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Real Estate Investment Decision Making

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To Lori, Sally, Tice, Fielding, and Rex;
and
Yale

Selected Symbols and Abbreviations

ENGLISH SYMBOLS AND ABBREVIATIONS

a	expected growth rate in effective gross income
A	principal payment
a_n	present value of ordinary annuity
$a_n{}^d$	present value of annuity-due
AB	adjusted basis
AFC	amortized financing costs
$AIRR_e$	adjusted internal rate of return on equity
AMIs	alternative mortgage investments
AR	amount realized
$ATCF$	after-tax cash flow
$\overline{ATCF}$	expected after-tax cash flow
$ATCF^*$	certain after-tax flow
$ATER$	after-tax equity reversion
$\overline{ATER}$	expected after-tax equity reversion
b	expected growth rate in total operating expenses
BEP	break-even point
BEP (\$)	break-even point in dollars
BEP (Q)	break-even point for occupied units

$BTCF$	before-tax cash flow
$BTER$	before-tax equity reversion
$CAPM$	capital asset pricing model
CG	capital gain
Cov_{AB}	covariance between investments A and B
d	rate of discount
D	depreciation deduction
DFL	degree of financial leverage
DOL	degree of operating leverage
DS	debt service
E	investment value of equity
ED	excess depreciation
EDR	equity-dividend rate
EGI	effective gross income
$E(R)$	expected rate of return
$FMRR$	financial management rate of return
GIM	gross income multiplier
i	rate of interest
I	interest payment
IRR	internal rate of return
IRR_e	internal rate of return on equity
IV	investment value
k	discount rate, required rate of return
k_d	pre-tax cost of borrowing, pre-tax cash of debt financing
k_e	required rate of return on equity
k_f	risk-free rate
k_m	market risk premium
k_o	overall required rate of return
k_p	inflation premium
L	amount of debt
L/E	debt-equity ratio
L/V	loan-to-value ratio
M	state of the world; also, the frequency of compounding
mc	mortgage constant
MD	mortgage debt
MV	current market value
n	expected planning horizon, expected holding period
NIM	net income multiplier
NOI	net operating income
NPV	net present value
$\overline{NPV}$	expected net present value
NPV^*	net present value of net terminal value of equity
$NPVTE$	net present value of tax effect
NSP	net sales proceeds

NTV_e	net terminal value of equity
OER	operating expense ratio
p	probability of occurrence
PP	prepayment penalties
r	reinvestment rate
r_a	after-tax return on investment
r_e	after-tax return on equity
r_v	valuation rate
R	overall rate of return
$\overline{R}_m$	expected rate of return of market portfolio
RR	replacement reserves
s_n	compound value of ordinary annuity
s_n^d	compound value of annuity-due
SE	selling expenses
SP	selling price
T	taxes from operations
T'	taxes due on sale
TI	taxable income
TLE	total leverage effect
TOE	total operating expenses
UL	useful life
UM	unpaid mortgage balance
v	coefficient of variation

GREEK SYMBOLS

α (alpha)	certainty-equivalent factor
β (beta)	measure of systematic risk
γ (gamma)	excess depreciation subject to tax
Δ (delta)	change in value
λ (lambda)	market price of risk
ϱ (rho)	correlation coefficient
σ (sigma)	generally, risk
σ	specifically, standard deviation
σ^2	variance
σ^2_{ATCF}	variance of after-tax cash flow
σ^2_{ATER}	variance of after-tax equity reversion
σ^2_{NPV}	variance of net present value of equity
σ_{NPV}	standard deviation of net present value of equity
σ^2_p	variance of portfolio of investments
σ_P	standard deviation of portfolio of investments
σ^2_m	variance of expected rate of return of market portfolio
τ (tau)	generally, tax rate
τ	specifically, investor's marginal tax rate

τ_{cg} investor's capital gains tax rate
τ_m minimum tax rate

MATHEMATICAL SYMBOLS

Σ (sigma) summation sign
π (pi) product sign

Preface

The development of real estate investment analysis from a descriptive, institutional area of study in the early 1960s to a systematic and analytical science has resulted in a need for a new perspective. Considerable progress has been made over the past twenty-five years in terms of developing real estate theories, applications, and to a limited extent, empirical verifications of hypotheses about real estate values and real estate investor behavior.

This book is based on the premise that investing is the commitment of a certain cash outflow for an expected, risky, cash inflow. Decision making occurs prior to the acquisition of the property rights in real estate, after the rights have been obtained, during the period of ownership, and at the time of disposition of the rights in real estate. The real estate investment process provides a systematic method of analyzing investment opportunities. After an introductory discussion about investing and investment analysis, we focus on the relationship between risk and return and analyze investor objectives. Next, we examine the market, the legal, and the sociopolitical environments in which the investment decision is made.

