Solutions Manual

for

Equity Asset Valuation
Second Edition

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NOTE: This file includes solutions to the book's end-of-chapter problems (Part II).

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PART I

LEARNING OUTCOMES, SUMMARY OVERVIEW, AND PROBLEMS

CHAPTER 1

EQUITY VALUATION: APPLICATIONS AND PROCESSES

LEARNING OUTCOMES

After completing this chapter, you will be able to do the following:

- Define valuation and intrinsic value and explain two possible sources of perceived mispricing.
- Explain the going-concern assumption, contrast a going concern to a liquidation value concept of value, and identify the definition of value most relevant to public company valuation.
- List and discuss the uses of equity valuation.
- Explain the elements of industry and competitive analysis and the importance of evaluating the quality of financial statement information.
- Contrast absolute and relative valuation models and describe examples of each type of model.
- Illustrate the broad criteria for choosing an appropriate approach for valuing a particular company.

SUMMARY OVERVIEW

In this chapter, we have discussed the scope of equity valuation, outlined the valuation process, introduced valuation concepts and models, discussed the analyst's role and responsibilities in conducting valuation, and described the elements of an effective research report in which analysts communicate their valuation analysis.

- Valuation is the estimation of an asset's value based on variables perceived to be related to future investment returns, or based on comparisons with closely similar assets.
- The intrinsic value of an asset is its value given a hypothetically complete understanding of the asset's investment characteristics.
- The assumption that the market price of a security can diverge from its intrinsic value—as suggested by the rational efficient markets formulation of efficient market theory—underpins active investing.

- Intrinsic value incorporates the going-concern assumption, that is, the assumption that a company will continue operating for the foreseeable future. In contrast, liquidation value is the company's value if it were dissolved and its assets sold individually.
- Fair value is the price at which an asset (or liability) would change hands if neither buyer nor seller were under compulsion to buy/sell and both were informed about material underlying facts.
- In addition to stock selection by active traders, valuation is also used for
  - Inferring (extracting) market expectations.
  - Evaluating corporate events.
  - Issuing fairness opinions.
  - Evaluating business strategies and models.
  - Appraising private businesses.
- The valuation process has five steps:
  1. Understanding the business.
  2. Forecasting company performance.
  3. Selecting the appropriate valuation model.
  4. Converting forecasts to a valuation.
  5. Applying the analytical results in the form of recommendations and conclusions.
- Understanding the business includes evaluating industry prospects, competitive position, and corporate strategies, all of which contribute to making more accurate forecasts. Understanding the business also involves analysis of financial reports, including evaluating the quality of a company's earnings.
- In forecasting company performance, a top-down forecasting approach moves from macroeconomic forecasts to industry forecasts and then to individual company and asset forecasts. A bottom-up forecasting approach aggregates individual company forecasts to industry forecasts, which in turn may be aggregated to macroeconomic forecasts.
- Selecting the appropriate valuation approach means choosing an approach that is
  - Consistent with the characteristics of the company being valued.
  - Appropriate given the availability and quality of the data.
  - Consistent with the analyst's valuation purpose and perspective.
- Two broad categories of valuation models are absolute valuation models and relative valuation models.
  - Absolute valuation models specify an asset's intrinsic value, supplying a point estimate of value that can be compared with market price. Present value models of common stock (also called discounted cash flow models) are the most important type of absolute valuation model.
  - Relative valuation models specify an asset's value relative to the value of another asset. As applied to equity valuation, relative valuation is also known as the method of comparables, which involves comparison of a stock's price multiple to a benchmark price multiple. The benchmark price multiple can be based on a similar stock or on the average price multiple of some group of stocks.
- Two important aspects of converting forecasts to valuation are sensitivity analysis and situational adjustments.
  - Sensitivity analysis is an analysis to determine how changes in an assumed input would affect the outcome of an analysis.
  - Situational adjustments include control premiums (premiums for a controlling interest in the company), discounts for lack of marketability (discounts reflecting the lack of a public market for the company's shares), and illiquidity discounts (discounts reflecting the lack of a liquid market for the company's shares).

