Notes

Preface

1. See Walter L. Gross Jr. et al., *Petitioners v. Commissioner of Internal Revenue.*
2. See www.axiomvaluation.com.

CHAPTER 1 The Value of Fair Market Value

1. Revenue Ruling 59–60, Section 2.02.
2. Intrinsic value is another value standard in addition to those noted in the text. *Intrinsic value* refers to what an individual believes something is fundamentally worth. When willing and informed buyers and sellers have the same view of an item's fundamental worth, then intrinsic value and FMV are equal. In some states, the value standard used in marital dissolutions is intrinsic value and not FMV. Personal items, such as family heirlooms, have intrinsic value to family members, but they may have no value to unrelated parties. In this instance, intrinsic value exceeds FMV.
3. See the FMV definition in the text.
4. The control premium, CP, is equal to [(control value (CV) – minority value (MV)) ÷ minority value] × 100%. If control value is $150 and minority value is $100, then CP is 50%. The minority discount (MD) is equal to [(MV – CV) ÷ CV] × 100. Using these values, MD = [($100 – $150) ÷ $150] × 100% = –33%.
5. MD = [($100 – $125) ÷ $125] × 100% = –20%.

CHAPTER 2 Creating and Measuring the Value of Private Firms

1. When calculating the value of private firms, two adjustments need to be considered. The first is the discount for liquidity; the second is a premium above minority equity value to reflect the value of control. Because this chapter focuses on the MVM, discussions of the discount for lack of liquidity and control are left for subsequent chapters.
2. The concept of the optimal capital structure is applicable to C corporations. On this point see Franco Modigliani and Merton Miller, "The Cost of Capital, Corporation Finance and the Theory of Investment," *American Economic Review,* June 1958, pp. 261–297; "The Cost of Capital, Corporation Finance and the Theory of Investment: Reply," *American Economic Review,* September 1958, pp. 655–669; "Taxes and the Cost of Capital: A Correction," *American*

Economic Review, June 1963, pp. 433–443; and "Reply," *American Economic Review,* June 1965, pp. 524–527.

3. See Bernard J. Picchi, *The Structure of the Oil Industry: Past and Future* (New York: Salomon Brothers Inc., July 1985).
4. Chapter 5 addresses the effect of size on the cost of capital in considerable detail. Ibbotson Associates estimates of the impact of firm size on the cost of capital. Axiom Valuation Solutions has extended this work to firms that are much smaller than those covered by Ibbotson Associates. Based on Axiom's analysis, the cost of capital for smaller private firms is likely to be much greater than the cost of capital for the smallest Ibbotson size class.
5. Katherine Schipper and Abbie Smith, "The Effects of Recontracting on Shareholder Wealth," *Journal of Financial Economics,* 1983, pp. 437–467.
6. Katherine Schipper and Abbie Smith, "A Comparison of Equity Carve-Outs and Seasoned Equity Offerings," *Journal of Financial Economics* 15, January/February 1986, pp. 153–186.

CHAPTER 3 The Restructuring of Frier Manufacturing

1. Throughout the analysis, values shown were not adjusted for lack of marketability of Frier equity. This was done so performance comparisons with public firm peers could be easily made. The impact of marketability as the value of private firm shares is taken up in this chapter.
2. Stanley Jay Feldman and Timothy Sullivan, "The Impact of Productivity, Pricing, and Sales on Shareholder Wealth," *Data Resources Long-term Review,* Summer 1992, pp. 19–23.

CHAPTER 4 Valuation Models and Metrics: Discounted Free Cash Flow and the Method of Multiples

1. Market price is the firm's share price. If the target firm has debt outstanding, then the value of the firm would be equal to its estimated equity value using the method of multiples plus the value of its debt.
2. Founded in 1914, The Risk Management Association is a nonprofit, member-driven professional association whose sole purpose is to advance the use of sound risk principles in the financial services industry. RMA promotes an enterprise-wide approach to risk management that focuses on credit risk, market risk, and operational risk.
3. This adjustment does not mean that the tax deductibility of interest has no value. The value emerges when operating cash flows are valued using a lower cost of capital that emerges because interest expense is tax deductible, a topic addressed in the next chapter.
4. *Excess cash* is defined as cash on the balance sheet in excess of what is required to normally operate the business. As a guideline, cash on the balance sheet in excess of 2 percent of revenue is treated as excess cash. Working capital would then reflect this adjustment. Based on the nature of Tentex's business, it was determined that Tentex's business required cash in excess of the 2 percent guideline. Hence, no excess cash adjustment was made.

