

**Volume 17**  
**Number 1**  
**Spring/Summer 1992**

# **REAL ESTATE ISSUES**

**Improving Real Estate Market Research**  
Robert H. Pittman and Grant I. Thrall

**Validation of Basic Valuation Models:  
A Multi-Family Housing Example**  
Phillip S. Mitchell and Gary L. Bernes

**Valuation of a Property Management  
Company for Acquisition**  
Richard C. Shepard, CRE

**Real Estate Investment Yield Linkages**  
Robert A. Steele, CRE

**The Impact of Supply Changes on Real  
Net Operating Income: The Multi-Family  
Perspective**  
Richard T. Garrigan, CRE and  
Joseph L. Pagliari, Jr.

**Commercial Real Estate Loan  
Evaluation in the Insurance Industry**  
Daniel M. Norris

**Developer's Disease Can be Hazardous  
to Your Health**  
David C. Bamberger

**Macro-Determinants of Time on the  
Market**  
Paul K. Asabere and Forrest E. Huffman

**Appraisal Thoughts from a  
Non-Appraiser**  
Bruce P. Hayden, CRE

**How Long is a Long-Term Lease?**  
Roy P. Drachman, CRE

**Real Estate Issues Index 1991**

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## CONTRIBUTOR INFORMATION FOR REAL ESTATE ISSUES

The journal is published twice a year (Spring/Summer and Fall/Winter), and reaches a lucrative segment of the real estate industry as well as an impressive cross section of professionals in related industries.

Subscribers to *Real Estate Issues* are primarily the owners, chairmen, presidents and vice presidents of real estate companies, financial corporations, property companies, banks, management companies, libraries and Realtor® boards throughout the country; professors and university personnel; and professionals in S&Ls, insurance companies and law firms.

*Real Estate Issues* is published for the benefit of the CRE (Counselor of Real Estate) and other real estate professionals, planners, architects, developers, economists, politicians, scientists and sociologists. It focuses on approaches, both theoretical and empirical, to timely problems and topics in the field of real estate. Manuscripts are invited and should be addressed to:

Rocky Tarantello, Editor in chief  
*Real Estate Issues*  
American Society of Real Estate Counselors  
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Chicago, IL 60611

### Review Process

All manuscripts are reviewed by three members of the editorial board with the author's name(s) kept anonymous. When accepted, the manuscript with the recommended changes are returned to the author for revision. If the manuscript is not accepted, the author is notified by letter.

Every effort will be made to notify the author of the acceptance or rejection of the manuscript at the earliest possible date. Upon publication, copyright is held by the American Society of Real Estate Counselors. The publisher will not refuse any reasonable request by the author for permission to reproduce any of his contributions to the journal.

### Deadlines

All manuscripts to be considered for the Spring/Summer edition must be submitted by February 1; for the Fall/Winter edition by August 1.

### Manuscript/Illustrations Preparation

1. Submit manuscripts on disk (along with hard copy) in ASCII file format, Work Perfect preferred. All submitted

materials, including abstract, text and notes, are to be **double-spaced** on one side of the sheet only, with wide margins. Recommended number of pages for a manuscript is not to exceed 25–30. Submit five copies of the manuscript, accompanied by a 50- to 100-word abstract and a brief biographical statement.

2. All notes, both citations and explanatory, are to be numbered consecutively in the text and placed at the end of the manuscript.

3. Illustrations are to be considered as figures, numbered consecutively and submitted in a form suitable for reproduction. Type figure legends **double-spaced** on a separate page.

4. Number all tables consecutively and type **double-spaced** on separate pages. All tables are to have titles.

5. Include glossy photographs that enhance the manuscript, whenever possible.

6. Title of article should contain six words or less with an active verb.

7. For uniformity and accuracy that is consistent with our editorial policy, refer to the style rules in *The Chicago Manual of Style*.

## THE BALLARD AWARD MANUSCRIPT SUBMISSION INFORMATION

The editorial board of *Real Estate Issues* (REI) is accepting manuscripts in competition for the 1992 Ballard Award. The competition is open to members of the American Society of Real Estate Counselors and other real estate professionals. The \$500 cash award and plaque is presented in November during the Society's annual convention to the author(s) whose manuscript best exemplifies the high standards of content maintained in the journal. Any articles published in REI during the 1992 calendar year (Spring/Summer and Fall/Winter editions) are eligible for consideration and must be submitted by August 1, 1992.

# JOHN McMAHAN, NAMED RECIPIENT OF THE LOUISE L. AND Y.T. LUM AWARD



John McMahan, CRE

**J**ohn McMahan, CRE, president and chief executive officer of Mellon/McMahan Real Estate Advisors, Inc., has been named the 1992 recipient of the Louise L. and Y.T. Lum Award. This honor recognizes McMahan's distinguished contribution to the advancement of knowledge and education in the real estate counseling profession.

