Investment Analysis for Real Estate Decisions

Eighth Edition

PHILLIP T. KOLBE, GAYLON E. GREER, AND BENNIE D. WALLER JR.

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To our beautiful brides, whose love and understanding were felt and appreciated during the many hours of writing and rewriting.
Previous editions of *Investment Analysis for Real Estate Decisions* were reviewed by Joseph Albert, James Madison University; Jaime R. Alavyay, California State University; Roger Cannaday, University of Illinois; Charles P. Edmonds III, Auburn University; Charles Floyd, University of Georgia; William Goolsby, Washington State University; Hans R. Isakson, University of Northern Iowa; Robert Mendelson, then of Southern Illinois University; Wade Ragas, University of New Orleans; James Vernon, Georgia State University; Leonard Zumpano, University of Alabama; Wayne Archer, University of Florida; Jerome Dasso, University of Oregon; Edwin E. Morgan, Baldwin-Wallace College; R. Keith Preddy, University of Tulsa; Linda Simms, then of DePaul University; Andy Do, San Diego State University; Paul R. Goebel, Texas Tech University; Samuel Goldman, New Mexico State University; Joseph J. Virostek, Duquesne University; Marcus T. Allen, Florida Gulf Coast University; Waldo Born, Eastern Illinois University; William J. Cahaney, Jefferson Community College; J. Douglas Timmons, Department of Economics and Finance, Middle Tennessee State University; William Voelker, University of Illinois; Robert Kaczmarek, ABR, Eclipse Realty, LLC; Deborah H. Long, EdD, DREI; Dr. Greg Smersh, Florida State University; and H. Shelton Weeks, Florida Gulf Coast University. Additional consultation was provided by Victor Abraham, University of California at Los Angeles; Fred A. Forgey, University of Texas at Austin; Jonathan C. Keefe, Boston University; Michael J. Murray, Winona State University; Ronald C. Rogers, University of South Carolina; and Jeffrey J. Rymazewski, School of Business Administration, University of Wisconsin, Milwaukee. (Note: All professional and school designations are current as of the time of the review.)

This eighth edition was reviewed by Mark Sunderman, professor and holder of the Morris Fogelman Real Estate Chair of Excellence at the University of Memphis.

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The three most important things in real estate are still location, location, location, but the industry is going through many transformations. The latest edition of this text reflects those changes. The eighth edition of *Investment Analysis for Real Estate Decisions* also reflects the impact of the many students and professors who have used earlier versions. We listened to both for advice on how to improve the text and incorporated it where it seemed wise. As has been said many times, including by us, we have been careful not to fix what isn’t broken. The eighth edition retains the structure, format, and tone that proved comfortable to users of earlier editions. The general organization has been retained: eight parts, with each part followed by case problems designed to illustrate the operation of principles explained in that part. The case problems, structured to reflect situations that occur in the real world of real estate, are coordinated so that a continuing case runs throughout the text. Yet the cases are still designed so that they can be used individually. An answer key for textbook questions is provided online.

**KEY CHANGES IN THE EIGHTH EDITION**

The most important change in this edition is the updating of material. Current real estate market data were incorporated throughout. The increased production of real estate research, including that in several new real estate journals, is reflected in the recommended readings at the end of each chapter. We have continued to expand the Internet references because of its growing relevance and ease of use. Problems, examples, and review questions have also been enhanced. The use of calculator boxes was expanded where applicable to illustrate the use of financial calculators in problems. The keystrokes illustrated are those for the most common financial calculators, such as the HP-12C, HP-10B II, and HP-17BII, from Hewlett-Packard; the BA-II Plus and BA-35, from Texas Instruments; and the EL-733A and EL-1071S, from Sharp.

**Student Spreadsheet Software**

To facilitate the use of computerized spreadsheets in solving the end-of-part case problems, a spreadsheet template is available to all schools using this text via Dearborn’s Instructor Resources Web site at www.dearborn.com. To access these files, please go to the instructor resources section there and click on *Investment Analysis for Real Estate Decisions, Eighth Edition*. An icon appears in the margin next to those case problems with which the student spreadsheet software can be used.
Rational Organization

To guide students through the material, each of the text’s eight parts begins with a brief explanation of purpose. Each part covers a subject that is fundamental to informed investment decision making:

- Part One sets the stage by explaining fundamental terms and concepts used throughout the text. It describes a widely accepted analytical framework and introduces relevant basic economic ideas.
- Part Two emphasizes the essential nature of market research, introduces key marketing concepts, and shows how market research is used to estimate future benefits from ownership.
- Part Three introduces the environment of mortgage lending, demonstrates the likely consequences of using borrowed money, and discusses commonly used credit instruments.
- Part Four explains relevant income tax provisions.
- Part Five covers ratio analysis and discounted cash flow analysis and shows how to apply modern decision criteria to investment analysis.
- Part Six introduces traditional and modern risk analysis. The chapters provide for choice in one’s degree of immersion in this complex yet essential subject.
- Part Seven illustrates the use of discounted cash flow analysis to make investment decisions regarding several major categories of real estate.
- Part Eight addresses the growing dimension of real estate as a security.

A Book of Many Teaching Paths

*Investment Analysis for Real Estate Decisions* has been extensively adopted for both graduate and undergraduate use. While crafting the eighth edition, we kept that dual role in mind. We also communicated with professors who use the text in a variety of real estate courses. As a consequence, *Investment Analysis for Real Estate Decisions* continues to accommodate many teaching paths. Instructors who stress the discipline’s theoretical aspects can omit Parts Six and Seven. Those who prefer to emphasize practical applications can omit Chapters 2, 3, 14, 17, and 18. Many schools offer a course that combines real estate investment and finance. Dearborn offers a package with both *Investment Analysis for Real Estate Decisions* and *Real Estate Finance*. The instructor’s manual maps several alternative paths and provides additional suggestions for using the book.
Fundamental Issues in Real Estate Investment Analysis

When real estate assets are considered for investors’ portfolios, these investors face a bewildering array of alternatives. They must select from among myriad combinations of opportunities that differ not only in the amount and timing of expected investment benefits but also in the degree of confidence with which investors hold their expectations.

