LITIGATION SERVICES HANDBOOK

The Role of the Financial Expert

Third Edition

CHAPTER 10: BUSINESS VALUATIONS

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10.1 Business Valuations in Litigation. Valuing a business or its securities for litigation purposes resembles valuing such interests under other circumstances. The appraiser must consider the relevant facts, subject them to analysis judgment, weigh them according to their importance, and develop a reasonable and supportable conclusion of value. An appraiser's skill in analyzing and communicating clearly and convincingly will establish the appraiser's value as an expert witness for business valuations.

In litigation, companies and their components frequently require valuation because no clearly established, independent value for the assets exists to which all parties agree. This frequently occurs for a closely held business, regardless of its size, because typically no established market or arm's-length negotiated transactions in the company's shares exist. Transactions that may have occurred for gifts and other purposes may not have been conducted at *fair market value* (as defined in Section 10.3). Furthermore, these types of transactions occur sporadically and may have occurred at a time distant from the relevant valuation date, when the value of the business may have differed.

Even if a company's shares are widely held and traded publicly, some question may exist as to whether their traded price is indicative of the company's true, or intrinsic, value. When public shares trade thinly and infrequently, the traded price may not reflect intrinsic value. Such thinly traded shares may incorporate discounts from intrinsic value because of insufficient information available to shareholders or because their limited marketability could materially affect subsequent liquidity.

Furthermore, even securities that are publicly traded in sufficient volume and that carry no restrictions on sale may require discounts or premiums because of the size of the block of shares in question. The holder of a large, noncontrolling block of shares cannot necessarily market that block and convert it to cash as readily as it could a few shares (the blockage theory). In other words, the offering of a large percentage of a company's shares in the market within a short time could depress the price of these securities. A block of shares constituting a controlling interest in the company can merit a premium for control above the market price of its freely traded securities.

10.2 Reasons for Valuation. Many litigation contexts demand a business valuation. Some examples of situations requiring a valuation include marital dissolutions, dissident shareholder suits, and taxable transactions.

Marital dissolutions frequently require a business valuation. A business or professional practice may be the prime asset of a husband and wife, worth more than the house and other assets combined. Rules on the division of property in a divorce vary from state to state and sometimes complicate the appraiser's task. For instance, in California—a community property state—valuation of the underlying asset is only part of the assignment. The court may ask the appraiser, for example, to calculate a reasonable return on assets one party held prior to marriage, with any appreciation exceeding that return deemed as community property.

Dissident shareholders may dispute the proposed price to be paid for their shares. With regard to past transactions, this often may involve preparing a retrospective fairness opinion to ascertain whether the structure and terms of the transaction, in addition to value received, provided adequate consideration.

A corporation or partnership dissolution may require a valuation to ascertain an equitable allocation of value among the involved parties. Often, when a major shareholder leaves the business, the terms of a buy-sell agreement require a share price.

Taxable transactions often require business valuations. A business owner who gifts shares in a closely held company to a family member wishes to minimize its value for gift tax purposes. An owner making a charitable contribution wishes to maximize the shares' value for income tax purposes. Estate tax implementation requires valuations of closely held shares. The Internal Revenue Service (IRS) or other tax-receiving authorities may challenge the value of any of these transactions. Hence, both the IRS and the taxpayer may require the services of a business valuation expert for analysis and, ultimately, testimony.

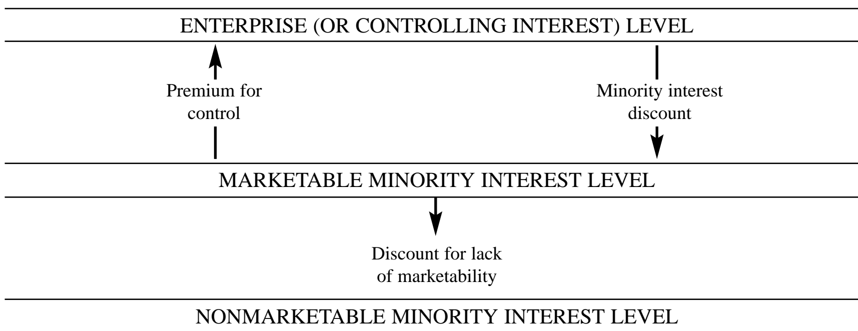
Regardless of the valuation question, the appraiser must remain independent and objective to avoid the appearance of advocacy. The appraiser does not attempt to minimize (or maximize) the client's economic damages in litigation but provides an objective appraisal that expert testimony can support.

10.3 Business Valuation Terminology. One of the most widely recognized and accepted standards of value is fair market value. *Fair market value* is the price at which an asset would change hands between a willing buyer and a willing seller, each having reasonable knowledge of the relevant facts, and neither under any compulsion to act (IRS Revenue Ruling 59-60 detailed in Section 10.16(b)). This value results when a buyer and seller negotiate at arm's length from a position of relatively equal strength. Three

levels of fair market value exist: the value of the enterprise or of a controlling interest, the value of marketable minority interests, and the value of nonmarketable minority interests (see Exhibit 10-1).

The fair market value of publicly traded securities is represented by the value of the shares as *marketable minority interests*, because the shares are liquid and their owners can easily convert them to cash. Such ownership typically represents small blocks of the subject company's shares and generally cannot affect control of the company. Transactions that do affect control (acquisitions or leveraged buyouts) often occur at a price that results in a premium above the value of marketable minority interests. One can quantify this premium paid for control. Conversely, securities without an active marketplace or with restrictions on their resale often transact at a discount reflecting the illiquidity of or lack of a ready market for the securities.

Thus, the measurement of *fair market value* of an ownership interest yields different results depending on the subject interest's liquidity and the percentage of ownership it represents. *Investment value* considers an asset's value to a particular buyer who may be willing to pay a premium over fair market value in exchange for a unique economic benefit or some special non-economic attraction. Examples of economic benefits include alleged synergies[1] and economies of scale that may benefit the special-purpose buyer but that most other purchasers would not realize or be able to exploit. The person or entity acquiring the shares may enjoy non-economic benefits such as a sports franchise, a newspaper, or a hotel.



In valuing a business, one must distinguish *going concern* value from *liquidation value*. Going concern value assumes that the business is a viable economic entity and will remain so. This valuation basis acknowledges that an established business may be worth more than the value of its underlying net assets because of economic goodwill resulting, perhaps, from customers who return even though not compelled to or from employees with human capital specific to the firm who return to work each day even though not compelled to. In addition to assets that a company may list on its balance sheet such as machinery, inventory, and real estate, a going concern may have valuable off-balance-sheet assets such as reputation, trained workforce, and unique, internally developed products or services that would command a premium from the marketplace. Although one could value these assets individually, they are frequently included as a part of economic goodwill, which makes the value of the business as an ongoing enterprise more than the value of its tangible assets in liquidation.

