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Review of *Present Value Models and Investment Analysis* by Lindon J. Robison and Peter J. Barry

Charles B. Moss

In general, the textbook provides a comprehensive overview of the use of present value analysis. Each section covers a particular subject, such as ranking alternative investments using text, equations and graphics. The primary narrative is supplemented with example boxes and other examples incorporated directly into the narrative. The book also provides review questions and applications questions at the end of each chapter.

The textbook is divided into five major parts: (1) "Introduction to Present Value Models," (2) "Constructing Present Value Models," (3) "Economic Analysis Using Present Value Models," (4) "Applications of Present Value Models, "and (5) "Optimization and Present Value Models." Each of these parts contains two to nine chapters with the greatest amount of text being dedicated to part 4.

Chapter Contents

Part 1, "Introduction to Present Value Models," lays out the basic concepts of investment analysis. This section first develops an historical background into the present value formulation and then discusses the investment scenario from individual and firm perspectives. Given this overview, the next challenge is to develop the general approaches of integrating the time value of money into the decision framework. Chapter 2 also compares the time valued approaches to other methods such as the payback method.

In its most general terms, the second major part of the text lays the foundation for actual present value analysis by examining its component parts. The first chapter of this section focuses on the notion of opportunity cost within the challenger/defender framework. Given the notion of opportunity cost, the next chapter then turns to the notions of consistency. The text indicates that the consistency principles are intended to ensure the correct investment decision will be made because the salient attributes of the investment decision are comparable. The text then focuses on geometric series which can be used to simplify the mathematics of present value analysis. Finally, the text the present value criteria is presented as a way to rank investment alternatives.

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Given the basic formulation of net present value analysis developed in the preceding section, part 3 of the text continues by examining some caveats and explicit applications of present value analysis. This part is possibly mislabeled. A more appropriate title might be "Building on the Basic Formulation." Two basic caveats/extensions are presented in this part of the book: The first extension/caveat involves the incorporation of financial considerations, such as liquidity and financing gaps for investments that may otherwise be very profitable. I believe this chapter to be one of the book's best. The second major caveat/extension is the impact of tax on investment analysis. Most of the discussion in this section involves the incorporation of tax considerations into the challenger/defender framework. However, the authors note that if the capital for the investment is to be raised by debt, the traditional r(1-T) adjustment is acceptable.

Building on these caveats/extensions of the traditional present value formulation, the text turns to three interpretations. The first interpretation deals with the distinction between accounting and economic rates of return. While both measures are based on internal rate of return type measures, differences occur in the change in the value of the asset over time. Accounting-based rates of return are based on historical cost accounting schemes and, as such, fail to recognize changes in asset values, such as appreciation or depreciation, in a manner not prescribed by generally accepted accounting principles. As such, the accounting rate of return may misstate the true rate of return on an investment. The second interpretation of the present value framework involves the valuation of durables, most notably land. Of particular concern in Chapter 10 is the valuation of farmland when conversion into nonfarm uses is anticipated. Finally, the last extension is the incorporation of risk into the present value using the results of the capital asset pricing model (CAPM). This section focuses directly on the application of the CAPM results without a detailed derivation of the pricing theorem itself.

One desirable attribute of this text is that it dedicates almost 40 percent of its pages to applications of present value analysis. Thus, instead of simply developing present value as an abstract tool and conjecturing that it can be used to accomplish useful business analyses, the book actually develops applications of the numerical procedure. This section of the text includes nine chapters, each highlighting a particular application. These applications include loan analysis, financial investments, land purchase/sale, farm management applications, applications to privately owned natural resources, enterprise budgeting, lease/purchase decisions, project analysis and the valuation of research.

The typical coverage in each of these applications can be found in Chapter 14 on land purchase/sale decisions. This chapter starts off with a typical discussion of the maximum bid model for land under the assumption that returns to land grow over time. Within the typical present value model, Robison and Barry adjust for buyer and seller transaction cost. After developing the maximum and minimum bid price models, the text turns to a discussion of land values and liquidity. The basic notion

of this section is that transaction costs can yield a range of prices that are both too low for the seller and too high for the buyer, even with homogeneous expectations about future rents. This spread reduces the liquidity of the asset. Next, going back to the original model, the authors develop consequences of both real estate and income taxes on the valuation of farmland. After discussing the implications of taxation, the study describes the possible incentives of seller financing. The chapter then ends with a sample application.

Given the extensive overview of typical applications, the text then finishes with four advanced applications of present value analysis. The first advanced application involves the determination of the optimal replacement time for a durable asset. The discussion of the replacement model is followed by a chapter on the design of depreciable assets. Finally, the book includes chapters on advanced considerations of risk analysis in present value models and dynamic optimization.

Placing the Textbook in the Literature

In attempting to place the textbook reviewed into the literature, it is difficult to separate my comments on the book from the courses I have offered. A compounding factor to this difficulty is the text's specificity towards investment analysis. I have not taught a course specialized toward investment analysis. Instead, I typically include investment analysis within a comprehensive survey of agricultural finance. As such, the Robison and Barry text could not be used as the sole textbook. However, the textbook does compare favorably with Bussey which I have used as a supplemental text in a master's level finance course. The advantage of Robison and Barry over Bussey is their focus on agriculture and agricultural issues. In addition, Robison and Barry provide similar treatments for comparisons of projects with unequal lives and reinvestment assumptions in internal rate of return formulations, although Bussey's coverage is somewhat more in depth in each case.

Mathematically, the textbook should be fairly accessible to students with modest backgrounds in calculus. Specifically, instead of structured proofs, Robison and Barry lead through proofs on geometric series in a rather low-key example format. In addition, the text focuses more on application than on proof. Thus, any mathematical proofs, while useful for understanding the specific point of inference, should not compromise the usefulness of the reference.

Taking these factors into account, I can see using the reference in an advanced undergraduate/master's level course in agricultural finance in addition to another reference. Specifically, I would consider using parts 1-3 to provide an overview of investment analysis. Given this background, individual chapters from parts 4 and 5 could be used as time allows. In particular, I would recommend Chapter 13, "Stocks, Bonds, and Other Financial Investments," Chapter 14, "Transaction Costs and Land

Purchase/Sale Decisions," Chapter 18, "Leasing Decisions," and Chapter 19, "Project Analysis" at the advanced undergraduate level, bringing in Chapter 21, "Replacement Principles," and Chapter 22, "Design and Selection of Depreciable Assets," at the master's level.

Miscellaneous Issues

While I found the text to be an excellent overview, I do have two reservations. The first involves the discussion of the choice of discount rate for the present value analysis. By focusing on the defender/challenger relationship, Robison and Barry tend to support an investment-specific discount rate. In other words, the appropriate discount rate is internal rate of return for the defender which must be sacrificed to make funds available for the acquisition of the challenger. If the challenger involves acquiring a loan, the discount rate is then the price of the loan together with any transaction cost involved in getting the loan. While this approach is consistent with the firm level focus of the text, it does lead to the unfortunate result that two firms may have different values for the same investment depending on the financial resources available to each firm. In some sense, evaluating an investment in this manner enmeshes gains to financing with the value of the investment. Of course, one could argue that it is the enmeshing which is important for analyzing options such as lease/purchase decisions. The second shortcoming of the textbook is the paucity of discussion regarding the term structure of interest rates.

Notes

The reviewer is an Associate Professor in the Food and Resource Economics Department, University of Florida, Gainesville.

References

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