Rational decision making under such circumstances tries even the most educated and experienced investment analysts. Approaches range from snap judgments based on little more than hunches or “hot tips” to carefully calculated decisions backed by research and sophisticated analysis. These first three chapters lay the groundwork for the latter approach. The nature of the investment decision, the market environment in which decisions must be made, and basic considerations incorporated into rational investment analysis are all addressed in Part One.
1

The Real Estate Investment Decision
An attorney purchases a $200,000 interest in a condominium on the beach; a doctor puts $10,000 into a real estate investment trust; a real estate broker buys an $800,000 apartment building; a manufacturing firm invests millions in a new plant; the U.S. government spends billions to create a dam and reservoir system. All have made real estate investment decisions. As diverse as they appear, all these decisions have a common element: each requires giving up something now in expectation of future benefits. The sacrifice is immediate and certain; rewards will be received in the future, if at all.

The problem is compounded because investors generally have more opportunities than they have resources. They have to choose, and they always have incomplete information. The only way to avoid getting lost in a maddening maze of alternatives is to rank them by their likely contribution to investment objectives, subject to constraints imposed by liquidity needs and ability to tolerate risk.
INVESTMENT ANALYSIS: ART AND SCIENCE

Real estate investment analysis has consistently lagged behind mainstream finance and investment thought. It wasn’t until the late 1960s and early 1970s, for example, that analytical tools and techniques pioneered by economists and corporate financial analysts in the 1950s began to appear in real estate literature. Writing for the *Appraisal Journal* in 1970, Richard Ratcliff and Bernhard Schwab decried the virtual absence from real estate appraisal and investment literature of terms such as *probability*, *utility function*, and *time value of money*, which were used routinely by investment decision theorists.¹

More recently, modern decision theory has been grafted onto traditional real estate analysis, and the equity valuation technique explained in later chapters has been widely adopted. Computerized modeling to forecast after-tax cash flows and explore the impact of variance from expected operating results or changes in the operating environment (such as altered tax law, new government regulations, or shifts in the economic climate) are now commonplace.

State-of-the-art investment analysis treats real estate as a capital asset desired for the stream of benefits it generates. In this context, real estate becomes a special case of modern capital budgeting. Its analysis can utilize discounted cash flow techniques and incorporates risk adjustments.

WHO ARE REAL ESTATE INVESTORS?

Personal success stories and how-to-books have conditioned us to think of real estate investment as the province of individual investors. Yet real estate has become a major asset in the portfolios of many institutions, and foreign investors have found U.S. real estate equities to be increasingly attractive.

Institutional Investors

With some false starts, real estate investment trusts and pension funds have become major investors in real estate equities. This is due in large part to changes in federal law: a 1961 Internal Revenue Code revision exempts distributed real estate investment trust (REIT) earnings from taxation at the corporate level. Subsequent tax law changes liberalized REIT operating rules: the Employee Retirement Income Security Act of 1974 (ERISA) directed pension fund managers to diversify their portfolios and thus encouraged them to move more aggressively into real estate equities.

*Pension funds*

Because of their steady and predictable streams of cash flow, pension funds are ideal real estate investors. Yet their investment in real estate was slight until the 1970s. They moved in aggressively, however, when ERISA mandated more portfolio diversification. After retreating somewhat following market reverses of the late 1980s, they

were back in force by the mid-1990s. In 2012, aggregate pension fund capital in real estate exceeded $3 trillion.\(^2\) Because real estate represents 6.3 percent of total pension funds’ assets, there is considerable room for growth.\(^3\)

**Real estate investment trusts**

In 2011, the National Association of Real Estate Investment Trusts reported that 130 member REITs that invest primarily in real estate equities had a market capitalization (aggregate market value of all shares) of approximately $408 billion.\(^4\) Many specialize in certain types of real estate, such as apartments, shopping centers, or office or industrial buildings. Others prefer to hold diversified portfolios. Figure 1.1 shows the capitalization of real estate equity investments by REITs in 2012, by type of property held.

**Foreign Participation in U.S. Real Estate Markets**

Foreigners directly own a very small percentage of U.S. real estate—about 8.9 percent of its dollar value in 2012, according to one estimate.\(^5\) The impact of these non-native property owners is distorted by disproportionate representation in certain parts of the country and in specific types of property. For example, the National Association of REALTORS\(^6\) reports that in 2012, five states accounted for 55 percent of international

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\(^3\) Ibid.


sales—Florida, California, Texas, Arizona, and New York. Government studies, though inconclusive, indicate that foreign direct investment surged during the early 1980s, then stabilized by the middle of that decade but—at least through 1987—remained high by historical standards. Real estate equities fell into widespread disfavor among foreign investors in the late 1980s, but the market heated up again in the early 1990s and at the beginning of this century. The percentage of real estate investments held by foreign interests more than doubled from 4 percent in 2001 to 8.9 percent in 2012.

Foreign interest in U.S. real estate seems heavily affected by two key factors: foreign exchange rates and relative interest rates between countries. These factors sometimes push demand in the same direction; at other times, they work at cross-purposes.

The influence of exchange rates
When shifts in foreign exchange rates make dollars relatively less expensive to holders of a foreign currency, as they have recently, U.S. real estate also becomes less costly to acquire. Suppose, for example, the euro sells for $1.20 on the foreign exchange market; a $9 million office building in Chicago will cost 7.5 million euros. If this and a comparable building in Paris generate the same operating income and have the same appreciation potential, investors might be indifferent between them. But suppose the euro climbs in value so that it trades at $1.50. Now the $9 million Chicago property costs only 6 million euros, while the comparable building in Paris still costs 7 million euros; holders of euros will be inclined to invest in the United States.