From this analysis the investor is ready to develop expectations about cash flows, so we analyze income and expenses, financing opportunities, and tax planning options. Finally, we show how various criteria are derived and developed to assist investors in choosing the best projects. The literature in real estate investment analysis has concentrated on criteria such as rules of thumb, discounted cash flow models, and advanced risk analysis.

This book relies heavily upon the equity valuation model. This model is the foundation of the real estate investment process and permits a systematic analysis of real estate investment decision making.

Topics are generally treated in both introductory and advanced chapters. Some readers may wish to omit portions of some of the advanced material. This is true for market analysis, legal analysis, financing, taxation, and the analysis of investment criteria. As a rule, the more rigorous material is discussed in the later chapters. Students and faculty with time constraints may also wish to omit some of this material without considerable loss of continuity.

We do not use extensive case studies, although there are many examples within the text and problems at the end of each chapter. Our feeling is that the book is large enough with the amount of material we had to cover without the luxury of including case studies for direct application of the material in the text. Also, the reader will not find separate chapters devoted to specific types of real estate investments (e.g., apartment buildings, office buildings, shopping centers, mobile home parks, etc.) Since we are primarily interested in real estate investment principles, we feel that many of the principles in this book apply to all types of real estate investments, despite some institutional differences among the various types of property. Readers interested in case studies or in studies of specific property types are referred elsewhere.

Students will be well prepared for this text if they have had introductory courses in real estate principles, financial management, and economics. Students with backgrounds in real estate finance and real estate appraisal will be even better prepared. A basic understanding of high school algebra is required, but needless mathematical derivations have been omitted.

We wish to thank our colleagues who provided valuable support and assistance to us since we began this project. Although we cannot thank everyone explicitly, we must acknowledge these colleagues in particular: Professor Jeff Fisher, Indiana University; Professor Jack Harris, Texas A and M University; Professor Ron Racster, Ohio State University; and Professor Hal Smith, University of Florida. Thanks also to Professor Ken Lusht, Pennsylvania State University and Professor Hugh Nourse, University of Georgia, for their insightful comments.

We also wish to acknowledge the assistance of Joseph Masarek, Greg Kantak, Bobby Newsome, Bert King, Al Brown, and Ronnie Duncan who read and checked many of the problems and examples. In addition, we thank our editor, John Connolly and his staff, for their patience, enthusiasm, and encouragement. Finally, we would like to express our sincerest appreciation to our wives for putting up with us on those long days and nights away from home and for their assistance with the production of the manuscript. The responsibility for any errors, omissions, or inaccuracies, of course, rests entirely with the authors.

Austin J. Jaffe

C. F. Sirmans

Introduction

The analysis and study of real estate investment may not differ very significantly from a well-known tenet: "The greatest of all gifts is the power to estimate things at their true worth."[1] In making real estate investment decisions, the ability to estimate the worth of a piece of property is paramount to success. However, that same estimate may be too high, too low, or precisely the same as another investor's estimate. Indeed, this is "what makes horse races" and serves as our opening to *Real Estate Investment Decision Making*.

Real estate investment analysis traditionally emphasized valuation concepts. It is fair to suggest that the notion of "value as a central concept" has received more attention than warranted, since the valuation process may prove to be the beginning of a methodology rather than the culmination of the analysis. In fact, the real estate investment process as specified in Chapter 1 forms the backbone and framework for this book. Only by carefully estimating "investment value" and comparing it with "market value" will the investor make a meaningful investment decision. As Warner said: "There is no such thing as absolute value in this world. You can only estimate what a thing is worth to you."[2]

[1]Duc de la Rouchefoucauld Francois, *Maxims,* #244.

[2]Charles Dudley Warner, "Sixteenth Week" *My Summer in a Garden* (Boston: J.R. Osgood & Co., 1871).

REAL ESTATE AS AN INVESTMENT

In this text, we will focus on real estate as an investment good. Its popularity as an investment vehicle can be attributed to a number of income-producing characteristics of which the following are noteworthy.

Emphasis on Cash Flow

Income-producing real estate generates a periodic cash flow from rental income of urban or rural space. This income is reduced by operating expenses, mortgage debt service, and income tax liability. The remainder is generally called "after-tax cash flow." Although cash flow is one of the principal reasons why real estate is sought by investors, after-tax cash flow has become increasingly scarce as operating expenses and interest rates on mortgages have risen relative to rental growth.