Liquidation value, on the other hand, assumes that the company will not remain a going concern and the owner will sell its assets piecemeal. Usually, a liquidation sale will lose some or all of the value reflected by economic goodwill. The assessment of liquidation value must consider the time needed to sell assets in an orderly fashion or the discounts associated with a fire sale. The valuation should consider costs of liquidating assets, such as commissions, shrinkage of inventory and receivables, and ongoing operating expenses.

Fair value is the standard of value associated with dissenters' rights cases in the state of Delaware and in most other states. As distinguished from fair market value, one generally measures fair value exclusive of any element of value arising from the expectation or accomplishment of any pending merger, and often without discounts commonly associated with minority interests.

10.4 VALUATION DATES AND INDEPENDENCE. The effective valuation date can significantly affect value. As the stock market fluctuates, so does the value of most securities. Similarly, the value of a business does not remain static over time but changes in response to both internal and external conditions.

One should ignore events that occur subsequent to the valuation date. Only to the extent that a knowledgeable investor could reasonably anticipate (as of the valuation date) that a subsequent event would occur should the valuation reflect such an event. Conversely, an appraiser cannot ignore contingent assets or

liabilities that exist as of the valuation date even though they may be difficult to quantify because of uncertainty about the magnitude and likelihood of impact.

Finally, the appraiser should provide an unbiased—and therefore objective—opinion. Such independence and objectivity will enhance the appraiser's credibility as an expert witness in litigation. To establish independence, the appraisal fee should be fixed and not contingent on the appraiser's conclusions or the litigation's outcome. Further, the appraiser should have no past or prospective material relationships with the client.

10.5 DISCOUNTS AND PREMIUMS. Valuation experts usually express discounts and premiums on valuation relative to the value of a marketable minority interest. A particular security may sell at a discount from this level of value primarily because the shares have no ready market or the security has restricted marketability. For example, one may have difficulty selling a small minority interest in a closely held business to an unaffiliated third party, and selling the shares would probably require a discount. In demanding a discount, purchasers acknowledge the difficulty they may have in finding a buyer when they want to sell. The appraiser can measure the appropriate level of discount for restricted shares by comparing the price paid for a private placement of restricted stock to the price paid for unrestricted shares of the same company trading on a public exchange. When selecting a discount rate, the appraiser should also consider restrictions on the ability to vote, restrictions on buy/sell agreements, and blockage that may affect the ability of a large shareholder to sell all of a large block in a reasonably timely fashion without depressing the share price.

A premium over the value of a marketable minority interest may also be appropriate. For instance, the ability to control a company and affect its decision making, rights not available to minority shareholders, has value. Therefore, one must usually pay a premium to minority shareholders to acquire a controlling interest in a company unless several such shareholders exist from whom one can buy enough shares to establish control. Furthermore, sellers will often extract from strategic buyers a portion of the present value of the expected synergies over and above the premium associated with control. The public marketplace provides a good measure of the combined control premiums and synergistic premiums that buyers will pay. By comparing the pre-announcement value of publicly traded securities to the price ultimately paid in acquisitions, leveraged buyouts, and similar transactions, one can quantify the types of premiums typically required to transfer control. A good source of such data is the *Control Premium Study* by Mergerstat, which publishes premiums paid in transactions on a quarterly basis, by industry.

The appraiser should also consider additional factors in the valuation analysis, such as key employee risk, key customer or supplier risk, reputation, market share, and future growth opportunities. While some experts quantify these factors and reflect them as a discount or premium to value, most incorporate them into the market multiples selected in the market comparison approaches, as described in Section 10.9(a).

10.6 APPRAISER QUALIFICATIONS. Currently no formal licensing procedures or other legal requirements exist for designation as a business appraiser or valuation consultant and expert. As a practical matter, however, certain educational experience and professional criteria bear on the ability of a potential expert witness to provide valuation services.

A broad range of prior appraisal assignments in sufficient number and with reasonable frequency helps. One does not have to perform business valuations as a sole occupation, but no substitute exists for frequent experience to sharpen skills and provide a base of experience.

Membership in professional organizations may act as a screening mechanism to ensure a minimal level of competency and exposure to sound business valuation principles. The American Society of Appraisers, for example, requires years of relevant experience, interviews, and written examinations before an appraiser can use its senior designation. In addition, it requires continuing education, provides a code of ethics, and reviews complaints regarding competency as further checks on members. Although not a guarantee of competency, membership in such an organization may help identify experts in business valuation services for litigation or other purposes.

10.7 SCOPE AND RETENTION. Once the client decides to hire an appraiser as an expert witness, both the appraiser and client must agree on the scope of the assignment. Key issues that require agreement include the following:

1. The business entity or securities to be valued
2. The valuation date or dates

3. Other analyses, outside of the appraisal, that may be required
4. The individual or team of individuals who will work on the valuation engagement
5. Any assistance the company or other professionals may provide that the appraiser may require

The engagement letter that formalizes the agreement spells out the scope of the assignment. In addition, the engagement letter should discuss fees, limitations or restrictions of scope being placed on the appraiser, if any, and similar matters. This document can help if a future misunderstanding arises regarding services to be rendered and affiliated payment. Chapter 1's Appendix has a sample letter for litigation engagements.

The engagement letter should specify the client and the responsibility for payment of fees. Frequently the client of record is the attorney who may protect the appraiser's work product under various legal theories. Alternatively, the client may be an individual shareholder, the company, or any party to the litigation. In any case, the client should sign the engagement letter acknowledging the agreement.

The engagement letter should specify fee arrangements. One usually can divide the engagement into an analytical stage and a testimony stage. Often, one can quote a fixed fee for the analytical portion of the assignment including conclusions and the preparation of a report. The appraiser cannot control the time required for preparation and testimony in deposition and trial. Therefore, the expert usually charges an hourly (or daily) rate for these items. The letter can specify reimbursement for out-of-pocket costs. Never let fees be contingent on conclusions or results; to do so raises issues of appraiser independence, and most professional appraisal societies deem it unethical. Good management practice suggests collecting all outstanding fees for the analytical work before testifying.

10.8 Data Gathering. Because the proper analysis of an asset's value depends on reasonable knowledge of the relevant facts, the appraiser should pursue the collection of data and information sufficient to form a sound opinion. Appraisers should be allowed to rely on information received from informed sources that they believe are reliable. Appraisers should list their assumptions and limitations.

