of regulations and incentives that are vital to the economics of the renewable energy industry. To hit its sales growth targets, SJC will need to increase sales to both

categories of end users, but the higher target profit margins among residential end users make expanding its distribution in this market important to achieve profitability goal.

**C.11.03** SJC is a niche player and does not have a large manufacturing capacity beyond what is necessary for design. Instead, SJC relies on overseas contract manufacturers to build, assemble, and test its completed solar panels before shipping these to customers. Overseas manufacturers have generally been able to build high quality solar panels at the lowest possible costs. As a result, the company has decided not to invest the high fixed costs necessary to build out its own manufacturing capacity. SJC differentiates itself by providing higher efficiency panels than other competitors in the market through its advanced technological design specifications. The company has focused on building out its distribution and support. Its current distribution is primarily focused on State C. SJC has plans to further invest in other regions of State C and expand into States A, B and D. The company's investment plan for the next several years is largely focused on expanding the company's own distribution capacity organically and through acquisitions.

#### **Industry Background/Incentives**

- C.11.04 In recent years, the declining cost of components has led to greater efficiency in the production of solar panels while industry revenue has increased close to 100 percent in 2X13. The solar panel manufacturing industry has a low level of concentration, with only a few companies staking large claims to the nascent industry.
- **C.11.05** The solar power industry's growth has been spurred, in part, by strong government incentives in the form of renewable portfolio standard (RPS) laws and tax credits. RPS legislation, currently implemented in a majority of states and territories, requires local utilities to generate a percentage of their total energy portfolio from renewable sources. Some RPS programs provide renewable energy producers with transferable certificates to demonstrate their compliance with renewable energy production mandates, resulting in a market based response to compliance with state mandates. These policies also incentivize utilities to enter into Power Purchasing Arrangements or set out specified Feed-in Tariffs to encourage producers to invest in renewable power generation capacity. Net metering and investment tax credits, as described subsequently, provide two opportunities for incentives and, when combined with state incentives, have been incorporated into SJC's analysis to determine its target market.
- C.11.06 Net metering or favorable fixed pricing arrangements State regulatory policies govern the pricing available to residential solar energy producers for excess power supplied to "the grid" while the homeowner's usage is less than the power being generated at the site. Net metering gives the residential producer credit for the full retail price that the producer would have paid for electricity it had consumed, without being burdened by any of the infrastructure, marketing or distribution costs that the utility incurs. This price is generally much higher than what the utility would pay for

power supplied by a wholesale producer. Other states offer fixed pricing per kilowatt of solar power generation, establishing a more uniform pricing policy based upon a fixed price that includes a targeted incentive.

- **C.11.07** *Investment Tax Credit (ITC).* As of the investment date, the ITC is a 30 percent federal tax credit permitting the homeowner or investor to apply the credit as a dollar-for-dollar reduction in the income taxes that a person or company claiming the credit would otherwise pay the federal government. The ITC is based upon the amount of qualifying investment in residential solar installations. However, the ITC was scheduled to expire at the end of 2X15, unless re-authorized by US Congress through new legislation. Although it had a history of being extended, there was no assurance that it would be extended again, or if an extension would include substantial revisions or reductions.
- **C.11.08** *State incentives.* As each state offers slightly different versions of incentive programs for solar energy, SJC has analyzed the incentives in each of its current and target states. In order to understand the state's commitment to providing, increasing and maintaining incentives, SJC has looked at the RPS legislation enacted in each state. In addition, it researched market factors and rate yields to estimate the average payback period for its residential customers in each state. SJC's experience suggests that sales to residential customers become more challenging when the payback period exceeds 10 years, although the availability of attractive financing or a long term purchase commitment can mitigate this factor to some extent.

Target State	State's Current Power from Renew- ables/ (Solar) (as of Oct. 2X13)	State's RPS Goal (% of Energy from Renewables / (Solar))	RPS Goal (Target Date)	Avg. retail elect- ricity cost per kwh	Excess power gener- ation price realized per kwh (avg.)	Avg. rebate for 5 kw array	Other Incentives	Avg. Customer Payback Period with Federal ITC at 30% (in years)	Avg. Customer Payback Period without Federal ITC at 30% (in years)
State A		1-01 ((-01))	2225	¢ 0.120	¢ 0.120	¢2.750	Add'l Year 1 Tax	8.2	10.66
State B	2%/(1%)	15%/(5%)	2X25	\$ 0.130	\$ 0.130	\$5,000	Financing, Prop Tax Exempt	10.4	13.52
State C (Primary Current market)	9%/(3%)	33%/(10%)	2X20	\$ 0.095	\$ 0.090	\$4,500	Long Term PPA's	9.8	12.74
State D	4%/(<1%)	25%/(6%)	2X25	\$ 0.110	\$ 0.095	\$6,500	Prop Tax Exempt	9.2	11.96

**C.11.09** SJC has analyzed these states as a result of the conducive environment (number of sun hours per day) and the various incentives offered in these states, which, when combined with the federal ITC, provide customers with significant opportunities to reduce their upfront cost and make the return on their investment relatively attractive. The selling process requires significant depth of understanding the specific incentives and programs in each county or municipality to assist the customer with its purchasing decision. States in which incentives are more robust tend also to be more competitive. As a result, even though its incentive structure is less generous than in the other three states, SJC has targeted State B due to its adjacency to State C (meaning it can operate in that state at a reasonable cost) and the relatively fewer incumbent competitors in that market.

## **Risk Factors**

- **C.11.10** The various subsidies and incentives that are offered to renewable energy producers (i.e., SJC's customers) can be divided between those that subsidize the initial investment and those which increase the return on the investment. In evaluating the return on the investment in solar production, including for residential installations, the returns on investment or the payback period often depend significantly on the subsidies offered to the end user. For example, in SJC's initial market of State C, it is estimated that the best case pay-back period on the investment in a solar installation is 9+ years. Therefore, in order to begin to benefit from their investment, even after subsidies, the customer has to assume they will continue to be using the solar panels after 9+ years (e.g., will not have moved) and the solar panels will not have become technologically obsolete.
- C.11.11 Many of the existing government subsidies require continued authorization by government bodies, including, by the US Congress (in the case of the investment tax credit (ITC)) and annual budget appropriations, as with many direct state subsidies and tax credits. Many of these subsidies are controversial beyond just looking at the budget implications to the taxpayers. As a result, the industry is generally assuming that these subsidies will decline over time, although the rate at which incentives are reduced is difficult to estimate.
- **C.11.12** SJC's business plan assumes that it will reach profitability beginning in 2X17. Thereafter, the company expects that its "normalized" gross margin will be approximately 45 percent and its pre-tax net income margin will be approximately 15 percent. As a result, if the 30 percent Federal investment tax credit were to be reduced to 15 percent, and it is assumed for simplicity that this change has no implication on the assumed unit volume in 2X17, but has the effect of reducing selling price by 15 percent, the company's gross margin would be reduced to 30 percent and its net income margin would be reduced to zero.
- **C.11.13** The preceding example demonstrates that the company's business model is entirely dependent upon government subsidies and incentives. In AAM's view, this helps explain why, as compared to other successful companies experiencing double and

triple digit top line growth rates, the solar industry trades at relatively low revenue multiples. It is, in part, a recognition that the subsidies and incentives are unlikely to last in perpetuity and, as those subsidies are withdrawn, the industry will be required to become more efficient and consolidation and price competition are likely to ensue. AAM estimates that the current level of subsidies is likely to persist for roughly the next decade, at which time it hopes that SJC will have been sufficiently well established and profitable in order to respond effectively to market developments.

#### **The Transaction**

- C.11.14 On October 7, 2X13, AAM Fund signed a purchase agreement to enter into a transaction to acquire 100 percent of the equity of SJC for \$230 million.<sup>1</sup> AAM valued the company at an enterprise value of \$230 million, reflecting a multiple of 1.2x projected 2X14 Revenue of \$191.7 million. The 1.2x revenue multiple represents a discount to the median multiple of publicly traded comps; a discount which is attributable to the company's early stage of development and short operating history at its current scale of production.
- C.11.15 AAM Fund completed its acquisition of the company on December 12, 2X13. The company had no leverage at acquisition, although it closed an asset-backed working capital loan facility in late December to finance the company's growth. Interest is due on the facility at a rate of 12% per annum.

Acquisition Summary		
Acquirer	AAM Fund	
Target	SJC Solar, Inc.	
Acquisition Date (Close)	December 12, 2X13	
Percent Acquired	100.0%	
Implied Enterprise Value	230.0	
Going-in Revenue Multiple	1.2x	

## **Investment Thesis / Planned Exit**

**C.11.16** As of the acquisition date (December 12, 2X13), AAM Fund plans to utilize this investment as a platform to which it will bolt on additional solar businesses in the next few years, and to leverage the technology and manufacturing techniques pioneered by SJC to improve the efficiency of panels manufactured in the facilities

<sup>&</sup>lt;sup>1</sup> For simplicity, this example shows AAM Fund acquiring 100% of the equity value, without any dilution from management share options or additional equity issuance. It further assumes that third party debt financing is sufficient to provide the capital required to finance its growth. See the discussion in paragraphs 13.65–.76 regarding the consideration of the impact of dilution from future equity issuances.

of AAM's future tuck in acquisitions. Growth is expected by leveraging the technologically superior product design to build a superior market position. AAM then plans to sell the company, as a larger entity augmented by future bolt on acquisitions, to one of the large strategic players in the industry, as the overall market consolidates.

C.11.17 Although AAM plans to use SJC as a platform for acquisitions, AAM's base case plan to determine its "going in" valuation assumed no acquisitions, assumed that revenue would grow at approximately 21 percent per year and envisages a sale of the investment in a transaction negotiated early in 2X18 (that closes 6 months later) at a value to equity of approximately \$650 million. This equates to a 2X18 Revenue, EBITDA and Net Income multiples of 1.3x, 8.0x and 9.0x, respectively. This would produce an internal rate of return on its investment of approximately 25%.

## Valuation Calibration at Entry on December 31, 2X13

**C.11.18** AAM valued its investment in SJC at 1.2x EV / NTM Revenue (Next Twelve Months), or \$230 million. No change in value from the entry price was deemed appropriate, as the initial investment transaction was considered to have been done at fair value, and no significant events for the company or changes to market multiples had taken place between closing and December 31, 2X13. (This illustrates valuation of equity in simple capital structures as discussed in chapter 7 and calibration to the initial investment transaction as discussed in chapter 10.)

## Valuation at June 30, 2X14

- **C.11.19** As of June 30, 2X14, SJC's operations and financial results were exceeding plan. AAM Fund's management performed an updated analysis of the solar panel industry. AAM Fund's management noted that EV / NTM Revenue multiples for public companies in the industry had increased approximately 5.0 percent since AAM Fund had conducted its initial research of the industry, while no new relevant transactions had taken place over the past six months. Industry sources indicated that Average Selling Prices (ASP's) had remained unchanged over the past six months, while demand for solar power solutions had increased for both residential and enterprise customers, driven by increasing comfort with the technology and increases in the price of traditional energy sources, such as coal and natural gas. This was consistent with SJC's increasing sales momentum as reflected in its order book.
- **C.11.20** AAM updated its estimate for expected SJC's cash flows to account for an increase in market demand, and SJC's better than expected ASP per panel, compared to the original forecast, ramping up to the industry's levels faster than expected. That is, SJC found that it could achieve its targeted growth in market share without having to discount its installations as much as originally anticipated. Ultimately, AAM concluded based upon the company's near term increased financial projections and the more attractive long term outlook for the investment that the value of the investment should be written up to \$265 million (adjusted for net debt that has been

incurred to fund the company's expansion), based on an EV / NTM Revenue multiple of 1.20x at 6/30/2X14 (and equating to 1.33x LTM Revenue).

	Calibrated 12/31/2X13		6/30/2X14	
	LTM	NTM	LTM	NTM
Revenue	\$172.9	\$191.7	\$203.0	\$225.0
Multiple	1.33x	1.2	1.2x to 1.4x	1.1x to 1.3x
BEV	\$230m	\$230m	\$243.6m to \$284.2m	\$247.5m to \$292.5m
Debt <sup>2</sup>	\$0.0	\$0.0	\$5.0m	\$5.0m
Equity	\$230m	\$230m	\$238.6m to \$279.2m	\$242.5m to \$287.5m
Concluded FV	\$230.0m		\$265.01	n

The following analysis illustrates the calibration of valuation multiples based on company specific information and factors as discussed in chapter 10.

## Valuation at December 31, 2X14

- **C.11.21** After AAM's first year of ownership, SJC had yet to complete a material acquisition although it has spent \$10 million to date on legal and due diligence costs. Although the company's growth rate has slowed from its initial rapid pace, it has performed generally in line with initial expectations, with gradual improvements in profit margins. The company appeared to still be on track to get to break even in 2X17. However, there were significant challenges on the horizon. Competition was increasing, particularly in State C, and State D ran into significant budget constraints which resulted in its failure to appropriate enough money in its 2X15 budget for its rebate program. As a result, sales orders slowed by more than 50% in State D in response to the fact that the estimated payback period on a solar investment had increased from 9.2 years to 13.5 years due to lack of rebates.
- **C.11.22** Relative to the prior calibration date, ASPs had begun to decline, as more solar panel companies had entered the market and increased the supply of available panels. While SJC was successful in differentiating its product from the competition due to its superior technological design and greater efficiency, competitors who had a more diversified product portfolio, particularly in storage, were starting to increase their market share among commercial energy producers. Nevertheless, SJC had succeeded in renegotiating terms with its contract manufacturers to be able to maintain its profit margin for the next 3 years even as ASPs saw increasing pressure. In addition, in

<sup>&</sup>lt;sup>2</sup> For the purposes of this example, at this measurement date as well as the subsequent measurement dates through 2X14, we have considered a situation where the company was performing relatively well, the credit markets had been stable, and the debt was prepayable at par. Therefore, the value of debt for the purpose of valuing equity was estimated at par, and the fund did not consider a range of debt values when calculating the value of equity at this measurement date. Please see paragraphs 6.19–.31, "Value of Debt for the Purpose of Valuing Equity," for discussion of other situations when it would be appropriate to consider a value of debt for the purpose of valuing equity that would differ from par. In 2X15, when certain additional challenges emerged, the fund considered a value of debt for the purpose of valuing equity of less than par.

response to the prospects for a more challenging market environment, the company took steps to freeze spending on SG&A at its current level. As a result of these factors, AAM updated its prospective financial information for the company to assume that revenue growth declined from a 21 percent annual growth rate in its original projections to 15 percent, reflecting:

- a 5 percent annual decline in ASPs
- continued margin improvement consistent with the new contract terms, and
- a 50 percent decline in unit sales in State D in 2X15, followed by a return to growth in 2X16.
- **C.11.23** Guideline public companies' median revenue multiples decreased, with a new median of 1.1x NTM Revenue, with multiples being slightly lower for companies with operations in State D. Using the market approach, AAM applied a multiple range of 1.0x to 1.2x NTM Revenue, indicating a value range of \$183.0 million to \$223.6 million for AAM's equity, after adjusting for net debt position. AAM determined that a multiple at the low end of the range was appropriate given the company's exposure to State D and its more limited product portfolio. As a result, AAM valued its position at \$200 million, or 1.09x NTM Revenue. AAM considered the value indicated by LTM multiples, but concluded that market participants would be more focused on future earnings given the market uncertainty.
- **C.11.24** Based upon the updated prospective financial information for the company and using consistent exit multiple assumptions as used at entry (which AAM still believed was consistent with market participant expectations for companies in the solar industry), AAM estimated that a market participant acquiring its position for \$200 million today could realize a return of approximately 28 percent through mid 2X18. AAM estimated that in light of the more subdued outlook and some of the pricing pressure facing the industry, this higher required rate of return relative to its expected rate of return at entry, was appropriate.

The following analysis illustrates the calibration of the valuation multiples based on external information and factors (i.e., increased competition and lack of rebates in some states) as well as company specific information and factors (i.e., new contract terms, decrease in SG&A costs) as discussed in chapter 10.

	6/30/2X14		12/31/2X14	
	LTM	NTM	LTM	NTM
Revenue	\$203.0	\$225.0	\$204.0	\$188.0
Multiple	1.2x to 1.4x	1.1x to 1.3x	1.0x to 1.2x	1.0x to 1.2x
BEV	\$243.6m to	\$247.5m to	\$204.0m to	\$188.0m to
	\$284.2m	\$292.5m	\$244.8m	\$225.6m
Debt	\$5.0m	\$5.0m	\$5.0m	\$5.0m
Equity	\$238.6m to	\$242.5m to	\$199.0m to	\$183.0m to
	\$279.2m	\$287.5m	\$239.8m	\$223.6m
Concluded FV	\$265.0m		\$200.0m	

## Valuation at June 30, 2X15

- C.11.25 As of June 30, 2X15, the whole industry is now facing uncertainty, as the extension of the solar ITC has come under political pressure, and may potentially not be extended, along with several other credits and incentives. In part, this is precipitated by the recent threatened government shut down by members of Congress and a high profile speech from an industry critic assailing the credit as "corporate welfare." In addition, State D has not resolved its budgetary issues and two of SJC's competitors have aggressively reduced their prices and made attractive financing offers to consolidate their market position in the state while the budgetary issues are resolved in hopes that they will have greater market share when the state resumes its rebate. This has led SJC to decide to withdraw from State D.
- **C.11.26** AAM updated its prospective financial information to reflect the withdrawal from State D (including \$5 million in shut down costs) and a 10 percent decline in sales volume for H1 2X16 in the remaining states. This decline is estimated based upon the assumption that the ITC is ultimately extended (since doing otherwise would be catastrophic for the entire industry and would undercut political commitments the administration has made to the green energy lobby), but that the uncertainty around its passage could stall sales momentum for the early part of 2X16.
- C.11.27 Guideline public companies' median revenue multiples declined reflecting the additional uncertainty, with a new median of 1.05x. Using the market approach, AAM applied a multiple range of 0.9x to 1.15x NTM Revenue, indicating a value range of \$140 million to \$180 million (after adjusting for the company's net debt position). AAM considered the value indicated by LTM multiples, but concluded that market participants would be more focused on future earnings given the market uncertainty and the company's decision to withdraw from State D. Given the fund's view on the longer term outlook for SJC when compared with the guideline companies, AAM concluded on a value indication of \$140 million, at the low end of the NTM range.
- **C.11.28** In light of the revised prospective financial information and the overall market uncertainty, AAM revisited its exit assumptions using its revised assessment of 2X18 performance metrics and assumed an exit revenue multiple of 1.1x, versus its prior

exit multiple assumption of 1.3x. On the basis of these assumptions, AAM estimated that a market participant could acquire its interest in the company for \$140 million and realize a 25 percent internal rate of return. Given the adjusted market participant assumptions AAM has now built into their model, they viewed the 25 percent return to be within an appropriate range for this investment. The decreased rate of return assumptions were deemed to be reasonable given the adjustment to the forecasted cash flows for the business, which reflected the lesser degree of optimism regarding the regulatory environment and market participants' correspondingly lower return expectations.

The following analysis continues to illustrate the calibration of valuation multiples based on changes in company specific or environmental factors as discussed in chapter 10.

	12/31/2X14		6/30/2X15	
	LTM	NTM	LTM	NTM
Revenue	\$204.0	\$188.0	\$192.0	\$160.6
Multiple	1.0x to 1.2x	1.0x to 1.2x	0.98x to 1.18x	0.90x to 1.15x
BEV	\$204.0m to	\$188.0m to	\$188.2m to	\$144.5m to
	\$244.8m	\$225.6m	\$226.6m	\$184.6m
Debt	\$5.0m	\$5.0m	\$4.5m to \$4.8m	\$4.5m to \$4.8m
Equity	\$199.0m to	\$183.0m to	\$183.7m to	\$140.0m to
	\$239.8m	\$223.6m	\$221.8m	\$179.9m
			[Not used]	
Concluded FV	\$200.0m		\$140	0.0m

## Valuation at December 31, 2X15

- **C.11.29** In late December 2X15, the US Congress passed an extension of the investment tax credit (ITC) which maintained the credit at 30 percent for the next 5 years, ramping down to 26 percent for the next two years and 22 percent for the two years thereafter. The removal of this uncertainty was widely noticed within the sector, resulting in higher market multiples following enactment. Revenue multiples of guideline public companies were in the range of 1.1x and 1.4x NTM Revenues, with a median of 1.25x.
- **C.11.30** The extension of the ITC caused a number of customers to reaffirm their 2X16 orders and SJC saw an increase in demand on the horizon. Simultaneously, SJC received an unsolicited offer from CES, its overseas contract manufacturer, which was looking to expand its operations into the US and pursue a vertical integration strategy. According to the non-binding term sheet, CES would purchase AAM's position for \$250 million, payable \$150 million in cash and \$100 million in one year, contingent upon realization of H1 2X16 revenues at 85 percent of AAM's prospective levels. In light of the fact that this offer was preliminary and not binding, AAM determined it would not use the implied valuation as its primary valuation approach, but it would consider it in relation to the other methodologies it employed.

**C.11.31** Considering the increase in revenue multiples and the company's 2X16 sales momentum, AAM estimated the fair value of its position to be \$225 million. This valuation was consistent with a 1.25x NTM revenue multiple. Because of the contingent nature of a portion of the \$250 million offer provided by CES, AAM considered the value of the consideration offered by CES to be worth less than \$225 million. AAM was confident that they would be able to negotiate a package of consideration that achieved a value at least equal to or more than \$225 million. Finally, AAM noted that a market participant acquiring its interest at a value of \$225 million, would receive a return of 25 percent on the investment assuming a 2X18 exit at a 1.2x revenue multiple.

The following analysis continues to illustrate the calibration of valuation multiples based on changes in company specific or environmental factors as discussed in chapter 10. Consideration of an indicative non-binding term sheet is also discussed in chapter 13.

	6/30/2X15		12/31/2X15	
	LTM	NTM	LTM	NTM
Revenue	\$192.0	\$160.6	\$176.3	\$183.6
Multiple	0.98x to 1.18x	0.90x to 1.15x	1.21x to 1.41x	1.10x to 1.40x
BEV	\$188.2m to	\$144.5m to	\$213.3m to	\$202.0m to
	\$226.6m	\$184.6m	\$248.6m	\$257.0m
Debt	\$4.5m to \$4.8m	\$4.5m to \$4.8m	\$4.5m to \$4.8m	\$4.5m to \$4.8m
Equity	\$183.7m to	\$140.0m to	\$208.8m to	\$197.5m to
	\$221.8m	\$179.9m	\$243.8m	\$252.3m
Concluded FV	\$140.0m		\$225.0m	

## Valuation at March 31, 2X16

- **C.11.32** On March 1, 2X16, AAM concluded an agreement with CES for a total potential purchase consideration of \$275 million, based on an updated estimated 2X16 revenue of \$200 million, at a multiple of 1.375x. AAM was to receive \$100 million on April 15, 2X16, and \$175 million on March 1, 2X17, subject to 2X16 revenues being at least equal to \$176 million (the same level as 2X15 revenues versus AAM projection of \$200 million for 2X16). Any shortfall in actual revenues as compared to the \$176 million would result in a reduction of 150% percent of that shortfall in the amount payable as of March 1, 2X17 (negotiated consistent with a revenue multiple of 1.5x rounded from the multiple corresponding to \$176 million of revenues). The closing of the transaction was contingent only upon the delivery of SJC's 2X15 audited financial statements and there were no regulatory approvals required. The payment of all amounts due under the agreement were guaranteed by CES's parent company, CLJ, a large publicly traded company based in Hong Kong.
- C.11.33 Although these transaction terms were more complicated than what AAM had sought, it afforded AAM the opportunity to receive total consideration \$25 million higher

than the initial offer made by CES. This higher total consideration came at the cost of AAM being exposed to a different risk profile relative to SJC's ability to meet its financial targets, but AAM determined that these near term targets were sufficiently attainable and that AAM had enough visibility that it was prepared to accept those terms.

- **C.11.34** For financial reporting purposes as of March 31, 2X16, AAM considered the value of both the cash payment due at closing as well as the contingent consideration due under the signed agreement. In valuing the contingent consideration, AAM considered the following factors:
  - During the first three months of 2X16, SJC had realized revenues of \$45 million and had orders for a further \$60 million in panels to be delivered in the next four months. As a result, the contingent payment was virtually assured to have a value of at least \$68.5 million (\$176 \$105 = 71 million possible shortfall, multiplied by 1.5 = \$106.5 million reduction in the possible contingent payment of \$175 million, resulting in a lower bound payment of \$68.5 million).
  - In the remaining 5 months of 2X16, SJC projected that they would achieve revenues of \$82.5 million, an increase of 10% relative to the pace of deliveries in Q2 2X16. This pace would result in total revenues of \$187.5 million, exceeding the \$176 million threshold for achieving the full \$175 million payment, but falling slightly behind the original forecast of \$200 million for the year.
  - If revenues in the last 5 months of 2X16 fell 15% behind the pace of deliveries in Q2 2X16, then total revenues for 2X16 would be \$168.75 million, or a \$7.25 million shortfall. With the 1.5x multiplier on the shortfall, the contingency payment would fall to approximately \$164 million. If revenues fell 30% behind the pace of deliveries in Q2 2X16, then total revenues would be \$157.5 million, a \$18.5 million shortfall, resulting in a contingency payment of approximately \$147 million.
- **C.11.35** Given this range of outcomes relative to SJC reaching its sales target, and considering an equal weighting across the three scenarios, AAM estimated an expected probability-weighted payoff for the contingent receivable of \$162 million. Although the fund had high level of confidence that the target could be reached, AAM recognized with the 1.5x multiplier on the shortfall, there was some risk that the contingency could reduce their proceeds by a meaningful amount, particularly considering the potential for the industry to suffer near term shocks from regulatory changes. In other words, although AAM's estimate was derived from probability based assumptions, its estimate was consistent with AAM being highly confident that the remaining contractual payment would be realized, beyond what was virtually assured during the remainder of 2X16.
- **C.11.36** AAM estimated the fair value of the contingent payment by discounting the expected probability-weighted payoff of \$162 million at a market participant required rate of

return for this risky payoff. AAM noted that the risk in the payoff was directly related to the risk of the underlying revenues over the remainder of 2X16, especially the risk in the last five months of the year where orders had not yet been received. AAM estimated that the required rate of return for revenues would be lower than the overall short-term cost of capital for the company, due to operational leverage, and that the required rate of return for the contingent payment would also be lower since the payment is debt-like (no forecast risk) above the cap. Finally, AAM estimated that the counterparty risk associated with the payment was minimal, given the guarantee by CLJ. Taking these factors into consideration, AAM used a discount rate of 12% for the 10 month forecast period, resulting in an estimated fair value of approximately \$147 million for the contingent payment.

