

Valuation for Mergers, Buyouts and Restructuring

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Abstract

Valuation for Mergers, Buyouts and Restructuring presents a comprehensive approach to corporate valuation. It treats in detail the valuation of mergers, acquisitions and leverage buyouts, and the assessment of asset restructuring options and recapitalization plans. It contains valuation procedures and examples for the different types of transactions and contractual arrangements commonly encountered in practice. It also discusses the theoretical underpinnings and the research evidence that justifies the recommended procedures.

The book is intended as the core text for corporate valuation courses taught to finance majors in undergraduate and MBA programs. It is also a reference source for professionals involved in transaction valuation.

The book assumes that readers are familiar with basic accounting and finance concepts. The mathematical requirement is limited to basic algebra with the exception of a few sections on option pricing applications that use calculus notation. Mathematical details have been relegated to notes at the end of the book.

Valuation procedures: The book provides detailed procedures for undertaking the following tasks:

- Valuation of stand-alone companies and business units with procedures for testing assumptions and results.
- Valuation of a merged firm involving the combination of two or more companies or business units, including expected price share impact, valuation of synergies, accretion-dilution analysis, and scenario analysis.
- Valuation of firms in developed and emerging markets, and how to treat foreign exchange translation, inflation, and country risk.
- Assessment of the value creation potential of business units and their restructuring options in terms of economic value added.
- Structuring and valuing leveraged buyouts and the recapitalization of troubled companies.
- Valuation of contingent clauses and agreements commonly included in the terms of a transaction.
- Valuation of real options in mergers and acquisitions involving postponement, entry, foothold, and exit options.

Tools: In addition to the description and examples of the procedure to follow in each task, the book provides a detailed treatment of the required tools of analysis:

- How to estimate the cost of capital for public and private companies from developed and emerging markets.
- How to perform discounted cash-flow valuation.
- How to estimate and apply valuation multiples.
- How to estimate the sustainable debt of a company and the debt capacity of a highly leveraged transaction.
- How to compute economic value added for companies and business units.
- How to value companies with changing capital structures.
- How to value financial and real options.

Software: Most of the valuation analyses treated in this book can be performed using generally available spreadsheet software. Specialized computations can be carried out with the software contained in the Valuation Aids CD-ROM included with this book. In particular, Valuation Aids has programs for estimating the prospective equity premium and valuing financial and real options.

A companion publication: *Modeling Mergers and Buyouts with DealModeler®: User's Manual and DealModeler Software*, John Wiley and Sons, 2004, contains a comprehensive financial modeling Excel workbook, and its instructor manual. This software generates accounting closing statements, stand-alone and consolidated pro-forma financial statements, and the valuation of mergers, acquisitions and buyouts using discounted cash flow and accretion-dilution analysis. DealModeler® is not required to reproduce the spreadsheets presented in this book or to apply its procedures.

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Overview of the Book

This book is organized in three parts. Part I contains the main methods used in valuation of companies and their business units, Part II applies these methods to the valuation of mergers, acquisitions and leveraged buyouts and Part III deals with recapitalization and restructuring analyses.

Readers interested in getting a detailed grounding on the different aspects of transaction valuation can follow the order of presentation of the book. Those using the book as a reference on valuation of particular transactions can read selected chapters as explained next.

1. Valuation of stand-alone firms and business units

Free cash flow valuation. The valuation of a stand-alone company or one of its business units is a common practical problem. Chapters 2 and 4 provide the background necessary to perform this type of valuation. Chapter 2 is an introduction to financial modeling and the valuation approach followed in the book and should be read first, even by those already familiar with the methods of free-cash flow valuation since it provides the foundation upon which the rest of the book is based as well a common terminology.

Chapter 2 presents a self-contained description of valuation based upon discounting the free cash flows generated by the enterprise. It shows how to compute free-cash flows and the weighted average cost of capital (WACC) in order to obtain the value of the enterprise, which is the value of the claims held by equity-holders as well as bondholders. From the enterprise value one can calculate the value of equity by subtracting the value of the outstanding net debt. This chapter also shows how to value equity directly from the cash flows available to equity-holders and discusses under what conditions each approach is appropriate.

In addition to the mechanics of valuation, Chapter 2 includes sections on sensitivity analysis, the examination and testing of the determinants of value and how to incorporate the effect of personal taxes on valuation, as well as the balance sheets adjustments that need to be made in order to complete the valuation of a company or a business unit.

Cost of capital. Chapter 3 provides a detailed discussion of the state-of-the-art approach to estimating the costs of equity and debt. In particular, the several approaches used in practice for estimating the equity premium and the cost of equity are surveyed and a procedure for estimating the prospective equity premium implicit in current stock prices is presented. In addition, this chapter deals with a number of technical aspects such as the proper way of adjusting the cost of equity for leverage and the additional premium required by investors from small capitalization companies. An spreadsheet containing an Equity Premium

Calculator is provided. It permits calculating the prospective equity premium weekly with generally available capital market data.