The amount and type of data will vary depending on the nature of the assignment and the type of business being valued. Typical documents sought include the following:

1. *Financial Statements:* An appraiser cannot analyze an established business without financial statements. If possible, one should obtain at least five years of annual data to track growth and other trends. The appraiser should have interim financial statements when seasonality is an issue or when changes of a material nature have occurred since the last annual financial statement. A financial statement as of the valuation date is also desirable, but if one is not available, the appraiser should at least be aware of any material changes in the company's financial condition since the date of the last available financial statement. Although audited statements are preferred, the appraiser can work with reviewed, compiled, or internally prepared statements by noting and considering significant deviations from generally accepted accounting principles. An appraiser should question management regarding the content of the financial statements, how management prepared them, and any atypical or unusual items.
2. *Tax Returns:* These provide a good verification of the financial statements, especially unaudited statements. Different accounting treatments for tax and financial statement reporting purposes may raise issues.
3. *Resumes of Key Personnel:* A company's prospects often depend on the quality of its management. Resumes will outline management's qualifications and credentials, including the length of time they have held their current positions.
4. *Share Agreements:* The valuation expert must know the rights, privileges, and restrictions of the particular class of shares to be valued as well as those of all other classes of equity.
5. *List of Shareholders:* When valuing the shares of a closely held business, one often needs to know who owns the shares. This relates to the issue of actual or effective control and the premiums associated with control.
6. *Transactions in the Company's Shares:* Some of the best indicators of value for a closely held business are actual transactions in the company's shares. Actual transactions that were conducted on an arm's-length basis at a time reasonably close to the valuation date merit consideration during valuation.
7. *Projections:* Buyers acquire companies based on expectations for the future, not past performance.

Supportable and reasonable projections provide an important source of information in a business valuation. Small companies without a formal planning process are unlikely to have long-term projections, but even a one-year projection may help the appraiser ascertain a company's direction.

8. *Other Appraisals:* Prior appraisals of the company may help. Real estate appraisals, for example, may indicate substantial value that does not appear in the financial statements. Depending on their prior use, the old appraisals may establish precedent for treatment of disputed items. For example, if the current owner acquired the business at a price excluding economic goodwill, the current prospective buyer may have a stronger case than otherwise for excluding it in the current valuation.
9. *History and Nature of the Company:* The appraiser must have a historical perspective on the company that provides a reasonableness check on the company's plans and projections. In addition, it is important to analyze the company within the context of its industry and the current and expected condition of the economy.
10. *Significant Contractual Agreements:* The appraiser should review significant contractual agreements. Examples of such agreements include customer and supplier contracts with fixed prices, employment agreements between the company and officers or shareholders, and leasing agreements.
11. *Product or Service Brochures*: These can often help the appraiser better understand the company's products or services, especially complex or technical ones.
12. *Offers for the Company:* An arm's-length offer for the company, made within a reasonable time period of the valuation date, can indicate the company's value, and the appraiser should consider it in the valuation process.
13. *Patents and Other Intellectual Property:* The appraiser should consider legal monopolies as well as unpatented proprietary technologies that give a company an advantage over its competitors.

When possible, the appraiser should meet with company management and tour the company's facilities. A field visit allows the appraiser to interview management. A tour of company facilities can aid in understanding the company's efficiency and organization and can help the appraiser better understand how the business operates. In a litigation setting, the appraiser is sometimes precluded from access to management and the company's facilities. The appraiser may need to collect data from management through formal procedures such as prior testimony, interrogatories, and depositions. Discussions with unrelated third parties familiar with the company and its operation, the industry, or other areas may be possible.

The nature of the appraiser's field visit questions will vary, depending on the specifics of the case. Whether by field visit or by less direct means, the appraiser could discuss the following areas and issues in almost any assignment:

1. *Management:* Who are the company's key decision makers? What are their qualifications and experience? What is the nature and amount of their compensation? Is there any key employee risk? What is the breadth and depth of management in key areas? Has management done any succession planning?
2. *Customers and Suppliers:* Do any customers or suppliers account for a large part of the company's business? Does the company have alternative sources of supply? Does it have unusual purchase or sales terms or other arrangements? What is the financial health of these customers or suppliers? Are the relations long-term or transient?
3. *Competition:* Who are the primary competitors—their strengths and weaknesses; their market shares? How do their products and services compare to that of the subject company? If publicly traded, would they make good comparables? What threats does technological change pose?
4. *Non-Recurring Gains or Losses:* What is their magnitude and timing? How, if at all, do they affect value? Do they suggest adjustments to reported earnings and cash flow?
5. *Intracompany and Related-Party Transactions:* Are they conducted at arm's length and at market value? Should adjustments be made for non-arm's length transactions?
6. *Contingent Assets and Liabilities:* What are the estimated size and timing? What is the probability of gain or loss? Management should identify these contingencies to the appraiser.
7. *Non-Operating Assets:* Does the balance sheet capture their value? What are management's plans for their use in the future? Should they be valued separately from the company's operations?

8. *Patents and Copyrights:* What is their remaining legal life? Economic life? Does the company vigorously enforce its legal rights?
9. *Anticipated Operating Changes:* Does the company plan to purchase or sell assets? Does it plan changes in services, products, or facilities?
10. *Operations:* What is the status of labor relations? What is the current or potential effect of regulatory changes? Does the company face, now or potentially, product liability issues?
11. *Adjustments:* What non-recurring elements of revenues and expenses should the appraiser remove from historical statements of operations? What expenses attributable to above-market owners' compensation should the appraiser add back to income?

As the data collection and interview processes continue, new issues will arise. The appraiser must be flexible and capable of moving from a fixed line of questioning to respond to issues raised during the interview process.

In addition to learning company specifics, the appraiser must understand the company's economic environment. First, understand the outlook for the economy as a whole and for the particular industry in which the company operates. Economy-wide business cycles affect many, but not all, companies. The appraiser should consider the effects of inflation, recession, interest rate changes, energy price changes, and other macroeconomic issues. Sources of such macroeconomic information include the *U.S. Industrial Outlook* and *Standard & Poor's Industry Surveys*, brokerage firm reports, economic reports from banks and other institutions, trade publications, and various newspapers and periodicals.