(The preceding analysis illustrates the use of multiple valuation methodologies (i.e., combination of the use of a binding offer as well as the use of a scenario analysis to value the contingent consideration) as discussed in chapter 5. Additionally, the scenario analysis illustrated in the assessment of the contingent consideration is discussed in chapter 13.)

C.11.37 The transaction closed, as expected, on April 15, 2X16, after the reporting date. AAM paid \$7.5 million in fees to legal and financial advisers, \$5.5 million of which were contingent upon the closing of the transaction. As of March 31, 2X16, AAM reported the fair value of its interest in SJC at \$247 million, an increase from its value as of December 31, 2X15. A discount of time value associated with the receipt of the first \$100 million was not included given the 15 day duration between the measurement date and the receipt of the funds, which was considered to be *de minimis*. The valuation of AAM's position was also not reduced for the anticipated transaction costs, although AAM recorded an accrued expense for the \$1.5 million of legal fees that had been incurred as of March 31, 2X16. (This illustrates the treatment of transaction costs as discussed in chapter 12.)

## **Task Force Observations**

- **C.11.38** Valuation of private companies inherently involve an element of judgment and familiarity with the portfolio company, the key drivers of the industry in which it operates, the competitive landscape, regulatory and other external factors and the long term outlook for the industry and the portfolio company. When making investment decisions relative to private companies, market participants generally undertake a thorough review and assessment of all of these relevant factors before determining the company's risk/return profile and establishing and negotiating an appropriate valuation. Calibration to the initial investment model and tracking relevant factors that impact the valuation along the way can be an important element in corroborating the fund's estimate as both external and company specific facts change and market participants perceptions of value change with those facts. (Please see chapters 3 and 10 for further discussion.)
- C.11.39 Non-binding term sheets or indications of interest generally don't provide a reliable basis for valuation by themselves, but should be considered as a data point and

evaluated in the context of the fund's primary valuation approach. (Please see chapter 5 for further discussion of use of multiple valuation approaches and chapter 13 for discussion of the impact of non-binding term sheets on fair value.)

C.11.40 Binding commitments and contracts can contain multiple provisions like contingent consideration that can alter the rights of the holder. To the extent these contractual rights are fully enforceable, the fair value of the holder's investment should include an assessment of such rights. Therefore, it is important to understand the contract and assess the value implied by its provisions and make estimates in light of the likelihood of enforceability or compliance with its terms and a careful review of each component of the consideration. (Please see chapter 13 for further discussion.)

## Case Study 12 – High Value Early Stage e-Commerce Startup in a High-Risk, High-Opportunity Market

*Note:* This case study is provided to demonstrate concepts discussed in the preceding chapters of this guide and is not intended to establish requirements, best practices or safe harbors. It was developed from a real-world situation, which was complex and involved numerous nuances that needed to be evaluated when estimating the fair value of the investment. However, this case study reflects only the high level approach that the fund would have considered in reaching its valuation conclusions and does not show the calculations or the support for each assumption.

The specific facts and circumstances of each individual situation should be carefully considered when performing an actual valuation, and professional judgment should be exercised in evaluating those facts and weighing various alternatives. This case study summarizes the key considerations that were encountered by the fund manager(s) described in the example. The judgments that were made in this case were specific to those facts, not all of which are highlighted herein. See the preamble for a more detailed description of the purpose of the case studies and factors to consider when reading the case studies.

<ul> <li>Case Study 12 – e-ChinaTech</li> <li>Ltd – Opportunities and Risks</li> <li>in a High Value e-Commerce</li> <li>startup in China</li> <li>Primary Concepts Illustrated</li> <li>Early-stage company valuation (chapter 5)</li> <li>Assessing when financing rounds are at fair value</li> <li>(paragraphs 5.52–55 and 13.37–38)</li> </ul>		
	Case Study 12 – <b>e-ChinaTech</b> <b>Ltd</b> – Opportunities and Risks in a High Value e-Commerce startup in China	<ul> <li>Primary Concepts Illustrated</li> <li>Early-stage company valuation (chapter 5)</li> <li>Assessing when financing rounds are at fair value (paragraphs 5.5255 and 13.3738)</li> </ul>
<ul> <li>Type of Security –</li> <li>Convertible Preferred</li> <li>(Participating)</li> <li>Industry – e-commerce</li> <li>Geography – China</li> <li>(Participating)</li> <li>Additional Concepts Illustrated</li> <li>Consideration of indicative offers (paragraphs 13.34–.36)</li> <li>Calibration when there is no recent financing round (chapter 10, paragraphs 13.39–.43)</li> <li>Evaluation of exit strategies based upon market participant assumptions (chapter 3)</li> </ul>	Type of Security – Convertible Preferred (Participating) Industry – e-commerce Geography – China	<ul> <li>Additional Concepts Illustrated</li> <li>Consideration of indicative offers (paragraphs 13.34–.36)</li> <li>Calibration when there is no recent financing round (chapter 10, paragraphs 13.39–.43)</li> <li>Evaluation of exit strategies based upon market participant assumptions (chapter 3)</li> </ul>

The primary purpose of this case study is to illustrate how information from multiple rounds of investments should be assessed and incorporated in management's estimate of fair value.

Specifically, this case study shows an investment in an early-stage company in the ecommerce, mobile internet industry. The fund invested in a minority position in e-ChinaTech Ltd Series B convertible preferred shares, alongside three other funds. Additional financing rounds were expected should the company be successful in addressing the e-commerce market. The investment was deemed to be very high risk given the company's unproven technology
and the presence of a much larger competitor in the market place. As such, the fund invested with the expectation of obtaining more than a 10x return.

Over the timeframe discussed in the case study, e-ChinaTech raised the following rounds of financing:

- Initial A financing round (not discussed)
- B financing round (the fund's initial investment)
- Follow-on B financing round (all insider; the fund participated)
- C financing round (the fund participated)
- D financing round (the fund participated, but did not conclude that the D round pricing was fully reflective of fair value)
- E Financing round (the fund was a partial seller).

The example illustrates some of the challenges associated with the valuation of early stage venture capital investments using market participant assumptions. Specific milestones and non-traditional valuation metrics were used to help inform the valuation conclusion. As described in paragraphs 1.57-.64, "Considerations for Early Stage Portfolio Companies," investors in early stage businesses often focus more on qualitative factors than on quantitative factors in determining whether and how much they will invest. These qualitative factors include but are not limited to the ultimate potential return, the quality of the management team and business plan, short term cash needs, investor demand, potential future dilution, etc. In addition, while a high failure rate with early stage enterprises is well documented, investors do not invest in businesses that they believe will be failures, and they typically evaluate their target returns considering only the success scenarios. Calibration to the price paid at various financing points is the best way to ensure that the quantitative support for the fund's fair value measurements is consistent with market participant pricing. Nevertheless, it is difficult to document quantitatively the specific factors which support the value of an ownership interest in an early stage business at various financing points, and it can be even more difficult to quantitatively demonstrate changes in value between financing points. As a result, in addition to considering a quantitative analysis at each valuation date, this case study includes some extended discussion of the facts surrounding the investment as the company progresses.

Investors in early stage enterprises generally exit their investment in one of three ways:

- 1. The portfolio company succeeds and either IPOs or has some other high value sale, in which case all interests in the portfolio company are converted to public stock in accordance with the conversion rights of each type of instrument so converted;
- 2. The portfolio company achieves some, but perhaps not all, of its target outcomes, in which case it is "liquidated" (typically by a merger / acquisition transaction) and the proceeds from the "liquidation" are allocated according to a negotiated or renegotiated liquidation formula; or
- 3. The portfolio company fails, meaning investors lose all of their money.

As a result of its evaluation of these possibilities, the fund determined that either the company would succeed or it would be liquidated with no value to the shareholders. As a result, even though the company raised several rounds of financing with each series of convertible

preferred shares having slightly different liquidation protections and governance rights, the fund's valuations generally looked only to the fully diluted ownership interest because in the scenarios in which the fund's shares would likely have value, all shares would convert to common shares and the liquidation preferences would not be meaningful. See chapter 8 (paragraphs 8.70–.74) and case study 10 for discussion and illustration of these fact patterns.

Based on the facts at the initial measurement date, this example demonstrates the qualitative factors considered by the fund and some other specific valuation considerations. Given the frequency of additional rounds of financing, the fund was able to calibrate to indications of value. However, given the rapid change in value combined with specific facts and circumstances as described below, the fund made adjustments to the valuation at interim dates based upon judgmental factors and considered the values indicated even by small rounds with a single investor.

# **Company Background**

- **C.12.01** e-ChinaTech Ltd, ("e-ChinaTech" or the "company") located in Shanghai, China, was an early stage, lead-generation platform focused on e-commerce and mobile Internet. Leveraging its search technology expertise, e-ChinaTech planned to become a leading electronic commerce shopping tool on the mobile Internet, creating an on-line marketplace that would match users' demand and merchants' supply.
- C.12.02 As of the initial investment date, China's e-commerce industry was well over a \$100 billion market and projected to continue growing at an annual rate of more than 20 percent. TCC, a competitor to e-ChinaTech and the largest e-commerce competitor in China, was twice the size of the leading e-commerce company in the United States and over twice the size of the largest offline "brick and mortar" retailers in China. At the date of the investment, the penetration of e-commerce in China was 38 percent, as compared to 66 percent in the United States. GlobalComm, a US based venture capital firm, believed the e-commerce industry will continue its rapid development over the next decade, largely as a result of many younger users in China who grew up using the Internet and are driving the growth in mobile Internet activity.
- **C.12.03** e-ChinaTech specialized in search technology and developed (but had not yet fully introduced) mobile applications that enable a personalized shopping experience. Much of its initial work in developing its search technology was in capturing and cataloguing products found on the internet sites of existing online merchants and incumbents like TCC, effectively providing a more efficient means for customers to transact on merchant sites, even those of other e-commerce vendors. This approach resulted in much higher conversion rates, thereby optimizing the lead-generation dollars spent by merchants in the system. Through its first PC-based product, as of the closing date of the initial investment, e-ChinaTech had already gained a significant user base of more than 40 million search users and approximately 5 million daily active online shoppers (about 3 percent of China's online shoppers). These metrics had increased significantly between the date as of which GlobalComm committed to the investment and the closing date. At commitment, three months

earlier, the company had 36 million search users and 3 million daily online shoppers. Part of e-ChinaTech's strategy was to begin expanding into the mobile user market, with a key milestone of reaching 2.5 million mobile daily users.

**C.12.04** Through its large user base and high conversion rates, the company had demonstrated the value of its search technology. Furthermore, the plan to leverage the existing infrastructure of online merchants and other e-commerce vendors would limit the required capital expenditures. However, it still needed to develop a transaction interface for merchants, and further invest in technology and marketing. These efforts presented a significant execution challenge for the founder and her team. In addition to developing and refining its online and mobile presence and search capabilities, the company needed to develop payment and fulfillment processes that currently did not exist. The founder was young and technically gifted with a strong entrepreneurial spirit but unproven in this sector. She had assembled a team consisting of experienced professionals from leading Chinese Internet companies.

# Initial Transaction and Calibration on October 15, 2X12

- C.12.05 On October 15, 2X12, GlobalComm Fund 2 invested \$15 million to acquire Series B Preferred Stock of e-ChinaTech representing a fully diluted ownership of 20 percent, implying an enterprise value of \$75 million at entry. GlobalComm's investment thesis highlighted the significant opportunity, but also noted a number of significant risk factors including e-ChinaTech's ability to achieve scale, generate revenue, demonstrate technological feasibility, and develop an engine for future growth. Until these factors were resolved, GlobalComm did not expect significant value to accrete. Further, should any of these milestones be missed, value would be expected to correspondingly decrease. Given the uniqueness of the strategy and the stage of development, GlobalComm had not identified any other companies that were comparable to e-ChinaTech.
- **C.12.06** In connection with its investment decision, GlobalComm evaluated a number of possible scenarios under which its investment might provide a return. However, GlobalComm understood that the market it planned to enter was dominated by TCC, and e-ChinaTech's business plan involved committing to spend between \$50 75 million in further development, promotion and customer acquisition costs during the next 18 months when it would generate little to no revenues. It was clear that these risks included the possible loss of all the capital invested.
- C.12.07 The company planned to try to reach monthly gross merchandise value (GMV) traded on its platform of \$90 million within the next 18 months. GlobalComm did not expect any significant value accretion until meeting such targets. Assuming it could capture 5 percent of the value of merchandise sales during this period, the company would be able to achieve breakeven. If the company could continue to grow and achieve double this growth level within 36 months, it could generate net income of up to \$34 million, which, assuming a 18x P/E multiple, would value the company's equity at \$600 million and GlobalComm's 20 percent interest at \$120 million.

- **C.12.08** At closing of the series B financing round, the company seemed to be performing very well, with 5 million daily online users at closing, compared to 3 million at the time the pricing for the round was negotiated. GlobalComm therefore considered whether or not fair value of the enterprise as of the date of the transaction had increased above the implied \$75 million negotiated value.
- **C.12.09** Using the number of daily online users as a metric, the \$75 million value of the Series B round implied a valuation of \$25 per user (3 million daily online users at negotiation of the transaction). At closing, the number of users had increased to 5 million. Thus, on a per user basis, the implied value at closing appeared to have increased to \$125 million. However, the investment thesis was predicated on the opportunity to profitably reach tens of millions of daily online users and 2.5 million daily mobile users, and this growth was already contemplated in the negotiated price. Because (i) the technology was unproven, (ii) the additional users were not yet generating revenue, and (iii) the additional investment was required, GlobalComm did not believe that value had increased by 67 percent between negotiating the financing round and closing.
- **C.12.10** Based on these considerations, GlobalComm concluded that the negotiated price still reflected fair value as of the transaction close date. GlobalComm further indicated that the \$15 million Series B round was negotiated based on a fully-diluted 20 percent ownership and considering e-ChinaTech's expected cash needs over the ensuing months. GlobalComm did not believe that they would have been required to pay more or receive less equity had they known for certain that daily users would grow to 5 million by the closing date. The number of daily online users and daily mobile users were important considerations, but at this point in time, sufficient growth had not been achieved to support an increase in value at the closing of the initial transaction.

(This analysis illustrates factors that may affect the initial fair value measurement and calibration, as discussed in chapter 10.)

# Valuation at December 31, 2X12

**C.12.11** At the first measurement date following the initial investment, GlobalComm considered its recent participation in the Series B investment round and assessed the company's performance in the fourth quarter of 2X12 as being in line with expectations. For example, the company's total daily users had increased from 5 million to 6 million and the active daily mobile users had grown from around 400,000 to 500,000, so the fund was encouraged by the early result. The following table shows some of the relevant statistics that GlobalComm considered in assessing the status of the company.

	Revenue Run Rate/Quarter (USD) - 3 month lag	Net Loss Run Rate	Monthly Cash Burn	Cash Balance	Daily Online Users	Daily Mobile Users (Mobile)	Registered Merchants	Monthly Gross Merchandise Value (USD)
Pre-Investment	-	-	-	5,000,000	3,000,000	400,000		NM
December 2X12	100,000	(2,100,000)	(1,000,000)	19,900,000	6,000,000	500,000	-	9,836,066

- **C.12.12** GlobalComm noted that there were early signs that the company had made progress between the negotiation date and closing, and between closing and December 31, 2X12, including signs that transaction volume was increasing and an increase in the daily online users from 5 million to 6 million. However, GlobalComm also noted that the daily mobile user base of 500,000 was far short of the 2.5 million necessary to demonstrate market acceptance. The company planned to develop a more integrated platform that would sign up merchants who in addition to paying for advertising on e-ChinaTech's website would, via subscription, receive preferential display in search results and would give e-ChinaTech a portion of their revenues from sales on the platform. This integrated platform would take some time for the company to further develop, and was expected to launch in 2X13. The subscription model and integrated platform were expected to require significant additional investment and the need to build out these capabilities increased the overall uncertainty with respect to e-ChinaTech being able to achieve its business plan.
- **C.12.13** Taking all these factors into account, GlobalComm judgmentally determined fair value to be \$15 million, equal to the initial investment value. Furthermore, GlobalComm did not expect that value would change in a linear manner. The initial valuation contemplated aggressive growth milestones. Reaching these targets would require not only growing the user base, but also making sure that the platform supported a broader range of services, meeting the needs of both merchants and users.

Summary of GlobalComm Valuation as of:	<b>December 31, 2X12</b>
Equity Interests Owned:	
Series B Preferred (cost)	15,000,000
Fully-diluted ownership percentage	20%
Enterprise Value Implied by Last Round Implied Valuation of GlobalComm Equity Interests (using 20 % fully	75,000,000
diluted ownership basis) <sup>1</sup>	15,000,000
GlobalComm view of Enterprise Value	75,000,000
GlobalComm Valuation of Equity Interests Owned	15,000,000

C.12.14 GlobalComm considered various models including: implied value per user, implied value per active user, and multiple of revenue. GlobalComm concluded that given the stage of development of e-ChinaTech, that a market participant would not pay more than the \$75 million implied enterprise value. Further, given the progress to

<sup>&</sup>lt;sup>1</sup>Based upon the fund's determination that the scenarios in which its investment is considered to have value would be those in which all shares covert to common shares, the fund is using the fully diluted ownership percentage to calculate its share of the enterprise value. See paragraphs 8.70–.74.

date and the available cash balance in the context of the company's business plan, there was no indication that value had eroded. Therefore, GlobalComm continued to value their 20 percent stake at \$15 million.

(This analysis illustrates factors that may affect the fair value measurement at future dates without a recent round of financing [as described in paragraphs 5.90–.92, 13.39–.43 and 14.14–.19].)

#### Valuation at December 31, 2X13

- **C.12.15** In November 2013, e-ChinaTech launched its integrated e-commerce platform and signed up 1,500 merchants for the trial phase. With these merchants in place, e-ChinaTech could monetize its platform by charging merchants for each user's click onto the merchant's site. But to maximize user experience, the company decided to only monetize a small portion of its traffic. Merchants purchased prepaid credits upfront and e-ChinaTech deducted these credits as clicks were consumed.
- **C.12.16** Approximately 900 of the 1,500 merchants purchased close to \$150,000 in credits and the daily cash collection totaled approximately \$15,000. The company was fine-tuning the advertising platform with the invited 1,500 merchants and planned to garner a wider merchant base in the next few months.

	Revenue Run Rate/Quarter (USD) - 3 month lag	Net Loss Run Rate	Monthly Cash Burn	Cash Balance	Daily Online Users	Daily Mobile Users (Mobile)	Registered Merchants	Monthly Gross Merchandise Value (USD)
Pre-Investment	-	-		5,000,000	3,000,000	400,000		NM
December 2X12	100,000	(2,100,000)	(1,000,000)	19,900,000	6,000,000	500,000	-	9,836,066
March 2X13	300,000	(2,700,000)	(1,100,000)	16,600,000	10,000,000	600,000	-	11,475,410
June 2X13	400,000	(3,400,000)	(1,267,000)	12,800,000	14,000,000	600,000	-	14,754,098
September 2X13	650,000	(3,900,000)	(1,633,000)	7,900,000	25,000,000	1,100,000	-	19,672,131
December 2X13	800,000	(1,100,000)	(1,333,000)	16,400,000	40,000,000	1,400,000	1,500	28,688,525

The following table shows some of the relevant statistics that GlobalComm considered in assessing the status of the company.

**C.12.17** In November 2X13, e-ChinaTech raised another round of Series B financing. All investors participated fully, including the prior investors, such that the percentage ownership among the investors was unchanged. GlobalComm contributed a further \$2.5 million in connection with this round. Since this was entirely an insider round and was not intended to change the investors' relative ownership, it was priced at the same per share value as the investment made in 2X12. While there was no third-party indication of value to be inferred from this transaction, the company's board (exercising their fiduciary duty, in particular considering the impact on common

shareholders), concluded that the inside round price reflected an arm's-length price and was representative of the value of the business at this stage of development.

- **C.12.18** While the company had made some progress in growing out its business plan, its user base remained below its original break even target, and the company's burn rate had increased significantly. As a result of e-ChinaTech's competitive threat which could take traffic away from their site, ChinaOnline (e-ChinaTech's contracted payment processor) began blocking access to its leading internet payment platform, meaning e-ChinaTech was going to have to build its own payment platform, pushing its break-even point further off given the added costs of building out the platform. It was clear that the company would need to make changes to its business plan and raise more capital in order to get to break even cash flow. These qualitative indicators of value further supported the board's conclusion that a "flat" price of the November 2X13 round was indicative of fair value.
- **C.12.19** Notwithstanding the significant increase in users, and revenue, as a result of the significant new and remaining risks, intensified competition from TCC, the challenges of building out a payment system and the absence of any third-party indications of value, GlobalComm judgmentally decided to value its investment at \$17.5 million.

Summary of GlobalComm Valuation as of:	<b>December 31, 2X13</b>
Equity Interests Owned:	
Series B Preferred (cost)	17,500,000
Fully-diluted ownership percentage	20%
Enterprise Value Implied by Last Round Implied Valuation of GlobalComm Equity Interests (using fully diluted	87,500,000
ownership %)	17,500,000
GlobalComm view of Enterprise Value	87,500,000
GlobalComm Valuation of Equity Interests Owned	17,500,000

- **C.12.20** GlobalComm again considered various models including: implied value per user, implied value per active user, and multiple of revenue. GlobalComm concluded that given the inherent risks, the stage of development, and the fact that e-ChinaTech had not achieved the key milestone of cash flow break even, that a market participant would not pay more than the \$87.5 million implied enterprise value.
- **C.12.21** This conclusion was further supported by the fact that all existing investors participated in the most recent round—had some investors decided not to participate that could have been an indication that value had declined. Had investors determined that significant value had accreted, they might have been willing to push the price higher to obtain a greater ownership interest. Based on the facts available, there was no indication that value had significantly increased or decreased and therefore GlobalComm valued their 20 percent stake at \$17.5 million.

(This analysis illustrates some of the factors that may affect the fair value at measurement dates with a recent round of financing [as described in paragraphs 10.31–.43] and the assessment whether an insider financing round is at fair value [as discussed in paragraphs 13.37–.38].)

#### Valuation at March 31. 2X14

**C.12.22** GlobalComm's original investment thesis was premised on e-ChinaTech becoming an e-commerce platform with a complete set of transaction and fulfillment capabilities. The business plan had outlined that only with such transaction and fulfillment capabilities could the company exist independently and fend off the giant Internet competitors in China. In March 2X14, about 18 months since GlobalComm's initial investment, due to competitive pressures, the company had fallen short of its original goal of 2.5 million daily active mobile users. In addition, quarterly revenue was significantly less than expectation, dropping to \$300,000.

The following table shows some of the relevant statistics that GlobalComm considered in assessing the status of the company.

	Revenue Run Rate/Quarter		Monthly		Daily	Daily Mobile		Monthly Gross
	(USD) - 3 month lag	Net Loss Run Rate	Cash Burn	Cash Balance	Online Users	Users (Mobile)	Registered Merchants	Merchandise Value (USD)
Pre-Investment	-	-		5,000,000	3,000,000	400,000		NM
December 2X12	100,000	(2,100,000)	(1,000,000)	19,900,000	6,000,000	500,000	-	9,836,066
March 2X13	300,000	(2,700,000)	(1,100,000)	16,600,000	10,000,000	600,000	-	11,475,410
June 2X13	400,000	(3,400,000)	(1,267,000)	12,800,000	14,000,000	600,000	-	14,754,098
September 2X13	650,000	(3,900,000)	(1,633,000)	7,900,000	25,000,000	1,100,000	-	19,672,131
December 2X13	800,000	(1,100,000)	(1,333,000)	16,400,000	40,000,000	1,400,000	1,500	28,688,525
March 2X14	300,000	(3,700,000)	(1,933,000)	10,600,000	55,000,000	1,500,000	250,000	34,426,230

- **C.12.23** It had also become clear that the amount of investment required to capture targeted market share would be significant. But the company had evolved and further developed its business plan with a clarified strategy. The company had gained a significant, early lead in mobile user traffic and transactions. The key to e-ChinaTech's revised strategy could be summarized as follows:
  - Enhanced User Experience
- **C.12.24** e-ChinaTech offered a leading mobile e-commerce traffic gateway for online shoppers. Through its personalized real time shopping recommendations, refined search, and quality comparisons across online stores within the network, e-ChinaTech provided a better user experience for online shoppers to browse, search and buy items using one's mobile phone. It could direct high-conversion buying

traffic to various e-commerce platforms, including TCC, other leading B2C Web sites, and more importantly to millions of small online stores within e-ChinaTech's own platform.