The currency of a country tends to appreciate on foreign exchange markets when that country’s economic and political prospects appear particularly sound. Thus, prosperity and political stability create a lure for foreign investors.

The relevance of relative interest rates
When interest rates in a country are higher than those in the country with whom one is trading, the higher rates tend to depress real estate prices, while lower rates elsewhere tend to inflate property prices there. The disparity makes real estate in the high-interest-rate country relatively more attractive.

Factors other than relative cost can influence the decision to invest in foreign real estate. Due to relative economic conditions, foreign real estate may offer the prospect of greater returns relative to risk, or it might reduce overall portfolio risk. Furthermore, investors might consider foreign real estate as a way to hedge against political risk.

**WHY INVEST IN REAL ESTATE?**

Real estate investors, either directly or indirectly, purchase rights to a stream of future cash flows that are expected to be generated by the real estate. The cash flows might come from rental income, from using the property as loan collateral, from cash savings through offsetting otherwise taxable income with tax-deductible losses from the real property interest, or from net profits upon resale of the property interest.

The price an investor is prepared to pay for a defined property interest depends in part on the amount and the timing of these anticipated cash flows; how much will be received, and when? It depends also on the degree of confidence with which
expectations are held and the investor’s tolerance for bearing risk. The final variable is the attractiveness of alternative investment opportunities.

Virtually any investment goal can be accommodated with a position in real estate. Speculators can deal in real estate futures (by buying and selling purchase options); developers can reduce risk exposure by using standby loan commitments or taking a position in interest rate futures; investors can buy fixed-income assets such as mortgage loans or net leased properties. Real estate may be even more attractive when approached not as a simple investment, but rather as a business opportunity.

In short, the possibilities are constrained primarily by limits on investors’ ability to conceive of alternatives. In Figure 1.2, investors are categorized in four ways: by the nature of their claims (debt or equity) and according to their degree of involvement in operations (passive or active).

**Passive and Active Investors**

Many investors acquire direct title to real estate in which they invest, and they either oversee its operation themselves or hire professional property management firms to handle day-to-day operations. In Figure 1.2, they are characterized as active investors. Their key distinguishing characteristic is that they make decisions—selecting on-site management personnel, negotiating maintenance contracts, making rental rate decisions, approving leases, and so forth—that directly affect operating results.

In contrast, passive investors make no operating decisions. They turn their wealth over to professional asset managers, who in turn acquire interests in real estate, or they acquire shares in corporations, partnerships, or trusts that hold extensive real property interests. In any event, their decisions have little direct impact on the outcome of real estate operations.

### Figure 1.2 | Variety in Real Estate Investments

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<th>Equity</th>
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<td><strong>Active</strong></td>
<td>Loan origination</td>
<td>Direct ownership of rental property;</td>
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<tr>
<td></td>
<td>Construction lending</td>
<td>purchase or development</td>
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<tr>
<td></td>
<td>Permanent loans</td>
<td></td>
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<tr>
<td></td>
<td>Loan purchases on secondary mortgage</td>
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<td></td>
<td>market</td>
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<tr>
<td><strong>Passive</strong></td>
<td>Pass-through certificates</td>
<td>Shares in real estate corporation</td>
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<tr>
<td></td>
<td>Mortgage real estate investment trust</td>
<td>Limited partnership shares</td>
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<tr>
<td></td>
<td>Mortgage-backed securities</td>
<td>Equity real estate investment trust</td>
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<td>Commercial</td>
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Investment in Equity and Debt

Also in Figure 1.2, distinctions are made between investment in real assets, such as land and buildings, and in real estate–related financial assets, such as mortgage-backed promissory notes. Both involve exchanges of certain and immediate assets for uncertain expectations of future gain, but expectations regarding yield and risk may differ radically.

Consider a development such as an office building or an apartment complex. The institution or individual that buys the real property interest is an equity investor. Usually, though, most of the purchase money comes from a mortgage lender: a debt investor. Lenders often sell their mortgage-secured promissory notes to still other investors who prefer debt to equity positions.

The benefits to equity investors are less predictable than those to holders of debt because an equity investor gets no cash until the debt holder’s periodic claims to payment on the promissory note are satisfied. Equity investors also reap the consequences of increases or decreases in property value.

HOW HAVE REAL ESTATE INVESTMENTS PERFORMED?

Returns on real estate investments and those on stocks, bonds, or other assets cannot be reliably compared because the yield data for real estate are sparse and contradictory. Unlike stock and bond markets, where minute-by-minute trading data generate enough information to crash a computer, real estate yield indices typically are computed using quarterly appraisal estimates. This causes a smoothing of trend indicators and makes real estate yields seem less volatile than they might with more frequent and more reliable information about value fluctuations. Yet comparisons, flawed as they are, are essential for rational portfolio decisions.

Surging interest in real estate ownership by institutional investors and the phenomenal growth in public offerings by REITs, described earlier, have contributed immensely to our knowledge about comparative yields. Research results, however, are heavily influenced by the period from which data are drawn.

Real estate became a darling of pension funds during the 1970s. An offspring of this relationship, the commingled real estate fund (CREF) acquires real estate and monitors its operation on behalf of institutional investors. CREFs have become treasure troves of information about real estate investment performance.