10.9 VALUATION APPROACHES. Business appraisers use a number of generally accepted valuation approaches. They include the following:

- Market comparison approach
- Discounted cash flow approach
- Net asset approach
- Prior transactions
- Comparable sales approach

(a) Market Comparison Approach. The market comparison, or guideline company, approach assumes that a company's value results from investors' perceptions of the risks and rewards from an investment in the subject company relative to other investments. One can reasonably assume that companies in the same industry have risks and rewards more comparable than those of companies in different industries. Therefore, the market would generally perceive the risks and rewards of Ford and General Motors as more similar and, therefore, more comparable than those of Ford and IBM. An investor will not, for example, pay ten times earnings for Ford but only five times earnings for General Motors unless it views Ford as less risky or potentially more rewarding in terms of profitability and growth.

The appraiser cannot directly observe how investors value a business which has no active trading of its shares. The appraiser often can identify publicly traded companies that resemble the subject company from an investor's standpoint. By comparing the company being valued to comparable public companies on the basis of accepted risk and reward measures such as size, liquidity, leverage, profitability, and growth statistics, the appraiser can judge its relative financial and operating risk profile.

The appraiser should consider other qualitative risk factors. These qualitative factors include key customer or key supplier risk, key employee risk, diversity of operations, reputation, market share, and future growth opportunities. For example, both key customer and key employee risk exist if an owner of a single-product company has a strong relationship with a customer that accounted for a significant portion of the company's revenues. If something happened to the owner or if the individual's relationship with the company ended, the company could suffer.

After analyzing the company's financial, operating, and qualitative risk profiles, the appraiser will ascertain the subject company's risk profile relative to the selected comparable public companies. If the subject company has greater risk and less potential reward than that of the comparable public companies, one could reasonably expect that it has relatively lower value (all other things being equal). Therefore, the appraiser would select a lower multiple (such as a price/earnings or price/cash flow ratio) than the comparative public companies' multiples, to reflect the subject company's relatively greater risk or smaller potential reward.

Market multiples, such as price/earnings and price/cash flow ratios, result from dividing the mean share price for the period on or immediately preceding the valuation date by earnings or cash flow (net income plus depreciation and amortization) per common share. The value derived from multiplying the subject company's earnings or cash flow by a price/earnings or price/cash flow ratio indicates the company's aggregate market value of common equity on a marketable, minority interest basis.

When the company being valued has a capital structure significantly different from that of the comparative public companies used to generate market multiples, one should apply debt-free approaches to valuation. Debt-free approaches measure the value that debt and equity holders together ascribe to the respective income and cash flow streams of a company. To calculate debt-free multiples for comparable companies, add the aggregate market value of debt to the aggregate market value of equity to compute the value of the total invested capital. Appraisers sometimes use the term *enterprise value* (EV) of the public company. Divide the enterprise value by debt-free earnings (or debt-free cash flow levels), such as earnings before interest and taxes, called *EBIT* (or earnings before interest, taxes, depreciation, and amortization, called *EBITDA*), to arrive at the EV/EBIT (or EV/EBITDA) ratio.

Other accepted market comparison approaches include multiples of enterprise value to debt-free earnings (net income plus interest expense net of tax effects), enterprise value to debt-free cash flow (debt-free earnings plus depreciation and amortization), and enterprise value to revenue.

An appraiser often calculates more than one comparative multiple. For instance, consider two companies with the same earnings potential: one with new equipment and one with old, but serviceable, equipment. The company with the newer equipment will have greater depreciation and consequently lower earnings. The company with older equipment and smaller depreciation will pay higher taxes and therefore generate less operating cash flow. An appraiser using only a multiple of earnings approach might conclude that the company with older equipment has higher value than the company with newer equipment, whereas relying only on a multiple of operating cash flow approach could lead to the opposite conclusion. Using both the multiple of earnings and multiple of cash flow approaches helps to identify factors requiring judgment.

One need not use every valuation approach in each situation nor, if used, give all approaches equal weight. The approaches and weight given to each in arriving at a conclusion will depend on the facts and circumstances surrounding each engagement. A multiple of book value, for instance, generally has little significance when valuing a service business with few fixed assets. Although the selection and weighting of approaches is subjective, it is not arbitrary. Base your decisions on facts and reasonable interpretations.

After completing the risk assessment and selecting the appropriate multiples, the appraiser must select for the subject company the relevant earnings, cash flow, and other measures to be multiplied by the market multiples. Using earnings as an example, the appraiser must decide whether to use more recent earnings or consider earnings over a period of time. For instance, the earnings of a cyclical company can fluctuate greatly from year to year, sometimes even producing a loss. Simply selecting the most recent earnings will give a misleading picture of the company's true earnings potential if the company has not operated normally. On the other hand, we use the most recent earnings for a non-cyclical growth company because the current nature of the company's operations most accurately reflects the company's earnings potential. The choice of time period selected for the subject company should be consistent with the derivation of multiples for the comparable public companies. In other words, the appraiser should not multiply three-year average EBITDA for the subject company by an EV/EBITDA multiple derived from the comparable companies calculated by dividing current EVs by current EBITDAs.

Non-recurring gains or losses and extraordinary items affect the selection of the base levels of earnings and cash flows both for the subject company and for the comparable companies used for establishing the multiple. One should not construct benchmark multiples from earnings data including any of the following: non-recurring items, extraordinary items, discontinued operations, or the effects of accounting changes. Neither should one mechanically apply the multiple, once computed, to the subject company's earnings if they include such items. Other items that might require an adjustment include significant changes in compensation levels, loss or gain of product lines, loss of a key customer, and anticipated changes in operating costs. Some financial economists and appraisers use the term *normalizing earnings* to refer to the process of removing non-recurring items, extraordinary items, discontinued operations, and the effects of accounting changes. The resulting income number is *normalized earnings*.

The appraiser who has selected the proper earnings level and an appropriate risk-adjusted multiple can derive an indication of value. As a simplistic example, an earnings level of $1 million multiplied by a factor of 10 would result in a value indication of $10 million. The appraiser then adjusts for a control premium or non-marketability discount from the marketable minority interest level of value, if appropriate. The appraiser

should similarly handle other equity market comparison approaches, such as a multiple of cash flow or book value.

Because debt-free methods arrive at a value indication for the total value of the company on an enterprise basis (debt plus equity), the analyst must subtract the value of interest-bearing debt from the product to arrive at the value of equity.