Valuation multiples. Chapter 4 discusses the use of multiples in valuation. In particular, the use of EBITDA (earnings before interest taxes depreciation and amortization) multiples to complement and test the results of discounted cash flow valuation. The spreadsheet Equivalent Multiple Calculator included in the Valuation Aids CD-ROM permits computing one type of multiple from another for a given set of company characteristics and to decompose multiples into their franchise and growth factors.

2. Economic value added

A number of firms around the world have adopted the economic value added approach to incentive compensation. This has led many of those companies to integrate their valuation methods with economic value added accounting in order to follow a unified approach to investment decisions and managerial incentive compensation. Chapter 5 shows how to value companies by discounting yearly economic value added in a way consistent with free-cash flow valuation and how to use it for examining and testing the sources of value. The economic value added approach is applied in Chapter 15 to the valuation of restructuring decisions.

3. Valuation with changing capital structure

The assumption of constant leverage ratio commonly made and adopted in Chapter 2 is often not met in practice. Chapter 6 examines the valuation of firms with changing capital structure. It shows that valuations made by discounting cash flows at WACC with constant weights are quite robust to large fluctuations in the debt ratio. In addition, for those situations in which leverage departures from their initial values are persistent, Chapter 6 introduces alternative valuation procedures and discusses when the use of each of them is appropriate. These procedures are: Adjusted present value (APV), two extensions of it: compressed APV and recursive APV, and an option-pricing model for the valuation of equity with uncertain debt retirement. Recursive APV and option pricing of equity can be made with the provided spreadsheet model HLF Value Calculator.

4. Valuation in developed and emerging markets

Chapter 2 deals with the valuation of a domestic company in a developed capital market. The expansion of the global economy has made common need the valuation of foreign acquisitions. This requires dealing with the translation of foreign currency cash flows and the estimation of the relevant cost of capital. In addition, issues of high inflation and potential devaluation need to be addressed and, if the company is located in an emerging market, an allowance for country

risk needs to be made. These issues are dealt with in Chapter 12, which provides the appropriate extension of the valuation model introduced in Chapter 2.

5. Merger and acquisitions

Those readers particularly interested in the structure and valuation of a merger transaction can go directly to Chapter 9 after having read Chapter 2.

Chapter 9 examines the analysis and valuation of mergers and acquisitions, including the legal form of the transactions and its accounting and tax treatments. It shows how to apply valuation tools and concepts to (i) estimating how the terms of the merger affect the shareholders of the bidder and the target, (ii) estimating the value of expected synergies and (iii) testing the robustness of the assumptions upon which the transactions is predicated.

6. Deal design and special offer structures

The parties to a transaction often disagree about the value of the asset in question. Chapter 10 discusses contractual arrangements that allow the parties to agree to disagree by establishing that the final price of the transaction be contingent on the realization of certain performance values, such as the attainment of a level of revenue or EBITDA. These contractual arrangements are generally called earnouts and are properly conceptualized and valued as options. This chapter discusses a number of arrangements made in negotiating stakes in new ventures, buyouts or acquisitions and shows how to value them using option pricing techniques.

Chapter 11 examines in detail merger structures with price guarantees and collars and shows how to value them with option pricing techniques. (The software for this purpose is included in the Valuation Aids CD-ROM.)

7. Leveraged buyouts

Readers interested in the structure and valuation of leveraged buyouts should refer to Chapters 7, Chapter 9, and 13. Chapter 7 provides an introduction to the concept of debt capacity and the relationship between growth and financing sources, as well as a detailed discussion of the concept of sustainable debt and its determination. In particular, it presents a model for estimating the debt capacity of a leveraged buyout or a leveraged recapitalization. Computation of debt capacity can be made with the Debt Capacity Calculator included in the Valuation Aids CD-ROM.

Chapter 9 deals with the legal form of acquisitions and its tax treatments. Further discussion of the financial structure and valuation of LBOs is made in Chapter 13, which deals with the determination of the financial sponsor's affordable bid and

the estimation of the expected returns to the sponsor, management and other suppliers of capital.

8. Recapitalization of troubled companies

Chapter 14 is a continuation of Chapter 13. Recapitalizing a distressed company is similar to structuring an LBO in the sense that both use all the debt capacity they can realistically manage and that the cash flow available to subordinated holders is in the distant future. Chapter 13 presents the basic framework for recapitalizations, discusses the options available in and out of court and examines their tax consequences. It shows how to carry out realistic analyses of debt capacity and how to value the several instruments offered in exchange for the existing claims, both of which are essential elements of any recapitalization plan.

9. Asset restructuring

Chapter 15 deals with sum-of-the-parts valuation and restructuring actions for increasing shareholder value and closing the value gap, including asset sales, spin-offs and carve-outs and shows how to use economic value added concepts and valuation to develop a restructuring plan. This chapter applies many of the concepts and analyses developed in Chapter 9 and should be read after having studied the latter. It complements Chapter 14 because recapitalizations under distress often require sale of assets and restructuring operations.