Emphasis on Changing Property Values

The possibility of growth in capital values accounts for much real estate investment activity. Even though growth in rents has not kept pace with expenses or general price changes, the value of income-producing property appears to be one of the few investment vehicles to appreciate at *rates* greater than inflation. In fact, prices paid for some properties with expected negative after-tax cash flows indicate expectations of even greater appreciation in the future.

Emphasis on Equity Investor

Modern real estate investment analysis centers upon the analysis and perspective of the equity investor, who in conjunction with lenders, tenants, and government tax authorities, bears the risk and reward of investment and financing decisions. Therefore, we take this viewpoint throughout the book. If the equity investor acts prudently, maximization of wealth is possible.

Emphasis on Decision Making

Another reason why real estate is attractive is because it allows the investor to actively participate in economic decisions at various times during the investment period. If improvements are considered, these may be analyzed in view of potential financial success. If these do not appear to be profitable, other options may be considered. It is this opportunity for decision making that attracts many investors.

Emphasis on Risk and Return

Of course, none of the advantages of real estate investment accrue to the investor without cost. There is a close relationship between risk and return for all investments. Real estate is no exception. In a market economy, an available real estate investment that promises a very high rate of return may be accompanied by an equally high degree of risk.

THE CONCEPT OF VALUE

A well-known anecdote recalls how Groucho Marx agreed, after a great deal of persuasion, to inspect some choice oceanfront property as a possible new residence. The anxious broker showed Groucho the long approach and driveway, the beautifully landscaped lot, the elegant mansion, the flowing gardens, the servants' quarters, and the pools. Groucho followed the broker obediently and appeared to be very impressed. At the end of the tour, the broker brought the comedian to the terrace for the grand finale: a panoramic view of the Pacific. The salesman reportedly asked, "Now what do you think of the property?" After thinking about what he had just seen, Groucho answered, "I don't really care for it. Take away the ocean and what have you got?"[3]

Value is a concept that is as difficult to understand as it is to estimate. Conceptually, we can define *the value of a good or asset as an amount of money that represents the present worth of future benefits, even if the timing or magnitude of the benefits are not clearly known.*

In order to effectively choose between alternatives, the correct estimation of "investment value" is vitally important. As we pointed out, the potential investor must understand the effects of location on property value. Groucho Marx appears to have understood the importance of investment value better than most.

Since valuation holds a central place in real estate analysis, it is not surprising that considerable attention has been placed on concepts of value.[4] Although nearly all of these are appraisal texts or manuals, formal real estate investment analysis has grown out of this market valuation environment.[5]

But value remains an elusive concept though many writers have attempted to define it. John Stuart Mill wrote that "the value of a thing is its general power of purchasing, the command which its possession gives over purchasable commodities in

[3]Edmund Fuller, *2500 Anecdotes for All Occasions* (Garden City, NY: Dolphin Books, 1961), p. 383.

[4]In real estate, entire volumes have been written on this subject. These include: Clarence A. Webb and Arthur Hunning, *Valuation of Real Property* (London: Macmillan, 1913).; Walter William Pollack and Karl W. H. Scholz, *The Science and Practice of Urban Land Valuation* (Philadelphia: Pollock, 1926).; Horace F. Clark, *Appraising the Home* (New York: Prentice-Hall, Inc., 1930).; Frederick M. Babcock, *The Valuation of Real Estate* (New York: McGraw-Hill, 1932).; James C. Bonbright, *The Valuation of Property* (New York: McGraw-Hill, 1937).; recent sources include Alfred A. Ring, *The Valuation of Real Estate,* 2nd ed. (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1970).; Paul F. Wendt, *Real Estate Appraisal Review and Outlook* (Athens, Ga.: University of Georgia Press, 1974).; William M. Shenkel, *Modern Real Estate Appraisal* (New York: McGraw-Hill, 1978).

[5]Recent investment analysis texts include Richard U. Ratcliff, *Real Estate Analysis* (New York: McGraw-Hill, 1961).; Maury Seldin and Richard H. Swesnik, *Real Estate Investment Strategy* (New York: Wiley-Interscience, 1970).; William N. Kinnard, Jr., *Income Property Valuation* (Lexington, Mass.: Lexington Books, D. C. Heath & Co., 1971).; James R. Cooper, *Real Estate Investment Analysis* (Lexington, Mass.: D. C. Heath & Co., 1974).; Sherman J. Maisel and Stephen E. Roulac, *Real Estate Investment and Finance* (New York: McGraw-Hill, 1976).; William R. Beaton and Terry Robertson, *Real Estate Investment,* 2nd ed. (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1977).; Paul F. Wendt and Alan R. Cerf, *Real Estate Investment Analysis and Taxation,* 2nd ed. (New York: McGraw-Hill, 1979).