- Superior Benefit to Merchants
- **C.12.25** e-ChinaTech's format was hugely valuable to merchants as they could easily create online storefronts on mobile devices, far easier than it was to create an online storefront on the PC. The setup and maintenance cost of such an online storefront had been reduced dramatically as compared to the PC. While the transaction traffic was then limited to the merchants' friends within different social networks, the company could start delivering external traffic to its registered merchants from its e-ChinaTech platform.
  - The Challenges
- **C.12.26** The combination of these 2 platforms connected the company's shoppers and merchants to create a bigger transaction platform. However, the challenge in managing such a sophisticated e-commerce platform required complex user segmentation, merchant management systems, efficient payment solutions and dispute resolution mechanisms for the marketplace to function well. These would be the next set of challenges in addition to keeping up high traffic and transaction order growth.
  - Competition
- C.12.27 Despite of its strong user and traffic growth, e-ChinaTech still faced fierce competition from the leading e-commerce players like TCC, and other potentially strong entrants. Market analysts had indicated that mobile e-commerce was one of the largest revenue and growth opportunities for the Internet industry and was expected to be a hotly contested area.
  - Valuation Conclusion
- **C.12.28** The company had developed a clearer vision of its mission and had a more focused strategy. Yet it was clear the company would need significantly more capital to build out its business and significant risk remained that the company could fail to achieve break even and need to be shut down, with no value to the investors. The failure to meet milestones and the decrease in the prior quarter's revenue was distressing, and gave pause for GlobalComm to consider whether the failure to meet milestones and the decrease in revenue were indications that value had decreased. However, the company remained well positioned and technically capable to execute on its new strategy.
- **C.12.29** GlobalComm considered the positive indicators of value, including the very positive feedback from merchants and the company's more focused strategy, against the negative indicators of value, shown by the failure to meet milestones and the decline in revenues. The revised strategy required additional capital, and GlobalComm was aware that positive initial discussions were underway with additional outside investors for a Series C financing round. However, GlobalComm also knew that these

discussions had not yet progressed to specific indications of interest, and value had not yet been determined.

**C.12.30** After taking these factors into account, and noting that there were no significant changes in the external market conditions for the company, GlobalComm decided to keep its estimated fair value of the investment unchanged. In particular, GlobalComm estimated that the fair value would be unchanged until (a) the company made more progress towards its milestones, (b) the level of interest and expected pricing for the next round of financing was more clear, or (c) there were significant changes in external market conditions.

Summary of GlobalComm Valuation as of:	<u>March 31, 2X14</u>
Equity Interests Owned:	
Series B Preferred (cost)	17,500,000
Fully-diluted ownership percentage	20%
Enterprise Value Implied by Last Round	87,500,000
Implied Valuation of GlobalComm Equity Interests (using fd %)	17,500,000
GlobalComm view of Enterprise Value	87,500,000
GlobalComm Valuation of Equity Interests Owned	17,500,000

**C.12.31** GlobalComm again considered various models including: implied value per user, implied value per active user, multiple of revenue and the impact of cash balances and expected cash burn rates. GlobalComm concluded that given the stage of development of e-ChinaTech, and the inherent risks that a market participant would not pay more than the \$87.5 million implied enterprise value. While at the current cash burn rate of approximately \$2.0 million per month, the company only had sufficient cash resources for 5 months, given the more focused business plan and initial positive interest from potential for new investors, GlobalComm did not have any information which indicated that value had eroded. Therefore, based on the facts available, there was no indication that value had significantly increased or decreased and GlobalComm valued their 20 percent stake at \$17.5 million.

(This analysis illustrates factors that may impact the fair value, including assessing progress against milestones [as discussed in paragraphs 5.90–.92], evaluating relevant information using market participant assumptions [as discussed in chapter 3], and preliminary discussions with potential investors for additional capital [as discussed in paragraph 13.34].)

#### Valuation at June 30, 2X14

**C.12.32** The company's discussions with potential Series C investors proved to be more fruitful than anticipated. Investors were impressed by the quality of the management team, the refocused strategy, and the potential upside that the investment could provide. In May 2X14, the company closed its Series C round of financing with a total \$180 million raised at \$500 million pre-money and \$680 million post-money valuation. ABC Capital and DEF Partners, two new venture capital firms, jointly led this round with a combined \$150 million investment. The three existing investors

exercised partial pro-rata rights to invest a combined \$30 million, of which GlobalComm invested \$10.5 million in this round taking its total investment up to \$28.0 million. Following the Series C round of financing, GlobalComm held 16.5 percent of the company on fully diluted basis.

C.12.33 The significant increase in value relative to GlobalComm's previous estimate, only two months earlier, was due to the unanticipated degree of success of the negotiations with ABC and DEF. In particular, ABC and DEF were less focused on the historical value and performance of the company than on the potential future upside, which required significant capital to achieve. Therefore, in the negotiations, the company held out for the new investors to commit the needed capital without overly diluting the existing shareholders. Since ABC and DEF felt that e-ChinaTech was in a unique position to capitalize on the enormous market opportunity they saw, these new investors agreed to pay a high price for the shares. When assessing the large increase in value with the benefit of hindsight, GlobalComm still considered the previous valuation to be reasonable, because until the fund knew that these new investors would be willing to provide this level of capital, market participants would not have had confidence that the company would have the resources to embark upon the new strategy. In effect, the magnitude of the capital provided by the Series C investment substantially reduced the risk associated with many of the previous concerns about whether the company could reach a scale necessary to build out the company's infrastructure to execute on its updated plans.

	Revenue Run Rate/Quarter (USD) - 3 month lag	Net Loss Run Rate	Monthly Cash Burn	Cash Balance	Daily Online Users	Daily Mobile Users (Mobile)	Registered Merchants	Monthly Gross Merchandise Value (USD)
Pre-Investment	•	-	-	5,000,000	3,000,000	400,000		NM
December 2X12	100,000	(2,100,000)	(1,000,000)	19,900,000	6,000,000	500,000	-	9,836,066
March 2X13	300,000	(2,700,000)	(1,100,000)	16,600,000	10,000,000	600,000	-	11,475,410
June 2X13	400,000	(3,400,000)	(1,267,000)	12,800,000	14,000,000	600,000	-	14,754,098
September 2X13	650,000	(3,900,000)	(1,633,000)	7,900,000	25,000,000	1,100,000	-	19,672,131
December 2X13	800,000	(1,100,000)	(1,333,000)	16,400,000	40,000,000	1,400,000	1,500	28,688,525
March 2X14	300,000	(3,700,000)	(1,933,000)	10,600,000	55,000,000	1,500,000	250,000	34,426,230
June 2X14	300,000	(6,600,000)	(1,000,000)	187,500,000	70,000,000	2,000,000	3,000,000	49,180,328

The following table shows some of the relevant statistics that GlobalComm considered in assessing the status of the company.

**C.12.34** In light of the substantial third party participation in the Series C round, and the fact that this capital now provided e-ChinaTech with the means to build out an infrastructure consistent with its current business plan, GlobalComm determined that

the valuation implied by the Series C round was the best means of approximating the fair value of its investment. As a result, it valued its Series B and Series C position at a combined \$112.2 million using the fully diluted ownership percentage attributable to its holdings.

C.12.35 In estimating the fair value for its position based on the fully-diluted ownership, GlobalComm considered the possible difference in value between the Series C and the earlier rounds of financing. While the Series C shares had a higher liquidation preference and therefore might receive a higher residual value in a potential liquidation scenario, GlobalComm noted that market participants were expecting the company to exit on an as-converted basis. In particular, if the company was successful, the value would increase significantly and all the classes of equity would convert. If the company was unsuccessful, the high losses experienced in the new business plan would most likely drive them out of business altogether. If the company was only moderately successful, an IPO would still be likely to be the company's optimal exit strategy; there was little chance that the company would have significant value in a sale if it was not able to execute on its new business plan – competitors already had their own technologies for addressing this space. The Series A and Series B investors retained the ability to trigger an IPO and force the Series C investors to convert. Therefore, GlobalComm concluded that a market participant would estimate the value of the shares on a fully-diluted basis.<sup>2</sup>

Summary of GlobalComm Valuation as of:	<u>June 30, 2X14</u>
Equity Interests Owned:	
Series B Preferred (cost)	17,500,000
Series C Preferred (cost)	10,500,000
Total Investment Cost	28,000,000
Fully-diluted ownership percentage	16.5%
Enterprise Value Implied by Last Round (post-money)	680,000,000
Implied Valuation of GlobalComm Equity Interests (using fd %)	112,200,000
GlobalComm view of Enterprise Value	680,000,000
GlobalComm Valuation of Equity Interests Owned	112,200,000

**C.12.36** GlobalComm again considered various models including: implied value per user, implied value per active user, multiple of revenue and the impact of cash balances and expected cash burn rates. GlobalComm concluded that given the revised strategy and the significant new outside investment, combined with the decision of other existing investors to increase their investment, the most recent round of financing provided the best indication of value.

(This analysis illustrates the use of calibration to infer value from transactions in a portfolio company's instruments [as discussed in chapter 10] and backtesting a prior

<sup>&</sup>lt;sup>2</sup> Based upon the fund's determination that the scenarios in which its investment is considered to have value would be those in which all shares (including the recently raised Series C shares) would covert to common shares, the fund continued using the fully diluted ownership percentage to calculate its share of the enterprise value. See paragraphs 8.70–.74.

valuation based upon valuations implied by subsequent rounds [as discussed in chapter 11].)

# Valuation at December 31, 2X14

#### Series D Round of Financing

- C.12.37 The company continued to aggressively execute its revised business plan. Given its progress, in November 2X14, the company was able to close a Series D round of financing with a total of \$500 million raised at a \$3 billion pre-money and \$3.4 billion post-money valuation after the redemption of \$100 million of existing shares. Existing investors, including DEF Partners and ABC Capital, invested \$155 million and \$70 million, respectively. Five new investors, led by BigChina Fund and 888 China Partners, invested a combined \$275 million. GlobalComm and another B round investor each sold \$50 million of their shares in this round, at the same price as the Series D. Following the Series D round of financing, GlobalComm held 11.25 percent of the company on a fully diluted basis and was still the company's second largest shareholder.
- **C.12.38** Even though the time since the prior financing round had been relatively short, the new investors considered the company's progress, business plan, and most importantly the size of the overall market and the potential upside, and concluded that they were afraid of missing out on the significant opportunity. The business plan called for significant additional capital. The Series D round provided such capital and as such reduced the risk of the investment by providing the cash runway to fully execute its strategy.

Users and Traffic

- **C.12.39** The company's plans to increase user traffic to its sites through a presence on social media sites was succeeding in attracting significant customer growth. The company had successfully migrated its online payment system from *ChinaPayOnline*, the leading online payment platform in China, to its own payment solution, partnering with BigChinaBank.
- C.12.40 The company's mobile platform continued to grow its merchant base and transaction traffic at a fast pace. Its cumulative registered merchants were over 15 million, and its latest monthly transacted GMV was at over \$655 million. GMV was growing at over 20 percent month on month.

The following table shows some of the relevant statistics that GlobalComm considered in assessing the status of the company.

	Revenue Run Rate/Ouarter		Monthly		Daily	Daily Mobile		Monthly
	(USD) - 3	Net Loss	Cash	Cash	Online	Users	Registered	Merchandise
	month lag	Run Rate	Burn	Balance	Users	(Mobile)	Merchants	Value (USD)
Pre-Investment	-	-	-	5,000,000	3,000,000	400,000		NM
December								
2X12	100,000	(2,100,000)	(1,000,000)	19,900,000	6,000,000	500,000	-	9,836,066
March 2X13	300,000	(2,700,000)	(1,100,000)	16,600,000	10,000,000	600,000	-	11,475,410
June 2X13	400,000	(3,400,000)	(1,267,000)	12,800,000	14,000,000	600,000	-	14,754,098
September 2X13	650,000	(3,900,000)	(1,633,000)	7,900,000	25,000,000	1,100,000	-	19,672,131
December								
2X13	800,000	(1,100,000)	(1,333,000)	16,400,000	40,000,000	1,400,000	1,500	28,688,525
March 2X14	300,000	(3,700,000)	(1,933,000)	10,600,000	55,000,000	1,500,000	250,000	34,426,230
June 2X14	300,000	(6,600,000)	(1,000,000)	187,500,000	70,000,000	2,000,000	3,000,000	49,180,328
September								
2X14	900,000	(13,600,000)	(17,500,000)	113,500,000	95,000,000	3,400,000	10,000,000	300,000,000
December 2X14	700,000	(21,400,000)	(36,100,000)	526,700,000	110,000,000	4,000,000	15,000,000	655,737,705

- **C.12.41** As a result of the meaningful uplift in the valuation from the Series B valuation and the Series D valuation and the strong investor interest in e-ChinaTech, GlobalComm decided to sell a portion of its original Series B investment at the price of the Series D round in order to partially realize a gain. Since even after the sale, GlobalComm was able to retain its status as the company's second largest shareholder, this opportunity was particularly attractive. GlobalComm realized a gain of \$47.25 million on its sale of roughly 15.5 percent of its Series B shares.
- **C.12.42** GlobalComm considered the fact that this round included several new investors and provided an indication of value for both a primary and secondary transfers as further strengthening their view as to the fair value. GlobalComm also noted that, as further evidenced by their sale of a portion of their Series B shares at the Series D price, market participants were expecting the company to exit on an as-converted basis; thus, GlobalComm concluded that there was no difference in value between the various classes of preferred.<sup>3</sup> Therefore, GlobalComm valued its remaining 11.25 percent interest at the value implied by the \$3.4 billion enterprise value, resulting in a fair value conclusion of \$382.5 million.

<sup>&</sup>lt;sup>3</sup> Based upon the fund's determination that the scenarios in which its investment is considered to have value would be those in which all shares (including the recently raised Series D shares) would covert to common shares, the fund continued using the fully diluted ownership percentage to calculate its share of the enterprise value. Further evidence of this fact was the company's decision to redeem a portion of the fund's Series B shares at the same per share value as the newly issued Series D shares. See paragraphs 8.70–.74.

Summary of GlobalComm Valuation as of:	December 31, 2X14
Equity Interests Owned:	
Series B Preferred (cost)	14,750,000
Series C Preferred (cost)	10,500,000
Total Investment Cost	25,250,000
Fully-diluted ownership percentage	11.25%
Enterprise Value Implied by Last Round (post-money)	3,400,000,000
Implied Valuation of GlobalComm Equity Interests (using fd %)	382,500,000
GlobalComm view of Enterprise Value	3,400,000,000
GlobalComm Valuation of Equity Interests Owned	382,500,000

**C.12.43** GlobalComm again considered various models including: implied value per user, implied value per active user, multiple of revenue and the impact of cash balances and expected cash burn rates. GlobalComm concluded that the significant new outside investment, combined with the value indicated by the partial sale of its shares, that the recent transaction price provided the best indication of value. Based on the \$3.4 billion valuation, for calibration purposes, GlobalComm calculated the implied value per total users as \$30.91 per user (3.4 billion/ 110 million) as they considered this to be a primary metric considered by market participants. GlobalComm had considered this metric in the past but had not relied upon it to specifically assess value because of the failure to achieve the other milestones that were regarded as more important indicators of value at earlier dates; however, because of the positive evolution of the company and the focus by new investors on number of users, the value per user was deemed to be a valid basis for considering value going forward.

(This analysis illustrates the use of transactions in a portfolio company's interests to infer value of the fund's holdings and the use of the metrics implied by transactions considered to be at fair value for calibration [as discussed in paragraphs 5.52–.55 and paragraph 10.34].)

#### Valuation at March 31, 2X15

- **C.12.44** During the first quarter of 2X15, the company continued to grow its merchant base and transaction traffic at a fast pace. At March 31, 2X15, transacted users had grown to 140 million, a 27 percent increase during the quarter. The company's projections showed that future significant growth in users were on track. In addition, a Series E round of financing was expected to be executed in the near future (terms to be determined; preliminary indications of value between \$4.5 and \$6.0 billion).
- **C.12.45** Because of the significant growth in users, and because of the anticipated valuation of the Series E round, GlobalComm concluded that value had accreted during the quarter. To determine fair value, GlobalComm considered the calibrated value per user of \$30.91, which when applied to the user base which had grown to 140 million, indicated an enterprise value of \$4.3 billion. GlobalComm also considered various metrics including: gross merchandise volume, implied value per active user, multiple of revenue and the impact of cash balances and expected cash burn rates, which indicated a range of value between \$4.0 billion and \$4.5 billion.

**C.12.46** While \$4.3 billion of enterprise value was below the range of the expected Series E round, GlobalComm was concerned that there is always risk that a round of financing may not close as expected. Therefore, GlobalComm judgmentally deemed that a market participant, given the facts and circumstances, would conclude that enterprise value was approximately \$4.0 billion. As such, GlobalComm's 11.25 percent interest was valued at \$450 million, an approximate 18 percent increase from the prior quarter.

(This analysis illustrates the use of calibration [chapter 10] and the impact of indicative offers or an expected financing event on the fund's estimation of fair value [paragraphs 13.34 and 14.69].)

#### Valuation at June 30, 2X15

C.12.47 During the second quarter of 2X15, the company launched a one-time advertising campaign to raise brand awareness. e-ChinaTech continued to grow its merchant base and transaction traffic at a fast pace. By June 2X15, e-ChinaTech had over 32 million cumulative registered merchants. Monthly transacted GMV (gross merchandise volume) reached \$1.7 billion with rapid growth of over 25 percent month on month.

The following table shows some of the relevant statistics that GlobalComm considered in assessing the status of the company.

	Revenue Run Rate/Quarter (USD) - 3 month lag	Net Loss Run Rate	Monthly Cash Burn	Cash Balance	Daily Online Users	Daily Mobile Users (Mobile)	Registered Merchants	Monthly Gross Merchandise Value (USD)
Pre-Investment		-	-	5,000,000	3,000,000	400,000		NM
December 2X12	100,000	(2,100,000)	(1,000,000)	19,900,000	6,000,000	500,000	-	9,836,066
March 2X13	300,000	(2,700,000)	(1,100,000)	16,600,000	10,000,000	600,000	-	11,475,410
June 2X13	400,000	(3,400,000)	(1,267,000)	12,800,000	14,000,000	600,000	-	14,754,098
September 2X13	650,000	(3,900,000)	(1,633,000)	7,900,000	25,000,000	1,100,000	-	19,672,131
December 2X13	800,000	(1,100,000)	(1,333,000)	16,400,000	40,000,000	1,400,000	1,500	28,688,525
March 2X14	300,000	(3,700,000)	(1,933,000)	10,600,000	55,000,000	1,500,000	250,000	34,426,230
June 2X14	300,000	(6,600,000)	(1,000,000)	187,500,000	70,000,000	2,000,000	3,000,000	49,180,328
September 2X14 December	900,000	(13,600,000)	(17,500,000)	113,500,000	95,000,000	3,400,000	10,000,000	300,000,000
2X14	700,000	(21,400,000)	(36,100,000)	526,700,000	110,000,000	4,000,000	15,000,000	655,737,705
March 2X15	1,200,000	(4,800,000)	(35,000,000)	456,700,000	140,000,000	5,000,000	25,000,000	1,016,393,443
June 2X15	500,000	(4,600,000)	-	688,100,000	179,000,000	6,000,000	32,000,000	1,704,918,033

- **C.12.48** In May 2X15, e-ChinaTech raised \$50 million in a Series E financing at a \$6.5 billion post-money valuation, from a single new investor, US Asset Manager Co, a mutual fund. This investment, coming 5 months after the Series D financing, suggested that the enterprise value of the company had almost doubled. Clearly, this financing recognized that the value of the company had increased, reflecting the company's progress and the strong brand recognition they had achieved. However, GlobalComm also noted that the financing was small relative to the prior financings, and was not the result of a complete and robust fundraising process. Furthermore, GlobalComm considered that the market participants in the fund's principal market would be other venture capital investors, rather than mutual fund investors. GlobalComm and the other previous investors were not offered the opportunity to either buy or sell in this financing.
- C.12.49 Given these factors, GlobalComm decided to value its investment in e-ChinaTech considering the increase in users from March 2X15 to June 2X15 as well as the Series E price. The user base increased by approximately 25% over the three-month period, which would imply an increase in value from \$450 million to \$562.5 million based solely upon this metric. This value reflected a 23% discount to the Series E price. GlobalComm also considered other metrics including the implied value per active user, implied revenue multiples, and the impact of cash balances and expected cash burn rates. Considering all of these indications of value, as well as placing some weight on the Series E price, GlobalComm concluded on a 20 percent discount to the enterprise value implied by the Series E round. The 20 percent discount was considered to be reasonable based on the small size of the Series E financing and taking into account GlobalComm's assessment of US Asset Manager Co's investment strategy based on the mutual fund's published reports, when compared with the investors in GlobalComm's principal market. As a result, GlobalComm valued their holdings at \$582 million.

Summary of GlobalComm Valuation as of:	<u>June 30, 2X15</u>
Equity Interests Owned:	
Series B Preferred (cost)	14,750,000
Series C Preferred (cost)	<u>10,500,000</u>
Total Investment Cost	25,250,000
Fully-diluted ownership percentage	11.2%
Enterprise Value Implied by Last Round (post-money)	6,500,000,000
Implied Valuation of GlobalComm Equity Interests (using fd %)	728,000,000
GlobalComm view of Enterprise Value	5,200,000,000
GlobalComm Valuation of Equity Interests Owned	582,000,000

(This analysis illustrates the use of multiple methods and factors to determine a fair value estimate [chapter 5] and the assessment of the relevance of an observable transaction in determining a fair value estimate [paragraph 3.13].)

#### **Task Force Observations**

- **C.12.50** The Task Force observes that various valuation techniques may be appropriate based on individual facts and circumstances. It is appropriate to consider a range of scenarios when determining the fair value of an early stage pre-revenue or pre-earnings company. In this case, based on the given facts and circumstances, the growth trajectory, and the frequency of the financing rounds, it was concluded that a market participant would focus only on a fully diluted valuation. Further, at certain points in time, there were indications that value had accreted, while at the same time additional risks presented themselves. It was deemed that at those points in time, the potential valuation accretion, if any.
- **C.12.51** The closing of a financing round in and of itself may cause an uplift in value, because of the reduced risk associated with having sufficient cash to fund the company's business plan.
- **C.12.52** Under certain circumstances, relatively insignificant rounds, even those with unrelated third parties, may or may not be an indication of value which would be considered by other market participants or reliable indications of fair value for other interests or the enterprise as a whole. Although some weight should be given to these observable transactions, judgment is required to evaluate what assumptions market participants would make when transacting in the interests being valued.
- **C.12.53** For early stage companies that do not have reliable financial metrics or robust cash flow projections, a fund will typically need to consider any indications of value from qualitative discussions with potential investors, assessments of the market potential for the investment, and achievement or progress toward any identifiable milestones. In these cases, the supporting calculations may be quite limited, and the valuation may require a significant amount of judgment.

# Case Study 13 – Business Development Company with Various Debt Investments

*Note:* This case study is provided to demonstrate concepts discussed in the preceding chapters of this guide and is not intended to establish requirements, best practices or safe harbors. It was developed from a real-world situation, which was complex and involved numerous nuances that needed to be evaluated when estimating the fair value of the investment. However, this case study reflects only the high level approach that the fund would have considered in reaching its valuation conclusions and does not show the calculations or the support for each assumption.

The specific facts and circumstances of each individual situation should be carefully considered when performing an actual valuation, and professional judgment should be exercised in evaluating those facts and weighing various alternatives. This case study summarizes the key considerations that were encountered by the fund manager(s) described in five discrete debt investment examples with various features. The judgments that were made in this case were specific to those facts, not all of which are highlighted herein. See the preamble for a more detailed description of the purpose of the case studies and factors to consider when reading the case studies.

Example 13 – Mountain	Primary Concepts Illustrated
Wealth Management (MWM) – SEC registered	• Valuing uncollateralized debt investments—Investment
Business Development Company (BDC)	<ul> <li>Valuing collateralized debt investments—Investment 2 (chapter 6)</li> <li>Valuing conversion features and equity enhancements—</li> </ul>
Types of Investments – Five illustrative Debt investments with various features and priority in the capital structure	<ul> <li>Valuing conversion relatives and equily enhancements Investment 3 (chapter 13)</li> <li>Valuing mezzanine debt investment with warrants— Investment 4 (chapter 13)</li> <li>Disaggregating components of a bundled investment to</li> </ul>
Industry – Various	<ul> <li>match unit of account—Investment 5 (chapters 3 and 10)</li> <li>Determining initial fair value—Investment 5 (chapter 10)</li> <li>Yield approach (chapter 6)</li> </ul>
	<ul> <li>Additional Concepts Illustrated</li> <li>Impact of call premiums—Investment 1</li> <li>Impact of adverse events—Investment 2</li> <li>Third party valuation specialist—Investments 1 and 3 (appendix A)</li> <li>Synthetic ratings—Investments 1 and 2</li> <li>Assessing relevance and reliability of pricing service information—Investment 4</li> </ul>

# The primary purpose of this case study is to illustrate judgments required when valuing various types of debt investments.

Estimating the fair value of private debt investments requires informed judgment applying valuation techniques applicable to the features of the debt instrument based on individual facts and circumstances and the unit of account. To expand on the conceptual discussion in chapter 6, "Valuation of Debt Instruments" the following five examples illustrate valuation considerations for debt investments with varying priority in the capital structure and with differing structural components such as conversion features and equity enhancements.

The examples highlight considerations important in determining fair value for debt instruments including initial calibration, disaggregating investments into component parts, impact of changes in credit quality, impact of changes in market yields, performing vs nonperforming loans, cash pay interest vs payment in kind interest, usability and reliability of market indications of value and original issuance discounts. Emphasis is placed on describing relevant factors that may be considered and approaches that might be used, assuming that the impact of those factors could be material on the fund's fair value estimate. As always, judgment is required to evaluate how market participants would evaluate such factors and whether they may have a material impact.

This case study highlights initial calibration and subsequent measurement date valuation for five different investments in debt instruments:

- Investment 1—Senior Unsecured Debt; Cash Pay; Prepayment Penalty
- Investment 2—Collateralized First Lien; Cash & PIK Pay; Initial strong performance; ultimate bankruptcy
- Investment 3—Second Lien; Conversion Feature
- Investment 4—Mezzanine Debt Investment with Warrants
- Investment 5—Basket of Debt and Equity interests

# **Fund Background**

C.13.01 Pace Noggle and Remy Liu founded Mountain Wealth Management (MWM or 'the fund') 25 years ago. MWM is a US Securities and Exchange Commission registered Business Development Company. MWM invests in a number of private debt and equity instruments with various priorities in the capital structure of the individual portfolio companies.