(b) Discounted Cash Flow Approach. Discounting a company's projected cash flows to their present value provides another approach to valuation. Investors will pay only for anticipated future—not historical—cash flows. Historical results often form the foundation for future expectations. This approach suffers from the uncertainty of those expectations. Forecasts or projections, when available, usually come from company management and should represent their best estimates regarding the future. Typically, projections cover a five-year period. The appraiser usually has to ascertain what will happen after the projection period and then estimate an appropriate residual or terminal value that adequately captures those expectations. Computing a value five or more years in the future presents more difficulty than computing a value for the company today. The terminal value estimate usually represents a significant component of the value computed by this method. The appraiser may calculate a residual or terminal value using multiples derived from the market comparison methodology discussed earlier, a perpetuity approach known as the Gordon Growth Mode[2] (which assumes a constant growth in cash flow beyond the projection period or, in some instances, a series of discrete annual growth rates), or possibly a liquidation approach.

The selection of the appropriate stream to discount will also affect the valuation. Although one can discount operating cash flow, free cash flow is more appropriate. *Free cash flow* is operating cash flow adjusted for required changes in working capital and net capital expenditures and taxes. Because free cash flow results from a measure that removes the amount of cash needed by the business to meet its projection, it represents the amounts theoretically available to shareholders as dividends and is therefore sometimes referred to as *dividend capacity*. Investors will pay only for the present value of future cash flows available to them for distribution, taking into consideration the timing of the flows and the perceived risk of achieving the flows. Discounting interim free cash flows plus the company's terminal value provides a useful estimate of value.

Selecting an appropriate discount rate is also an important aspect of the discounted future cash flow approach. No simple formula exists for selecting an appropriate discount rate. If the company has debt outstanding, the interest rate on the debt provides one indication of investor risk. Because equity is riskier than debt, it commands a rate of return higher than that on debt. Analytical techniques such as the Capital Asset Pricing Model (CAPM),[3] help the appraiser select a reasonable cost of equity and, where required, a blended or weighted average cost of capital (WACC).[4] A blended or weighted average cost of capital considers the cost of debt, the cost of equity, and the proportionate amount of each in the company's capital structure.

No model, no matter how accurate, tells the entire story. If the company's projections are optimistic and overstate probable future results, CAPM and other models will not capture the additional risk that the company will not achieve its forecasts. The CAPM may understate the appropriate discount rate and therefore overstate value. Some appraisers add a premium to the discount rate to reflect those company-specific risks that CAPM, in its purest form, does not consider. To ascertain the appropriate premium, review historical results as a reality check on the projections, and question management regarding assumptions underlying the projections. If the company's revenues have been growing at 5 percent per year and the projections anticipate growth at 20 percent per year, the appraiser must understand why the company anticipates faster growth and feel comfortable with this assumption. If the assumption seems aggressive, apply a higher discount rate in the analysis or have management re-address the projections.

To check on the reasonableness of company projections, use a sensitivity analysis. By varying the key assumptions in the projections, such as growth in revenues or profit margins, the appraiser can ascertain just how sensitive the projections are. The appraiser should identify key assumptions and discuss them with management. Although, in principle, one can compensate for aggressive assumptions with a higher discount rate (or for conservative ones with a lower rate), the offsetting can never be exact. The analyst should instead work with management to correct the assumptions themselves.

(c) Net Asset Approach. A third valuation approach, the *net asset approach*, looks at the underlying value of a company's assets, net of liabilities, to indicate value. Book value, based on historical costs rather than economic value, usually does not accurately indicate value.

An adjusted book value approach considers the economic value of assets and liabilities rather than their book values. This approach is most useful for companies with large investments in real estate and natural

resources, where the income statements do not capture the economic value of such assets. The adjusted book value approach requires appraisals for assets whose value may differ from book value, such as real estate that has appreciated since purchase. Then the analysis substitutes economic value for book value on the balance sheet, typically increasing owners' equity. Additionally, this approach calls for appraisals of the market value of the intangible assets and the use of those values, not book values, on the balance sheet. The following examples of intangible assets may need appraising: patents and copyrights, trademarks, special licensing agreements, favorable raw material purchasing agreements, and special or unique computer software.

One specialized version of the adjusted book value approach is the *liquidation value approach*. Liquidation value assumes that the company will not remain a going concern but will sell its assets for their individual values. An orderly liquidation assumes that the company will sell assets over a reasonable time period to realize their full economic value. A forced liquidation assumes a quick sale of assets with appropriate discounts taken to reflect the transaction's urgency. In either case, the analysis must include the costs associated with the sale of assets and discounts appropriate for the passage of time between the appraisal dates and the later cash collection dates.

(d) Prior Transactions. Prior transactions in the subject company's shares can help in estimating current fair market value. In considering the relevancy of prior transactions, the appraiser must ascertain whether the sale was between unrelated parties, whether it was negotiated in good faith, whether both the buyer and seller were reasonably informed as to matters relating to the company's investment merits, and whether the buyer or the seller faced duress or compulsion. The appraiser must also consider the size of the block of shares previously sold and the proximity of the prior sale to the valuation date.

An arm's-length transaction of approximately the same size that was reasonably close to the valuation date might indicate value appropriately. The appraiser should consider any differences in the circumstances of the prior sale and the contemplated transaction.

(e) Comparable Sales Approach. Comparable sales transactions provide another source of pertinent information useful in a business valuation. Appraisers rarely have information on transactions that involve closely held businesses and interests in such businesses. Moreover, the appraiser may be unable to obtain enough financial, operational, and other information about the comparable company to evaluate the relative risk between it and the subject company. Additionally, some transactions include shares, notes, other forms of consideration, or unusual payment terms, which affect the transaction's cash value.

Nonetheless, with sufficient information, this approach may yield highly relevant indications of the subject company's value. The calculation and selection of multiples generally follows the procedures discussed in prior sections (i.e., Sections 10.9(a) and 10.9(b)). The appraiser will need to consider adjusting the resultant multiples for the effects of intervening company-specific events and differences in general economic and market conditions between the dates of the transactions and the date of valuation.

(f) Conclusion of Value. The appraiser who has applied the valuation methods described and has arrived at various indications of value must then reconcile these amounts to arrive at a conclusion as to value. The appraiser may express the conclusion as a range of value but more typically as a point estimate. Rarely do all the valuation methods result in similar indications of value.

The valuation indications typically will span a range of values, although indications from some approaches have a tendency to cluster. The appraiser should consider how much weight to give to indications distinctly different from the others. The appraiser should investigate these outliers to ensure that no conceptual or mechanical errors occurred in applying the method.

No fixed procedure exists for assigning weights to various valuation indications. The appraiser may know that certain methods work better than others for a given industry or situation. Appraisers typically value asset-holding companies as a collection of assets, which suggests that an asset-based approach merits the greatest weight. In contrast, appraisers typically value service companies, whose tangible assets generally are a small part of overall value, on the basis of their ability to consistently generate earnings and cash flow or with a market comparison approach.