general."[6] David Ricardo felt that "value essentially differs from riches, for value depends not on abundance but on the difficulty or facility of production."[7] Even as early as the first century B.C., it was noted that "everything is worth what its purchaser will pay for it."[8]

The courts have provided literally hundreds of working definitions of value. Sir Edward Coke reportedly said that "goods are worth just as much as they can be sold for."[9] Some other definitions resulting from court opinions include:

> Value is a nebulous concept and made up of many ponderables.[10]
>
> Value means the desirability or worth of a thing.[11]
>
> Value is monetary worth of a thing; marketable price; estimated or assessed worth.[12]
>
> The value of a thing is what it would presently bring in exploitation or exchange under presently possible conditions.[13]
>
> Value of goods is not what they cost their owners; it is what they are worth to him or to others.[14]
>
> Value is not a single purpose word.[15]

So the real estate profession has been forced to provide its own "official" definition:

> Market value is the highest price in terms of money which a property will bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently, knowledgeably and assuming the price is not affected by undue stimulus.[16]

This, of course, is the definition of *market value* with which we will deal more extensively later in the book. In addition, Ring has provided a list of thirty other types of value.[17]

[6]John Stuart Mill, *Principles of Political Economy.* (London and New York: G. Routledge, 1847).

[7]David Ricardo, *On the Principles of Political Economy and Taxation,* 2nd ed. (London: J. Murray, 1819).

[8]Publilius Syrus, *Moral Sayings* (1st Century B.C.).

[9]Sir Edward Coke, *The First Part of the Institutes of the Laws of England.* Reprinted (Philadelphia: Johnson and Warner, and S. R. Fisher, Jr., 1812).

[10]In re Boston and P.R. Corp., D.C. Mass., 143 F. Supp. 866,873.

[11]People, on Complaint of Rosenzweig v. Axelrod, 130 N.Y.S. 2d 301,305.

[12]In re Moffett's Estate, 85 A. 2d 109,110,369 Pa. 159.

[13]Babbitt v. Read, C.C.A.N.Y., 236 F. 2d 42,46.

[14]Agency of Canadian Can and Foundry Co. v. Pennsylvania Iron Works Co., C.C.A. Pa., 256 F. 339,344.

[15]Andrews v. Commissioner of Internal Revenue, C.C.A., 135 F. 2d 314,317.

[16]Byrl N. Boyce (ed.), *Real Estate Appraisal Terminology* (Cambridge, Mass.: Ballinger Publishing Co., 1975), p. 137.

[17]Ring, *The Valuation of Real Estate,* 2nd ed., p. 6.

In this text, the concept of *investment value* is also critical and comprises the next chapter. This particular value is

> The worth of a property to a specific investor based on available financing, desired rate of return, and other assumptions unique to the investor.[18]

Probably no other profession has spent as much time and effort in attempting to define, conceive, or understand a more elusive concept. Though John Stuart Mill remarked that

> Happily there is nothing in the laws of value which remains for the present or any future writer to clear up; the theory of the subject is complete,[19]

he was never more incorrect.

THE CONCEPT OF PROPERTY

Few words convey as much meaning as the word "property." Although most real estate writers have tried to distinguish between real and personal property, corporeal and incorporeal rights, or between similar comparisons, a more comprehensive view of the concept of property is warranted.

Rousseau, for instance, held property to be one of the most important treasures for modern societies:

> The first man who, having enclosed a piece of ground, bethought himself of saying, **This is mine**, and found people simple enough to believe him, was the real founder of civil society.[20]

In a similar fashion, Voltaire amplified the significance of property rights when he wrote "the spirit of property doubles a man's strength."[21] But perhaps an equally significant piece of graffito was found in Paris after the student revolt in May 1968.

> It is because property exists that there are wars, riots, and injustice.[22]

Considerable insight into the concept of property came from philosopher, economist, and legal scholar Jeremy Bentham. The following quotations have been attributed to him.

> Property is entirely the creature of the law. . . . There is no form, or color, or visible tract, by which it is possible to express the relation which constitutes

[18]Alfred A. Ring and Jerome Dasso, *Real Estate Principles and Practices,* 9th ed. (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1981), p. 703.

[19]*The Encyclopaedia Britannica,* 11th ed. (1911), vol. 27, p. 867.

[20]Jean Jacques Rousseau, *Discourse on the Origin and Basis of Inequality Among Men* (1754). Reprinted. (New York: St. Martin's Press, 1964).