#### Investment 1–Valuation of Senior Unsecured Debt Investment–Jane Pharmaceuticals

#### **Business Description**

- **C.13.02** Jane Pharmaceuticals (JP) is a biopharmaceutical company, focused on identifying, developing, and marketing products in the fields of infertility, obstetrics, urology, gastroenterology, endocrinology, and osteoarthritis. Its products include various injectable therapies.
- C.13.03 The company was founded more than 20 years ago by Dr. Olivia Jane, and generates substantial revenue and EBITDA.

#### **Investment Description**

C.13.04 On December 15, 2X14, MWM provided Jane Pharmaceuticals with \$25,000,000 in debt financing, for general corporate purposes and to fund research and development. The debt had the following terms:

Debt Instrument	Senior Unsecured
Origination Date	December 15, 2X14
<b>Contractual Maturity Date</b>	December 15, 2X19
Expected Maturity Date	December 15, 2X19
Commitment	\$25,000,000 (Fully funded as of closing date)
Interest Rate	6.0% Cash Interest; Payable Monthly; Actual/365
Collateral	None
OID	None
Exit Fees	None
Amortization	None
Call Feature	Yes
Call Premiums	12/15/2X14 to 12/15/2X15: 104.0%
	12/15/2X15 to 12/15/2X16: 102.0%
	12/15/2X16 to 12/15/2X17: 101.0%
	After 12/15/2X17: 100.0%
IRR / Pricing at Origination	6.17% (1.71% 5.0Yr Swap Rate + 4.46% Implied Spread) / 100.00%

#### Initial Transaction and Calibration on December 15, 2X14

- **C.13.05** As of the transaction date, MWM calibrated the valuation inputs to the initial investment amount, as discussed in chapters 6 and 10. The senior unsecured debt was priced at \$25,000,000 or 100.00 percent of par, and the IRR was 6.17 percent. Using the 5.0-year swap rate<sup>1</sup> of 1.71 percent as of December 15, 2X14, the implied spread was 4.46 percent (6.17 less 1.71 percent). A comparable 5-year swap rate was used to benchmark similar duration instruments and to calibrate the resulting spread for this particular instrument.
- C.13.06 MWM noted that JP was not rated and did not have any publicly-rated debt. Based on an analysis of JPs financial position (balance sheet ratios, margins, etc.), MWM determined a synthetic rating<sup>2</sup> for JP, concluding that JP had characteristics comparable to BBB/Baa2 (S&P/Moody's) rated instruments. The spread of 4.46 percent fell between the median and third quartile of observable spreads for BBB/Baa2 senior unsecured bonds with similar terms to maturity.
- C.13.07 Although MWM noted that the instrument was callable with a prepayment penalty, MWM deemed the probability of exercising the call to be *de minimis* and implicitly included the company's right to call the instrument at a penalty as a component of the 6.17 percent origination IRR.

# First Fair Value Measurement Date on December 31, 2X14

#### MWM Analysis

- **C.13.08** At December 31 2X14, MWM estimated the fair value of the instrument by taking into account changes in market conditions (spreads) and credit quality. The company performed in line with budget and expectations given the short time since investment. Existing products produced a strong revenue and profit stream and no changes in competitive environment were noted. The company continued to invest in research and development of future opportunities.
- **C.13.09** Using the latest available financial information as of the measurement date, the company's synthetic ratings continued to be "BBB/Baa2 (S&P/Moody's)." While the company's performance continued to be strong, the synthetic rating requires judgment and is not sensitive enough to capture small changes in the company's credit quality.
- **C.13.10** The median spread of the BBB index narrowed by 17.0 basis points from the origination date, implying that the market was accepting a slightly lower return for similar rated instruments. Given the company's relatively stable overall performance,

<sup>&</sup>lt;sup>1</sup> MWM selected a benchmark yield based on the LIBOR swap rate curve, one commonly used benchmark yield curve.

<sup>&</sup>lt;sup>2</sup> Not all market participants formally determine synthetic ratings; rather, they consider the relative change in credit risk between measurement dates and the resultant impact on value. This example uses the concept of synthetic ratings for illustrative purposes.

the change in observable spreads was used to assess the change in value of the company's debt.<sup>3</sup>

- C.13.11 The swap rate as of the measurement date moved from 1.71 percent to 1.76 percent.
- **C.13.12** MWM applied the change in the median spread of the BBB index (17 basis points) to the senior unsecured debt's implied spread as of the origination date, resulting in a concluded spread as of the measurement date of 4.29 percent (4.46 percent implied origination spread less the 0.17 percent change in median spreads of the BBB index).
- **C.13.13** MWM added the concluded spread of 4.29 percent to the swap rate of 1.76 percent resulting in a yield of 6.05 percent as of the measurement date. A range of value was determined by applying +/– 25 basis points around the concluded yield, consistent with the inherent estimation uncertainty based on management judgment considering the relatively high credit quality and the fund's experience with the competitive environment on other deals. As a result, MWM concluded a market participant would expect a yield of 5.80 to 6.30 percent.
- **C.13.14** Based on its analysis, the fund concluded that the fair value of the senior unsecured debt was in the range of \$24,868,982 to \$25,378,432, or 99.48 to 101.51 percent of par. The fund further concluded that the best estimate in the range was \$25,065,753 or 100.0 percent of the face value (par plus accrued interest, or 100.26 percent of par).
- **C.13.15** Given the short time since investment, after considering JP's risk profile and the overall market movements, MWM concluded that market participants would likely transact at the face value and therefore estimated a fair value equal the face value (par plus accrued interest). Further, MWM continued to deem the probability of exercising the call to be *de minimis* and, therefore, did not explicitly model the call in its analysis.
- C.13.16 The estimated fair value was below the call premium and as such, MWM concluded that it would not be advantageous for JP to refinance at this time.

# Third-Party Valuation Specialist Analysis

C.13.17 MWM also engaged a third-party valuation specialist to validate the reasonableness of the fund's fair value estimates, performing detailed valuation testing as of December 31, 2X14. Since the JP debt included a prepayment option, the valuation specialist corroborated MWM's conclusions by calculating an option-adjusted spread (OAS) which was estimated from the initial investment amount using a Black-Derman-Toy model (BDT Model)<sup>4</sup>. OAS is the yield spread added to a benchmark

<sup>&</sup>lt;sup>3</sup> Generally, changes in leveraged loan index spreads are used for directional insight on market interest rate movements. Due to individual loan features, they may be less correlated with such broader syndicated loan indices price movements. However, for illustrative purposes, the taskforce shows absolute change in the indices as a proxy for the judgmental directional movement in market participant required yield.

<sup>&</sup>lt;sup>4</sup> BDT model is a one-factor short rate model assuming the future evolution of interest rate follows a stochastic process. BDT is presented for illustrative purposes. It is not the only possible method and would only be used if facts and circumstances dictated that its use would be appropriate.

yield curve that discounts an instrument's payments to match its market price, using a dynamic model that accounts for embedded options.

- **C.13.18** As of the transaction date, the valuation specialist selected BDT model inputs considering the term structure of market yields and the volatility structure for market yields at the time. The valuation specialist then calibrated the model, deriving a calibrated OAS by matching the modeled callable bond value to the initial investment amount of \$25,000,000 or 100.00 percent of par.
- **C.13.19** The OAS at origination was 438.7 basis points when benchmarked to the U.S. treasury yield curve as of December 15, 2X14. Note that the fund's valuation specialist chose to use the U.S. treasury yield curve as the benchmark curve instead of the LIBOR swap rate curve; both yield curves are reasonable benchmark curves. Similar to MWM's approach, the valuation specialist estimated a synthetic rating of BBB/Baa2 for JP based on an analysis of JP's financial position.
- **C.13.20** The valuation specialist performed similar procedures to estimate the fair value as of December 31, 2X14 using the BDT model. The valuation specialist considered the company's development and financial information and observed no changes in credit quality. The median spread of the BBB index had narrowed by 17.0 basis points from the origination date as noted previously.
- **C.13.21** The valuation specialist applied the change in the median spread of the BBB index (-17.0 basis points) to the senior unsecured debt's implied OAS as of the origination date, resulting in a concluded OAS as of the measurement date of 421.7 basis points (438.7 bps implied origination OAS less 17.0 bps change in median spreads of the BBB index). The valuation specialist developed a range of value by applying +/- 25 basis points around the concluded OAS (396.7 bps to 446.7 bps).
- **C.13.22** In the BDT model, the valuation specialist applied the OAS to the treasury yield curve as of the measurement date to determine a range of value of the callable senior unsecured debt, and concluded on a fair value of the senior unsecured debt of \$24,877,500 to \$25,262,425 or 99.51 to 101.05 percent of par.
- **C.13.23** The valuation specialist used the BDT methodology to capture the value of the embedded call provisions in the concluded value of the senior unsecured debt. The call feature gives the issuer the option to redeem the note at some point before maturity. The ability to call benefits the issuer and the premium compensates the holder for the early repayment. Because the call feature was deeply out of-the-money as of the measurement date, it had a minimal impact on the conclusion.
- **C.13.24** As MWM's estimate fell within the valuation specialist's range, the valuation specialist concluded that MWM's fair value estimate was reasonable.

# Fair Value Measurement at September 30, 2X15

#### MWM Analysis

- **C.13.25** At the end of the third quarter of 2X15, MWM determined fair value by taking into account changes in overall market conditions and changes in the credit quality of JP. The company continued to perform extremely well. Revenue increased over 30.0 percent and margins continued to improve as the company expanded internationally and built scale. JP obtained regulatory approval in the EU for two high demand products with no comparable products in the market. Using the latest available financial information as of the measurement date, the company's synthetic ratings improved to "A/A2 (S&P/Moody's)."
- **C.13.26** MWM took into account the improved credit quality of the company and estimated the change in credit spread considering the median spread of the BBB index as of the origination date compared with the A index as of the measurement date, noting a reduction of 36 basis points. Furthermore, the swap rate matching the remaining term to maturity moved from 1.71 percent as of the origination date to 1.23 percent as of the measurement date.
- **C.13.27** Applying the change in the median spread of the BBB index to the A index (-36 basis points) to the senior unsecured debt's implied spread as of the origination date resulted in a concluded spread as of the measurement date of 4.10 percent (4.46 percent implied origination spread less the 0.36 percent change in median spreads of the BBB index to A index). MWM then added the concluded spread of 4.10 percent to the swap rate of 1.23 percent, resulting in an expected market participant yield of 5.33 percent as of the measurement date. (The origination yield was 6.17%. The implied yield at this measurement date was 5.33%. The decline of 84 bps considered both the decline in the swap rate of 48 bps and the decline in spreads of 36 bps considering the change in credit quality from BBB to A and market changes in the required rate of return for BBB and A debt instruments).
- C.13.28 MWM determined a range by applying +/-25 basis points around the concluded yield, resulting in a yield range of 5.08 percent to 5.58 percent.
- **C.13.29** Using this yield, MWM determined the fair value of the senior unsecured debt to be in the range of \$25,526,280 to \$25,983,256 or 102.11 percent to 103.93 percent of par. MWM then concluded on a fair value estimate of \$25,753,403 or 103.01 percent of par, based on the adjusted calibrated yield, as they had no reason to conclude that any other point in the range was a better estimate of fair value.
- C.13.30 The increase in the carrying value of the senior unsecured debt was driven by an increase in the credit quality of the company, which resulted in a decrease in spreads, plus the impact of a shortened time to maturity. The 103.01 percent mark was below the call premium and as such MWM concluded that it would not be advantageous for JP to refinance at this time.

# Third-Party Valuation Specialist Analysis

- **C.13.31** MWM's third party valuation specialist corroborated MWM's value using the BDT methodology. The company's growth and improved financial position led to an increased synthetic rating of A/A2 (S&P/Moody's). The median spread of the BBB index to A index had narrowed by 36.0 basis points from the origination date.
- **C.13.32** The valuation specialist applied the change in the median spread of the BBB index to A index to the senior unsecured debt's implied OAS as of the origination date, resulting in a concluded OAS as of the measurement date of 402.7 basis points (438.7 bps implied origination OAS less 36 bps change in median spreads of BBB index to A index).
- **C.13.33** The valuation specialist estimated a range of value by applying +/- 50 basis points around the concluded OAS (352.7 bps to 452.7 bps). The valuation specialist selected a wider range of spreads than at the previous measurement date, considering the inherent estimation uncertainty given the time that had passed since the origination date and the uncertainty in the price at which market participants would transact given the company's improvement in credit quality.
- **C.13.34** In the BDT model, the valuation specialist applied the OAS to the treasury yield curve as of the measurement date to determine a range of value of the callable senior unsecured debt. The valuation specialist estimated the fair value of the senior unsecured debt to be in the range of \$25,200,500 to \$25,605,475, or 100.80 to 102.42 percent of par. The valuation specialist noted that even though the yield range encompassed MWM's selected yield, the upper bound of the fair value range was lower than MWM's concluded value, since JP has the right to prepay the debt at 102 percent of par in a few months.
- **C.13.35** As the valuation specialist's range was below MWM's fair value estimate, MWM worked with the valuation specialist to understand the reason for the difference. Based on these discussions, MWM realized that the probability of prepayment was higher than they had previously considered. Therefore, MWM adjusted its carrying value to 102 percent of par.
- **C.13.36** The carrying value of the senior unsecured debt increased due to the increase in the credit quality of the company, which resulted in a decrease in the OAS, as well as the impact of a shortened time to liquidity. However, the value of the call option also increased due to a higher probability of exercising. An increase in value of the embedded call option reduced the value of the overall senior unsecured debt, offsetting some of the increase in the carrying value driven by the decrease in OAS.

# **Task Force Observations**

C.13.37 In estimating the fair value of debt investments, calibration of initial inputs combined with observations of changes in market yields and the underlying credit quality of the borrower are all used to determine an appropriate discount rate when using a discounted cash flow valuation technique.

- **C.13.38** The fair value of debt investments is often estimated using a discounted cash flow valuation technique. However, other techniques, such as the BDT, provided for illustrative purposes in Example 1, may be applicable depending on the facts and circumstances.
- **C.13.39** The Task Force has not illustrated the creation of specific synthetic ratings. A robust synthetic rating allows comparison of the investee company to other investments in a portfolio as well as other instruments in the public markets. In theory, two instruments with a similar rating should have a similar default probability; however, there are more aspects of credit quality than just the key metrics (leverage ratios, fixed charge coverage ratios, etc.), and some of those considerations are subjective (e.g., future business outlook, industry conditions, etc.). The rating methodology published by established ratings agencies sets forth a common framework and weighting system for assessing those subjective points.
- **C.13.40** From a calibration perspective, because of the need to assess relative change in market inputs rather than absolute credit risk, calculating a synthetic rating that reflects all aspects of the company's performance may not be necessary. When calibrating the initial yield and as is the case with many private debt issuances, and the key metrics have not changed (e.g., leverage, interest coverage), it may be assumed the credit risk is similar to origination. However, when valuing debt that has recently been restructured, doesn't have an initial calibration point, or has had a dramatic change in business performance, a synthetic credit rating or other approach for measuring the company's credit quality may be needed.
- **C.13.41** The fair value estimate provided by an external valuation specialist, while likely enhancing the independence of management's valuation assertions, should not be blindly accepted. Management is responsible for the fair value assertions they make. The valuation of debt investments should not be overly mechanical. While an income approach and binomial lattice techniques such as BDT have a tendency to be formula based, it should be noted that judgment is still required to ensure that fair value is estimated using market participant assumptions. In this case, MWM worked with the valuation specialist to understand the rationale for the differences and incorporated these judgments in the concluded fair value estimate.
- **C.13.42** The valuation of debt investments requires the assessment of a number of qualitative factors to assess the credit risk of the investee. Valuation judgments are supported by an income approach and other valuation techniques which reflect these qualitative assessments in mathematical-based yield analysis. While an income approach and other valuation techniques have a tendency to be very formulaic, it should be noted that judgment is still required to ensure that fair value is estimated using market participant assumptions.

# Investment 2–Collateralized First Lien Debt; Adverse Events–ELI Machinery

# **Business Description**

- C.13.43 ELI Machinery Inc. sells construction equipment in the United States. The company operates in four segments: Construction Industries, Resource Industries, Energy & Transportation, and Financial Products.
  - The company's Construction Industries segment offers track excavators, tracktype tractors, motor graders, and soil compactors.
  - Its Resource Industries segment provides electric rope, hydraulic shovels, wheel tractor scrapers, and wheel dozers.
  - The company's Energy & Transportation segment offers reciprocating engines, generator sets, and diesel-electric locomotives.
  - Its Financial Products segment provides retail and wholesale financing for ELI Machinery equipment, machinery, and engines.

The company employs 3,000 people and is headquartered in Lexington, KY.

#### **Investment Description**

**C.13.44** MWM provided ELI with a first lien loan for working capital and general corporate purposes. The first lien loan had the following terms:

Debt Instrument	First Lien
Origination Date	August 20, 2X13
<b>Contractual Maturity Date</b>	August 20, 2X18
Expected Maturity Date	August 20, 2X18
Commitment	\$30,000,000 (Fully funded as of closing date)
	LIBOR+10.5%; 1.0% Floor;
Interest Rate	7.5% Cash Interest; remaining (LIBOR+3.0%) PIK Interest
	Payable Quarterly; Actual/360
Collateral	Property and Equipment
Original Issue Discount (OID)	0.5%
Exit Fees	None
Amortization	None
Prepayment	No
Prepayment Fee	NA
IRR / Pricing at Origination	13.24% IRR (1.74% 5.0Yr Swap Rate + 11.50% Implied Spread)
	/ 99.50% or \$29,850,000

# Initial Transaction and Calibration – August 20, 2X13

C.13.45 As of the transaction date, MWM calibrated the valuation inputs to the initial investment amount, as discussed in chapter 10. The first lien debt was priced at \$29,850,000 or 99.50 percent of par (\$150,000, or 0.50 percent, OID was deemed to offset face value), and the IRR at origination was 13.24 percent (1.74 percent 5.0 yr. swap rate + 11.50 percent implied spread).

C.13.46 The company's synthetic ratings determined at origination date were "B/B2 (S&P/Moody's)." MWM noted that first lien debt was typically rated one notch above the senior secured rating implied by the synthetic credit rating, which would indicate a credit rating of "B+/B1 (S&P/Moody's)." However, MWM also noted that the implied spread of 1,150 basis points was comparable to the third quartile of "B–/B3 (S&P/Moody's)" rated debt. Therefore, MWM considered the first lien note to have risk comparable to the third quartile of "B–/B3 (S&P/Moody's)" credits. (See paragraph 6.14 for a discussion of synthetic credit ratings and the reasons that the credit quality for a specific company or instrument might vary from the estimated synthetic credit rating.)

#### Fair Value Measurement at September 30, 2X13

- **C.13.47** At the end of Q3 2X13, MWM determined the fair value by updating the valuation model taking into account changes in the market (spreads) and credit quality.
- **C.13.48** MWM noted that the company had performed in line with budget and expectations. Quantitatively, MWM used latest financial statement information as of the measurement date, and determined the company's synthetic ratings were "B/B2 (S&P/Moody's)," implying no changes in credit quality between the origination date and the measurement date. MWM observed that the third quartile of the B– index expanded by 6.0 basis points from the origination date to the measurement date and the swap rate moved from 1.74 percent to 1.49 percent.
- **C.13.49** MWM applied the change in the third quartile spread of the B– index (6 basis points) to the first lien debt's implied spread as of the origination date, resulting in a concluded spread as of the measurement date of 11.56 percent (11.50 percent implied origination spread +0.06 percent change in spreads of the B– index). MWM then added the concluded spread of 11.56 percent to the swap rate of 1.49 percent, resulting in a yield of 13.06 percent as of the measurement date. MWM estimated a range by applying +/– 50 basis points around the concluded yield, consistent with the inherent estimation uncertainty based on management judgment considering the below investment grade credit quality and the fund's experience with the competitive environment on other deals.
- **C.13.50** As of the measurement date, the concluded yield was 12.56 to 13.56 percent with a point estimate of 13.06 percent. The fund, therefore, concluded on a fair value of the first lien debt of \$29,413,048 to \$30,509,418, or 97.60 to 101.24 percent of par, with a point estimate of \$29,954,451 or 99.40 percent of the new par value including the \$136,667 accrued PIK interest. With no prepayment penalty, MWM considered whether the company's prepayment option was relevant. Since the point estimate of 99.40 was below par, MWM considered prepayment irrelevant at this measurement date. Since MWM did not consider any point in the range to be a better representation of fair value, the fund concluded on a value of 99.40 percent of par.

**C.13.51** The increase in the carrying value of the first lien was driven by the accrued PIK interest and a decline in the swap rate, partially offset by a minimal increase in the spread of the B– index.

#### Fair Value Measurement at June 30, 2X14

- **C.13.52** In the nine months ended June 30, 2X14, the company performed extremely well. Revenue increased over 50.0 percent since the origination date and margins significantly improved.
- C.13.53 MWM determined the fair value by taking into account changes in market movement and credit quality. MWM used the latest available financial information as of the measurement date and concluded the company's synthetic rating improved to "BB–/Ba3 (S&P/Moody's)," compared with the synthetic rating determined at origination date of "B/B2 (S&P/Moody's)." Since the implied rating for the loan based on the origination date spreads was one notch lower than the synthetic credit rating, MWM considered a rating of B+/B1 as of the measurement date.
- C.13.54 The change in the third quartile of "B–/B3 (S&P/Moody's)" to third quartile "B+/B1 (S&P/Moody's)" spread of the corresponding indices had narrowed by 25 basis points from the origination date. The swap rate matching the remaining term to maturity moved from 1.74 percent as of the origination date to 1.43 percent as of the measurement date.
- C.13.55 MWM applied the change in the third quartile spreads of the B– index to B+ index (-25 basis points) to the first lien debt's implied spread as of the origination date, resulting in a concluded spread as of the measurement date of 11.25 percent (11.50 percent implied origination spread less 0.25 percent change in median spreads of the B– index to B+ index). After adding the concluded spread of 11.25 percent to the swap rate of 1.43 percent, MWM estimated a yield of 12.68 percent as of the measurement date. MWM estimated a range by applying +/- 50 basis points around the concluded yield, resulting in a range of 12.18 to 13.18 percent with a point estimate of 12.68 percent.
- **C.13.56** Using this range, the fund concluded on a fair value of the first lien debt of \$30,709,267 to \$31,706,085, or 98.87 to 102.08 percent of par, with a point estimate of \$31,202,225, or 100.46 percent of the new par value including the \$1,060,086 accrued PIK interest. MWM again considered whether a market participant would pay above par. Given the high costs that the company would incur to refinance and the limited improvement in yields that the company might achieve, MM concluded that a market participant would consider the probability of a near-term refinancing to be low, and that a value of 100.46 was likely still within the range that a market participant would pay.
- **C.13.57** The increase in the carrying value of the first lien was driven by accrued PIK interest, a reduction in spreads due to improved credit quality, and a decline in the swap rate.

#### Fair Value Measurement at March 31, 2X16

- C.13.58 In March 2X16, the economy was headed into a recession and the company's industry was expected to be one of the hardest hit.
- C.13.59 Over the 1.75 years since the previous measurement date (described earlier), the company's performance had declined due to the early impact of the recession. Revenue and EBITDA had declined and financial metrics had weakened relative to origination.
- C.13.60 MWM used the latest available financial information as of the measurement date and determined the company's synthetic rating had declined to "B–/B3 (S&P/Moody's), " compared with the company's synthetic rating determined at the origination date were "B/B2 (S&P/Moody's)." Since the calibrated yield at the origination date was one notch lower than the synthetic rating, MWM considered a credit rating of "CCC+/Caa1(S&P/Moody's)" as of the measurement date.
- C.13.61 The change in the third quartile of "B–/B3 (S&P/Moody's)" to third quartile "CCC+/Caa1 (S&P/Moody's)" spread of the corresponding indices had increased by 11.69 percent from the origination date. The swap rate matching the remaining term to maturity moved from 1.74 percent as of the origination date to 0.81 percent as of the measurement date.
- **C.13.62** As a result of the change in the company's credit quality and overall tight credit markets for this industry, a market participant was now expected to require a yield of approximately 24.00 percent for the first lien debt (11.50 percent implied spread at origination date + 11.69 percent increase in spread due to changes in the credit risk of the company + 0.81 percent swap rate matching the remaining term to maturity).
- **C.13.63** As of the measurement date, MWM estimated that the range of market participant yields for the first lien debt was 19.0 to 29.0 percent. MWM applied a range of +/- 500 bps which it believed to be consistent with (a) the inherent estimation uncertainty based on management judgment considering the low credit quality and the wide range of observed spreads for CCC debt, and (b) the fund's experience with the competitive environment on other deals.
- C.13.64 Using this range, the fund concluded on a fair value of the first lien debt of \$24,552,000 to \$29,265,895, or 73.47 percent to 87.58 percent of the par value including accrued PIK interest, with a point estimate of \$26,752,128 or 80.06 percent of par. (See Q&A 14.13, "Bid / Ask Spread Considerations," for a discussion of methods that may be used for selecting a point estimate from a range.)
- **C.13.65** The decrease in the carrying value of the first lien was driven by the decline in credit quality and the increase in credit spreads for high yield bonds, which increased the rate of return required by a market participant.