10. Real options: valuing entry and exit options. As usually applied, the discounted cash flow approach fails to properly value the option to exit the business under poor realizations of cash flows or the option to further invest in the business when future conditions warrant it. Chapter 8 deals with the valuation of entry and exit options, as well as valuation of the option to establish a foothold in a potential market before deciding whether or not to carry out a full-scale expansion. This is done by applying option pricing theory. Chapter 8 presents the option pricing models and illustrates their application. In addition, it shows how to examine the robustness of the discounted cash flow (DCF) valuation in the presence of real options. Computation of the value of real options can be carried out using the provided spreadsheets Real Option Calculators I and II.

11. Financial options. In addition to the specialized models computed with the real option software, a number of real options can be valued by the direct application of models developed for the valuation of financial options. Appendix A reviews the valuation of number of common financial options (European, American and Asian calls, puts, warrants and knock-out options) and illustrates their application and computation with the Financial Options Calculator included in the Valuation Aids CD-ROM.

12. Technical notes and problems

Chapter notes are collected at the end of the book. They deal with technical aspects, extensions and proofs of some assertions made in the main text. Their study is not required to understand the main text or to successfully apply its valuations procedures. Most notes use simple algebra, with the exception of the notes to Chapter 8 and Appendix A, which require familiarity with differential calculus.

Review problems are included at the end of each chapter. They are meant to reinforce and complement the concepts presented in the main text. Solutions to selected problems are provided at the end of the book.

Valuation Aids Software

The Valuation Aids CD-ROM contains a number of Excel spreadsheets written to assist the reader in applying the models presented in this book. It includes:

- **Equity Premium Calculator:** This spreadsheet calculates the prospective equity premium implied by the one-year forward P/E multiple of the S&P500 index. Additional inputs required are: 5-year consensus growth rate of earnings, the long-term growth rate of earnings, present and long-term payout ratios, and the annually compound yield on the 10-year government bond benchmark. The prospective equity premium is defined as the difference between the rate required by investors on a market portfolio and the long-term government yield. The required return on equity is the rate that equates the present value of the future dividends of the market portfolio to the value of the portfolio. See Chapter 3 for details.
- **Equivalent Multiple Calculator:** This workbook calculates equivalent forward or trailing valuation multiples from any given multiple and parameters values characterizing the earnings of the firm. It permits calculating a different multiple from a known multiple, checking a given multiple against another known multiple, and adjusting comparable multiples for different debt ratios and growth rates. In each case the corresponding common-size income statements (for \$100 revenues) are calculated to facilitate interpretation of the results. It also decomposes multiples into their no-growth value and the franchise and growth factors. For a discussion of the formulas used in this workbook see Chapter 4.
- **Debt Capacity Calculator:** Computes the debt capacity of a company for a given period of amortization of senior debt principal under assumptions about sales growth, EBITDA margins, non-cash items, capital expenditures, changes in working capital, proportions of senior and subordinated debt and interest rates. Its use is shown in Chapters 7 and 13.
- **HLF Value Calculator:** Computes the enterprise and equity values of a highly leveraged firm that plans to reduce its leverage over a number of years by applying its free cash flow to paying interest and debt reduction. Two models are provided: a recursive adjusted present value model and an option-pricing model. Both models are described and applied in Chapter 6.
- **Financial Options Calculator:** Provides programs for calculating the values and implied volatilities of European, American, Asian and knock-out options, and values of European and American warrants. These options are used in Chapters 6, 8, 10, 11, 13 and 15. Appendix A provides additional details and review problems.

- **Real Options Calculator I:** Provides an algorithm for valuing firms with entry and exit options. Examples of its use are provided in Chapters 8 and 10.
- **Real Options Calculator II:** Values firms with foothold and growth options using a version of the explicit finite difference algorithm. Applications are discussed in Chapter 8. The algorithm is described in a technical note.

DealModeler[®]

DealModeler[®] is an integrated financial modeling software for preparing pro-forma financial statements and performing valuation of mergers, acquisitions and leveraged buyouts, similar to those used by investment bankers and appraisal professionals. It is contained in the separate publication: *Modeling Mergers and Buyouts with DealModeler: User's Manual and DealModeler Software*, John Wiley & Sons, 2005. It

DealModeler[®] permits the analysis of stand-alone acquisitions or a merger involving an acquirer and up to two targets or one target with a division that requires separate treatment. It permits the consolidation of the target with a subsidiary and the complete consolidation of the surviving subsidiary into the holding company by simply specifying the units involved in the transaction. Similarly, it permits modeling a single LBO or roll-up LBOs, with an initial investment (the acquirer) and up to two add-on acquisitions.

DealModeler[®] generates:

- Pro-forma financial statements (balance sheet, income and cash flow statements) for a projection period of up to 10 years.
- Closing balance sheet with the accounting entries made at the closing of the transaction.
- WACC, economic value added and APV valuation of free cash flows for valuing stand-alone targets and/or merged companies.
- LBO valuation of sponsor, management and mezzanine investors' returns.
- Summary statements of
 - a. Enterprise purchase price
 - b. Transaction sources and uses of funds
 - c. M&A valuation multiples paid and break-even synergies
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