5. NOPAT + interest expense + depreciation – (gross investment) = free cash flow = NOPAT + interest expense + depreciation – (net capital expenditure – depreciation) = NOPAT + interest expense – net capital expenditure.
6. Sustainable competitive advantage is created when a firm can shield itself from competitive forces to some degree. Protection from competitive forces can emerge in a number of ways. A firm can achieve low-cost producer status through continuously improving firm productivity and passing on some of the cost savings to customers in the form of lower prices. Patents, of course, offer protection for a limited time frame. For private firms, sustaining customer allegiance is likely to be the best protection against market forces. Depending on the industry, customer allegiance results from providing excellent service, therefore making it difficult for competitive firms to bid these customers away. The combination of low prices, reliable products and services along with excellent customer service is likely to create sustainable competitive advantage.
7. To see this relationship, we define the growth index in revenue for industry i, geography *g* as GIREV*i,g*. If GIREV*i* is 1.10, industry revenue growth is 10%, GIREV is 1.05, GDP growth is 5%, and GIREV*g* is 2.1%, then GIREV*i,g* is equal to (GIREV*g* ÷ GIREV) × (GIREV*i*), or (1.021 ÷ 1.05) × (1.10), which equals 1.07 or a growth rate of 7%.
8. Any standard macroeconomic textbook covers the multiplier theory of investment.
9. In addition to a marketability adjustment, there is a question of whether the value of Tentex reflects control. To the extent it does not, a control premium must be added to the value shown. For now, we assume that value of control is in the cash flows, although in Chapter 7 we demonstrate that the value of control is separate from the value of underlying cash flows of a stand-alone business.
10. Price-to-EBITDA (earnings before interest, tax, depreciation, and amortization) multiples are often used to value a target firm. The EBITDA multiple, like the revenue multiple, is subject to less variability than the earnings multiple. However, while less easily distorted than earnings, EBITDA is still subject to some degree of manipulation.
11. The target capital structure represents the combination of debt and equity that minimizes the firm's cost of capital. Based on an analysis of Tentex's credit risk, it was determined that the 90-10 capital structure was optimal.
12. Equation 4.9 was used to solve for Tentex's revenue multiple, which was 1.31. The difference between this value and 1.36 is essentially rounding error.
13. Steven N. Kaplan and Richard Ruback, "The Market Pricing of Cash Flow Forecasts: Discounted Cash Flow vs. the Method of Comparables," *Journal of Applied Corporate Finance* 8, no. 4, Winter 1996, pp. 45–60.
14. Kaplan and Ruback, "Market Pricing," p. 45.

CHAPTER 5 Estimating the Cost of Capital

1. Ibbotson Associates, *Stocks, Bonds, Bills, and Inflation, Valuation Edition, and the Cost of Capital Yearbook,* 2004.
2. Ibbotson Associates, *Stock, Bonds, Bills and Inflation, Valuation Edition, 2004 Yearbook,* p. 115.

3. Ibbotson Associates, *Cost of Capital Yearbook,* 2004, pp. 3–55.
4. See Ibbotson Associates, *Cost of Capital Yearbook,* 2004, p. 34, for a discussion of the method used to create adjusted industry betas.
5. See www.axiomvaluation.com for data sources used to construct this data set.
6. A zero beta means that the return on debt is not correlated with the return on a diversified portfolio of financial securities. This is the typical assumption made about the debt beta. Note that to the extent the debt beta is not negative, which it might well be, assuming the debt beta of zero understates the systematic risk of a firm with debt.
7. Axiom sales size classes and Ibbotson Associates size premium data.
8. P. Gompers and J. Lerner, "Risk Reward and Private Equity Investments: The Challenge of Performance Assessment," *Journal of Private Equity* 1, pp. 5–12.
9. John Cochrane, "The Risk and Return of Venture Capital," NBER working paper 8066.
10. Edward Altman, "Predicting Financial Stress of Companies: Revisiting the Z Score and Zeta Models," working paper, July 2000.
11. For more information on the 7(a) loan program refer to www.sba.gov/financing/sbaloan/7a.html.
12. The example assumes that principle is paid at the end of the loan term. To the extent that principal is paid over the life of the loan, the market value of the debt would be greater than shown in the text.