- Applying valuation conclusions depends on the purpose of the valuation.
- In performing valuations, analysts must hold themselves accountable to both standards of competence and standards of conduct.
- An effective research report
  - Contains timely information.
  - Is written in clear, incisive language.
  - Is objective and well researched, with key assumptions clearly identified.
  - Distinguishes clearly between facts and opinions.
  - Contains analysis, forecasts, valuation, and a recommendation that are internally consistent.
  - Presents sufficient information that the reader can critique the valuation.
  - States the risk factors for an investment in the company.
  - Discloses any potential conflicts of interest faced by the analyst.
- Analysts have an obligation to provide substantive and meaningful content. CFA Institute members have an additional overriding responsibility to adhere to the CFA Institute Code of Ethics and relevant specific Standards of Professional Conduct.

PROBLEMS

1. Critique the statement: "No equity investor needs to understand valuation models because real-time market prices for equities are easy to obtain online."

2. The text defined intrinsic value as "the value of an asset given a hypothetically complete understanding of the asset's investment characteristics." Discuss why "hypothetically" is included in the definition and the practical implication(s).

3. A. Explain why liquidation value is generally not relevant to estimating intrinsic value for profitable companies.
   B. Explain whether making a going-concern assumption would affect the value placed on a company's inventory.

4. Explain how the procedure for using a valuation model to infer market expectations about a company's future growth differs from using the same model to obtain an independent estimate of value.

5. Example 1-1, based on a study of Intel Corporation that used a present value model (Cornell 2001), examined what future revenue growth rates were consistent with Intel's stock price of $61.50 just prior to its earnings announcement, and $43.31 only five days later. The example states, "Using a conservatively low discount rate, Cornell estimated that Intel's price before the announcement, $61.50, was consistent with a forecasted growth rate of 20 percent a year for the subsequent 10 years and then 6 percent per year thereafter." Discuss the implications of using a higher discount rate than Cornell did.

6. Discuss how understanding a company's business (the first step in equity valuation) might be useful in performing a sensitivity analysis related to a valuation of the company.

7. In a research note on the ordinary shares of the Milan Fashion Group (MFG) dated early July 2007 when a recent price was €7.73 and projected annual dividends were €0.05, an analyst stated a target price of €9.20. The research note did not discuss how the target price was obtained or how it should be interpreted. Assume the target price represents the expected price of MFG. What further specific pieces of information would you need to form an opinion on whether MFG was fairly valued, overvalued, or undervalued?

8. You are researching XMI Corporation (XMI). XMI has shown steady earnings-per-share growth (18 percent a year during the past seven years) and trades at a very high multiple to earnings (its P/E is currently 40 percent above the average P/E for a group of the most comparable stocks). XMI has generally grown through acquisition, by using XMI stock to purchase other companies whose stock traded at lower P/Es. In investigating the financial disclosures of these acquired companies and talking to industry contacts, you conclude that XMI has been forcing the companies it acquires to accelerate the payment of expenses before the acquisition deals are closed. As one example, XMI asks acquired companies to immediately pay all pending accounts payable, whether or not they are due. Subsequent to the acquisition, XMI reinstitutes normal expense payment patterns.
   A. What are the effects of XMI's preacquisition expensing policies?
   B. The statement is made that XMI's "P/E is currently 40 percent above the average P/E for a group of the most comparable stocks." What type of valuation model is implicit in that statement?

CHAPTER 2

RETURN CONCEPTS

LEARNING OUTCOMES

After completing this chapter, you will be able to do the following:

- Distinguish among the following return concepts: holding period return, realized return and expected return, required return, discount rate, the return from convergence of price to intrinsic value (given that price does not equal value), and internal rate of return.
- Explain the equity risk premium and its use in required return determination, and demonstrate the use of historical and forward-looking estimation approaches.
- Discuss the strengths and weaknesses of the major methods of estimating the equity risk premium.
- Explain and demonstrate the use of the capital asset pricing model (CAPM), Fama-French model (FFM), the Pastor-Stambaugh model (PSM), macroeconomic multifactor models, and the build-up method (including bond yield plus risk premium method) for estimating the required return on an equity investment.
- Discuss beta estimation for public companies, thinly traded public companies, and nonpublic companies.
- Analyze the strengths and weaknesses of the major methods of estimating the required return on an equity investment.
- Discuss international considerations in required return estimation.
- Explain and calculate the weighted average cost of capital for a company.
- Explain the appropriateness of using a particular rate of return as a discount rate, given a description of the cash flow to be discounted and other relevant facts.