#### Fair Value Measurement at September 30, 2X16

- **C.13.66** Unable to recover from the severe recession, the company filed for bankruptcy and defaulted on its first lien debt. Since the company had filed for bankruptcy, market participants would transact in the debt based on the amount expected to be recovered through the bankruptcy process. A recovery analysis was conducted to estimate the liquidation values of collateral (Property & Equipment).
- **C.13.67** Property & equipment was reported to be \$60.0 million as of the latest available balance sheet. Based on precedent bankruptcy cases of similar companies with similar collateral, the fund determined that the percent of collateral deemed to be recoverable was 45 to 60 percent of the balance sheet value, after considering the difference between the balance sheet value and the value that would be expected to be recovered through the sale process as well as the expected impact of negotiations with other creditors. Therefore, the estimated liquidation value was \$27.0 million to \$36 million.
- **C.13.68** The fund also estimated bankruptcy and related costs to be approximately 25.0 percent of the estimated liquidation value range. The total net realizable value after these costs was deemed to be \$20.3 million to \$27.0 million.
- C.13.69 MWM estimated that the time to collection from the bankruptcy estate would be approximately 1.5 years from the measurement date. Using a discount rate of 20.0%, factoring in the risk associated with timing and mechanics of the bankruptcy process consistent with the required rate of return for other non-performing loans, the present value of MWM's concluded share of the collateral was \$15.4 million to \$20.5 million. MWM concluded on a fair value of \$18.0 million.

#### **Task Force Observations**

- **C.13.70** This example highlights judgments required when considering changes in the underlying credit quality of the obligor. Initial calibration provided a framework for incorporating changes in market conditions. The synthetic rating provides a basis for estimating the changes in the credit quality of the obligor. As the credit quality deteriorated (March 31, 2X16), the estimated cash flows were discounted at an assumed market participant discount rate, taking into account the riskiness of the cash flows.
- **C.13.71** Once the company filed for bankruptcy (September 30, 2X16), MWM changed from using the contractual cash flows and instead considered the amount and timing of the expected recovery and discounted at a lower rate, commensurate with the risk of the expected cash flows consistent with market participant assumptions.
- C.13.72 Note that market participants also might consider a valuation analysis based on the expected cash flows upon recovery rather than contractual cash flows whenever there is a significant probability of default, even if the issuer had not yet filed for bankruptcy. Other valuation methods may incorporate the probability of default even for loans with lower risk of default, rather than incorporating the risk solely through

a risk-adjusted discount rate. (See chapter 5, "Overview of Valuation Approaches" for a discussion of discount-rate adjustment techniques and other income approach variants.)

# Investment 3–Investment in Second Lien Convertible Debt–Prim Solutions

#### **Business Description**

- C.13.73 Prim Solutions Inc. was a public company that focused on delivering computing and software solutions to various customers throughout the United States. The company operated in 3 segments: Personal Computing Systems, Storage Products, and Software.
  - The company's Personal Computing Systems segment offered personal workstations, laptops, and tablets.
  - Its Storage Products segment provided various high capacity storage platforms, external hard drives, and portable USB drives.
  - The company's Software segment offered programs used for digital media creation, management solutions, and financial tracking.

The company employed 1,500 people and was headquartered in Squib, Washington.

#### **Investment Description**

C.13.74 MWM provided the second lien convertible debt to assist Prim in increasing inventory, expanding operations, and for other corporate uses.

Fixed Income Features	Second Lien Convertible Debt
Origination Date	May 15, 2X14
<b>Contractual Maturity Date</b>	May 15, 2X19
Expected Maturity Date	May 15, 2X19
Commitment	\$20,000,000 (Fully funded as of closing date)
Interest Rate	5.0% Cash Interest; Payable Monthly; Actual/365
Collateral	Building
IRR / Pricing at Origination	9.64% IRR (1.62% Swap Rate + 8.02% Implied Spread)
Equity Features	Second Lien Convertible Debt
Stock Price at Origination	\$100.0
Historical Volatility	30.0%
Stock Dividend	None
<b>Conversion Features</b>	Second Lien Convertible Debt
Conversion Ratio	160,000
Conversion Price	\$125.0
Call Protection	None
Parity	80 or 80.0% of face value

# Initial Transaction and Calibration - May 15, 2X14

- C.13.75 MWM calibrated the valuation inputs with the initial investment amount which was deemed to be fair value as of the transaction date.
- **C.13.76** The second lien convertible debt was issued at \$100.0 or \$20,000,000 (100.0 percent of par). However, for purposes of estimating fair value, MWM disaggregated the components of the debt instrument to facilitate valuation at future measurement dates.
- C.13.77 The value attributable to the call option on the underlying stock of the company was \$16.91 per bond, or \$3,382,000 (16.91 percent of par). The value of the option component was determined using a Black-Scholes option pricing model using the inputs described in the Investment Description above.
- **C.13.78** The price attributable to the straight debt component of the convertible debt was \$83.09 per bond, or \$16,618,000 (83.09 percent of par). The price attributable to the straight debt component was determined by calibrating to the issuance price of the convertible bond, \$100.0, and subtracting the value attributable to the call option on the underlying stock of the company, \$16.91.
- **C.13.79** The IRR at origination for the bond component, using the \$16,618,000 initial fair value, was 9.64 percent (1.62% 5.0 year swap rate + 8.02 percent implied spread).
- **C.13.80** The company had traded first lien debt with an observable credit rating at the origination date on an unsecured basis of "BB+/Ba1 (S&P/Moody's)." For the second lien debt, MWM used "BB-/Ba3 (S&P/Moody's)" as a proxy for the rating of their second lien investment, as it was deemed to be slightly more risky given the second lien position.

#### Fair Value Measurement at June 30, 2X14

#### **MWM** Analysis

- **C.13.81** As of June 30, 2X14, a month and a half subsequent to the transaction, the company was performing in line with budget and expectations. Consistent with the calibrated analysis as of the issuance date, MWM concluded that a market participant would determine fair value based on the component parts of the investment, (that is, the fair value of the second lien convertible debt investment would equal the straight bond value plus the value of the call option on the underlying stock).
- C.13.82 MWM noted that there had been no change in the credit rating for the first lien debt, and therefore used a credit rating used for the second lien debt of "BB–/Ba3 (S&P/Moody's)."
- **C.13.83** The option adjusted spread (OAS) reported for the company's first lien debt contracted by 5 basis points from the origination date. Although the movement in credit spreads for debt with lower credit quality is typically larger than the movement

for debt with higher credit quality, given the small change, MWM applied the same change in estimating the fair value of the second lien debt.

- C.13.84 The swap rate as of the measurement date increased from 1.62 to 1.66 percent.
- C.13.85 Applying the change in the observed spreads for the company's first lien debt (-5 basis points) to the second lien convertible debt's implied spread as of the origination date, MWM determined the concluded spread as of the measurement date was 7.97 percent (8.02 percent implied origination spread less 0.05 percent change in median spreads of the first lien debt). MWM added the concluded spread of 7.97 percent to the swap rate of 1.66 percent, resulting in a yield of 9.63 percent as of the measurement date. MWM determined a range by applying +/-20 basis points around the concluded yield, consistent with the inherent estimation uncertainty based on management judgment considering the availability of a traded price for the company's first lien debt and the fund's experience with the competitive environment on other deals.
- C.13.86 As of the measurement date, the concluded yield was 9.43 percent to 9.83 percent with a point estimate of 9.63 percent. The fund, therefore, concluded on a value attributable to the straight debt component of the second lien convertible debt of \$82.82 to \$84.12, or \$16,564,120 to \$16,824,192 (81.86 to 85.11 percent of par). The point estimate for the straight debt component was \$83.47, or \$16,693,485 (83.47 percent of par).
- C.13.87 The increase in the value of the straight debt component of the second lien convertible debt was driven by the reduced time to maturity, since part of the value of the second lien convertible debt derived from the option component, and thus the straight debt component of the convertible debt had a market yield that was higher than the coupon at origination.
- **C.13.88** The stock price as of the measurement date was \$108.00 per share. The time to expiration of the option had decreased to 4.9 years, and the historical volatility remained unchanged at 30.0 percent. The risk free rate corresponding to the remaining term of the option was 1.59 percent. Using an option pricing model, MWM determined the dollar price attributable to the call option on the underlying stock was \$20.27 per bond as of the measurement date. Parity was 86.40 percent of par as of the measurement date. Parity was calculated as 160,000 conversion ratio times the \$108.00 stock price divided by 20,000,000 total par value of the bond. (Note: for a convertible bond to be "in-the-money," its parity must be higher than 100.0 percent of par. Mathematically, that would occur when the traded price per share is equal to the strike price of \$125.00 per share in this example.)
- **C.13.89** MWM added the values attributable to the straight debt component and the option component of the convertible debt, estimating a total value of \$103.09 to \$104.39 per bond (point estimate of \$103.74). Using this analysis, the fund determined that the fair value of the second lien convertible debt as of the measurement date was

\$20,618,465 to \$20,878,537, or 103.09 percent to 104.39 percent of par (point estimate of \$20,747,830 or 103.74 percent of par).

# Third-Party Valuation Specialist Analysis

- C.13.90 MWM's external valuation specialist considered an alternative valuation approach, using a binomial lattice model to capture the convertible feature of the debt. The valuation specialist noted the binomial lattice model better incorporates the interaction between credit risk and the stock price. (See appendix B, section B.10, "Valuation Issues Convertible Instruments," for further discussion.)
- **C.13.91** The external valuation specialist calibrated valuation inputs with the initial investment amount. Using the binomial lattice model, the valuation specialist estimated an implied yield at origination of 9.82 percent, based on the initial fair value of \$20,000,000 (1.59 percent risk-free rate based on U.S. treasury rates + 8.20 percent implied spread). The implied yield was slightly higher than the yield implied in MWM's approach because the binomial lattice model takes into account the interaction between stock price and the credit risk for the convertible debt, and therefore captured more value for the conversion feature than a Black-Scholes model. Since more value was attributed to the conversion option, less value was attributed to the straight debt component, and therefore the implied yield was higher.
- **C.13.92** Under the valuation specialist's approach, the same procedures were performed to determine the change in spread of -5 basis points since origination.
- **C.13.93** Applying the change in the median spread of the first lien debt (-5 basis points) to the second lien convertible debt's implied spread as of the origination date, the valuation specialist estimated a concluded spread as of the measurement date of 8.15 percent (8.20 percent implied origination spread less 0.05 percent change in median spreads of the first lien debt). The valuation specialist added the concluded spread of 8.15 percent to the risk-free rate of 1.59 percent, resulting in a yield of 9.74 percent as of the measurement date. The valuation specialist estimated a range by applying +/-20 basis points around the concluded yield. As of the measurement date, the concluded yield was 9.54 to 9.94 percent, with a point estimate of 9.74 percent.
- **C.13.94** The stock price as of the measurement date was \$108.00. The time to expiration of the option decreased to 4.9 years and the historical volatility remained unchanged at 30.0 percent. The risk free rate corresponding to the remaining term of the option was 1.59 percent.
- **C.13.95** Using a binomial lattice model, the valuation specialist determined that the fair value of the second lien convertible debt as of the measurement date was \$21,135,010 to \$21,253,570, or 105.68 to 106.27 percent of par. The difference between the specialist's range and MWM's range was due to the specialist's use of a lattice model that incorporates the interaction between the stock price and the credit risk. Since the stock price had increased from \$100 to \$108 from the origination date to the
measurement date, the probability of conversion had also increased, reducing the overall risk of the convertible debt.

**C.13.96** Considering the external valuation specialist's analysis and MWM's analysis, the fund determined that market participants would transact at a price that reflects the estimates from both approaches and concluded on a fair value of \$21,000,000, slightly below the external valuation specialist's estimate, but above its preliminary estimate of \$20,747,830.

#### Fair Value Measurement at June 30, 2X15

#### MWM Analysis

- C.13.97 The company performance exceeded expectations and its profit margins continued to improve. Given the improved performance, the company was in the process of refinancing its first lien debt, and obtained an updated credit rating of "BBB/Baa (S&P/Moody's). Therefore, for the second lien position, MWM used a rating of "BB+/Ba1 (S&P/Moody's)."
- **C.13.98** Since the first lien debt was priced to call, the first lien debt did not provide reliable information on spreads. Therefore, MWM considered the change in the credit spreads from "BB–/Ba3" to "BB+/Ba1." Given the change in credit markets, the median spread of these indices widened by 31 basis points from the origination date, even though the credit quality had improved.
- **C.13.99** The swap rate matching the remaining term to maturity moved from 1.62 percent as of the origination date to 1.51 percent as of the measurement date.
- C.13.100 Applying the change in the median spread of the BB– index to BB+ index (31 basis points) to the second lien convertible debt's implied spread as of the origination date, MWM determined the concluded spread as of the measurement date was 8.32 percent (8.02 percent implied origination spread plus 0.31 percent change in median spreads of the BB– index to BB+ index). MWM added the concluded spread of 8.32 percent to the swap rate of 1.51 percent, resulting in a yield of 9.83 percent as of the measurement date. MWM determined a range by applying +/– 20 basis points around the concluded yield.
- **C.13.101** As of the measurement date, the concluded yield was 9.63 to 10.03 percent with a point estimate of 9.83 percent. The fund, therefore, concluded on a value attributable to the straight debt component of the second lien convertible debt of \$85.18 to \$86.27, or \$17,036,330 to \$17,254,498 (85.18 to 86.27 percent of par). The point estimate for the straight debt component was \$85.72, or \$17,144,943 (85.72 percent of par). The increase in the value of the straight debt component of the second lien convertible debt was driven by the shorter time to maturity.
- **C.13.102** The stock price as of the measurement date had increased to \$125.00. The time to expiration of the option had decreased to 3.9 years and the historical volatility remained at 30.0 percent. The risk free rate corresponding to the remaining term of

the option was 1.31 percent. Using an option model, the dollar price attributable to the call option on the underlying stock was determined to be \$25.21 per bond as of the measurement date. Since the stock price matched the conversion price, parity was 100.00 percent of par as of the measurement date. Even after the convertible bond becomes in the money, however, it would not be optimal for the debt to convert into equity before it is forced to do so, as the conversion option benefits from the time value for the option, and the convertible debt also receives coupon payments.

**C.13.103** MWM added the values attributable to the straight debt component and the option component of the convertible debt, resulting in a total price of \$110.39 to \$111.48 (point estimate of \$110.93). Using this analysis, the fund determined that the fair value of the second lien convertible debt as of the measurement date was \$22,078,061 to \$22,296,229, or 110.39 to 111.48 percent of par (point estimate of \$22,186,675 or 110.93 percent of par).

#### Third-Party Valuation Specialist Analysis

- **C.13.104** The external valuation specialist used a binomial lattice model, consistent with the model used at the previous measurement dates. The valuation specialist agreed with the change in spread of 31 basis points since origination.
- C.13.105 Applying the change in the median spread of the BB– index to BB+ index (31 basis points) to the second lien convertible debt's implied spread as of the origination date, the valuation specialist estimated a concluded spread as of the measurement date of 8.51 percent (8.20 percent implied origination spread + 0.31 percent change in median spreads of the BB– index to BB+ index). The valuation specialist added the concluded spread of 8.51 percent to the risk-free rate of 1.31 percent, resulting in a yield of 9.82 percent as of the measurement date. The valuation specialist estimated a range by applying +/– 50 basis points around the concluded yield, consistent with the inherent estimation uncertainty given the change in the company's credit quality and the lack of an observable spread for the company's first lien note. As of the measurement date, the specialist's concluded yield was 9.62 to 10.02 percent with a point estimate of 9.82 percent.
- **C.13.106** The stock price as of the measurement date had increased to \$125.00. The time to expiration of the option decreased to 3.9 years and the historical volatility remained at 30.0 percent. The risk-free rate corresponding to the remaining term of the option was 1.31 percent.
- C.13.107 Using a binomial lattice model, the valuation specialist determined that the fair value of the second lien convertible debt as of the measurement date was \$23,162,869 to \$23,255,510, or 115.81 to 116.2 percent of par (point estimate of \$23,188,733 or 115.94 percent of par).
- **C.13.108** The valuation specialist's initial estimate exceeded MWM's initial estimate. MWM is ultimately responsible for the fair value estimates reported to investors. MWM considered the reasons for differences between their estimate and the valuation

specialist's estimate. MWM concluded that market participants would consider the indicated values from both valuation methodologies. The valuation specialist's methodology reflected the interaction between the stock price and the credit risk given the company's strong performance and assumed that the risk associated with the debt instrument had declined. However, MWM had noted that the company's improved performance was only recent, and there was uncertainty as to whether the company could sustain that level of performance. Thus, MWM concluded a market participant would not pay as much for the potential upside from the conversion option as the specialist's model indicated. Taking these considerations into account, MWM concluded that they would adjust their fair value estimate upward since the last measurement date to \$22.5 million to reflect the improved performance. This carrying value was below the external valuation specialist's estimate of \$23,188,733, but above MWM's preliminary estimate of \$22,186,675.

#### **Task Force Observations**

- **C.13.109** When debt instruments have other features, for example, redemption or conversion options, initial calibration may include disaggregating the various features to be able to estimate fair value on subsequent measurement dates. While the various components of a debt investment may be combined and reported as one unit of account, for valuation purposes in many cases disaggregation will be appropriate.
- **C.13.110** The fair value estimate provided by an external valuation specialist, while likely enhancing the independence of management's valuation assertions, should not be blindly accepted. Management is responsible for the fair value assertions they make. The valuation of debt investments should not be overly mechanical. While an income approach and binomial lattice technique have a tendency to be formula based, it should be noted that judgment is still required to ensure that fair value is estimated using market participant assumptions. In this example, MWM considered the reasons for the differences between the fund's model and the valuation specialist's model, and concluded that market participants would likely transact at a price between the two indications.
- **C.13.111** Further, as noted in the example, management's best estimate should be selected as the fair value estimate, which may not be the midpoint of the calculated range.

#### Investment 4–Mezzanine Debt Investment with Warrants–Max Marine Technologies

#### **Business Description**

**C.13.112** Max Marine Technologies Inc. (MMT) was a publicly-traded company that provided repair and conversion services for the United States Navy. The company offered structural repairs, steel plate fabrication, paint and coating, armor repair, pipe repair, valve repair, and electrical services. The company primarily served the U.S. Navy and the U.S. Military Sealift Command, servicing amphibious warfare ships including amphibious assault ships, cruisers, destroyers, frigates, and littoral combat ships. The company had shipyards in Norfolk, VA and in San Pedro, CA. The company was founded in 19X8 and was headquartered in Kittery, ME.

#### **Investment Description**

**C.13.113** MWM provided financing to fund expansion of a shipyard on the West Coast and for other general corporate purposes. MWM provided \$15.0 million of a syndicated \$100.0 million facility.

Debt Instrument	Mezzanine Debt with Warrants		
Origination Date	March 31, 2X14		
Contractual Maturity Date	March 31, 2X19		
Expected Maturity Date	March 31, 2X19		
Commitment	\$15,000,000 (Fully funded as of closing date)		
Interest Rate	10.00% Cash Interest; Payable Quarterly; Actual/365		
Collateral	None		
OID	None		
Exit Fees	None		
Amortization	None		
Prepayment	No		
Prepayment Fee	NA		
IRR / Pricing at Origination	10.39% (1.80% 5.0Yr Swap Rate +		
	8.58% Implied Spread) / 100.00%		
Stock Price at Origination	\$100.0		
<b>Exercise Price of Warrants</b>	\$100.0		
Life of Warrants	5.0 Years (Expiration date =		
	Maturity date of Mezzanine debt)		
Number of Warrants	25,000		
Historical Volatility	43.4%		
<b>Risk-Free Rate at Origination</b>	1.73%		

#### Initial Transaction and Calibration on March 31, 2X14

- **C.13.114** MWM calibrated the valuation inputs with the initial investment amount which was deemed to be fair value as of the transaction date, as discussed in chapter 10. The combined value of the investment was \$15,000,000. For purposes of determining fair value, MWM disaggregated the value of the warrants from the value of the debt on a standalone basis, as discussed in chapter 13 (paragraphs 13.77–.82).
- C.13.115 Using an option based model, MWM determined the value of the warrants as of the transaction date was \$1,000,000, and therefore, the initial value of the mezzanine debt on a standalone basis was \$14,000,000 (\$15 million less \$1 million). MWM used the \$14,000,000 initial fair value and calculated the IRR at origination to be 10.39% (1.80% 5.0 year swap rate + 8.58% implied spread).
- C.13.116 The company's rating at origination date was "BB+/Ba1 (S&P/Moody's); therefore, MWM estimated a rating for the mezzanine debt of "B+/B1 (S&P/Moody's)."

#### Fair Value Measurement at June 30, 2X14

- **C.13.117** The company performed in line with budget and expectations and the company's credit rating was unchanged at the measurement date. Therefore, MWM estimated that the rating for the mezzanine debt remained at "B+/B1 (S&P/Moody's)."
- C.13.118 MWM noted that prices for the company's senior debt were available only through brokers and that there were no trades for the senior debt in the second quarter of 2X14. Therefore, MWM considered the change in the B+ index to estimate the change in spread for the mezzanine debt. The median spread of the B+ index contracted by 9 basis points from the origination date.
- C.13.119 The 4.75 year swap rate as of the measurement date was 1.62 percent.
- **C.13.120** Applying the change in the median spread of the B+ index (-9 basis points) to the mezzanine debt's implied spread as of the origination date, MWM estimated a concluded spread as of the measurement date of 8.49 percent (8.58 percent implied origination spread less 0.09 percent change in median spreads of the B+ index).
- **C.13.121** MWM added the concluded spread of 8.49 percent to the swap rate of 1.62 percent, resulting in a yield of 10.12 percent as of the measurement date. MWM developed a range by applying +/- 30 basis points around the concluded yield, consistent with the inherent estimation uncertainty based on management judgment considering (a) the availability of a credit rating for the company, (b) the non-investment grade credit rating, and (c) the fund's experience with the competitive environment on other deals.
- **C.13.122** As of the measurement date, the concluded yield was 9.82 to 10.42 percent, with a point estimate of 10.12 percent. The fund, therefore, concluded on a fair value of the mezzanine debt of \$13,985,337 to \$14,281,300, or 93.2 percent to 95.2 percent of par (point estimate of \$14,132,234 or 94.2 percent of par). The increase in the carrying value of the mezzanine debt was driven by the reduced time to maturity, as well as a slight narrowing in the median spread of the B+ index and a decline in the swap rate since the transaction date.
- C.13.123 The stock price as of the measurement date was \$110.00. The life of the warrants had decreased to 4.8 years and historical volatility had slightly increased to 43.5 percent. The risk free rate corresponding to the life of the warrants was 1.55 percent. Using an option model, the value of the warrants was \$1,152,137 as of the measurement date.
- **C.13.124** The fund determined that the aggregate fair value of the debt and the common stock warrants as of the measurement date was \$15,137,474 to \$15,433,438 (point estimate of \$15,284,371, or 101.90 percent of par).
- **C.13.125** For a subscription fee, MWM also had access to reported pricing information obtained by a consensus pricing service. MWM noted that this service had reported three indicative bids at 101, 102 and 98. The pricing service did not identify the size of the positions being offered, the age of the bids, and whether or not the warrants

were included in the pricing. MWM noted that the 101 and 102 prices were reasonably consistent with the fund's concluded value inclusive of the warrants, whereas the 98 was not consistent with the change in market spreads and the increasing stock price.

C.13.126 MWM noted that indicative bids do not represent an offer to purchase the investment, but do provide potential corroborative or contradictory evidence that needs to be considered when assessing fair value. Therefore, MWM considered what they knew about the bids in assessing their relevance. Through its own experience with such bids prior to completing sales of such loans, MWM understood that when providing non-binding indicative bids, potential buyers have little incentive to do a thorough analysis to decide what price to bid, and many of these bids may reflect a low price to open negotiations, rather than an actual expression of interest. Furthermore, MWM considered that given the characteristics of changes in market spreads since the last measurement date, the underlying performance of the company, and the recent nature of the origination of the loan, there was nothing that would lead a market participant to pay less than the origination price of the loan. Finally, MWM considered that they did not have evidence that the pricing service data was contemporaneous and actionable, nor did they have the ability to obtain more information. Even though two out of the three bids were close to MWM's fair value estimate, MWM did not have enough information to know whether those bids were reliable. Therefore, they deemed the value derived from the model to be more representative of fair value.

#### Fair Value Measurement at June 30, 2X15

- **C.13.127** The company was performing extremely well. Max Marine Technologies won a major contract and renewed several others with the U.S. Navy. Furthermore, the company also won a new contract with the U.S. Coast Guard. As the U.S. Navy was expected to pivot towards the Pacific, the company's earlier decision to expand its shipyard and repair facilities on the West Coast was proven fortuitous.
- C.13.128 MWM considered whether the company's credit rating had improved relative to the "B+/B1 (S&P/Moody's)" rating as of the origination date. The company had not obtained a recent rating for its senior debt; therefore, MWM considered a synthetic credit rating analysis. Using the latest financial information as of the measurement date, MWM determined that the company's ratings had increased by one notch, indicating an improvement for the mezzanine debt to "BB–/Ba3 (S&P/Moody's)."
- **C.13.129** Using the debt and option model used at previous measurement dates, considering the improvement in yields and the increase in the public stock price, MWM concluded on a range of fair value for the debt and the common stock warrants as of the measurement date of \$15,064,395 (100.43 percent of par) to \$15,305,438 (102.04 percent of par).
- **C.13.130** MWM also considered the prices provided by the consensus pricing service. The consensus pricing service provided two indicative bids of 96 and 99, indicating a fair value of \$14,400,000 to \$14,850,000. MWM had obtained additional information on

some of the bids reported by the pricing service and concluded that they were contemporaneous and included the value of associated warrants. However, MWM noted that these bids made no sense relative to the original transaction price and the indicative bids at the last measurement date, since the company's stock price had increased and the company's credit quality had improved.

**C.13.131** Understanding their responsibility to consider the potentially contradictory information from the pricing service when assessing fair value, MWM further confirmed by discussion with their deal team and brokerages who were knowledgeable about the specifics of this investment and the overall market, that based on their experience in buying and selling similar debt instruments, actual transactions would likely take place in the range of 101 to 105. MWM was also observed recent market transactions of somewhat similar credits on both originated and sold loans that would place the range of value from 100 to 102.25. MWM therefore concluded that their point estimate of \$15,184,176 (101.23 percent of par – the midpoint of the range discussed in paragraph C.13.130) was the best estimate of fair value.