William Brueggeman, A. H. Chen, and T. G. Thibodeau analyzed asset performance data from two CREFs from 1972 through 1983. They broke the data, which at the time accounted for about 25 percent of all CREF assets, into various subperiods to see whether comparative results varied significantly through time. They found that on a risk-adjusted basis, real estate outperformed the Standard & Poor’s index of 500 stocks and the Ibbotson Associates bond index for the entire period and for each subperiod. The real estate portfolio’s superior performance differed considerably, however, among subperiods.7

For the entire period, and for the subperiod from 1972 through 1977, the researchers concluded that the CREF portfolio had higher yields than those of the Standard & Poor’s 500 stock index, before and after adjusting for risk. For 1978 through 1983, average yields on the Standard & Poor’s index exceeded the CREF yields by a narrow margin before adjusting for risk. The real estate portfolios were less risky, however, and after adjusting for relative risk the advantage shifted back to the CREF portfolio.

Other studies show conflicting results. Michael Giliberto compared total returns for an index of more than 1,200 large REITs with Standard & Poor’s 500 stock index for 1978 through 1989 and found that the advantage had shifted decisively to common stocks. In a 1984 analysis of 17 previous comparative yield studies, Robert Zerbst and Barbara Cambon concluded that real estate assets have shown returns roughly similar to common stocks since 1950, but they also found that real estate tends to outperform stocks during periods of inflation. A study of data from 16 countries suggests that real estate is a good long-term hedge against inflation and that real estate values and rents are significantly related to stock returns. F. C. Neil Myer and James Webb looked at returns to REITs and concluded that returns are more closely related to those on common stocks and closed-end mutual funds than they are to returns on unsecuritized real estate. A more recent study, by Jim Clayton and Greg MacKinnon, drew similar conclusions but indicated that the relationship has changed over time. REIT returns are less related to returns on large capitalization stocks than they were in earlier years and more closely correspond to returns on small capitalization stocks.

**DEFINITIONS AND CONCEPTS**

The investment perspective requires a slightly different view of real estate from the one to which many are accustomed. An investor must develop a perception of the property’s worth as a portfolio asset and compare this with an estimate of the probable price at which the real estate can be acquired. Neither of these values can be determined with certainty. Investors must work with ranges within which they expect the values to lie. This brings us to three key definitions: most probable selling price, investment value, and transaction range.

---

Investment Value

The investment value of a property is its worth to a specific owner. Investment value is unique to the individual and need not be closely related to most probable selling price. It is the value today, to the specific investor, of anticipated future benefits of ownership. It reflects the investor’s assumptions about the asset’s future ability to produce revenue, about the likely holding period, selling price, tax consequences, available financing, and all other factors that affect net benefits of ownership. Because there will not be precise agreement on all these factors or on the appropriate adjustment for waiting and for uncertainty, each individual’s investment value is inevitably unique.

Most Probable Selling Price

The most likely amount at which a property will sell, given the prevailing market conditions and available financing arrangements, is commonly called most probable selling price. This is not to be confused with market value, which is defined by appraisers as the most probable price when a property is exposed to the market under specific, rigidly prescribed conditions that often do not prevail in the marketplace.

Transaction Range

The price range within which a transaction can occur and leave both the buyer and the seller better off than before is the transaction range. The present owner’s investment value sets the lower end of the range; the prospective buyer’s sets the upper end. The actual transaction price will fall somewhere between these extremes.

The current owner (prospective seller) establishes a minimum acceptable price based on assumptions about future benefits of continued ownership. This is shown as $V_s$ in Figure 1.3. To be motivated to sell, the owner must conclude that the most probable selling price (shown as $V_p$ in Figure 1.3) is greater than investment value.

As we have observed, the property also has an investment value from the prospective buyer’s point of view. That value, too, is based on assumptions about future benefits of ownership. It is the maximum amount the prospective buyer is justified in paying for the property. This relationship is illustrated in Figure 1.4. To be motivated to buy, the prospective buyer must conclude that investment value ($V_b$ in Figure 1.4) is greater than the most probable selling price, $V_p$.

Within the range of possible prices set by the owner’s and the prospective buyer’s investment values (net of transaction costs), both will gain by getting together. Owners will not take less than a property’s investment value to them, and buyers will not pay more than their investment value. This creates a transaction range, as shown in Figure 1.5. The exact price within this range will depend upon the parties’ relative bargaining skills.

In Figures 1.3 through 1.5, it is assumed that buyer and seller agree on most probable price, but that need not be the case. For a transaction to be possible, all that is needed is a transaction range—a difference between buyer’s and seller’s investment values—sufficient to absorb transaction costs.
Market Value

An early step in lender analysis is an appraisal of a property to determine current market value: the most probable price at which the property would sell for in a competitive market as of the date of the appraisal, if it had been exposed to the market for a reasonable time before that date. The estimate assumes reasonably informed parties acting in their own individual best interest and with neither subject to undue influence.
An analyst usually starts by analyzing the economic environment of the property being appraised. A typical first step is observations about the relationship between the national or regional economy and that of the city or community in which the property is located. The analysis proceeds from the wider or more general to the narrow and more specific—from the general economy to the neighborhood. Although this part of an appraisal report is often skipped by the mortgage loan analysis, it should, in fact, be studied intensely. Because the property is immovable, its value is acutely influenced by favorable or unfavorable neighborhood trends.

The use of a site will be concerned with convenience and accessibility. Neighborhood issues (e.g., the view from the property and unfavorable exposure) that can detract from market value might also be a concern. Locations near objectionable or incompatible uses often have a depressing impact on desirability and thus, on value. Examples include noise from traffic or activity at other sites, smoke, odors, or congestion.

The focus of the physical basis of market value should be on the functional efficiency of the layout, the durability of the construction, and the structure’s aesthetic appeal.

**INVESTMENT VALUE: AN OVERVIEW**

Investment value, the most a would-be seller is justified in taking for a property or the maximum a prospective buyer is justified in paying, is at best difficult to estimate, requiring analysis of a wide range of disparate yet interwoven elements. The chore is greatly simplified when reduced to a system. This book presents such a system, sometimes called a *decision process*, which is widely used for evaluating real estate investment proposals.
This process is not unique to real estate. In spite of its complexity, real estate investment analysis is not fundamentally different from other investment decision making. Whatever the exact nature of the investment vehicle, for those schooled in modern financial analysis, the decision process does not vary.