The award was established by the late Y.T. Lum, CRE, to encourage the continuing professional education of those engaged in real estate counseling through an understanding of its principles, theories, techniques and practices. McMahan's distinguished career exemplifies the standards set forth by this award.

A member of the Society since 1982, McMahan has been a member of the Board of Governors and has been an active member of numerous committees. He presently is serving again as program chairman of the Society's High Level Conference.

McMahan has nearly 30 years of experience in various types of real estate projects including all phases of the development/investment process. He has acquired and/or developed several hundred million dollars in real estate assets, and he has assisted other investors in working out their problem investments.

Besides building McMahan Real Estate Advisors into a top-performing real estate consulting firm, McMahan also is considered a leader in the real estate asset management industry. He personally initiated strategic research for pension fund clients interested in real estate investment. The results of this research, published in 1980, have provided pension fund managers with a systematic approach to real estate investing.

His other activities include serving as a faculty member of the Stanford Graduate School of Business, and his professional memberships in various real estate associations include the Pension Real Estate Association, the Urban Land Institute, Lambda Alpha International and the National Association of Real Estate Investment Managers.

McMahan also speaks and writes extensively on issues of interest to the investment community. He is the author of the book *Property Development*, published in 1989, and his articles have frequently been published in *Real Estate Issues*, the Society's semi-annual professional journal.

Previous recipients of the Louise L. and Y.T. Lum Award include CREs Wayne D. Hagood (1991), Charles W. Bradshaw, Jr. (1990), Jared Shlaes (1989), John R. White (1988) and Thurston H. Ross (1987).

# AUTHOR SUBMISSIONS KEY TO SUCCESS

**F**ollowing Real Estate Issues' special edition last Fall on environmental hazards in real estate, this issue returns to our more traditional multidimensional approach. Several of the Society's distinguished members have contributed valuable insight with articles on valuation, investment performance, and strategy. I wish to thank CREs' Robert Steele, Richard Garrigan, Bruce Hayden and Roy Drachman. Your efforts hopefully will serve as a call to other members of our Society to share their experiences and knowledge.

And of course, we are again fortunate to have the fine authors from industry and academia who chose to submit their works to REI. A fundamental principle of this journal is to foster excellence in real estate counseling and decision-making. Through knowledge gained from practice, application and theory, each author brings a unique perspective which contributes to that goal. Development, market research, commercial lending, and investment modeling are some of the "real estate issues" that are also explored in this edition. I wish to thank each of these authors on behalf of the Society.

Lastly, buoyed by the successful sales of REI's first special edition, we are now soliciting submissions on the topic of current real estate investment yields and capitalization rates for a second special edition to be published in Fall/Winter 1992. We hope to assemble a current and comprehensive collection of articles which address real estate investment performance, asset class comparisons, cap rate trends, institutional investment strategies, historical performance measurement or any related issue which explains the current environment in the real estate investment market. With development of this special edition now underway, we eagerly look forward to receiving your manuscripts on this topic. Your inquiries and submissions should be directed to REI's managing editor, Linda Magad, in the Society's Chicago office. With your contributions, this special edition of REI should be one of our very best. Let us hear from you now in order to meet our approaching publication deadlines.



Editor in chief

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## THE PRESIDENT SPEAKS

# A SOUND INVESTMENT

**I**n today's real estate economy where problems are abundant and solutions elusive, the need for independent professional advice has never been greater. The CRE (Counselor of Real Estate) designation from the American Society of Real Estate Counselors identifies those persons who have demonstrated outstanding ability to provide independent real estate counseling services.

As the professional consulting affiliate of the National Association of Realtors since 1954, the Society's membership represents preeminence in real estate counseling. The CRE designation is awarded to the Counselor by his peers, members of the Society, in recognition of demonstrated judgment, integrity and experience.

Members of the American Society of Real Estate Counselors, through their national and international network, often employ a team approach for today's complex real estate situations. Individual CREs within the Society are specialists in appraising, financing, property management, asset management, leasing, and acquisition or disposition of properties. Each of these disciplines can play a role, and today's complex world often requires input from many sources.

When I was younger I thought decision making would become easier with more experience. But in today's complex world with the multitude of direct and indirect real estate-related problems, the reverse seems to be true. Even a casual observer recognizes the dramatic changes taking place in the U.S. economy and the real estate industry in particular. Where once the U.S. was the manufacturing center of the world, now it is a prime consumer and importer of finished goods. Where once the U.S. was the source of world capital, now it is a borrower. While the U.S. maintains a leadership role in research, space and food production, it is also a member of the world economic society rather than the sole leader. Capital for major real estate projects in the U.S. frequently comes from offshore banks, pension funds and investment companies.