#### **Task Force Observations**

**C.13.132** In estimating the fair value of debt investments, calibration of initial inputs combined with observations of changes in market yields and the underlying credit quality of the borrower are all used to determine an appropriate discount rate when using a discounted cash flow method. A DCF analysis should be augmented by market (transaction) data where it is available and deemed contemporaneous and actionable. However, even when a bid exists, judgment is required to determine how much weight to place on it, if any, depending on the facts and circumstances.

## Investment 5–Multiple Components of a Single Investment; Disaggregation of Initial Fair Value–Jude Jeremy Corporation

#### Initial Transaction, Calibration and Fair Value Measurement - March 31, 2X16

- **C.13.133** JJC is a Hong Kong based manufacturer of dental appliances and equipment. JJC shares are traded on the Hong Kong exchange. The majority of JJC shares are still owned by its founder Erika Cris.
- C.13.134 Given the growth prospects of JJC and the company's need for additional growth capital, JJC and MWM entered into an agreement whereby MWM invested \$100 million into a basket of JJC instruments during January 2X16. The instruments consisted of:
  - a. a convertible bond (issued by JJC on January 13, 2X16), face value \$60,200,000.
  - b. \$25,000,000 of actively traded JJC equity shares (purchased from a third party seller, on January 20, 2X16, at a 10 percent discount to the actively traded price;

11,000,000 freely tradeable shares at a market price of 2.53 minus 10 percent discount).<sup>5</sup>

- c. \$14,800,000 loans to 5 members of JJC management to facilitate their purchase of JJC equity shares (funding date of the loans was January 25, 2X16). The loans are repayable after 5 years and carry a 2 percent PIK interest rate (no payments are due under the loan until January 2X21). The loans are full recourse personal loans to the management team members and are secured by the underlying shares of JJC which are held in escrow.
- **C.13.135** MWM considered the aggregate transaction price for the basket of instruments to reflect fair value at initial recognition, since it was a negotiated price where there was no incentive for the investors to pay more than fair value nor for the company to accept less than fair value. Specifically, the fund noted that the transaction took place between unrelated parties and did not take place under duress; neither party was required to transact; and the company was not experiencing financial difficulty.
- C.13.136 For valuation purposes, MWM concluded that the instruments would be disaggregated into four component parts for purposes of valuing the combined investment, considering (1) the traded common stock, (2) the management loans, (3) the straight debt component and (4) the conversion option for the convertible bond. MWM also noted that, due to the integrated nature of the arrangements between the parties, even though the transaction specified a price for the common stock, management loans and convertible bond, only the aggregate transaction price was evident; the fund and the company did not buy or sell any of these pieces individually. In particular, MWM noted that the loans to 5 members of JJC management were used to allow these members of management to buy JJC stock, giving them a stake in the success of the business. MWM would not have agreed to issue the loans with only the JJC stock as collateral if it were not for the other instruments.

#### **Initial Fair Value Allocation/Calibration**

- **C.13.137** Having concluded that the transaction price represented fair value in aggregate, for valuation purposes MWM concluded that the following methodology was appropriate to determine the initial fair value of the four component parts: the traded public stock, the management loans, the straight-debt component for the convertible note, and the conversion option for the convertible note.
  - 1. The fair value of the tradeable shares was deemed to be P\*Q. Even though the shares were purchased as a block and nominally priced at a discount, given the

<sup>&</sup>lt;sup>5</sup> The component parts of the \$ 100 million purchase price are shown based on the deal team's considerations in negotiating the transaction. Without considering the other components of the transaction, the discount attributable to the actively traded equity shares implies a blockage discount. If this were the only security purchased, from an accounting perspective, there would likely be a "day-one gain" as the actively traded securities would be valued at P\*Q at subsequent measurement dates. However, because the transaction included several component parts that were executed pursuant to an integrated plan as contemplated by an agreement with the company, the parts in the aggregate were deemed to have a fair value of \$ 100 million. Accordingly, there is no "day-one gain" attributable to the deemed blockage discount.

integrated nature of the overall transaction, it was concluded that the shares were actively traded, given their volume and level of activity, and therefore should be valued at P\*Q. The initial fair value was, therefore, deemed to be \$27,830,000 (11 million shares times \$2.53 per share). MWM then calibrated the inputs with respect to the value of the remaining \$72,170,000 (\$100,000,000 - \$27,830,000).

2. MWM considered the management loans not to have been issued at fair value. Specifically, MWM concluded that a market participant buyer of the management loans would require a yield greater than 2 percent PIK. Instead, the loans to management provided a framework to allow management to participate in the appreciation of JJC based on their efforts.

To determine the initial fair value of the loans, MWM considered the yield for similar secured loans and concluded that a market based interest rate would be 6 percent. MWM then estimated the initial fair value by scheduling the loans cash flows over the 5-year term and discounting the cash flows back to their present value using the 6 percent rate, resulting in an initial fair value estimate of \$12,000,000.

- 3. MWM valued the convertible bond by bifurcating the option component from the debt component.
  - a. MWM first considered a market participant yield for the bond. Based on an analysis of debt instruments for similar instruments in the Asian market, MWM concluded that a market participant would expect a yield of 10 to 13 percent. MWM concluded that for calibration purposes they would use a 12 percent discount rate, determined after judgmentally assessing the yields of similar debt instruments.
  - b. MWM then scheduled the convertible bond's cash flows over the five-year term and calculated the initial fair value of the standalone bond component by discounting the expected cash flows at 12 percent, resulting in an initial value for the bond of \$38,000,000.
- 4. MWM attributed the remaining \$22,170,000 of value to the conversion option. MWM used an option model for valuing the conversion option, calibrating inputs consistent with the \$22,170,000 initial value. MWM tested these inputs versus market indications for volatility and determined that these inputs were reasonable.

#### **Subsequent Measurement Dates**

- **C.13.138** MFM concluded that at subsequent measurement dates, they would apply the following methodology to determine the fair value of each of the instruments:
  - 1. The tradeable shares were valued as  $P^*Q$ .
  - 2. The fair value of the management loan would be determined by assessing any changes to the contractual principal and interest cash flows, and then applying a

discount rate which would be adjusted from the initial 6 percent, as appropriate, based on changes in market conditions for similar loans and the changes in the risk profile driven by the value of the underlying collateral (that is, the share price of JJC).

- 3. The straight debt component of the convertible bond would be valued as follows:
  - a. The bond component was valued by discounting expected future cash flows at a current required yield for the bond (which would be adjusted from the initial calibrated 12 percent discount rate).
  - b. Cash Flow Adjustments Adjusted to reflect expectations as of the measurement date. Adjustments included any changes in the expected principal and interest payments to be received.
  - c. Required Yield Adjustments, if appropriate, based on changes in:
    - i. the risk profile of the bond (e.g. credit quality as measured by LTV, for example), and;
    - ii. changes in market required yields for similar debt instruments (as comparable bonds may be difficult to identify, an index may be an appropriate guidepost).
- 4. The conversion option component of the convertible bond would be valued by updating the option based model, adjusted for updated common share price, volatility, term, and so on, and appropriately considering the calibration at inception.

#### **Task Force Observations**

- **C.13.139** Some transactions are very complex. Judgment is required to determine the appropriate unit of account and market participant perspectives in estimating fair value. When a basket of instruments is combined in a single transaction, the contractual value for individual components may not be reflective of fair value at inception. Disaggregation of the component parts is often required in such circumstances to calibrate the price paid with the ongoing inputs and valuation techniques.
- **C.13.140** The fair value of the bond and the management loans will accrete as the term decreases. If the common share price increases, the value of the equity components will increase (other inputs remaining constant), and if the share price decreases the value of the equity components will decrease (other inputs remaining constant). In addition, as the common share price increases the value of the management loans may increase given the increased security (loan to value ratio), making the loans less risky; and as the share price decreases, the value of the management loans may decrease given the decreased value of the collateral (loan to value ratio).

## Case Study 14 – Private Investment in Traded Public Company Stock

*Note:* This case study is provided to demonstrate concepts discussed in the preceding chapters of this guide and is not intended to establish requirements, best practices or safe harbors. It was developed from a real-world situation, which was complex and involved numerous nuances that needed to be evaluated when estimating the fair value of the investment. However, this case study reflects only the high level approach that the fund would have considered in reaching its valuation conclusions and does not show the calculations or the support for each assumption.

The specific facts and circumstances of each individual situation should be carefully considered when performing an actual valuation, and professional judgment should be exercised in evaluating those facts and weighing various alternatives. This case study summarizes the key considerations that were encountered by the fund manager(s) described in the example. The judgments that were made in this case were specific to those facts, not all of which are highlighted herein. See the preamble for a more detailed description of the purpose of the case studies and factors to consider when reading the case studies.

Case Study 14 – Blue Horizon	Primary Concepts Illustrated			
-private investment in traded	• Private investment in a publicly-traded entity (chapter			
public company restricted	10)			
common stock	• Discount to traded price (chapter 10)			
Type of Security – Private Investment in Public Equity (PIPE)	<ul> <li>Additional Concepts Illustrated</li> <li>Restrictions on securities (chapter 13)</li> <li>Calibration (chapter 10)</li> </ul>			
Industry – Travel agency	• Adjustment to discount at subsequent date (chapter 5			
	and appendix B)			

# The primary purpose of this case study is to illustrate the valuation of a PIPE and a method to quantify a discount to the publicly-traded share price using calibration.

Specifically, the case study includes a fund that invests privately in a public company at a 12.5 percent discount to the public price. At the transaction date, the fund calibrated the discount to the transaction using a Finnerty Model (as described in appendix B, paragraph B.08.05). The fund then used the Finnerty Model at later valuation dates to quantify the changes to the discount considering the changes in volatility and the remaining restriction period. When the restriction period ended, the fund marked the investment at P\*Q, based on the publicly-traded share price.

This example explains a fund's approach to valuing a PIPE that consisted of securities that were restricted under Rule 144 of the Securities Act. As explained, the illustration includes the use of a Finnerty Model, calibrated to the transaction price and then updated as the

volatility and remaining restriction period changed. Other methods for quantifying discounts are possible. See chapter 10, "Calibration" for additional discussion on calibration; chapter 13, "Special Topics" for discussion regarding valuation of investments in entities that have traded securities; and appendix B for a discussion of methods for estimating discounts.

#### **Company Background**

- C.14.01 Blue Horizon (the "Company") was a full-service tour operator that provided leisure travel arrangements in the US and the Caribbean. The company also offered hotel, airline, cruise, and touring reservation services. Blue Horizon served its customers through its tour agency locations, as well as through its website and call centers. The company had been developing an online and mobile booking system which was expected to enable customers to book travel reservations and check tour availability and pricing in real-time.
- **C.14.02** Blue Horizon was headquartered in Miami, Florida. The company completed its initial public offering in 2X01 and actively traded over-the-counter (OTC).
- C.14.03 The company was looking to acquire a key online travel agency, TravelBitz. If the transaction was completed, the combined business would be the third-largest online travel business in the country. However, Blue Horizon was currently running low on cash and would need to raise capital in order to fund the acquisition. Furthermore, since Blue Horizon expected that its competitors might also be interested in acquiring TravelBitz, the company sought to raise capital as soon as possible.
- C.14.04 Blue Horizon estimated that a secondary equity offering would involve a lengthy process and would necessitate a road show to generate investor demand and other time-consuming marketing efforts. Further, Blue Horizon's history of violating bond covenants and failing to repay its debt in a timely manner had damaged its creditworthiness, which had made it challenging for the company to secure a loan. Therefore, the company's investment bank had advised Blue Horizon to consider alternative financing avenues to meet its capital requirements, specifically mentioning that a PIPE (private investment in public equity) offering might best suit the company's needs. Through a PIPE issuance, Blue Horizon would sell common equity shares, equivalent to those that were currently traded OTC, to a targeted group of institutional investors.

#### **The Transaction**

C.14.05 On June 30, 2X12, Blue Horizon announced it raised \$14 million from institutional investors in a private placement of the company's common PIPE shares. The fund participated in the offering by investing \$1.4 million in exchange for 100,000 of Blue Horizon's PIPE shares, which equated to a 1.0 percent equity ownership percentage based on the company's 10,000,000 total shares outstanding. In order to entice investors to take part in the issuance, the company sold the PIPE shares at \$14.00 per share, which represented a 12.5 percent discount to the \$16.00 price of

the publicly-traded stock as of June 30, 2X12. The PIPE shares included a six month trading restriction pursuant to the stock purchase agreement, and thus the PIPE shares were not freely-tradable until six months following the closing of the transaction. The PIPE shares were identical in all other respects to the company's other outstanding common shares.

**C.14.06** In preparation for valuing the PIPE shares for financial reporting purposes, the fund considered relevant guidance (ASC 820-10-55-52) as to whether the restriction on the shares related to the holder (i.e., the fund) or the shares themselves. After reviewing the terms of the PIPE share issuance and considering the relevant guidance, the fund determined that the restriction pertained to the fund's position (that is, the restriction was a characteristic of the asset), thus warranting the application of a discount to reflect the restriction. (See paragraphs 13.08–.14, for further discussion on the factors to consider when assessing whether a contractual restriction would be considered to be a characteristic of the fund's position.)

#### **Investment Thesis**

C.14.07 The fund believed that Blue Horizon was likely to become the top tour agency in the nation within the next ten years based on its ambitious growth plans and strong management team. As the economy continued to rebound and consumers' discretionary spending capacity increased, the fund believed spending on vacations and travel would increase, which would benefit Blue Horizon.

#### **Key Risks**

- C.14.08 The fund believed the key risks to be as follows:
  - The investment in Blue Horizon's PIPE shares would initially lack liquidity, as the fund would be subject to a six month contractual trading restriction.
  - Blue Horizon's business was extremely sensitive to fluctuations in the health of the economy, and any downturn in the labor market would likely translate into lower growth prospects for the company.
  - The company's historical difficulty complying with loan covenants and payment schedules.

#### Initial Calibration on June 30, 2X12

**C.14.09** On June 30, 2X12, the fund valued its investment in Blue Horizon's PIPE shares at the transaction price of \$14.00 per share which was determined by the fund's management to be fair value. The 12.5 percent discount to the company's publicly-traded stock price reflected the six month trading restriction associated with the PIPE shares. The fund decided to use a Finnerty model to quantify this discount and calibrated the inputs as of the transaction date. Using a six month term to liquidity and a discount of 12.5 percent, the fund calculated an implied equity volatility

corresponding to this discount of 79 percent, which was reasonably consistent with the 87 percent implied equity volatility from Blue Horizon's publicly-traded options with term of about six months. Alternatively, the fund could have estimated the discount based on the model using the observed volatility, or could have considered using other models, calibrating to the transaction for consistency. (See appendix B for a discussion of commonly used models.) These alternative approaches would likely have implied different calibration adjustments for use in the analysis at later measurement dates, but would produce similar overall results. The fund selected the Finnerty model using the adjusted volatility required to calibrate to the transaction, noting that the model was a reasonably good fit to the transaction.

#### Valuation at September 30, 2X12

- **C.14.10** On September 30, 2X12, the fund updated its valuation approach to reflect the price of Blue Horizon's publicly-traded shares, less a discount to account for the resale restriction. Consistent with the calibrated model selected in the initial valuation, the fund used a Finnerty model to estimate an appropriate discount to apply to the price of Blue Horizon's publicly-traded stock. As of September 30, 2X12, three months remained before the shares would be freely tradable, and thus the fund used a time to liquidity of three months in the model. The fund selected a volatility figure of 65 percent based on the change in the implied volatility of the company's publicly-traded options matching the remaining term of the restriction, from 87 percent to 72 percent (a ratio of 0.83x), multiplied by the 79 percent calibrated volatility from the initial transaction. Given the fact that volatility in the overall equity markets, including the volatility of Blue Horizon's stock, had declined over the past three months, the fund determined a decline in volatility since the June 30, 2X12 investment seemed reasonable.
- **C.14.11** Based on these inputs, the Finnerty model resulted in an implied discount for the restricted stock of 7.5 percent. This discount was 5 percentage points lower than the initial discount on the PIPE shares, reflecting the shorter length of time before the shares would be freely tradable and the decline in volatility.
- C.14.12 Blue Horizon's publicly-traded shares closed at \$15.00 per share on September 30, 2X12, and the fund calculated the price of its PIPE shares as follows:

PIPE share price as of September 30, 2X12 = \$15.00 \* (1-.075) = \$13.88

#### Valuation at December 31, 2X12

C.14.13 On December 31, 2X12, the full six months had passed from the date of the issuance of the PIPE shares, and the fund was now permitted to sell its shares on the public market. As a result, the fund concluded that a discount for restricted stock was no longer applicable, and valued its shares based directly on the price of the company's publicly-traded stock. Following multiple positive readings on consumer sentiment and the realization of synergies from the recent acquisition of

TravelBitz, Blue Horizon's stock closed at \$19.00 per share on December 31, 2X12.

PIPE share price as of December 31, 2X12 = \$19.00

#### **Task Force Observations**

- **C.14.14** The fund made its investment in Blue Horizon at a discount to the publicly traded share price. As part of the transaction, the fund agreed to a contractual lock-up period of six months before they would be permitted to sell the shares through the public market. The transaction price implied a discount to the stock which was used to calibrate the inputs to be used in the Finnerty model. This model was utilized to calculate the impact of the restriction at future measurement dates until the security became freely tradable. In this case study, the Finnerty model provides a consistent and systematic means of calibrating the discount for a non-marketable investment over time. The inclusion of the Finnerty model in the discussion of this case study should not be interpreted as a specific recommendation of its use nor a suggestion that its use is a best practice. The fund's choice to use this model was one of many acceptable approaches. (See appendix B)
- C.14.15 PIPE investments have unique characteristics that need to be carefully considered by management in estimating fair value. See chapter 10 for more information regarding calibrating to PIPE transactions and chapter 13, "Enterprise Has Traded Securities," paragraphs 13.02–.19, for a discussion of the P\*Q rule, application of calibration and discounts related to restrictions imposed by underwriter lockups and SEC Rule 144A, and the distinction in the accounting guidance for similar versus identical securities.

# Case Study 15 – Investment in Related Instruments in an Entity with Publicly-Traded Securities

*Note:* This case study is provided to demonstrate concepts discussed in the preceding chapters of this guide and is not intended to establish requirements, best practices or safe harbors. It was developed from a real-world situation, which was complex and involved numerous nuances that needed to be evaluated when estimating the fair value of the investment. However, this case study reflects only the high level approach that the fund would have considered in reaching its valuation conclusions and does not show the calculations or the support for each assumption.

The specific facts and circumstances of each individual situation should be carefully considered when performing an actual valuation, and professional judgment should be exercised in evaluating those facts and weighing various alternatives. This case study summarizes the key considerations that were encountered by the fund manager(s) described in the example. The judgments that were made in this case were specific to those facts, not all of which are highlighted herein. See the preamble for a more detailed description of the purpose of the case studies and factors to consider when reading the case studies.

Case Study 15 – <b>Titanic</b> – Related	Primary Concepts Illustrated
Instruments in an Entity with Publicly-Traded Securities Type of Security – Private Investment in Public Equity (PIPE) Industry – US Shipping Business	<ul> <li>Using a traded public stock price as an input in valuing related instruments such as convertible preferred stock (chapter 10)</li> <li>Calibrating the valuation model to the transaction price using a negotiation discount or calibration factor to capture the differences in the required rate of return between the public market and the principal market for the instrument (chapter 10)</li> </ul>
	<ul> <li>Additional Concepts Illustrated</li> <li>Adjusting the negotiation discount or calibration factor as the facts changed at subsequent measurement dates (chapter 10)</li> <li>Using an enterprise value analysis to provide additional support for the fair value at subsequent measurement dates (chapter 5)</li> </ul>

# The primary purpose of this case study is to illustrate the complexities and considerations when estimating fair value of instruments in an entity where there are related publicly-traded securities.

Specifically, this example illustrates the valuation of a private investment in a company with publicly traded securities (a PIPE transaction), where the investment was in the form of convertible preferred shares. On the initial investment date, the company needed financing due to losses experienced over the previous year, given the challenging global economic conditions for the shipping industry. The fund was optimistic about the company's prospects and considered that the paid-in-kind (PIK) preferred dividends would provide the fund with a significant return on investment. The fund was able to negotiate superior features relative to the company's traded public stock due to the company's need for cash. Although the company conducted an orderly process to attract investment, the fund was one of the only bidders, and the company determined that the fund would be the best strategic partner for them in capitalizing on the opportunities they saw as the economy recovered.

As things worked out, less than a year after the transaction, the company experienced a significant adverse event, when one of its ships sank. The resulting disruption to its business allowed a competitor to capture market share on one of its key routes. The company's stock price fell dramatically, changing the investment risk.

Given the availability of both a traded public stock price and a transaction price that reflected fair value at initial recognition, the fund estimated the value of the investment considering the factors that market participants would consider in assessing the changes in value over time:

- The fund's primary valuation model considered the expected payoff structure for the preferred and the traded public stock price input. The fund calibrated the model to the transaction price by estimating a "negotiation discount" on the transaction date. The negotiation discount reflected the differences in the required rate of return between the public market and the principal market for the instrument, as evidenced by the transaction.
- For subsequent measurement dates, the fund updated the valuation model given the changes in the public stock price and the changes in the negotiation discount, given the facts and circumstances.
- The fund used an analysis of the total enterprise value, the corresponding equity value, and the resulting allocation to the preferred stock, to provide additional support for the negotiation discount on subsequent measurement dates.

Despite the favorable terms for the preferred equity interests relative to the common stock, the fund considered the transaction to reflect fair value at initial recognition, and therefore there was no day one gain. In particular, the fund believed that market participants in their

principal market would not have paid more for the instruments than the fund paid in the transaction.

#### **Company Background**

- C.15.01 Titanic Shipping, Inc. ("Titanic" or the "Company") was a public company traded on the New York Stock Exchange headquartered in Los Angeles, California. The company provided ocean freight transportation services and integrated logistics. Titanic owned or leased 14 vessels. The company controlled a key route along a specific corridor that allowed it access and majority market share to a shipping route between Panama and eastern China. In order to maintain its stronghold on this route, Titanic needed to acquire additional ships and refurbish its existing ships.
- C.15.02 As a result of the global economic downturn, the container shipping industry struggled as vessel capacity outstripped volumes of goods for transport. In order to maintain market share, other large shipping operators discounted their shipping rates. The prevailing ocean freight rates continued to be below the level required for many shipping operators to cover their operating and transportation costs. As a result of overcapacity, Titanic was forced to back off its plan to boost shipping rates and purchase additional vessels, and instead focus on reducing costs. The company's EBITDA margins declined by 2.5 percent in 2X10 due to depressed freight rates.
- C.15.03 Titanic's management filed a shelf registration with the SEC in 2X10. This filing provided the company with additional financial flexibility and allowed Titanic to finance business expansion. According to the shelf registration, Titanic had 50.0 million shares issued and outstanding and had authorized the issuance of a total of 100.0 million shares.

#### **The Transaction**

C.15.04 On May 30, 2X11, Brice Capital Management (BCM) signed and closed an investment transaction pursuant to which it provided capital of \$60 million to Titanic in exchange for 12 million convertible preferred shares. The preferred shares had a liquidation preference equal to the face amount plus a 6 percent PIK dividend in the form of additional convertible preferred shares, compounding quarterly, such that after the fourth anniversary of the transaction, BCM would hold 15,227,827 convertible preferred shares. Each preferred share was convertible into a common share at a price of \$5.00 per share, which was equal to the closing price on the date of the transaction, May 30, 2X11. BCM also had the right to appoint one member to Titanic's sevenperson board of directors, as long as BCM held at least 10.0 million preferred or common shares. At the end of four years, BCM had the right to convert its shares or have them redeemed for their face value of \$76,139,133. In the event that BCM sought a redemption of its shares. Titanic had the right to force conversion of BCM's shares to common equity at a conversion price of \$2.50 per common share, which would result in the issuance of 30,455,653 common shares.

Initial investment	\$60 million, 12 million shares
PIK dividends	6% for four years, compounding quarterly
Expected accruals through maturity	\$76,139,133; 15,227,827 shares
Conversion price	\$5.00
Forced conversion price (in lieu of cash redemption)	\$2.50, corresponding to 30,455,653 shares

C.15.05 Consistent with the average trading volume in the most recent quarter, approximately 150,000 Titanic common shares traded on May 30, 2X11, when the company's share price closed at \$5.00 per share. Since BCM expected its holding period would be the entire four year period, they considered their effective purchase price on the shares to be \$3.94 per share (\$60 million cost divided by 15,227,827 shares upon conversion in four years). BCM considered this difference in their effective cost per share, following their expected holding period, to be comparable to a discount on the price per share relative to the \$5.00 per share market price. If BCM chose to convert its preferred shares to common at the end of the four year period, BCM could exercise its rights under the registration rights agreement to cause the registration of its shares to permit all 15,227,827 shares to be fully marketable. BCM considered the receipt of the additional shares on the forced conversion to be sufficiently remote (and outside of its control) that BCM did not factor those additional shares into its consideration in thinking about its initial pricing considerations.

#### **Investment Thesis**

**C.15.06** BCM believed that, despite the near-term pressure on the shipping industry caused by the current excess of vessels, developing economies' growing need for commodities would eventually result in favorable supply and demand dynamics for bulk shippers. Given its optimistic view of the longer-term prospects for Titanic, BCM was attracted to the conversion feature of the investment, which would allow the fund to participate in the company's upside through increased equity ownership over time. The fund would achieve a 2x return over four years if the stock reached a price of slightly less than \$8, and would receive at least the specified 6 percent cumulative return at a stock price of \$2.50 or more.