**Steps in the Investment Decision Process**

1. *Estimate the stream of expected benefits.* Investment assets are desired only for the benefits that ownership is expected to bestow. Investors, in effect, purchase a set of assumptions about the property’s ability to produce income over the proposed ownership period.

2. *Adjust for timing differences among expected streams of benefits flowing from investment alternatives.* As a rule, the sooner benefits are expected to be received, the more highly prized they are by investors.

3. *Adjust for differences in perceived risk associated with the alternatives.* Just as investors are not indifferent to the timing of expected benefits, neither are they indifferent to the degree of certainty with which expectations are held.

4. *Rank alternatives according to the relative desirability of perceived risk-return combinations they embody.* Attitudes toward risk differ, but rational investors seek financial return as a reward for bearing the risk. Investors demand greater expected returns for higher risk. Most investors set a limit at which they will not shoulder additional risk, no matter what the potential return.

The investment analysis system explained in this book represents an application of this four-step process. It is an adaptation of capital-budgeting techniques long employed among corporate financial analysts. Three concerns—amount of benefit, and the timing and certainty of their receipt—determine the relative value of all investment alternatives.

**The Value of the Benefit Stream**

The benefits expected to be received in the far distant future add less to a property’s investment value than do those whose anticipated receipt is more imminent. In general, the further in the future expected receipts lie, the less is their value today. The exact nature of the trade-off will differ among investors, depending on each individual’s time preference for money.

Financial analysts have long recognized that the value of a business enterprise is the sum of the value of the outstanding debt plus the value of the equity. Real estate valuation theory also recognizes value of an investment property as the sum of the debt and equity positions. This is evidenced in appraisal techniques in which market value is estimated by capitalizing the property’s expected net operating income by the weighted average cost of debt and equity capital.
Investment value can, therefore, be expressed as the present value of the equity position plus the present value of the debt position. This is illustrated in Figure 1.6, which starts with the property’s net operating income: operating revenue minus operating expenses (these terms are defined and illustrated in Part Two). Holders of mortgage-secured debt have a senior claim on the property’s net operating income; their portion—annual debt service—flows down the left side of Figure 1.6. The remainder accrues to equity investors, but part of this will be siphoned off as income taxes. The residual is the after-tax cash flow to the equity investors, as shown on the right side of Figure 1.6. The bottom of the diagram illustrates the transformation of these expected cash flows into lump-sum equivalents: the investment value of each position.

The present value of the debt position is the amount of available mortgage financing or (in the case of present owners’ investment values) the outstanding mortgage loan balance. Present value of the equity position is the value today of the anticipated after-tax cash flow during a prospective ownership period and of the anticipated proceeds from disposal. Investment value can be expressed algebraically as follows:

\[
P_V = \sum_{i=1}^{n} \frac{CF_i}{(1+r)^i} - \frac{CF_d}{(1+r)^n}
\]

where:
- \(PV_i\) = Present value of total investment position
- \(PV_e\) = Present value of the equity position
- \(PV_d\) = Present value of the debt position
- \(CF_i\) = After-tax cash flows to the equity investor occurring in year \(i\) \((i = 1, 2, 3 \ldots n)\)
- \(CF_d\) = After-tax cash flow to the equity investor from property disposal at the end of year \(n\)
- \(r\) = Discount rate

Estimating present value of the equity position requires assumptions about income, operating expenses, amount and terms of financing, sales price, and income tax. It also depends on the investor’s opportunity cost of capital (the yield available on equally risky alternative opportunities).

To illustrate, consider an investment proposal for an apartment complex. A prospective investor notes that the property is expected to generate $1,265,700 of net operating income the first year (don’t worry about how the information is gathered, we will address that in later chapters) and is subject to a mortgage loan that requires annual payments (debt service) of $803,000. The remaining $462,700 of net operating income will accrue to the equity investor, but part of it will be diverted to pay income taxes, which are estimated to be $123,100 for the first year. This leaves an estimated $339,600 in after-tax cash flow for the equity investor. Figure 1.7 replicates a portion of Figure 1.6, but it applies only to the first year, and cash flow estimates have been entered in the boxes.
CHAPTER 1  The Real Estate Investment Decision

**Figure 1.6** Cash-Flow Distribution and Value Relationships

Net operating income

- Annual debt service (to mortgage lender)
- Before-tax cash flow (to equity investor)

Income tax

After-tax cash flow

Value of cash flows

- Value today of mortgage payments = $P_V^d$
- Value today of future after-tax cash flow to equity investor = $P_V^e$

\[ P_V^f = P_V^d + P_V^e \]

**Figure 1.7** First-Year Cash Flows and Value Relationships

Net operating income

\[ = \$1,265,700 \]

- Annual debt service (to mortgage lender) $803,000
- Before-tax cash flow $462,700
- Income tax $123,100
- After-tax cash flow $339,600

Value today

\[ = \frac{\$803,000}{(1 + k)^*} \]
\[ = \frac{\$339,600}{(1.10)} \]

*\(k = \text{lender’s rate of return}\)
Numbers below the line on Figure 1.7, the value of the cash flows, will depend on the appropriate discount rate and the amount of time the investor must wait to receive the cash. (Chapter 13 explains discounted cash flow analysis in greater detail.) If the appropriate discount rate for this investor is 10 percent, the value of the first year’s cash flow to the equity investor will be $339,600/1.10, as shown in the bottom-right box of Figure 1.7, or $308,727. The cash flows to the lender are discounted at the lender’s expected rate of return and would be placed in the bottom-left box of Figure 1.7.