SUMMARY OVERVIEW

In this chapter we introduced several important return concepts. Required returns are important because they are used as discount rates in determining the present value of expected future cash flows. When an investor's intrinsic value estimate for an asset differs from its market price, the investor generally expects to earn the required return plus a return from the convergence of price to value. When an asset's intrinsic value equals price, however, the investor only expects to earn the required return.

For two important approaches to estimating a company's required return, the CAPM and the build-up model, the analyst needs an estimate of the equity risk premium. This chapter

examined realized equity risk premia for a group of major world equity markets and also explained forward-looking estimation methods. For determining the required return on equity, the analyst may choose from the CAPM and various multifactor models such as the Fama-French model and its extensions, examining regression fit statistics to assess the reliability of these methods. For private companies, the analyst can adapt public equity valuation models for required return using public company comparables, or use a build-up model, which starts with the risk-free rate and the estimated equity risk premium and adds additional appropriate risk premia.

When the analyst approaches the valuation of equity indirectly, by first valuing the total firm as the present value of expected future cash flows to all sources of capital, the appropriate discount rate is a weighted average cost of capital based on all sources of capital. Discount rates must be on a nominal (real) basis if cash flows are on a nominal (real) basis.

Among the chapter's major points are the following:

- The return from investing in an asset over a specified time period is called the *holding period return*. *Realized return* refers to a return achieved in the past, and *expected return* refers to an anticipated return over a future time period. A *required return* is the minimum level of expected return that an investor requires to invest in the asset over a specified time period, given the asset's riskiness. The (*market*) *required return*, a required rate of return on an asset that is inferred using market prices or returns, is typically used as the *discount rate* in finding the present values of expected future cash flows. If an asset is perceived (is not perceived) as fairly priced in the marketplace, the required return should (should not) equal the investor's expected return. When an asset is believed to be mispriced, investors should earn a *return from convergence of price to intrinsic value*.
- An estimate of the equity risk premium—the incremental return that investors require for holding equities rather than a risk-free asset—is used in the CAPM and in the build-up approach to required return estimation.
- Approaches to equity risk premium estimation include historical, adjusted historical, and forward-looking approaches.
- In historical estimation, the analyst must decide whether to use a short-term or a long-term government bond rate to represent the risk-free rate and whether to calculate a geometric or arithmetic mean for the equity risk premium estimate. Forward-looking estimates include Gordon growth model estimates, supply-side models, and survey estimates. Adjusted historical estimates can involve an adjustment for biases in data series and an adjustment to incorporate an independent estimate of the equity risk premium.
- The CAPM is a widely used model for required return estimation that uses beta relative to a market portfolio proxy to adjust for risk. The Fama-French model (FFM) is a three factor model that incorporates the market factor, a size factor, and a value factor. The Pastor-Stambaugh extension to the FFM adds a liquidity factor. The bond yield plus risk premium approach finds a required return estimate as the sum of the YTM of the subject company's debt plus a subjective risk premium (often 3 percent to 4 percent).
- When a stock is thinly traded or not publicly traded, its beta may be estimated on the basis of a peer company's beta. The procedure involves unlevering the peer company's beta and then relevering it to reflect the subject company's use of financial leverage. The procedure adjusts for the effect of differences of financial leverage between the peer and subject company.
- Emerging markets pose special challenges to required return estimation. The country spread model estimates the equity risk premium as the equity risk premium for a developed market plus a country premium. The country risk rating model approach uses risk ratings for developed markets to infer risk ratings and equity risk premiums for emerging markets.

- The weighted average cost of capital is used when valuing the total firm and is generally understood as the nominal after-tax weighted average cost of capital, which is used in discounting nominal cash flows to the firm in later chapters. The nominal required return on equity is used in discounting cash flows to equity.

PROBLEMS

1. A Canada-based investor buys shares of Toronto-Dominion Bank (Toronto: TD.TO) for C$72.08 on 15 October 2007, with the intent of holding them for a year. The dividend rate is C$2.11 per year. The investor actually sells the shares on 5 November 2007, for C$69.52. The investor notes the following additional facts:
   - No dividends were paid between 15 October and 5 November.
   - The required return on TD.TO equity was 8.7 percent on an annual basis and 0.161 percent on a weekly basis.