#### **Key Risks**

- C.15.07 The key risks were identified to be:
  - Titanic had not yet proved it could capitalize on its dominant market share of the trade between the port of Panama and eastern China.

• In the aftermath of the recent collapse in commodity prices caused by the global recession, the bulk shipping industry's economics might remain unfavorable for years.

#### Initial Calibration on May 30, 2X11

- C.15.08 On May 30, 2X11, BCM recorded the investment at its transaction price, \$60 million. The fund noted that the transaction was an orderly transaction in which the company solicited interest from multiple investors, and therefore considered the transaction price to reflect fair value at initial recognition.
- **C.15.09** To prepare for subsequent measurement dates, the fund also created a valuation model. Since the preferred had a 6 percent PIK dividend, compounding quarterly, it would ultimately be convertible into 15,227,827 common shares if everything went well. Given the \$5 stock price on May 30, 2X11, the expected ultimate as-converted value of these shares was \$76.139 million, equivalent to the specified redemption value inclusive of the 6 percent return. The fund noted that the preferred was entitled to this minimum payoff unless the stock price fell below \$2.50. At a stock price below \$2.50, the fund would receive twice as many shares in lieu of the specified redemption value.

At the end of four years, the payoff structure of the investment would be as follows:



### **Convertible Preferred (\$MM)**

Thus, the payoff structure had three components:

- Long, 30,455,653 shares of common (if the stock price is less than \$2.50)
- Short, 30,455,653 call options struck at the forced conversion price of \$2.50
- Long, 15,227,827 call options struck at the conversion price of \$5

The valuation analysis required the following assumptions:

Input	Value
Observed stock price	\$5.00
Conversion price	\$5.00
Forced conversion price	\$2.50
Risk-free rate	1.5% (yield on 4-year US Treasury notes)
Time to maturity	4 years
Common stock volatility	48%
Implied negotiation discount or calibration factor	41.8% (as discussed in the following section)

Negotiation discount or calibration factor

C.15.10 Since private equity funds must outperform the public stock market in order to attract capital from limited partners, market participants in the principal market for these types of instruments typically require a "negotiation discount" or calibration factor. This negotiation discount or calibration factor reflects the incremental rate of return that market participants demand for these PIPE investments. The size of the discount negotiated ultimately depends on the relative strength of the negotiating positions between the company and the investors. In this offering, the transaction was highly dilutive, increasing the total outstanding number of shares from 50 million to 62 million immediately, and 65 to 80 million by the end of the four year term. Although the company conducted an orderly process, it was not able to raise less expensive capital via more traditional debt or equity financing. The fund estimated a negotiation discount of 41.8 percent by calibrating to the transaction. This discount represented the difference between the publicly-traded common stock price and the \$2.91 stock price implied by the valuation model that produced an investment value for the fund equal to \$60 million. The fund's calibration of the stock price using an option pricing model is summarized in the following table:

Component:	Stock	Short Option	Long Option
Calibrated stock price	\$2.91	\$2.91	\$2.91
Strike price	\$0.00	\$2.50	\$5.00
Option value	\$2.91	\$1.27	\$0.66
Number of shares	30,455,653	(30,455,653)	15,227,827
Total component value	\$88,588,562	\$(38,655,465)	\$10,066,904
Total investment value	\$60,000,000		

The fund noted that this discount corresponded to an incremental rate of return of 14.5 percent per year over the four year term of the investment (calculated as  $((1 - 41.8\%)^{(-1/4)} - 1)$ .<sup>1</sup> (See chapter 13 for a discussion of similar versus identical securities and negotiation discounts.)

Business Enterprise Value and Calibrated Market Approach

- **C.15.11** The fund also noted that market participants would consider the underlying value of the business and the resulting allocation to the preferred stock when evaluating the investment. To calibrate this approach as of initial recognition, the fund considered the market cap and the corresponding enterprise value. Immediately prior to the transaction, Titanic had a market cap of \$250 million and a term loan with a par value of \$350 million and a fair value (used as a proxy for the value of debt for the purpose of valuing equity) of 92 percent of par, or \$322 million<sup>2</sup>. Thus, with the new preferred investment of \$60 million, Titanic's total enterprise value was \$632 million. As of the transaction date, Titanic had last twelve month revenues of \$147.0 million and EBITDA of \$84.3 million, and forecasted next calendar year revenues of \$183.7 million and EBITDA of \$101.1 million. (See chapter 10 for more information regarding calibration.)
- **C.15.12** The fund compared Titanic with selected guideline companies from the industry, and noted that Titanic's historical growth and margins lagged behind the guideline companies, but forecasted performance was better. The implied multiples from the transaction compared with the guideline company multiples were as follows:

<sup>&</sup>lt;sup>1</sup> Note that for simplicity, it is assumed in this case study that the incremental rate of return is the same at each measurement date (14.5 percent). In practice, this rate could change on the basis of the different facts and circumstances that exist at each point in time.

<sup>&</sup>lt;sup>2</sup> For purposes of this example, since the business enterprise value was used as a supporting analysis to corroborate the analysis using the public stock price input, we assumed that the fund used the fair value of debt (rather than a higher assumed payoff amount) as a proxy for the value of debt for the purpose of valuing equity. This approach was used consistently both in estimating the initial business enterprise value for calibration and in estimating the equity value based on the estimated business enterprise value at subsequent measurement dates.

Titanic's Implied LTM Revenue and EBITDA Multiples:

Enterprise Value:	\$632.0 million
LTM Revenue:	\$147.0 million
Implied EV/LTM Revenue Multiple:	4.3x

Enterprise Value:	\$632.0 million
LTM EBITDA:	\$84.3 million
Implied EV/LTM EBITDA Multiple:	7.5x

Titanic's Implied NTM Revenue and EBITDA Multiples:

Enterprise Value:	\$632.0 million	
NTM Revenue:	\$183.7 million	
Implied EV/NTM Revenue Multiple:	3.4x	
Enterprise Value:	\$632.0 million	
NTM EBITDA:	\$101.1 million	

Multiples from Guideline Public Companies:

Implied EV/NTM EBITDA Multiple: 6.3x

Ticker	EV /	EV /	EV /	EV/NTM
	LTM Rev	LTM EBITDA	NTM Rev	EBITDA
SHIP	3.9x	5.9x	3.8x	5.7x
BOAT	4.3x	7.4x	4.1x	7.1x
BULK	6.2x	7.8x	5.9x	7.3x
CARGO	2.2x	8.1x	2.2x	7.5x
VESL	2.9x	7.4x	2.8x	7.0x
DRY	4.2x	5.5x	4.0x	4.9x
Median	4.0x	7.4x	3.9x	7.1x
Calibrated	<i>4.3x</i>	7.5x	3.4x	<i>6.3x</i>

#### Valuation at June 30, 2X11

C.15.13 On June 30, 2X11, after trading for the previous week had averaged 225,000 shares per day Titanic's common share price closed at \$5.40 per share, an 8 percent increase over the \$5 stock price at the transaction. As of that date, one month after the initial investment, BCM's preferred stock had accrued a face value of \$60.304 million, corresponding to 12,060,850 common shares upon conversion. BCM still expected to ultimately convert the preferred into 15,227,827 shares given the PIK accruals through maturity. At the June 30, 2X11 share price would have a

value of approximately \$65.129 million on an as-converted basis based on shares accrued through the measurement date or \$82.230 million given the expected PIK accruals through the maturity.

- C.15.14 BCM noted that market participants in the principal market for the preferred stock would be other PIPE investors, who would demand a similar incremental rate of return as was reflected in the calibrated valuation model. Furthermore, BCM noted that part of the value for the preferred stock was attributable to the downside protection, and therefore, the value of the preferred stock would be expected fall less as the common stock price falls but also would be expected to increase less as the common stock price rises. Accordingly, while the current market price was considered as a relevant input to its determination, BCM estimated that the fair value would be in a range between the stated liquidation preference on the shares and the as-converted value given one month of accrued dividends (that is, between \$60.30 million and \$65.13 million). Using the calibrated valuation model and updating the inputs to reflect the change in stock price, an increase in the company's estimated common stock volatility from 48 percent to 52 percent, and the discount corresponding to the 14.5 percent incremental rate of return over the 3.92 year remaining term, BCM estimated a fair value of its investment in Titanic's convertible preferred shares at \$63.36 million.
- **C.15.15** The fund also considered whether there had been any change in facts and circumstances that would indicate a change in the incremental rate of return that market participants would require for this investment. The fund noted that only one month had passed since the initial transaction, and that the multiples for the guideline public companies had not changed significantly over that period. The fund's assessment was that the increase in the company's stock price was most likely a positive reaction to the announcement of the financing. Therefore, the fund estimated that market participants would still demand a similar incremental rate of return for the investment.

#### Valuation at December 31, 2X12 [1.6 years following the initial transaction]

C.15.16 On November 10, 2X12, through a series of mishaps involving weather, a mechanical failure, and poor judgment, one of the company's ships sank. Titanic was forced to cancel certain shipments, and one of the company's key customers moved all of its shipping contracts to a competitor. Due to the negative developments affecting Titanic's operations, the company's last twelve month revenues fell to \$112.0 million and EBITDA declined to \$54.0 million. Moreover, the fallout from the sunken ship and cancelled shipments were projected to linger into 2X13, leading the company's management to project next year revenues of \$75.0 million and EBITDA of \$27.0 million. Titanic's stock price fell to \$1.60 per share by the close of trading on December 31, 2X12.

As of December 31, 2X12, using the same valuation model with updated assumptions, the fund estimated a fair value of \$28.78 million, as follows:

Input	Value
Observed stock price	\$1.60
Conversion price	\$5.00
Forced conversion price	\$2.50
Risk-free rate	1.4% (yield on 2.4-year US Treasury notes)
Time to maturity	2.4 years
Common stock volatility	73%
Negotiation discount	27.9% (incremental return of 14.5% over remaining term)

Business Enterprise Value and Updated Market Approach

**C.15.17** To further support the valuation of the preferred stock, the fund also considered a BEV analysis. The fund calculated the revenue and EBITDA multiples of the guideline public companies as of the measurement date as follows:

Ticker	EV /	EV /	EV /	EV /
	LTM Rev	LTM EBITDA	NTM Rev	NTM EBITDA
SHIP	4.6x	6.9x	4.3x	6.4x
BOAT	5.4x	8.8x	5.0x	8.2x
BULK	7.1x	8.9x	6.6x	8.3x
CARGO	2.9x	10.3x	2.7x	9.6x
VESL	3.6x	8.9x	3.4x	8.3x
DRY	5.1x	6.8x	4.7x	5.5x
Median	4.8x	8.8x	4.5x	8.3x
Selected	3.6x	Implied: 7.5x	4.5x	Implied: 12.5x

Multiples from Guideline Public Companies:

**C.15.18** The fund noted that Titanic's issues were unique, reflecting the company-specific operational mishap occurring in the fourth quarter of 2X12, as opposed to any industry-wide negative trends. Furthermore, the fund noted that performance in the NTM period was expected to be lower than the LTM period, but that the business was expected to recover in the following years. Therefore, the fund selected a revenue multiple of 25 percent below the median of the peers for the LTM period and equal to the median of the peers in the NTM period. The fund chose not to rely on EBITDA metrics since given the disruption in the business and the company's

high fixed costs, the company's EBITDA in the LTM and NTM periods were not reflective of the steady state expected performance of the business.

C.15.19 Based on these selected metrics, the fund calculated a BEV as follows:

LTM Revenue:	\$112.0 million
Selected LTM Revenue Multiple:	3.6x
Enterprise Value:	\$403.2 million
LTM EBITDA:	\$54.0 million
Implied LTM EBITDA Multiple:	7.5x
NTM Revenue:	\$75.0 million
Selected NTM Revenue Multiple:	4.5x
Enterprise Value:	\$337.5 million
NTM EBITDA:	\$27.0 million
Implied NTM EBITDA Multiple:	12.5x

- C.15.20 The fund calculated the implied EBITDA multiples, and noted that they were lower than the median in the LTM period, but significantly higher than the median in the NTM period. This result made sense given the disruption to the business, since NTM EBITDA was much lower than usual due to the one-time event.
- C.15.21 Further, the fair value of the company's debt had fallen to 71 percent of par, or \$248.5 million, as the yield on Titanic's debt rose following the fourth quarter downturn in the company's business and the resulting increase in the perceived risk in the business. Subtracting the fair value of debt (used as a proxy for the value of debt for the purpose of valuing equity) from the estimated BEV range, the fund calculated a range of equity values of \$89.0 to \$154.7 million for Titanic as of the measurement date. Based on the midpoint of the range, the fund calculated an equity value of \$121.9 million.
- **C.15.22** The calculated equity value of \$121.9 million was reasonably consistent with the \$117.2 million total equity value corresponding to the \$80 million market cap (common stock price of \$1.60 per share times 50 million shares outstanding) plus the fund's calculated value of \$37.2 million for the preferred stock without application of the incremental rate of return that PIPE investors would demand. The fund's calculation of the aforementioned value for the preferred stock is summarized in the following table:

Component:	Stock	Short Option	Long Option
Stock price	\$1.60	\$1.60	\$1.60
Strike price	\$0.00	\$2.50	\$5.00
Option value	\$1.60	\$0.50	\$0.25
Number of shares	30,455,653	(30,455,653)	15,227,827
Total component value	\$48,729,016	\$(15,321,260)	\$3,788,192
Total value	\$37,195,947		

Given this result, the fund considered whether the common stock price had already fully incorporated the dilution impacts from a forced conversion of the preferred stock and whether it was still appropriate to apply this incremental discount. Given the facts and circumstances, the fund concluded that if the company were to raise additional capital or if the fund were to sell its preferred stock investment, market participants would still require a significant incremental rate of return, consistent with the original investment. Therefore, the fund concluded on a fair value of \$28.78 million after applying a discount of 27.85 percent reflecting an incremental rate of return of 14.5 percent per year for the remaining 2.4 years to maturity, as summarized in the following table. (See chapter 8 for further discussion of the valuation of equity interests in complex capital structures.)

Component:	Stock	Short Option	Long Option
Stock price	\$1.15	\$1.15	\$1.15
Strike price	\$0.00	\$2.50	\$5.00
Option value	\$1.15	\$0.27	\$0.12
Number of shares	30,455,653	(30,455,653)	15,227,827
Total component value	\$35,157,661	\$(8,177,033)	\$1,796,673
Total value	\$28,777,301		

#### **Task Force Observations**

**C.15.23** The fund made its investment in Titanic expecting that the company would be well positioned to grow through the anticipated economic recovery, while also noting

that even if the stock price fell by 50 percent, it would receive at least its 6 percent contractual return. Furthermore, the fund was able to acquire the preferred stock, with all its additional features, at the same price as the public common stock. Nevertheless, the fund concluded that the transaction price reflected fair value at initial recognition. Specifically, the fund noted that the transaction was orderly and that market participants in the principal market for PIPE investments require higher returns than investors in the public markets. The calibrated negotiation discount reflected this incremental rate of return. The fund used the same valuation model at subsequent measurement dates, updating the assumptions as the public stock price and other inputs changed. Given the lack of certainty about the degree to which the public markets already reflected the dilution from the PIPE investment when trading in the common shares, the fund also estimated the value of the business and the corresponding value of the investment directly. Market participants typically would consider both approaches in assessing the price they would pay for such an investment.

C.15.24 PIPE investments have unique characteristics that need to be carefully considered by management in estimating fair value. See chapter 10 for more information regarding calibrating to PIPE transactions and chapter 13, "Enterprise Has Traded Securities," paragraphs 13.02–.19, for a discussion of the P\*Q rule, application of calibration and discounts related to restrictions imposed by underwriter lockups and SEC Rule 144A, and the distinction in the accounting guidance for similar versus identical securities.

### Glossary

This glossary contains terms from the following sources when indicated:

- International Glossary of Business Valuation Terms (IGBVT), which has been adopted by a number of professional societies and organizations, including the AICPA
- Financial Accounting Standards Board (FASB) *Accounting Standards Codification™* (ASC)
- Statement on Standards for Valuation Services (SSVS) No. 1, Valuation of a Business, Business Ownership Interest, Security, or Intangible Asset (AICPA, Professional Standards, VS sec. 100)
- **acquisition premium.**<sup>1</sup> In a merger or an acquisition, the difference between the purchase price and preacquisition value of the target firm.
- **active market.** A market in which transactions for the asset or liability take place with sufficient frequency and volume to provide pricing information on an ongoing basis. (FASB ASC master glossary)
- **affiliate.** A party that, directly or indirectly through one or more intermediaries, controls, is controlled by, or is under common control with an entity (FASB ASC master glossary). For the definition of an affiliate per SEC rules and regulations, see paragraph 946-10-S99-2, Regulation S-X Rule 6-02(a).
- **alpha testing.** A process of obtaining opinions from selected users (typically from within the enterprise) on an enterprise's product or service under development for the purpose of testing performance and quality and making improvements prior to more widespread (beta) testing; see also **beta testing**.
- **angel** or **angel investor.** An individual or fund who provides capital to one or more start-up enterprises. (The individual or fund typically is affluent or has a personal stake in the success of the venture. Such investments are characterized by high levels of risk and a potentially large return on investment.)
- **antidilution provision.** Standard antidilution provisions are those that result in adjustments to the conversion ratio for convertible instruments or warrants in the event of an equity restructuring transaction such as a stock split or special dividend. These antidilution provisions are designed to maintain the value of the instrument before and after the restructuring. Another form of antidilution

<sup>&</sup>lt;sup>1</sup> As of the writing of this guide, the Appraisal Foundation is working on a project regarding the assessment and measurement of control premiums in valuations for financial reporting. The purpose of this project is to present views on how to approach and apply certain aspects of the valuation process appropriate for measuring the fair value of controlling interests in business enterprises for financial reporting purposes. Please refer to the Appraisal Foundation's website at <u>www.appraisalfoundation.org</u> for further information about this project and its status.

provision is a down round feature, which is a right that provides one or more classes of equity with protection against dilution in the event of subsequent down rounds of financing. These rights result in an automatic adjustment of the original conversion ratio of the convertible instrument or warrant in the event that an enterprise subsequently issues stock at a price per share below the original issue price of the existing preferred stock. A standard antidilution provision is not considered a down round feature. See also **down-round feature, full ratchet** and **partial ratchet**.

- **asset accumulation method.** A method commonly under the asset approach under which the value of the enterprise is determined to be the net of the fair value of the enterprise's individual assets and liabilities. The asset accumulation method is also commonly referred to as the adjusted net asset value method or the adjusted book value method.
- **asset approach.** A general way of determining a value indication of a business, business ownership interest, or security using one or more methods based on the value of the assets net of liabilities (IGBVT). Also known as asset-based approach.
- **backsolve method.** A method within the market approach wherein the equity value for a privately held company is derived from a recent transaction in the company's own instruments. (This term is used by some business valuation specialists but generally is not found in valuation literature.) The backsolve method is a form of calibration where management first estimates the other assumptions used within the valuation model, and the remaining assumption (total equity value) is then inferred from the transaction price.
- **basis of valuation.** The basis of valuation reflects the types of premiums or discounts that should be considered for the subject interest, given the premise of value. In traditional valuation practice, valuations may be considered on a controlling or minority basis and on a marketable or nonmarketable basis. In valuing an interest in an enterprise, the basis of valuation for the enterprise should be consistent with the required rate of return for the investors who in aggregate have control over the business. Additional premiums or discounts may be applied to the extent that the required rate of return for the minority investors would differ from that for the investors who in aggregate have control over the business. See chapter 9, "Control and Marketability."
- **benchmark yield curve.** A yield curve constructed to facilitate fair valuation of debt. The benchmark yield curve or reference yield curve may be based on government yields (such as U.S. constant maturity treasury yields), LIBOR or EURIBOR yields, or constructed benchmark curves using debts of issuers that are of similar credit quality (such as the Merrill Lynch High Yield Benchmark Yield Curve). The market yield for a specific debt instrument may then be estimated by using a spread relative to the selected benchmark yield curve.

- **beta testing.** A second stage (following alpha testing) of testing a new product or service in which an enterprise makes it available to selected users who use it under normal operating conditions and in the kind of environment in which it will be used more widely; see also **alpha testing**.
- **board composition rights.** Rights that provide preferred stockholders the ability to control the board composition in a manner that is disproportionate to their share ownership.
- **burn rate.** For an enterprise with negative cash flow, the rate of that negative cash flow, typically per month.
- **business development company (BDC).** A company defined in Section 2(a)(48) of the 1940 Act as a closed-end investment company that chooses to be treated as a BDC under the act and is operated to make equity or debt investments in eligible portfolio companies. These portfolio companies are typically small and mid-sized businesses.
- **calibration.** The process of reconciling the unobservable inputs used in a valuation technique so that the result of that valuation technique equals a specified value. As further explained in FASB ASC 820-10-35-24C, "[i]f the transaction price is fair value at initial recognition and a valuation technique that uses unobservable inputs will be used to measure fair value in subsequent periods, the valuation technique shall be calibrated so that at initial recognition the result of the valuation technique equals the transaction price. Calibration ensures that the valuation technique reflects current market conditions, and it helps a reporting entity to determine whether an adjustment to the valuation technique is necessary (for example, there might be a characteristic of the asset or liability that is not captured by the valuation technique)."
- **capital asset pricing model (CAPM).** A model in which the cost of capital for any stock or portfolio of stocks equals a risk-free rate plus a risk premium that is proportionate to the systematic risk of the stock or portfolio. (IGBVT)
- **capitalization rate.** The rate of return on a real estate investment property based on the income that the property is expected to generate. It can be calculated by dividing the investment's net operating income (NOI) by the fair value of the property.
- **carried interest.** An incentive based capital allocation where a portion of profits are allocated from limited partner capital accounts to the general partner capital account in return for performance, typically above a hurdle rate.

#### clawback. See contingent consideration.

**club deal.** An arrangement in which a group of unrelated investment managers jointly make investments in a private company on behalf of funds they manage.

- **contemporaneous valuation.** A valuation that is performed concurrent with, or a short time after, the as-of date of the valuation; see also **retrospective valuation**.
- **contingent consideration.** Usually an obligation of the acquirer to transfer additional assets or equity interests to the former owners of an acquiree as part of the exchange for control of the acquiree if specified future events occur or conditions are met [also referred to as an **earnout**]. However, contingent consideration also may give the acquirer the right to the return of previously transferred consideration if specified conditions are met [also referred to as a **clawback**]. (FASB ASC master glossary)
- **control.** The power to direct the management and policies of a business enterprise. (IGBVT)
- **control premium.**<sup>2</sup> An amount or a percentage by which the pro rata value of a controlling interest exceeds the pro rata value of a noncontrolling interest<sup>3</sup> in a business enterprise to reflect the power of control. (IGBVT) The task force recommends estimating the total equity value corresponding to the required rate of return for the investors who in aggregate have control of the business, via calibration when possible. This value effectively measures the value of the business on a controlling basis, consistent with the perspective of the investors who in aggregate have control of the business, without application of a separate control premium. It may then be appropriate to apply a discount for lack of marketability to estimate the value of specific interests that are not part of the controlling group, to the extent that these interests lack information rights or the other rights that investors typically expect. See **marketability discount**, as well as chapter 9, "Control and Marketability."
- **conversion right.** A feature on some bonds and preferred stock issues allowing the holder to convert the instruments into common stock.
- **convertible debt.** Debt that the holder can convert into equity dependent on the contractual conversion terms of the debt.
- **cost approach.** A valuation approach that reflects the amount that would be required currently to replace the service capacity of an asset (often referred to as current replacement cost). (FASB ASC master glossary) A general way of determining a value indication of an individual asset by quantifying the amount of money required to replace the future service capability of that asset. (IGBVT)
- **cost of capital.** The expected rate of return that the market requires in order to attract funds to a particular investment. (IGBVT)

<sup>&</sup>lt;sup>2</sup> See footnote 1 in the glossary.

<sup>&</sup>lt;sup>3</sup> It should be noted that in this definition, the reference to noncontrolling interest is similar to *minority interest* throughout this guide. It is not intended to refer to noncontrolling interest addressed in Financial Accounting Standards Board (FASB) *Accounting Standards Codification* (ASC) 810, *Consolidation*. See paragraph 9.01.

- **corporate carve-out.** A divestiture by a corporation of a struggling or non-core division. Buying carved-out business units can be more challenging than buying existing standalone businesses. Strategic buyers usually have an existing business infrastructure that can be used to run the business. Private equity buyers, on the other hand, need to develop this infrastructure so that the carved-out entity can operate independently.
- **day one gain or loss.** A gain or loss at initial recognition of an asset or liability that arises from a difference between the transaction price and the fair value at initial recognition.
- **debt-like preferred stock.** Preferred-stock that is entitled to repayment of its liquidation preference upon a liquidity event or at a contractual redemption date, similar to the repayment of principal for a debt instrument. The distinction from other preferred stock is that debt-like preferred stock does not participate alongside common or convert to common at a fixed conversion price to participate in the upside appreciation in the value of the enterprise. Debt-like preferred stock may be redeemed at a liquidity event, or may have a contractual redemption date or put date, which gives the holder influence over the timing of a liquidity event. Debt-like preferred stock may also be used for bridge financing, where the liquidation preference may be settled in shares via conversion into the next financing round or into common stock at the initial public offering, at a conversion price that depends on the price in the financing.
- **debt to assets ratio.** Indicates the proportion of a company's assets that are being financed with debt, rather than equity. The ratio is used to determine the financial risk of a business. A ratio greater than 1 shows that a considerable proportion of assets are being funded with debt, while a low ratio indicates that the bulk of asset funding is coming from equity.

#### discount for lack of marketability. See marketability discount.

#### discount for illiquidity. See marketability discount.

- **discount rate.** A rate of return used to convert a future monetary sum into present value. (IGBVT)
- **discount rate adjustment technique.** A present value technique that uses a riskadjusted discount rate and contractual, promised, or most likely cash flows. (FASB ASC master glossary)
- **discounted cash flow (DCF) method.** A method within the income approach whereby the present value of future expected net cash flows is calculated using a discount rate. (IGBVT)
- **down round.** A round of financing in which investors purchase stock from an enterprise at a lower price than the previous round.