Of course, cash is expected to continue flowing beyond the first year. To properly analyze an investment proposal, cash flow must be estimated for every year of the expected holding period and for the anticipated year of property disposal. Figure 1.8 illustrates a multiple-year forecast of cash flows to an equity investor who expects to hold the apartment complex for six years. Derivation of these numbers is explained in later chapters, and the numbers are used to further illustrate how investment decisions are made. For the moment, simply note the relationship between the numbers in the first column of the Figure 1.8 and those in Figure 1.7. Also note that borrowing more money would increase the debt service component and thereby reduce the expected after-tax cash flow to the equity investor. However, it would also reduce the amount of equity capital that must be invested.

Let us revisit our equation for determining the present value of the equity position, using the bottom line of Figure 1.8 for annual after-tax cash flow from operations. Assume further that the investor expects to sell near the end of the sixth year and to receive $7,828,100 in after-tax cash flow from the sale. (Chapter 11 explains how to estimate the tax consequences of selling.) With these numbers, and continuing our assumption that 10 percent is the appropriate discount rate for the equity investor, our equation for determining the present value of the equity position becomes:

\[
P_{V_e} = \sum_{i=1}^{n} \frac{CF_i}{(1+r)^i} + \frac{CF_d}{(1+r)^n}
\]

\[
\frac{260,300}{(1+.10)^1} + \frac{364,200}{(1+.10)^2} + \frac{414,500}{(1+.10)^3} + \frac{368,600}{(1+.10)^4} + \frac{398,600}{(1+.10)^5} + \frac{422,800}{(1+.10)^6} + \frac{7,828,100}{(1+.10)^6}
\]

\[
= $236,636 + $300,992 + $311,420 + $251,554 + $247,499 + $238,660 + $4,418,758
\]

\[
= $6,005,519
\]
Figure 1.8 Projected After-Tax Cash Flow Operations: Maegan's Magic Manor Apartments*

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Year 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential gross rent</td>
<td>$2,346,100</td>
<td>$2,463,400</td>
<td>$2,586,600</td>
<td>$2,677,100</td>
<td>$2,770,800</td>
<td>$2,867,800</td>
</tr>
<tr>
<td>Less: Vacancy allowance</td>
<td>176,000</td>
<td>98,500</td>
<td>103,500</td>
<td>160,600</td>
<td>166,200</td>
<td>172,100</td>
</tr>
<tr>
<td></td>
<td>$2,170,100</td>
<td>$2,364,900</td>
<td>$2,483,100</td>
<td>$2,516,500</td>
<td>$2,604,600</td>
<td>$2,695,700</td>
</tr>
<tr>
<td>Add: Other income</td>
<td>102,000</td>
<td>111,200</td>
<td>116,700</td>
<td>118,300</td>
<td>122,400</td>
<td>126,700</td>
</tr>
<tr>
<td>Effective gross income</td>
<td>$2,272,100</td>
<td>$2,476,100</td>
<td>$2,599,800</td>
<td>$2,634,800</td>
<td>$2,727,000</td>
<td>$2,822,400</td>
</tr>
<tr>
<td>Less: Operating expenses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management fee</td>
<td>$113,600</td>
<td>$123,800</td>
<td>$130,000</td>
<td>$131,700</td>
<td>$136,400</td>
<td>$141,100</td>
</tr>
<tr>
<td>Salary expense</td>
<td>204,000</td>
<td>211,100</td>
<td>218,500</td>
<td>226,200</td>
<td>234,100</td>
<td>242,300</td>
</tr>
<tr>
<td>Utilities</td>
<td>109,000</td>
<td>112,800</td>
<td>116,800</td>
<td>120,900</td>
<td>125,100</td>
<td>129,500</td>
</tr>
<tr>
<td>Insurance</td>
<td>36,700</td>
<td>38,000</td>
<td>39,300</td>
<td>40,700</td>
<td>42,100</td>
<td>43,600</td>
</tr>
<tr>
<td>Supplies</td>
<td>21,700</td>
<td>22,500</td>
<td>23,300</td>
<td>24,100</td>
<td>24,900</td>
<td>25,800</td>
</tr>
<tr>
<td>Advertising, legal, misc.</td>
<td>33,100</td>
<td>34,300</td>
<td>35,500</td>
<td>36,700</td>
<td>38,000</td>
<td>39,300</td>
</tr>
<tr>
<td>Maintenance, repairs, and replacement</td>
<td>188,300</td>
<td>194,900</td>
<td>201,700</td>
<td>208,800</td>
<td>216,100</td>
<td>223,700</td>
</tr>
<tr>
<td>Property taxes</td>
<td>300,000</td>
<td>300,000</td>
<td>300,000</td>
<td>375,000</td>
<td>375,000</td>
<td>375,000</td>
</tr>
<tr>
<td>Total expenses</td>
<td>$1,006,400</td>
<td>$1,037,400</td>
<td>$1,065,100</td>
<td>$1,164,100</td>
<td>$1,191,200</td>
<td>$1,220,300</td>
</tr>
<tr>
<td>Net operating income</td>
<td>$1,265,700</td>
<td>$1,438,700</td>
<td>$1,534,700</td>
<td>$1,470,700</td>
<td>$1,535,300</td>
<td>$1,602,100</td>
</tr>
<tr>
<td>Less: Interest expense</td>
<td>752,700</td>
<td>736,100</td>
<td>718,000</td>
<td>699,500</td>
<td>677,300</td>
<td>654,400</td>
</tr>
<tr>
<td>Depreciation</td>
<td>383,300</td>
<td>400,000</td>
<td>400,000</td>
<td>400,000</td>
<td>400,000</td>
<td>383,300</td>
</tr>
<tr>
<td>Taxable income (loss)</td>
<td>$129,700</td>
<td>$302,600</td>
<td>$416,700</td>
<td>$372,200</td>
<td>$458,000</td>
<td>$564,400</td>
</tr>
<tr>
<td>Times: Marginal tax rate</td>
<td>.40</td>
<td>.40</td>
<td>.40</td>
<td>.40</td>
<td>.40</td>
<td>.40</td>
</tr>
<tr>
<td>Income tax (tax savings)</td>
<td>$51,900</td>
<td>$121,000</td>
<td>$166,700</td>
<td>$148,900</td>
<td>$183,200</td>
<td>$225,800</td>
</tr>
<tr>
<td>Net operating income</td>
<td>$1,265,700</td>
<td>$1,438,700</td>
<td>$1,534,700</td>
<td>$1,470,700</td>
<td>$1,535,300</td>
<td>$1,602,100</td>
</tr>
<tr>
<td>Less: Debt service</td>
<td>953,500</td>
<td>953,500</td>
<td>953,500</td>
<td>953,500</td>
<td>953,500</td>
<td>953,500</td>
</tr>
<tr>
<td>Before-tax cash flow</td>
<td>$312,200</td>
<td>$485,200</td>
<td>$581,200</td>
<td>$517,200</td>
<td>$581,800</td>
<td>$648,600</td>
</tr>
<tr>
<td>Less: Income taxes</td>
<td>51,900</td>
<td>121,000</td>
<td>166,700</td>
<td>148,900</td>
<td>183,200</td>
<td>225,800</td>
</tr>
<tr>
<td>After-tax cash flow</td>
<td>$260,300</td>
<td>$364,200</td>
<td>$414,500</td>
<td>$368,300</td>
<td>$398,600</td>
<td>$422,800</td>
</tr>
</tbody>
</table>