It is not unusual for a Counselor to be the final check in the decision making process. A knowledgeable and experienced developer, lender or property asset manager frequently requires the services of a Counselor as a final confirmation before committing to purchase or finance a project. Whenever sound advice is required for real estate matters, a CRE could well be any project's most important investment.



**Lawrence A. Kell, CRE**  
*President*  
*American Society of Real Estate Counselors*

## **REAL ESTATE ISSUES**

# **CONTENTS**

### **Volume 17 Number 1 Spring/Summer 1992**

#### **Reprint Information**

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## **1**

### **Improving Real Estate Market Research**

Robert H. Pittman and Grant I. Thrall

At the present time, there are compelling reasons to bridge the gap between academic research and its application to industry. A new research tool, geographic information systems (GIS), may facilitate the exchange of information between academia and industry.

## **8**

### **Validation of Basic Valuation Models: A Multi-Family Housing Example**

Phillip S. Mitchell and Gary L. Bernes

The authors present a thorough study of 30 apartment complex transactions in the vicinity of Atlanta, Georgia, for the years 1984 through 1988 was undertaken. Statistical techniques were used to test the validity of the simple, direct proportionality models of valuation and expense estimation. The dataset was of unusually good quality and was based on audited income statements.

## **13**

### **Valuation of a Property Management Company for Acquisition**

Richard C. Shepard, CRE

Valuing and acquiring a property management company require the use of analytical approaches, modified by experience-based intuitive judgment. Retention of clients and professionals is a major factor to be recognized. The author describes how the multiplier applied to net income to determine value has declined.

## **17**

### **Real Estate Investment Yield Linkages**

Robert A. Steele, CRE

This article illustrates the relationship between the gross rental multiplier and the overall capitalization rate, the overall capitalization rate and the discount/internal rate of return, the equity yield and internal rate of return, and the linkage to the equity dividend (cash-on-cash) rate.

# 24

## The Impact of Supply Changes on Real Net Operating Income: The Multi-Family Perspective

Richard T. Garrigan, CRE and  
Joseph L. Pagliari, Jr.

Against the backdrop of historical debt and equity capital market flows, this article examines the impact of additions to the supply of multi-family dwellings on real (i.e., inflation-adjusted) net operating income. It offers suppositions regarding future capital market flows and their likely impact on apartment projects' real net operating income and suggests when apartment investments may generate above-average returns.

# 33

## Commercial Real Estate Loan Evaluation in the Insurance Industry

Daniel M. Norris

Recent increases in the rate of default for commercial real estate mortgages held by life insurance companies have raised concerns about the health of the U.S. life insurance industry. Thirty-six real estate loan underwriters at a large insurance company participated in a study, described in this article, to determine the importance of 19 variables in the approval of commercial real estate mortgages.

# 37

## Developer's Disease Can be Hazardous to Your Health

David C. Bamberger

A real estate developer who suppresses negative information about a proposed development project to protect himself from losing the project has what is called "developer's disease." This term is a form of defensive reasoning, and it is the underlying cause of failure for many real estate development projects.

# 39

## Macro-Determinants of Time on the Market

Paul K. Asabere and Forrest E. Huffman

Time on the market (TOM) is a function of supply and demand in real estate markets and a measure of real estate market activity. A data set of 337 urban, suburban and rural residential sales was used to examine the effect of macro-economic variables on TOM. The study controlled for housing attributes, neighborhood condition, location and broker pricing.

# 44

## Appraisal Thoughts from a Non-Appraiser

Bruce P. Hayden, CRE

The tasks of the appraiser, as described in this article, demonstrate that real estate appraisal is art as well as science. Appraisers should be paid properly for their services—and not considered "for sale" at any price.

# 46

## How Long is a Long-Term Lease?

Roy P. Drachman, CRE

Ground leases of 50 or 60 years are too short from a developer's or an investor's point of view. The leases should be much longer if an important development is going to be constructed on the land.

# 48

## Real Estate Issues Index 1991

# 52

## Contributor Information for REAL ESTATE ISSUES

# IMPROVING REAL ESTATE MARKET RESEARCH

*Real estate researchers and practitioners need to engage in an exchange that trades market research techniques from academia for data from industry.*

by Robert H. Pittman and  
Grant I. Thrall

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**R**eal estate market research is a broad term by definition. To the appraiser market research is to identify appropriate comparables for valuation purposes. To the real estate counselor, real estate market research is to be concerned with demand, supply and price or rental rates. To the academic researcher real estate market research is quantitative analysis of demand and supply factors which culminate in an econometric model of the market being studied.