CHAPTER 6 The Value of Liquidity: Estimating the Size of the Liquidity Discount

1. We use the terms *liquidity discount* and *marketability discount* interchangeably in this paper, as is customary in this literature.
2. Yakov Amihud and Haim Mendelson, "Asset Pricing and the Bid-Ask Spread," *Journal of Financial Economics* 17, 1986, pp. 223–249. Also, "The Effects of Beta, Bid-Ask Spread, Residual Risk and Size on Stock Returns," *Journal of Finance,* June 1989, pp. 479–486.
3. Yakov Amihud and Haim Mendelson, "Liquidity and Cost of Capital: Implications for Corporate Management," *The New Corporate Finance, Where Theory Meets Practice,* edited by Donald H. Chew Jr. (New York: McGraw-Hill, 1993), pp. 117–125.
4. Gary C. Sanger and John J. McConnell, "Stock Exchange Listings, Firm Value, and Security Market Efficiency: The Impact of NASDAQ," *Journal of Financial and Quantitative Analysis* 21, no. 1, March 1986, pp. 1–25.
5. The reason is that observing price behavior of an OTC stock at the time it moves to the NYSE is akin to a private firm today initially listing with a business broker and then subsequently listing on the NYSE. During the period prior to the Nasdaq, there was no electronic posting, no Internet, and pink sheet stocks were made available to investors only through the retail broker community. Hence, this research offers an important source of knowledge about the impact of liquidity, or lack thereof, on the prices of minority shares of quasi-private firms.
6. Richard B. Edelman and H. Kent Baker, "The Impact of Company Pre-Listing

Attributes on the Market Reaction to NYSE Listings, *Financial Review* 28, no. 3, August 1993, pp. 431–448.

7. John D. Emory Sr., F. R. Dengell III, and John D. Emory Jr., "Discounts for Lack of Marketability, Emory Pre-IPO Discount Studies 1980–2000 (As Adjusted October 10, 2002), *Business Valuation Review,* December 2002, pp. 190–193; William L. Silber, "Discounts on Restricted Stock: The Impact of Illiquidity on Stock Prices," *Financial Analysts Journal,* July, August 1991, pp. 60–64; Michael Hertzel and Richard Smith, "Market Discounts and Shareholder Gains for Placing Equity Privately," *Journal of Finance* 48, no. 2, June 1993, pp. 459–485.
8. S. C. Myers and N. S. Majluf, "Corporate Financing and Investment Decisions When the Firm Has Information That Investors Do Not Have," *Journal of Financial Economics* 13, pp. 187–221.
9. K. H. Wruck, "Equity Ownership Concentration and Firm Value: Evidence from Private Equity Financings," *Journal of Financial Economics* 23, pp. 3–28.
10. Mukesh Bajaj, David J. Denis, Stephen P. Ferris, and Atulya Sarin, "Firm Value and Marketability Discounts," *Journal of Law and Economics,* 2002.
11. Hertzel and Smith, "Market Discounts."
12. Regression coefficients are a function of sample characteristics. This means that simulating models under conditions that were not present during the estimation period will result in biased simulation results. In the case of simulating the Silber model under an assumption of a control placement, the simulated discounts would be much too large.
13. John Koeplin, Atulya Sarin, and Alan Shapiro, "The Private Company Discount," *Journal of Applied Corporate Finance* 12, no. 4, Winter 2000, pp. 94–101.

CHAPTER 7 Estimating the Value of Control

1. *Control Premium Study* (Los Angeles: Houlihan Lokey Howard and Zukin, 1995), p. 1.
2. James Ang and Ninon Kohers, "The Takeover Market for Privately Held Companies: The US Experience," *Cambridge Journal of Economics* 25, 2001, pp. 723–748.
3. CAR is the cumulative abnormal return. The abnormal return is the difference between the return earned and the expected return. The expected return is typically derived using a version of the CAPM.
4. Kimberly Gleason, Anita Pennathur, and David Reeb, "An Analysis of Mergers and Acquisitions of Family-Owned Businesses," working paper, October 2002.
5. James Ang and Ninon Kohers, "The Takeover Market for Privately Held Companies: The US Experience," *Cambridge Journal of Economics* 25, 2001, pp. 723–748. The authors state on p. 725: "Overall, our results show that, in contrast to acquisitions of publicly traded targets, acquisitions of privately held targets yield substantial gains for both bidder and target firms. Specifically, the event-period, abnormal returns for acquires of privately held targets are significantly positive, regardless of the method of payment used. Thus, takeovers of

privately held firms are, on average, perceived too be value enhancing for acquiring firms. Furthermore, private sellers also gain, as the premiums paid to private targets exceed those paid for publicly traded targets in either cash or stock offers."