*All numbers have been rounded to the nearest $100.
If a prospective purchaser places a higher investment value on a property than the acquisition cost, buying it will increase the buyer’s net worth. In like manner, selling a property that has a higher market value than its investment value enhances the seller’s total wealth position.

Alternative investment strategies regarding a specific property can also be evaluated using the investment value model. Holding financing constant, the investor varies other investment criteria (such as alternative income tax treatments, as discussed in Part Four, or proposed remodeling or rehabilitation) and notes the impact on investment value. Financing or refinancing alternatives can be evaluated by holding all other factors constant and determining the effect of each financing plan on the value of the equity position. The investor accepts the alternative that produces the highest value of equity per dollar of required equity investment, provided each alternative is perceived as entailing equal risk.

We all interpret information according to our own frames of reference, which result from our unique history. For this reason, individuals reviewing the same information will usually draw different conclusions. There will likely be disagreement about the future stream of rental revenue and operating expenses associated with a property. Individuals will also differ in the degree of certainty with which they hold their expectations; they will perceive differing levels of risk associated with expected outcomes. For these reasons, there will seldom be general agreement about investment value.

Income tax situations are seldom exactly comparable. Consequently, most investors will anticipate different after-tax cash-flow streams even when they generally agree about the before-tax cash flows.

People also differ in their willingness to defer immediate consumption in the interests of even greater benefits in future years. Those with a high preference for present consumption will require a greater incentive to defer after-tax cash flows. Investment value for such investors will be relatively high for investments with a short-term payoff and relatively low for those requiring greater patience. This subject is pursued at length in Part Three.

We do not all have the same tolerance for risk. Those who are less bothered by the possibility of variance between expected and actual investment outcomes will be inclined to place a greater investment value on risky ventures than will those who prefer to face a more precisely determinable future. Other things being equal, almost all investors will prefer less risk to more risk; they differ greatly regarding the risk premium.
they attach to proposed investment ventures (that is, the reduction in investment value due to possible variations between expected and actual after-tax cash flows).

**Investor Objectives and Risk**

Any attempt to discuss investor objectives quickly runs afoul of the nebulous term *investor*. Like Humpty-Dumpty, we choose to let the expression mean just what we choose it to mean, and we mean it to include any person or entity that takes a debt or an equity position in real estate. This definition could mean something entirely different—it frequently does when used elsewhere.

Given the diverse entities—corporations, partnerships, trusts, pension funds, and so forth—that fit our definition of the term, there can be no doubt that investors will have varied objectives. Some (for example, real estate investment trusts, pension funds, and commercial banks) are constrained by law and regulatory agencies. Others, because of their relatively high income tax obligations, seek tax-shelter situations. Some view real estate as an opportunity to diversify their portfolios. Others seek fixed incomes. Some take speculative positions in search of enormous capital appreciation. Others consider real estate as their inventory in a basic merchandising sense.

Most investors, however, do hold in common certain basic traits, regardless of their motivations or personal objectives. All rational investors seek financial return as a reward for committing resources and as compensation for bearing risk. The amount of expected compensation and the acceptable degree of risk depend on specific investor objectives and individual attitudes toward risk.

Emotional temperament plays a large role in an investor’s attitude toward risk. Some people are risk takers by nature; they not only accept it but go out of their way to incur it. This risk-seeking behavior is typified by gambling. These people gamble even when they know the game favors the house. They seem to revel in defying the odds. For them, the long shot is worth courting failure. Although there are people who are addicted to gambling, most risk seekers are mentally healthy people who wager only modest amounts relative to their total wealth.

Other people avoid risk at almost any price. They sacrifice expected returns to hedge their bets, even where the cost of hedging is disproportionate to the relatively small associated risk. As investors, these people favor fixed-income securities that carry a high degree of safety of principal, such as government bonds or insured certificates of deposit at commercial banks.

Most investors probably are somewhere in between these extremes. They tend to minimize risk exposure, preferring the relatively low-return certainty to the higher-return long shot. Moreover, they tend to become progressively more risk-averse as their total wealth increases. These propositions about investor behavior have been explored at length in the economic and financial literature and are not generally a matter of serious dispute.