10.10 SUBSEQUENT EVENTS. Subsequent events generally fall into two categories: those that knowledgeable investors could have expected, such as increased operating costs or increased revenues, and those that investors could not have reasonably anticipated as of the valuation date. The latter might include

natural disasters that interrupt the company's operations or lawsuits resulting from undetected product flaws or major production accidents. Post-valuation date transactions involving the company or its shareholders may fall into either category.

When an investor can reasonably anticipate the event prior to the valuation date, the appraisal must reflect such an event's economic or informational consequences. Examples include an announced but not yet implemented increase in raw material prices, a liability resulting from a known toxic waste hazard for which the company is responsible, or the anticipated sale of an operating entity of the company.

On this subject, the Tax Court has opined as follows:

> A distinction may usefully be drawn between later-occurring events which affect fair market value as of the valuation date, and later-occurring events which may be taken into account as evidence of fair market value as of the valuation date. When viewed in this light—as evidence of value rather than as something that affects value—later-occurring events are no more to be ignored than earlier occurring events. (*Estate of Jung* 101T.C. No. 28 Nov. 10, 1993)

10.11 Non-operating Assets. Many companies have non-operating assets on their balance sheets. These assets do not contribute to the ongoing operations of the business. Examples include undeveloped land or other real estate held for investment purposes, investment securities, or cash that exceeds normal working capital requirements. These assets may, as in the case of investment securities, generate income or, as in the case of undeveloped land, generate losses.

Because these assets do not contribute to the business's ongoing operations, the appraiser should remove their financial consequences from the company's financial statements and value them separately. The value of the business enterprise would then be the sum of the value of its operations, as discussed above, and the value of its non-operating assets.

10.12 Allocating Values To Securities. An appraiser's task frequently extends beyond establishing a value for the equity of a business as a whole. Many companies have more than one class of securities or may have other claims on the equity value. The appraiser often must value the individual securities of a business rather than the business as a whole.

After developing a value for the business as a whole, the appraiser must ascertain the rights, privileges, and restrictions of the various equity securities. Such securities take many forms but generally include multiple classes of common shares, preferred shares, convertible preferred shares, warrants, and other contingent equity claims such as stock appreciation rights, incentive stock options, and phantom stock.

Common shareholders have a residual claim on the firm's equity. This means that their shares capture the remaining value of the business after satisfying the claims of preferred shareholders and other senior equity claimants. For example, if a business worth $10 million has 1 million common shares outstanding and no other claims on equity value exist, the common shares would be worth $10 per share. If other claimants have securities worth $6 million, however, the common shareholders in aggregate have a claim on only the residual $4 million, and their shares are worth only $4 per share.

A company may have warrants or other contingent claims on a firm's equity. A warrant is a potentially dilutive form of option. A warrant holder must pay a set exercise price per share for common stock received. The holder will exercise a warrant only if the share price exceeds the exercise price. This dilutes the value per common share.

For economic purposes, one can view soon-to-expire warrants with market value exceeding exercise price as certain to be exercised and, hence, as equivalent to common shares. Add the aggregate exercise price of such warrants to the aggregate common share value and divide by the total number of warrants plus common shares. In other cases, where the common share value is below the warrants' exercise price, warrants may be valued through the use of analytical tools such as the Black-Scholes option pricing model, adjusted for anticipated dilution (Black and Scholes, 1973). Subtract the value established for warrants in this fashion from aggregate common share value, and divide the remainder by the total common shares outstanding to establish a value per common share.

Many other forms of claims on equity value exist, such as participating preferred shares, constant-dollar convertible preferred shares, convertible debt, and even different classes of common shares.

Preferred shares have a priority claim on a specified portion of the company's equity value and typically are entitled to a fixed dividend that the company must pay before common shareholders receive dividends. Preferred shares are also generally entitled to a preferential payout in the event of the company's liquidation.

The company issuing the preferred shares frequently has the right to redeem them at their liquidation value or some other predetermined amount.

10.13 Valuing Preferred Shares. Valuation of preferred shares begins with an understanding of the nature of preferred shares as well as the typical preferred share rights and privileges and their effects on value.

Unlike common shares, whose dividend rate often fluctuates with the level of corporate earnings, the dividend paid on preferred shares generally is fixed, either as a percentage of the shares' par (or stated) value or as a flat dollar amount. As such, higher grade preferred issues resemble long-term bonds in the sense that their values fluctuate inversely with interest rates. Common share values, on the other hand, vary with earnings or cash flows.

Because preferred dividends are fixed, valuation should focus primarily on risk considerations. Company-specific risk relates to the ability of the subject company to meet its dividend and redemption commitments and provide for the preferred share's liquidation preference in the event of liquidation. For preferred shareholders, the most important company-specific risk is the reliability of future dividend payouts.

To assess the likelihood of future preferred payouts, the appraiser uses objective and quantifiable measures of company-specific risk to indicate the company's capability to meet dividend obligations. The standard measure of company-specific risk has been the *pretax fixed charges coverage ratio*, defined as the sum of pretax income plus interest expense (or, equivalently, earnings before interest and taxes, EBIT) divided by the sum of interest expense plus pretax earnings required to pay after-tax preferred dividends. The higher the ratio, the greater the company's capacity to pay its preferred dividends and therefore the lower the risk and the required yield to an investor.

In addition to pretax fixed charges coverage, other meaningful ratios assess the subject company's ability to pay preferred dividends. One is the *cash flow to long-term debt ratio*, defined as the sum of net income plus non-cash charges (e.g., depreciation, deferred income taxes, and so on) divided by total long-term debt. Because the amount of interest on long-term debt is fixed and its claim is senior to any dividend payout, a higher ratio indicates to preferred shareholders a more favorable financial position.

The company's debt-to-common-equity ratio, with equity measured on a fair market value rather than an accounting basis, measures longer-term dividend safety. For a preferred shareholder this ratio measures the relative importance of claims on assets and earnings senior to the preferred shareholder (i.e., debt) versus those claims junior to the preferred shareholder (common equity). Thus, if the company has performed poorly, its various coverage ratios may indicate inadequate dividend coverage. The same company with a relatively low (or favorable) debt-to-equity ratio is more likely to maintain preferred dividends; or if dividends are in arrears, it has sufficient corporate resources to cover arrearages.

Another company-specific risk measure is its diversification. The more diversified a company, the less likely it is that adversity will affect earnings and dividend-paying capability.

In addition to dividend protection, the appraiser should consider liquidation preference in valuing preferred shares. One measure of protection of the liquidation preference is total assets minus liabilities divided by the aggregate preferred liquidation preference. A higher ratio implies a greater protection of the shareholders' investment in the event of liquidation.