6. On this point see Pratt, Reilly, and Schweihs, *Valuing a Business,* Chapter 14.
7. James Ang and Ninon Kohers, "The Takeover Market for Privately Held Companies: The US Experience," *Cambridge Journal of Economics* 25, 2001, pp. 723–748. The authors state on p. 725: "Overall, our results show that, in contrast to acquisitions of publicly traded targets, acquisitions of privately held targets yield substantial gains for both bidder and target firms. Specifically, the event-period, abnormal returns for acquires of privately held targets are significantly positive, regardless of the method of payment used. Thus, takeovers of privately held firms are, on average, perceived too be value enhancing for acquiring firms. Furthermore, private sellers also gain, as the premiums paid to private targets exceed those paid for publicly traded targets in either cash or stock offers."
8. An option has *intrinsic value* if the expected present value of the cash flows, excluding ongoing investment requirements, exceeds the present value of the investment requirements. This is termed an *in the money* call option.
9. The period over which a strategy is expected to be successful has a finite life based on the competitive nature of the business environment, technological developments, and the actions of competitive firms. Thus, there is nothing special about a five-year competitive advantage period.
10. The Mergerstat/Shannon Pratt's Control Premium Study currently contains approximately 3,450 total transactions, with more than 485 deals in business services, more than 430 deals on depository institutions, and 138 deals in the communications industry; 51 percent of the deals in the database have net sales less than $100 million, with the remainder having net sales greater than $100 million.
11. In the 1980s, T. Boone Pickens of Mesa Petroleum attempted to acquire Unocal to get access to its oil reserves and to stop the wasting of corporate resources on exploring and drilling for new oil supplies. As it turned out, drilling for oil was a negative NPV investment. T. Boone realized that if he had control of Unocal, he could stop the oil-drilling activity, which in turn would result in a windfall that in large part would provide the capital to finance the acquisition. As it turned out, Unocal management got the message. Unocal's defense in the Mesa tender offer battle resulted in a $2.2 billion (35 percent) gain to shareholders from retrenchment and return of resources to shareholders. Unocal paid out 52 percent of its equity by repurchasing stock with a $4.2 billion debt issue and reduced costs and capital expenditures.

CHAPTER 8 Taxes and Firm Value

1. See Roger J. Grabowski, "S Corporation Valuations in the Post-Gross World," *Business Valuation Review,* September 2002, pp. 128–141.
2. See *Gross v. Commissioner.*

3. The after-tax cost of capital is equal to the before-tax cost of capital multiplied by 1 minus the tax rate. Thus a 20 percent after-tax cost of capital is equivalent to a before-tax cost of capital of approximately 33 percent if the tax rate is 40 percent [20% ÷ (1 – 0.4) = 33.33%].
4. The analysis presented in this section is based on Scholes, Wolfson, Erickson Maydew, and Shevlin's book, *Taxes and Business Strategy: A Planning Approach,* 2nd ed., Prentice Hall.
5. The example used in the text is taken from Scholes et al., *Taxes and Business Strategy,* 2nd ed., p. 378.
6. See Appendix 8A for the formulas used to calculate the acquirer's indifference price shown in Table 8.4.
7. Merle Erickson and Shiing-wu Wang, "The Effect of Organizational Form on Acquisition Price," University of Chicago working paper, May 2, 2002.

CHAPTER 9 Valuation and Financial Reports: The Case of Measuring Goodwill Impairment

1. FAS 142 uses the term *fair value* and defines it as the amount at which an asset (or liability) could be bought (or incurred) or sold (or settled) in a current transaction between willing parties, other than in a forced or liquidation sale. This value standard is equivalent to the fair market value standard, which states that *fair market value* is the price a willing buyer will pay a willing seller when each is fully informed of the relevant facts and each is under no compulsion to transact.
2. Refer to FAS 142, paragraph 28.
3. By definition, the fair market value of a reporting unit equals the fair market value of net assets (fair market value of assets minus fair market value of liabilities) plus fair market value of implied goodwill plus the fair market value of liabilities. Thus, the implied fair market value of goodwill can also be calculated as the difference between the fair market value of the reporting unit and the aggregated fair market value of its assets. The FASB routinely describes the cost of acquiring in net terms—that is, transaction price less liabilities assumed. This is confusing from a valuation perspective since the cost of an acquisition reflects the value of assets purchased. How the acquisition was financed, on the other hand, is an important but separate matter.
4. For purposes of defining reporting units, an *operating segment* is defined in paragraph 10 of FAS 131, *Disclosures about Segments of an Enterprise and Related Information.*
5. Refer to FAS 142, paragraph 19.
6. In FAS 142, the term *value of operating unit* means value of the operating unit's equity and not the unit's total market value.
7. Refer to FAS 142, paragraph 23, footnote 16, p. 9.
8. FAS 142, B 155, p. 73.
9. U-Bid and eBay are examples of Internet sites that offer transaction information for many types of generic business equipment. However, for more specialized equipment, a secondhand market will generally not be available.

10. FAS 141, paragraph A14, p. 27, states that "assets designated by the symbol (Ŧ) are those that would be recognized apart from goodwill because they meet the contractual legal criterion even if they do not meet the separability criterion. Assets designated by the symbol (▲) do not arise from contractual or other legal rights, but shall nonetheless be recognized apart from goodwill because they meet the separability criterion. The determination of whether a specific intangible asset meets the criteria in this Statement for recognition apart from goodwill shall be based on the facts and circumstances of each individual business combination."