It is generally agreed that, to the extent they are motivated by rational financial considerations, most investors have the attitude toward risk and expected return depicted in Figure 1.9. They prefer a higher return for a given perceived risk, they prefer less risk for a given expected return, and they accept additional perceived risk only if accompanied by additional expected return.
An additional investor characteristic demonstrated in Figure 1.9 is the tendency to become increasingly averse to additional risk as total perceived risk increases. Thus the investor whose attitude is depicted can be induced to accept the additional risk indicated by the distance $r_2$ to $r_4$ by the promise of an increase in total reward indicated by the distance $p_2$ to $p_3$. But to be induced to accept an identical additional risk increment (from $r_2$ to $r_3$), the investor must be able to anticipate a substantially greater reward increment (from $p_2$ to $p_3$). In addition, as indicated in the illustration, there is some level of perceived risk ($r_4$) beyond which the investor cannot be induced to venture, regardless of the possible benefits.
Of course, the exact shape and location of the curve depicted in Figure 1.8 depend on an investor’s personal attitude toward risk. A more risk-averse attitude would be depicted by a much more steeply inclined curve, while a less risk-averse attitude would be depicted by a shallower curve. Someone who loves risk would actually trade expected return for additional risk. These various attitudes are shown in Figure 1.10. Moreover, investors will react differently to various types of risks. These issues are addressed in later chapters.

**SUMMARY**

Real estate investors make an immediate and certain sacrifice of current purchasing power in expectation of future economic benefit. Investment proposals are evaluated by comparing the magnitude of the sacrifice with the quantity and timing of expected benefits and by considering the level of certainty with which expectations are held. Adjusting for time and uncertainty permits comparison among competing alternatives.

Attempts to measure and compare real estate investment returns with those on other investments have been inconclusive. Outcomes are heavily influenced by the dates over which performance is measured. The preponderance of evidence seems to suggest that real estate and common stocks offer roughly equal long-term yield prospects but that real estate performs better during periods of high inflation. Research suggests that real estate prices are less volatile, but this may be an illusion due to real estate market inefficiencies.

Institutions as well as individuals find real estate an attractive investment medium. Changes in federal laws and regulatory attitudes have in recent years enhanced its appeal to pension funds. Equity REITs have multiplied in the more benign income tax environment.

Foreign direct investment in U.S. realty became a major public issue when its volume grew dramatically during the early 1980s; concern abated when the net flow of foreign equity capital ebbed at the end of the decade. The market heated up again in the early 1990s and in the beginning of the 21st century. Foreign investors’ interest in U.S. realty is heavily influenced by foreign exchange rates and by comparative interest rates.

Investment analysis follows a consistent pattern regardless of the investment vehicle or investor entity: The streams of benefits from alternative proposals are forecast and are adjusted for timing and risk differences. Alternatives are then ranked according to their desirability, in terms of the trade-off between perceived risk and anticipated return. Rankings will differ according to the discount rate used for timing adjustments and with varying investor attitudes toward risk.

Investment value is the highest price a prospective buyer is justified in paying for a property or the lowest price a prospective seller is justified in accepting. It is a function of available financing, the investor’s income tax position, the yield available on alternative investments, and the timing and amount of anticipated benefits flowing from the investment under consideration. The investment decision is subjective, and investment value will be different for each investor.

Investment value can be estimated by summing the present values of the equity position and the debt position associated with a proposed venture. Present value of the
equity position is the discounted value of all anticipated future cash flows to the equity position. Present value of the debt position is the available loan or the remaining balance on an existing loan.

Investors differ in both their perceptions of and their attitudes toward risk. The difference among attitudes is sometimes expressed as degrees of risk aversion. The more risk-averse the investor, the greater the expected reward will have to be to induce investment in a given project.

**RECOMMENDED READING**


CHAPTER 1 The Real Estate Investment Decision

INTERNET REFERENCES

For numerous links and articles on real estate investment:
www.real-estate-online.com
For a real estate directory on many real estate topics:
www.reals.com
For links to over 20,000 investment sites and definitions of investment terms:
www.investorwords.com

REVIEW QUESTIONS

1. What are investors really looking for when they invest in real estate?
2. Who are the major participants in real estate investments?
3. What are some major determinants of foreign investment in U.S. real estate?
4. Describe the differences between passive and active investors.
5. What are the major steps in modern investment decision analysis?
6. Distinguish between the most probable selling price and the market value.
7. Explain how the transaction range for a given property is set. What is the role of investment value in arriving at the transaction range?
8. When estimating investment value, what factors are of concern to the investor?
9. What effect does the timing of cash flows have on investment value?
10. What is the relationship between the amount of risk to which an investor feels exposed and the investor’s attitude toward additional risk?

DISCUSSION QUESTIONS

1. What difficulties might a researcher face when trying to compare the long-term investment performance of real estate and securities portfolios? Discuss problems in measuring yield and in comparing risk.
2. Real estate equity and debt markets are closely intertwined: Most new properties are financed in part with mortgage-secured notes, and there is an active secondary market for both mortgage notes and real estate equity interests. Under what circumstances would prices in these markets most likely move in opposite directions?
3. Under what circumstances would the most probable selling price of a property and its market value be essentially the same? Under what circumstances might they differ significantly?
4. To better determine just what a property is worth in the marketplace, would it make sense to ask an exorbitant price and wait for a series of offers, then accept the first subsequent offer that is higher than any received during the trial, or information-gathering, period? What problems do you see with such a procedure?

5. Gambling is risk-seeking behavior and buying insurance is a risk-avoidance measure. Yet many people who gamble also buy insurance. How can these contradictory actions be reconciled?

6. If the U.S. dollar continues to weaken, how will that affect the U.S. real estate market?