   A. State the lengths of the expected and actual holding periods.
   B. Given that TD.TO was fairly priced, calculate the price appreciation return (capital gains yield) anticipated by the investor given his initial expectations and initial expected holding period.
   C. Calculate the investor's realized return.
   D. Calculate the realized alpha.
2. The estimated betas for AOL Time Warner (NYSE: AOL), J.P. Morgan Chase & Company (NYSE: JPM), and The Boeing Company (NYSE: BA) are 2.50, 1.50, and 0.80, respectively. The risk-free rate of return is 4.35 percent and the equity risk premium is 8.04 percent. Calculate the required rates of return for these three stocks using the CAPM.
3. The estimated factor sensitivities of TerraNova Energy to Fama-French factors and the risk premia associated with those factors are given in the following table:

	Factor Sensitivity	Risk Premium (%)
Market factor	1.20	4.5
Size factor	–0.50	2.7
Value factor	–0.15	4.3

   A. Based on the Fama-French model, calculate the required return for TerraNova Energy using these estimates. Assume that the Treasury bill rate is 4.7 percent.
   B. Describe the expected style characteristics of TerraNova based on its factor sensitivities.
4. Newmont Mining (NYSE: NEM) has an estimated beta of –0.2. The risk-free rate of return is 4.5 percent, and the equity risk premium is estimated to be 7.5 percent. Using the CAPM, calculate the required rate of return for investors in NEM.
5. An analyst wants to account for financial distress and market capitalization as well as market risk in his cost of equity estimate for a particular traded company. Which of the following models is *most appropriate* for achieving that objective?

A. The capital asset pricing model (CAPM)
B. The Fama-French model
C. A macroeconomic factor model

6. The following facts describe Larsen & Toubro Ltd.'s component costs of capital and capital structure:

Component Costs of Capital	
Cost of equity based on the CAPM	15.6%
Pretax cost of debt	8.28%
Tax rate	30%
Target weight in capital structure	equity 80%, debt 20%

Based on the information given, calculate Larsen & Toubro's WACC.

Use the following information to answer Questions 7 through 12.
An equity index is established in 2001 for a country that has relatively recently established a market economy. The index vendor constructed returns for the five years prior to 2001 based on the initial group of companies constituting the index in 2001. Over 2004 to 2006 a series of military confrontations concerning a disputed border disrupted the economy and financial markets. The dispute is conclusively arbitrated at the end of 2006. In total, 10 years of equity market return history is available as of the beginning of 2007. The geometric mean return relative to 10-year government bond returns over 10 years is 2 percent per year. The forward dividend yield on the index is 1 percent. Stock returns over 2004 to 2006 reflect the setbacks but economists predict the country will be on a path of a 4 percent real GDP growth rate by 2009. Earnings in the public corporate sector are expected to grow at a 5 percent per year real growth rate. Consistent with that, the market P/E ratio is expected to grow at 1 percent per year. Although inflation is currently high at 6 percent per year, the long-term forecast is for an inflation rate of 4 percent per year. Although the yield curve has usually been upward sloping, currently the government yield curve is inverted; at the short end, yields are 9 percent and at 10-year maturities, yields are 7 percent.

7. The inclusion of index returns prior to 2001 would be expected to
A. Bias the historical equity risk premium estimate upwards.
B. Bias the historical equity risk premium estimate downwards.
C. Have no effect on the historical equity risk premium estimate.

8. The events of 2004 to 2006 would be expected to
A. Bias the historical equity risk premium estimate upwards.
B. Bias the historical equity risk premium estimate downwards.
C. Have no effect on the historical equity risk premium estimate.

9. In the current interest rate environment, using a required return estimate based on the short-term government bond rate and a historical equity risk premium defined in terms of a short-term government bond rate would be expected to

A. Bias long-term required return on equity estimates upwards.
B. Bias long-term required return on equity estimates downwards.
C. Have no effect on long-term required return on equity estimates.

10. A supply-side estimate of the equity risk premium as presented by the Ibbotson-Chen earnings model is *closest* to
    A. 3.2 percent.
    B. 4.0 percent.
    C. 4.3 percent.

11. Common stock issues in this market with average systematic risk are *most likely* to have required rates of return
    A. Between 2 percent and 7 percent.
    B. Between 7 percent and 9 percent.
    C. At 9 percent or greater.

12. Which of the following statements is *most accurate*? If two equity issues have the same market risk but the first issue has higher leverage, greater liquidity, and a higher required return, the higher required return is most likely the result of the first issue's
    A. Greater liquidity.
    B. Higher leverage.
    C. Higher leverage and greater liquidity.