[21]Francois-Marie Arouet de Voltaire, "Property," *Philosophical Dictionary* (1764). Reprinted. (New York: A.A. Knopf, 1929).

[22]Anonymous graffito, May 1968.

property. It belongs not to physics, but to metaphysics; it is altogether a creature of the mind.[23]

> Property and law are born and must die together.[24]
>
> . . . There is no such thing as natural property . . . it is entirely the work of law.... Property is nothing but a basis of expectation; the expectation of deriving certain advantages from a thing which we are said to possess, in consequence of the relation in which we stand towards it.[25]
>
> Before laws were made there was no property; take away laws, and property ceases.[26]

Finally, a famous quotation by Blackstone on the nature of property summarizes the importance of property rights as well as any statement ever written.

> There is nothing which so generally strikes the imagination, and engages the affection of mankind, as the rights of property; or that sole and despotic dominion which one man claims and exercises over the external things of the world, in total exclusion of the right of any other individual in the universe.[27]

As all of these passages imply, the concept of property is a far-reaching and very complex construct. The rights of property owners and the limitations placed upon these rights are frequently misunderstood and often require careful analysis. These topics are addressed in Chapter 1. We feel that narrower definitions of property and real estate are more helpful, so the following definitions will be used throughout this text:

> **Real estate**–the physical asset (land and improvements to the land), or the business or profession dealing with land and/or its improvements, or the field of study dealing with the analysis of land and/or its improvements.
>
> **Realty**–the tangible or real assets, generally consisting of land and manmade improvements; a synonym for real estate.
>
> **Real property**–the rights associated with the realty, commonly called property rights.
>
> **Personalty**–personal items which are movable, tangible, and generally owned by the current possessor.
>
> **Personal property**–the rights associated with the personalty.

In a sense, valuation or investment analysis of real estate is a misnomer because the value lies not in the physical asset itself but in the rights associated with the owner-

[23]Jeremy Bentham, *The Works of Jeremy Bentham* (London: Simpkin, Marshall, 1843), p. 308.

[24]Jeremy Bentham, *Principles of the Civil Code* (1864), vol. 1, p. 309.

[25]*Ibid.*, p. 111.

[26]*Ibid.*, p. 113.

[27]William Blackstone, *Commentaries on the Laws of England,* 4th ed. (Chicago: Callaghan, 1899).

ship. Furthermore, since no property rights are absolute, an analysis of the legal limitations of real property is an essential activity. Therefore, the role and impact of the legal environment cannot be overlooked. We will discuss these concerns more extensively in Chapters 6 and 7.

GOALS AND OBJECTIVES

This book formulates real estate investment decision making into "an investment process." This process helps us develop a framework with which to systematically integrate many of the relevant considerations for making investment decisions. The emphasis placed on an analytical approach is paramount to effective decision making because a knowledgeable investor must understand the evaluative methods for choosing one alternative over another.

Our text focuses on one concept: valuation of income-producing real property. Traditionally, this is divided into an analysis of market valuation (or appraisal theory and methods) and investment valuation (or investment analysis for specific investors). Although these areas are distinct in some cases, it is argued that the analysis of income-producing property is a valuation process. Whether the appraiser is seeking to estimate *market value* or the counselor is calculating *investment value* for his/her client, both analysts are engaged in the process of valuing property. Therefore, the discussion will address the theories, methods, and problems of valuation from both of these perspectives. We will describe the valuation of income-producing real property as a method or process rather than as a disjointed series of calculations and general concerns.

OVERVIEW OF THE BOOK

Real Estate Investment Decision Making is divided into six major parts. Part I discusses the fundamentals of real estate investment for decision makers. Since the analysis of income-producing real estate is an investment process, careful attention must be paid to details in order to understand how investment decisions are made (Chapter 1). We will follow a step-by-step approach that will eventually lead to the desired result. This part also discusses what real estate investment involves in terms of risk, rewards, and accumulation of wealth. The basic investment model is presented in Chapter 2. Chapter 3 details the history of real estate valuation and investment and argues that modern real estate investment analysis is a logical progression of developments that have occurred in economics, finance, and real estate appraisal.

Part II describes the modern urban environment for real estate investment decision making. Chapters 4 and 5 discuss the analysis of real estate market analysis techniques and measures of business risk. Although we do not provide extensive analysis of these areas, these chapters are very important because a basic understanding of the urban setting is crucial in the investment process.

Chapters 6 and 7 analyze the legal environment for real estate investment. This is particularly important in view of developments in such areas as land use controls, air rights, urban renewal legislation, and the renewed interest in the "economics of property rights." It is imperative for decision makers to become introduced to and become aware of these changing developments.