- **down round feature.** A feature in a financial instrument that reduces the strike price of an issued financial instrument if the issuer sells shares of its stock for an amount less than the currently stated strike price of the issued financial instrument or issues an equity-linked financial instrument with a strike price below the currently stated strike price of the issued financial instrument. A down round feature may reduce the strike price of a financial instrument to the current issuance price, or the reduction may be limited by a floor or on the basis of a formula that results in a price that is at a discount to the original exercise price but above the new issuance price. A standard antidilution provision is not considered a down round feature. (FASB ASC Master Glossary)
- **drag-along rights.** Rights that allow one class of shareholder to compel the holders of one or more other classes of shares to vote their shares as directed in matters relating to sale of the enterprise.
- **EBIT.** Earnings before interest and taxes.
- EBITDA. Earnings before interest, taxes, depreciation, and amortization.
- **EBITDA coverage ratio.** A solvency ratio that measures a company's ability to pay off its liabilities related to debts and leases. It compares the company's earnings before interest, taxes, depreciation, amortization (EBITDA) plus lease payments to the sum of debt payments and lease payments.

#### earnout. See contingent consideration.

- enterprise value. For purposes of this guide, enterprise value is defined as the value of equity and interest-bearing debt. In broader valuation practice, the term *enterprise value* is sometimes used to refer to the value of equity and interest-bearing debt, less all cash and equivalents; however, for this guide, the task force considers enterprise value to include cash and cash equivalents. Enterprise value may also be referred to as invested capital, market value of invested capital (MVIC), or total enterprise value.
- **equity value.** For purposes of this guide, the enterprise value, less the fair value of debt, measured considering the required rate of return for the investors who in aggregate have control over the business, as discussed in paragraphs 7.03–.04 and 7.08.
- **expected cash flow.** The probability-weighted average (that is, mean of the distribution) of possible future cash flows. (FASB ASC master glossary)
- **expected present value technique.** A technique that uses as a starting point a set of cash flows that represents the probability-weighted average of all possible future cash flows (that is, the expected cash flows). The resulting estimate is identical to expected value, which, in statistical terms, is the weighted average of a discrete random variable's possible values with the respective probabilities as the weights.

Because all possible cash flows are probability-weighted, the resulting expected cash flow is not conditional upon the occurrence of any specified event (unlike the cash flows used in the discount rate adjustment technique). (FASB ASC 820-10-55-13)

- FASB. Financial Accounting Standards Board.
- **fair market value.** The price, expressed in terms of cash equivalents, at which property would change hands between a hypothetical willing and able buyer and a hypothetical willing and able seller, acting at arm's length in an open and unrestricted market, when neither is under compulsion to buy or sell and when both have reasonable knowledge of the relevant facts. (IGBVT)
- **fair value.** The price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. (FASB ASC 820)
- **fairness opinion.** An opinion as to whether or not the consideration in a transaction is fair from a financial point of view. (IGBVT)
- **first lien debt.** Senior debt instruments that rank ahead of subordinated debt of a given portfolio company
- **first refusal rights.** Contractual rights frequently granted to venture capitalists to purchase shares of common stock held by other shareholders (typically, founders and key management) before such shares may be sold to a third party.
- **flat round.** A round of financing in which investors purchase stock from an enterprise at the same price as the previous round.
- **forward EBITDA.** The EBITDA of a company in an immediately succeeding period, usually the next twelve months (e.g., next twelve month (NTM) or next fiscal year (NFY) EBITDA).
- **forward revenue.** The revenue a company is expected to earn in an immediately succeeding period, usually the next twelve months (e.g., next twelve month (NTM) or next fiscal year (NFY) revenue).
- **full ratchet.** An antidilution provision that uses the lowest sales price for any shares of common stock sold by an enterprise after the issuance of an option (or convertible instrument) as the adjusted option price or conversion price for existing shareholders.
- **growth investing.** Growth investing is an investment strategy that involves investing in companies that are deemed to have good potential for growth. In most cases, a growth company is defined as a company whose earnings are expected to grow at an above-average rate compared to its industry or the overall market.

- **guideline company transactions method.** A method within the market approach whereby market multiples are derived from the sales of entire companies engaged in the same or similar lines of business. (Appendix C, "Glossary of Additional Terms," of SSVS No. 1)
- **guideline public company method.** A method within the market approach whereby market multiples are derived from market prices of stocks of companies that are engaged in the same or similar lines of business and that are actively traded on a free and open market. (IGBVT)
- **hurdle rate.** A minimum rate of return which must be achieved before the fund manager can receive any carried interest payments. Also known as preferred return.
- **hybrid method.** The hybrid method is a hybrid between the probability-weighted expected return method and option pricing method (OPM), estimating the probability weighted value across multiple scenarios but using OPM to estimate the allocation of value within one or more of those scenarios.

**IPO.** Initial public offering.

#### illiquidity discount. See marketability discount.

- **income approach.** Valuation approaches that convert future amounts (for example, cash flows or income and expenses) to a single current (that is, discounted) amount. The fair value measurement is determined on the basis of the value indicated by current market expectations about those future amounts. (FASB ASC master glossary) A general way of determining a value indication of a business, business ownership interest, security, or intangible asset using one or more methods that convert anticipated economic benefits into a present single amount (IGBVT). Also known as income-based approach.
- **information rights.** Contractual rights of access to prespecified information, such as monthly or audited financial statements or the annual operating plan, within a specified time period after that information is available to management.
- intrinsic value. The amount by which the fair value of the underlying stock exceeds the exercise price of an option. For example, an option with an exercise price of \$20 on a stock whose current market price is \$25 has an intrinsic value of \$5. (A nonvested share may be described as an option on that share with an exercise price of zero. Thus, the fair value of a share is the same as the intrinsic value of such an option on that share.) (FASB ASC master glossary)
- **internal rate of return (IRR).** A popular measure of return on invested capital which takes into consideration the time over which that return is realized. It is calculated as return on capital (realized and unrealized) divided by invested capital, expressed as an annualized growth rate. If you invest \$1,000,000 and return
\$10,000,000 in 10 years your IRR is 25.9% per year. If you invest \$1,000,000 and return \$10,000,000 in 3 years your IRR is 215.4% per year.

**investment period.** The period during which the fund's sponsor is permitted to make investments on behalf of the fund in newly identified deals.

## junior debt. See subordinated debt.

- **junior equity interest.** An equity interest that ranks lower than other equity interests in regard to the owner's claims on assets and income in the event of the enterprise becoming insolvent. Sometimes, the term is used interchangeably with junior interest, junior instrument or junior class of equity.
- **lead investor.** Usually a private equity or venture capital firm that takes the lead in negotiating the terms of the deal or makes the initial investment in the company.
- **leveraged buyout (LBO).** When a company is purchased with a combination of equity and significant amounts of borrowed money, structured in such a way that the target's cash flows or assets are used as the collateral to secure and repay the money borrowed to purchase the target-company. In most cases the firm structuring the LBO takes full control of the company, often incentivizing the company's management by offering equity ownership in the newly constituted company. Since the debt has a lower cost of capital than the equity, the returns on the equity increase as the amount of borrowed money does until the perfect capital structure is reached. As a result, the debt effectively serves as a lever to increase returns-on-investment. An LBO investment generally requires that the target company be sufficiently mature that its expected cash flows will be sufficient to service the interest and principal amortization on the debt, since many debt investors are generally not comfortable with speculative returns based upon unproven business models or products.
- **liquidation preference.** The right to receive a specific value for shares of stock if an enterprise is liquidated. (In this context, a dissolution, merger, sale, change of control, or sale of substantially all assets of an enterprise are collectively referred to as a liquidation.)
- **liquidity event.** A change or transfer in ownership of an enterprise or a significant portion of the enterprise (for example, an IPO, merger, sale, change of control, sale of substantially all assets, or dissolution). Note that although an IPO can provide liquidity to the company's freely traded shares and also, in most cases, leads to the conversion of the preferred stock and, thus, resolves the optionality of the common stock, it seldom provides liquidity for all shareholders. For purposes of this guide, the term liquidity event presupposes that the event involves a process of price discovery that may be relied on when estimating fair value.

MVIC. Market value of invested capital.

- **management rights.** Contractual rights to perform certain specific activities normally afforded only to management, such as rights to inspect in detail an enterprise's books and accounts as well as rights to visit board meetings.
- **mandatory redemption rights.** Contractual rights to redeem one's investment for a specific amount.
- **market approach.** A valuation approach that uses prices and other relevant information generated by market transactions involving identical or comparable (that is, similar) assets, liabilities, or a group of assets and liabilities, such as a business. (FASB ASC master glossary) A general way of determining a value indication of a business, business ownership interest, security, or intangible asset by using one or more methods that compare the subject to similar businesses, business ownership interests, securities, or intangible assets that have been sold (IGBVT). Also known as market-based approach.
- **market participants.** Buyers and sellers in the principal (or most advantageous) market for the asset or liability that have all of the following characteristics:
  - *a*. They are independent of each other, that is, they are not related parties, although the price in a related-party transaction may be used as an input to a fair value measurement if the reporting entity has evidence that the transaction was entered into at market terms
  - *b.* They are knowledgeable, having a reasonable understanding about the asset or liability and the transaction using all available information, including information that might be obtained through due diligence efforts that are usual and customary
  - c. They are able to enter into a transaction for the asset or liability
  - *d*. They are willing to enter into a transaction for the asset or liability, that is, they are motivated but not forced or otherwise compelled to do so.

(FASB ASC master glossary)

## marketability discount (or illiquidity discount or discount for lack of marketability or discount for illiquidity). An amount or percentage deducted from the value of an ownership interest to reflect the relative absence of marketability. (IGBVT). Note that discounts for lack of marketability are often used not only to capture incremental rate of return that market participants may require for investing in an interest that is not marketable (such as restricted stock), but also to capture the incremental rate of return that market participants may require for investing in illiquid interests (such as private company investments). The task force recommends estimating the total equity value corresponding to the required rate of return for the investors who in aggregate have control of the business via calibration, considering the enterprise value on a marketable basis but capturing the rate of return required given the illiquidity of the investment

within the total equity value. It may then be appropriate to apply a discount for lack of marketability to estimate the value of specific interests that are not part of the controlling group, to the extent that these interests lack information rights or the other rights that investors typically expect. See chapter 9, "Control and Marketability."

- **mezzanine debt.** Debt that is subordinated to senior loans (e.g., first lien and second lien debt) and is generally unsecured
- **mezzanine financing.** A financing round generally associated with venture capitalbacked enterprises occurring after the enterprise has developed its product or service and has commenced operations but before the enterprise is ready for an IPO or to be acquired.
- **minority interest.**<sup>4</sup> An ownership interest with less than 50 percent of the voting interest in a business enterprise. (IGBVT)
- multiple of invested capital (MOIC). A popular measure of return on invested capital which does not take into consideration the time value of money or opportunity cost. It is calculated as return on capital (realized and unrealized) divided by invested capital. If you invest \$1,000,000 and return \$10,000,000 in 10 years your MOIC is 10x. If you invest \$1,000,000 and return \$10,000,000 in 3 years your MOIC is still 10x.
- natural logarithm (ln). A logarithm to the base e where e is a constant with the value 2.718281828 .... The natural logarithm is commonly written as ln x to mean log e x (that is, log x to the base e). It can be thought of as the amount of time needed to reach a certain level of continuous growth where ln x is the time needed to grow to x (with 100% continuous compounding).
- **net debt.** A measure of a company's ability to repay all debt if it were called immediately. It is calculated by adding short-term and long-term debt and subtracting all cash and cash equivalents.
- **option-adjusted spread (OAS).** A yield spread that has to be added to a benchmark yield curve to discount a debt or debt-like preferred instrument's payments to match its market price, using a dynamic model that accounts for embedded options.
- **over-the-counter (OTC) market.** A securities trading market made up of brokerdealers that may or may not be members of a securities exchange. Thousands of companies either have insufficient shares outstanding, stockholders, or earnings to warrant application for or maintaining a listing on a stock exchange, or choose not

<sup>&</sup>lt;sup>4</sup> It should be noted that the minority interest discussed in this guide is considered from the perspective of the holder, with a focus on the degree of influence that a market participant transacting in the interest would have over the portfolio company's strategy and operations. It is not intended to refer to noncontrolling interest addressed in FASB ASC 810. See paragraph 9.01.

to be listed on a stock exchange for other business or economic reasons. Securities of these and other companies are traded in the OTC market between brokerdealers that act as either principals (dealers) or agents (brokers) for customers. The OTC market is the principal market for U.S. government and corporate bonds and municipal securities. In the United States, over-the-counter trading in securities is carried out by market makers using interdealer quotation services such as OTC Pink (operated by OTC Markets Group) and OTC Bulletin Board (operated by FINRA). (AICPA Accounting Guide, *Brokers and Dealers in Securities*)

- **orderly transaction.** A transaction that assumes exposure to the market for a period before the measurement date to allow for marketing activities that are usual and customary for transactions involving such assets or liabilities; it is not a forced transaction (for example, a forced liquidation or distress sale). (FASB ASC master glossary)
- payment-in-kind (PIK) interest (or dividends) interest on a debt (or dividends on a preferred stock) paid either by issuing additional like-kind instruments or by increasing the principal of the existing instrument, rather than by paying in cash. Also commonly referred to as pay-in-kind or paid-in-kind.
- **partial ratchet.** An antidilution provision that uses some type of weighted average sales price of shares of common stock sold by an enterprise after the issuance of an option (or convertible instrument) as the adjusted option price or conversion price for existing shareholders.
- **participation rights.** Rights that relate to situations when after the holders of preferred stock receive their full liquidation preference, they are then entitled to share with the holders of common stock in the remaining amount being paid for the company.
- **portfolio company investments.** Investments of funds in both equity and debt instruments of privately-held enterprises and certain enterprises with traded securities.
- **postmoney value.** An enterprise's value immediately following its most recent round of financing; see also **premoney value**.
- **premise of value.** An assumption regarding the most likely set of transactional circumstances that may be applicable to the subject valuation; for example, going concern, liquidation. (IGBVT)
- **premoney value.** An enterprise's value immediately preceding its most recent round of financing; see also **postmoney value**.
- **private equity fund.** A closed-end investment company which typically seek to generate returns through longer term appreciation from investments in privately held and nonlisted publicly traded companies. Private equity funds often obtain

majority controlling interests or significant minority interests that allow for active involvement in investee operations, restructuring, and merger and acquisition activity, through board oversight positions for the purpose of improving the portfolio company. Such funds are not widely available to the public and have traditionally been limited to accredited investors and large institutions.

- **private investment in public equity (PIPE) transaction.** A transaction where a fund or other private investor purchases an interest in a public company in a private placement or from other investors. These investments may be in the form of a direct investment in the common stock, but often instead take the form of convertible debt or preferred stock or warrants.
- **prospective financial information (PFI).** Any financial information about the future. The information may be presented as complete financial statements or limited to one or more elements, items, or accounts. Prospective financial information can be either a forecast or a projection. (AICPA Guide, *Prospective Financial Information*)
- **registration rights.** Contractual rights of an investor to require an enterprise to register and to sell his or her unregistered stock in the enterprise.

related parties. Related parties include:

- *a.* Affiliates of the entity
- *b.* Entities for which investments in their equity securities would be required, absent the election of the fair value option under the "Fair Value Option" subsection of Section 825-10-15, to be accounted for by the equity method by the investing entity
- *c*. Trusts for the benefit of employees, such as pension and profit-sharing trusts that are managed by or under the trusteeship of management
- d. Principal owners of the entity and members of their immediate families
- e. Management of the entity and members of their immediate families
- *f*. Other parties with which the entity may deal if one party controls or can significantly influence the management or operating policies of the other to an extent that one of the transacting parties might be prevented from fully pursuing its own separate interests
- *g.* Other parties that can significantly influence the management or operating policies of the transacting parties or that have an ownership interest in one of the transacting parties and can significantly influence the other to an extent that one or more of the transacting parties might be prevented from fully pursuing its own separate interests

(FASB ASC master glossary)

- **replacement cost new.** The current cost of a similar new property having the nearest equivalent utility to the property being valued. (IGBVT) Also known as *current replacement cost* or *replacement cost*.
- **required rate of return.** The minimum rate of return acceptable by investors before they will commit money to an investment at a given level of risk. (IGBVT)
- **retrospective valuation.** A valuation that is performed after the as-of date of the valuation and that is not considered to be a contemporaneous valuation; see also **contemporaneous valuation**.
- **right to participate in future rounds.** Contractual right that allows each preferred stockholder to purchase a portion of any offering of new instruments of the enterprise based on the proportion that the number of shares of preferred stock held by such holder (on an as-converted basis) bears to the enterprise's fully diluted capitalization or total preferred equity. The right to participate in future rounds gives the preferred stockholders the ability to maintain their respective ownership percentages and restricts the ability of common stockholders to diversify the shareholdings of the enterprise.
- **risk premium.** Compensation sought by risk-averse market participants for bearing the uncertainty inherent in the cash flows of an asset or a liability. Also referred to as a risk adjustment. (FASB ASC master glossary)
- **roll-up strategy.** An investment strategy where multiple small companies in the same market are acquired and merged. The principal aim of a roll-up is to reduce costs through economies of scale and also benefit from the effect of increasing the valuation multiples the business can command as it acquires greater scale.
- **SSVS.** Statement on Standards for Valuation Services issued by the AICPA and available in VS section 100.
- **second lien debt.** A senior debt instruments that rank ahead of subordinated debt of a given portfolio company, but is junior to First Lien Debt
- **secondary market transaction.** A transaction in which nonpublic debt or equity instruments are traded, either directly on a secondary exchange or by the use of the exchange as an intermediary. A secondary market transaction differs from a public market transaction in that the instruments transacted are not public; therefore, the buyers in these transactions must be qualified investors, and the issuers of the instruments are not subject to public company reporting requirements.

secured debt. Debt that is backed or secured by collateral.

- **seed capital.** The initial equity capital used to start a new enterprise, typically provided in order to develop a business concept before the enterprise is started.
- seed investor. An individual or fund that provides seed capital.
- **senior debt.** A debt instrument that gets priority in repayments in the event of a claim or bankruptcy liquidation.
- **senior equity interest.** An equity interest that has priority over other equity interests in the event of a claim or bankruptcy liquidation. Sometimes, the term is used interchangeably with senior interest, senior instrument or senior class of equity.
- **simple capital structure.** A capital structure that includes only a single primary class of equity (for example, common stock or common units of an LLC), as well as options and warrants or profits interests, plus debt, debt-like preferred instruments, or both.
- **small business investment company (SBIC).** An investment company registered under the Small Business Investment Company Act of 1958 and established to provide capital to small business enterprises.
- **soft costs.** A construction industry term for an expense item that is not considered direct construction cost. Soft costs include architectural, engineering, financing, and legal fees, and other pre- and post-construction expenses.
- **stabilization.** A point in time when a real estate property reaches a normal occupancy rate and operating expenses.
- **standard of value.** The identification of the type of value being utilized in a specific engagement; for example, fair market value, fair value, investment value. (IGBVT)
- **subordinated debt.** A debt instrument whose holders have a claim on the company's assets only after the senior debtholders' claims have been satisfied. Sometimes, the term is used interchangeably with **junior debt** or subordinated loan.
- **subsequent events.** Events or transactions that occur after the balance sheet date but before financial statements are issued or are available to be issued. There are two types of subsequent events:
  - a. The first type consists of events or transactions that provide additional evidence about conditions that existed at the date of the balance sheet, including the estimates inherent in the process of preparing financial statements (that is, recognized subsequent events).
  - b. The second type consists of events that provide evidence about conditions that did not exist at the date of the balance sheet but arose subsequent to that date (that is, nonrecognized subsequent events).

(FASB ASC master glossary)

- **sunk costs.** Costs already incurred that cannot be recovered, regardless of future events.
- **swap rate.** The rate of the fixed leg of a swap as determined by its particular market. In an interest rate swap, it is the fixed interest rate exchanged for a benchmark rate such as LIBOR plus or minus a spread.
- **synergy.** Used mostly in the context of mergers and acquisitions, the concept that the value and performance of two enterprises combined will be greater than the sum of the separate individual parts. In the context of developing prospective financial information, synergies refer to the difference between the assumptions used to estimate cash flows that are unique to an enterprise and the assumptions that would be used by synergistic buyers.
- **synthetic rating.** A method whereby unrated debt is synthetically rated based on the credit ratings of similar debt issued by other companies whose financial metrics are comparable. Once a synthetic rating is assessed, it can be used to estimate a credit spread that may be added to the selected benchmark curve to estimate the market yield for a specific debt instrument. The market yield and corresponding credit spread at inception should typically be estimated via calibration.
- **tag-along investors.** Investors who typically purchase an interest in a deal negotiated by another party (the lead or other follow-on investor).
- **tag-along rights.** Contractual rights typically granted by founders and key management shareholders in connection with a venture capital investment. Founders and key management shareholders typically agree that they will not sell any of their common shares in the enterprise without giving the investors the right to participate in the sale with the founder and management sellers pro rata to the investors' holdings; also referred to as co-sale rights.
- **terminal value.** The value as of the end of the discrete projection period in a discounted future earnings model. (IGBVT) In the context of this guide, this represents enterprise value as of the end of the discrete cash flow period in a discounted cash flow model when earnings are expected to stabilize. Also known as residual value.
- **top-down method.** Valuation method that involves first valuing an enterprise and then using that enterprise valuation as a basis for allocating the enterprise value among the enterprise's debt and equity instruments.
- **trailing EBITDA.** The EBITDA of a company in an immediately previous period, usually the past twelve months (e.g., last twelve month (LTM) EBITDA).
- **trailing revenue.** The revenue a company earned in an immediately previous period, usually the past twelve months (e.g., last twelve month (LTM) revenue).

- **USPAP.** Uniform Standards of Professional Appraisal Practice published by the Appraisal Foundation.
- **underwriter lockup.** An agreement that prohibits the investors from selling or hedging their investment for a period of time, typically 180 days, following the IPO.
- **unitranche debt.** Debt that combine both senior and mezzanine debt, generally in a first lien position.
- **unobservable inputs.** Inputs for which market data are not available and that are developed using the best information available about the assumptions that market participants would use when pricing the asset or liability. (FASB ASC master glossary)
- **unrelated party.** Other than a *related party*, as defined in the FASB ASC master glossary.<sup>5</sup>
- unsecured debt. Debt that is not backed or secured by collateral.
- **up round.** A round of financing in which investors purchase stock from an enterprise at a higher price than the previous round.
- valuation specialist. An individual recognized as possessing the abilities, skills, and experience to perform valuations. A valuation specialist may be external or internal. Many private equity and venture capital funds employ professionals to perform valuations for the fund's investments and, thus, the fund may produce valuations internally rather than engaging an external party. Other funds may engage an external third party to perform valuations or to corroborate the fund's valuations. When referring to the valuation specialist within this guide, it is generally presumed that the valuation specialist may be either an external party or the individual(s) within the entity who possess the abilities, skills, and experience to perform valuations.
- **venture capital fund.** A closed-end investment company which typically seeks to generate returns through longer term appreciation from investments in privately held early stage and start-up companies. Such portfolio companies may be pre-revenue or pre-earnings and the ultimate goal is to grow the company to a point where it can go public or be acquired by a larger corporation at a price that exceeds the amount of capital invested. Such funds are not widely available to the

<sup>&</sup>lt;sup>5</sup> The task force recommends that consideration also be given to the requirements of item II.C., "Disclosures about Effects of Transactions with Related and Certain Other Parties," of Securities and Exchange Commission Release No. FR-61, *Commission Statement about Management's Discussion and Analysis of Financial Condition and Results of Operations*. Under that release, consideration should be given to relationships that might cause dealings between parties to be at other than arm's length despite the parties not being considered *related parties* under the FASB ASC definition. For example, an enterprise may be established and operated by individuals who were former senior management of, or have some other current or former relationship with, the other entity. Please see www.sec.gov/rules/other/33-8056.htm for more information.

public and have traditionally been limited to accredited investors and large institutions.

- **voting rights.** Contractual rights to vote as a shareholder for members of the board of directors and other matters of corporate policy on the basis of the number and class of shares held.
- **waterfall.** The contractual allocations of cash flows returned to the various instruments in an enterprise or to the limited and general partners in a fund, reflecting the seniority of each claim. The waterfall is a hierarchy delineating the order in which funds are distributed and may ensure certain claims have priority of payment over others. For example, upon the sale of an enterprise, the proceeds might first be used to repay senior debt, then junior debt, then senior preferred, then junior preferred, then common. Similarly, upon the sale of the underlying investments in a fund, the proceeds might first be distributed to the limited partners until they have received a specified return on their investment, then the general partner might begin sharing in any further profits.
- weighted average cost of capital (WACC). The cost of capital (discount rate) determined by the weighted average, at market value, of the cost of all financing sources in the business enterprise's capital structure. (IGBVT)
- **yield method.** The yield method is a type of discounted cash flow analysis that estimates the fair value of a debt or debt-like preferred instrument based on the expected cash flows (given the contractual interest or dividend rate, any scheduled principal repayments, and the expected maturity), discounted at the market yield for the instrument given its risk. The expected maturity considers both the contractual maturity, as well as market participant assumptions regarding the expected timing of a liquidity event, and any principal repayments expected in connection with the liquidity event.
- **zero coupon bond equivalent.** A zero coupon bond is a bond that has a face value that is payable at maturity, with no interim interest or principal payments. The fair value of a zero coupon bond is the face value discounted at the market yield from maturity back to the valuation date. The zero coupon bond equivalent for a debt instrument is the future payoff amount (face amount) for a zero coupon bond that has the same fair value as the debt instrument, considering the interest payment and principal amortization schedule for the debt instrument.