No ratio by itself directly implies either a fair dividend yield or a fair market value for the company's preferred shares. To conclude as to value, the appraiser should compare the company's ratios to similarly calculated ratios for a group of publicly traded preferred shares having the same rights and privileges as shares of the subject company.

If the ratio comparison shows that the subject company is a relatively greater investment risk than the group of public preferred shares, the subject company's preferred shares should be assigned a correspondingly greater yield and smaller value.

Ideally, the publicly traded preferred shares should contain rights and privileges identical to those of the subject company. Closely held preferred shares, however, tend to have rights and privileges different from those commonly found in the public marketplace. When differences exist, the valuation should look at the individual rights and privileges of each security and assess their effect on the risk to an investor.

The most common and relevant factors to valuation are cumulative dividends, voting rights, redemption privileges, and conversion rights.

Most publicly traded preferred shares include a cumulative dividend provision. If dividends are non-cumulative, the company's intention to pay dividends as they become due adds risk not entirely related to the company's financial capability.

The right of preferred shareholders to influence company management varies with circumstances. Generally, voting rights can add value to preferred shares, but the magnitude of the value enhancement varies. In most cases, preferred shareholders have a negligible fraction of the total votes in a corporation and thus little power to affect company policies. In a few cases, preferred shareholders as a group may have voting control, but the added value derived would depend, at least in part, on the cohesiveness of the preferred group. Voting rights for non-cumulative preferred shares tend to be more valuable than for cumulative because the preferred shareholders can use their influence to compel payment of dividends.

Most publicly traded preferred shares are callable. This call option detracts from preferred share value, but the amount of reduction in value depends on several factors. The length of time, if any, during which the company cannot call the preferred share away from the investor is referred to as the *call protection period*. A shorter call protection period and a lower call price reduce value to the shareholder, both by increasing the probability that the preferred share will be redeemed and by diminishing the proceeds to the shareholder upon redemption. Consider also the company's financial ability to cash out the preferred shares as well as the company's track record of calling previous preferred share issues.

Other possible claims on equity value include convertible preferred share, participating preferred share, constant-dollar convertible preferred shares, convertible debt, and even different classes of common shares. All of these represent valuation challenges that go beyond the scope of this chapter.

10.14 REPORT CONTENT. The appraiser usually documents the conclusions as to value in an opinion letter or a narrative report the length and format of which will depend on the valuation's purpose and the client's desires. Any such written transmittal should include the following:

1. *Valuation Date:* A valuation pertains to a particular date. The letter should specify this date to avoid confusion.
2. *Identification of the Asset or Assets Valued:* Identify the businesses or securities being valued; state whether the valuation is on a controlling, marketable minority basis, or a non-marketable minority interest basis.
3. *Purpose of the Appraisal; Standard of Value Defined:* Describe the purpose understood by the appraiser and the standard of value being used.
4. *Scope of Investigation:* State the documents reviewed, people interviewed, facilities visited, and assumptions relied upon. Note limitations on the investigation, particularly those imposed by others.
5. *Restrictions on Use of Report:* Limit the use of the report and its conclusions to the specific parties and for the specific reasons for which it was commissioned. A report intended for tax purposes need not be appropriate for other types of transactions or for litigation matters.
6. *Limiting Factors:* No matter how extensive an appraiser's investigation–fees, time, and expertise impose limitations. For instance, the appraiser relies on financial statements without further investigation as representing the company's financial position in accordance with generally accepted accounting principles (GAAP) unless the statements say otherwise. Appraisers accept industry information derived from publications deemed reliable without further investigation. These limitations help define the limits of the appraiser's responsibility.
7. *Detailed Analysis:* In a narrative report, the appraiser should support conclusions of value with a detailed, logical, and well-presented analysis. The description will enable the reader to ascertain the viability of the appraiser's conclusions relative to the facts presented. The description includes the analyses performed on the company and the application of the various valuation methods.
8. *Conclusions of Value:* The report should state the valuation conclusion clearly.

The narrative report also may include an industry review, a general economic outlook, a review of various valuation methods and the reason the analyst deemed the selected approaches appropriate, a risk analysis of the subject company compared to comparable publicly traded companies, and a description of the comparable companies.

10.15 WORKPAPERS. Whatever the content of the written transmittal, the appraiser must develop and maintain workpapers to document the analysis and the information relied upon in arriving at the conclusions for the following reasons:

1. They provide a record of the documents, interviews, correspondence, and analysis upon which the appraiser relied in rendering the opinion.

2. They establish a clear record of the scope of the appraiser's investigation.
3. Appraisers can use the workpapers as a checklist to ensure that they received all necessary materials and documents for the analysis.
4. If a question or problem arises months or years later, the workpapers provide an invaluable resource in refreshing the appraiser's memory and recreating the appraisal process.

To meet these goals, workpapers should include:

1. An administrative section containing the engagement agreement, billings, expenses, documentation of hours spent on the engagement (if appropriate), and similar matters
2. A correspondence section
3. A section containing any notes of meetings and telephone conversations
4. Information dealing with the company's industry and the general economic outlook
5. Specific information on the company, such as financial statements, product brochures, and organization chart
6. An analysis section detailing the valuation methods used
7. Information on the comparable publicly traded companies selected
8. Financial statement information for the subject company
9. A section on projections and business plans
10. Other company documents, such as articles of incorporation and shareholders' agreement

One should ensure that workpapers do not contain superfluous or inconsistent materials, unanswered questions, and other items irrelevant to the appraiser's analysis and conclusions.

10.16 COURT CASES AND REVENUE RULINGS. Appraisals frequently attempt to satisfy the particular requirements of a regulatory agency, such as the Internal Revenue Service, or to comply with the provisions of a particular law. In such instances, knowledge of particular guidelines and relevant court cases can help the appraiser deal with controversial issues.

(a) Court Cases. A summary of the significant court cases is beyond the scope of this chapter. The appraiser should, however, keep informed of case law regarding the valuation of business and interests therein. Good sources for case law include: *Federal Tax Valuation*, by John A. Bogdanski; *Federal Tax Valuation Digest*, by Idelle A. Howitt; *Business Valuation Review*, published by the American Society of Appraisers; *Shannon Pratt's Business Valuation Update*; and consultation with the attorney involved in the specific valuation matter.

(b) Revenue Rulings. Appraisers dealing primarily with federal income tax matters should understand the IRS pronouncements and revenue rulings as well as the relevant case law in this area. The following summarizes some of the revenue rulings in this area.

(i) Revenue Ruling 59-60. Revenue Ruling 59-60 has served as a general guideline for the valuation of closely held securities since 1959. It remains the most widely used guideline in valuation. While the ruling specifically addresses share valuations for gift and estate tax purposes, one can apply its principles to many valuation problems, including those related to employee share-ownership plans, shareholder buy/sell agreements, mergers and acquisitions, corporate reorganizations, marital dissolutions, and bankruptcies.

Revenue Ruling 59-60 states, in effect, that one must base sound opinions of value on all relevant facts and that no one formula will be universally acceptable. Revenue Ruling 59-60 sets forth the following factors to consider and analyze in valuing capital shares:

1. The nature of the business and the history of the enterprise from its inception
2. The economic outlook in general and the condition and outlook of the specific industry
3. The book value of the shares and the financial condition of the business
4. The earnings capacity of the company
5. The dividend-paying capability of the company
6. Whether the enterprise has economic goodwill or other intangible value

7. Sales of the shares and the size of the block to be valued
8. The market price of shares of corporations engaged in the same or a similar line of business having their shares actively traded in a free and open market, either on an exchange or over the counter

(ii) Revenue Ruling 65-192. This ruling contains Appeals and Review Memorandum 34 (ARM 34). ARM 34 provides a formula to value the intangible assets of a business. The total value of the business is then the net value defined as tangible net book value, plus the goodwill value as established by the ARM 34 formula.

(iii) Revenue Ruling 68-609. This ruling sets forth an approach often referred to as the *IRS formula approach* to valuation. The ruling applies as a general guideline for estimating the value of intangible assets and the value of a business enterprise. The valuation is a capitalization-of-earnings process that allows an after-tax return on investment of 8 to 10 percent on net tangible assets and a return of 15 to 20 percent on intangible assets, depending on the inherent risk associated with the investment. Revenue Ruling 68-609 states, however, "The 'formula' approach may be used for determining the fair market value of intangible assets (and the business enterprise) only if there is no better basis therefor available."

(iv) Revenue Ruling 77-287. Revenue Ruling 77-287 amplifies Ruling 59-60 and sets forth valuation guidelines in computing discounts for lack of marketability for securities registered under SEC Rule 144. Because of the resale restrictions of Rule 144, Revenue Ruling 77-287 recognizes that the value of a restricted security is less than the value of its freely traded counterpart and provides guidelines in calculating this discount.

The basis for Revenue Ruling 77-287 is the *Institutional Investor Study Report* published by the Securities and Exchange Commission in 1971. This study empirically examined discounts in transactions involving securities restricted under Rule 144. Based on more than 300 transactions, the SEC study found that the amount of discount allowed for restricted securities from the trading price of unrestricted securities generally relates to four factors:

1. *Earnings.* The higher the earnings level, the lower the discount.
2. *Sales.* The greater the dollar sales amount, the lower the discount.
3. *Trading Market.* According to the study, discount rates were greatest on restricted shares with unrestricted counterparts traded over-the-counter, followed by those with unrestricted counterparts listed on the American Stock Exchange, while the discount rates for those stocks with unrestricted counterparts listed on the New York Stock Exchange were the smallest.
4. *Resale Agreement Provisions.* Resale agreement provisions—such as "piggyback" provisions, registration provisions, and disclosure provisions—could reduce the discount.

(v) Revenue Ruling 83-120. This ruling attempts to amplify Revenue Ruling 59-60 by specifying additional factors for valuing common and preferred shares. It reinforces Ruling 59-60 with respect to the key factors in valuing common shares but details certain considerations important in valuing preferred shares. This ruling discusses yield, dividend coverage, and protection of liquidation preferences.

10.17 Other Valuation Guidelines. Consult the *IRS Valuation Guide for Income, Estate and Gift Taxes.* Although the IRS designed this guide specifically for training purposes and its contents cannot be "used or cited as authority for settling or sustaining a technical position," it nevertheless provides a useful guideline for valuation purposes. The guide includes chapters on methods and approaches to valuing closely held corporations, valuing preferred shares, and discounts. See also Pratt and Schwiehs (1998) and Copeland, et al. (1994).

10.18 Summary. Situations frequently arise during litigation that require a business valuation. Valuing a business for any purpose requires understanding the company and its operations, the industry in which the company operates, and various valuation approaches. Because no single method or approach to valuation exists for unambiguously developing a company's value, the appraiser must know valuation methods and procedures and must understand ancillary areas of finance, economics, and accounting to effectively support the conclusion.

Notes

1. The editors point out that the literature on synergy in mergers rarely finds evidence that it exists but often shows that it is illusory. See "How to Make a Merger Work," *Forbes*, Jan. 24, 1994; Michael Jensen and Richard Ruback, "The Market for Corporate Control: The Scientific Evidence," *Journal of Financial Economics*, April 1983; Paul Asquith, "Merger Bids, Uncertainty and Stockholder Returns," *Journal of*

Financial Economics, April 1983; Anup Agrawal, Jeffrey Jaffe, and Gershon Mandelker, “The Post-Merger Performance of Acquiring Firms: A Re-examination of an Anomaly,” *Journal of Finance*, September 1992.

2. The formula for the Gordon Growth Model is as follows:

$$V = \frac{D}{K - G}$$

Assuming that the dividend (D) grows forever at a constant rate G, and G is less than the discount rate K, then V is the present value of the growing annuity stream (Gordon, 1959).

The editors like to call this the *Perpetuity Growth Model* because John Burr Williams wrote about it before Myron Gordon did. Still, many appraisers use the term *Gordon Growth Model*.

3. The Capital Assett Pricing Model is a framework for analyzing the relation between risk and rates of return (see also Chapter 8). The relation between risk and return, known as the Security Market Line, is expressed by the equation:

$$E(R_i) = R_f = B \text{ x } [E(R_m) - R_f]$$

where

$E(R_i)$ = the expected returns on share *i*
R_f = the risk-free rate of return
B = the beta coefficient for share *i*
$E(R_m)$ = the expected return on the market

4. The cost of capital is a weighted average of the firm’s cost of debt and equity. The cost of capital can be estimated with the equation:

$$\frac{D}{V} K_i(1-t) + \frac{E}{V} K_e$$

where

K_o = weighted average cost of capital
K_i = company’s cost of debt
t = company’s marginal tax rate
V = market value of the company’s total invested capital
D = market value of the company’s debt
E = market value of the company’s equity
D/V = proportion of debt to total invested capital
E/V = proportion of equity to total invested capital
k_e = company’s cost of equity

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