Because of the numerous connotations of the term real estate market research, for purposes of this article it is defined as the study of the economic structure and performance of real estate markets, including the development of theoretical and empirical frameworks or models that facilitate the understanding of how markets work as total systems. To accomplish this, one must understand demand and supply fluctuations and how they jointly determine price and rental rates and the driving forces behind demand and supply and how these forces have behaved historically.

To this definition, we can add that the goals of real estate market research are to understand how markets react to changes in exogenous variables and to forecast market movements with a reasonable degree of success. Understanding market reactions and forecasting likely future movements are the *raison d'être* of real estate market research.

## Types of Models

We can classify empirical models of real estate markets into two basic types: econometric and judgmental. Real estate market research requires the development and application of both types of models.

### *Econometric Models*

Econometric models can be powerful analytical tools, but they are extremely data hungry. To develop a properly specified econometric model, one must have a sufficient amount of high-quality data. However, the availability of data is a primary binding constraint to the real estate market researcher. Since most real estate is privately owned, information about its performance is difficult to obtain. In research oriented toward evaluating the performance of properties for investment purposes, a classic data problem is that of appraisal-based versus market transaction measures of performance. Problems such as this often are compounded by limited

*Robert H. Pittman is executive vice president of Hoyt Advisory Services, a real estate counseling firm and subsidiary of the Homer Hoyt Institute. He is the author of numerous articles in real estate, economic development and market analysis. He was deputy director of the Industrial Development Research Council.*

*Grant I. Thrall specializes in the theory and application of market analysis techniques in geographic information systems. Thrall is recognized as a leading expert on the application of geographic information systems in real estate market analysis and is presently completing a book on this subject for Oxford University Press. He is a professor of geography at the University of Florida.*

time series or cross-section sample sizes, which call for special approaches, such as Bayesian techniques.

Of course, there is danger in building *ad hoc* econometric models that do not have adequate theory behind them. Lack of adequate data can cause variables to be misstated or omitted from *ad hoc* econometric models. Misstated or omitted variables can reduce the value of econometric models in helping to understand and forecast real estate markets. It also is difficult to forecast with econometric models because relationships among variables may change due to fundamental factors that have not been captured fully in the model.

Many econometric models of real estate markets do not employ simultaneous equations that incorporate a price or rent variable because accurate price or rent data are difficult to obtain in sufficient quantity and quality. Despite these pitfalls, econometric models can be useful for quantifying relationships among variables, e.g., office space absorption as a function of employment, population, etc.

#### *Judgmental Models*

The judgmental model is a less elegant but nonetheless useful alternative to the econometric model. The term judgmental has been applied to the class of models that are based on the analyst's judgment of the quantitative relationship among variables rather than on statistical estimation of relationships. Most often, judgmental models operate within a spreadsheet environment.

For example, the office judgmental model is a simple, step-by-step approach for translating employment forecasts into forecasts for the demand for office space based on employment and space parameters. A judgmental model of demand for office space usually begins with a forecast for employment by industry. To derive the demand for office space, the employment forecast is adjusted according to the percent of office workers within each Standard Industrial Classification (SIC) code, the amount of office space per worker and other parameters.

Similarly, a judgmental model of demand for residential space usually starts with a forecast of the number of households in the region under consideration. The number of households is adjusted to account for several parameters, including owner/renter split, price/income ratio, etc. The end result is a quantitative estimate of the demand for new housing units, given anticipated growth in the number of households and their behavior regarding the demand for housing.

The judgmental model allows the analyst to impose his judgment interactively on the model. If, for example, the analyst believes that the parameters are likely to change in the future, then he can easily change the parameters within the spreadsheet environment. The judgmental model also is intuitive for the layman.

However, judgmental models can be data hungry as well. For example, to derive the best estimates of

space per worker in an office judgmental model, large amounts of data specific to SIC code and location often are required.

#### *Hybrid Models*

Occasionally, hybrid judgmental/econometric models are developed for real estate market analysis. Most often, these hybrid models are judgmental in nature but use some parameters that have been estimated econometrically. This type of hybrid often produces a useful model that can be applied by a broad audience, however, it can be extremely data hungry.

#### *Interpretation*

Whatever type of model is chosen for real estate market analysis, care must be taken when interpreting the results it yields. Industry practitioners and academic researchers alike are skeptical of the analyst who simply cranks through his model and derives a point estimate for a real estate market. Industry practitioners may not understand what is inside the black box, but they know that point forecasts often are wrong, and they liken the practice of forecasting to gazing into a crystal ball. Academic researchers, who understand the workings of the black box, also realize that the probability of a particular point forecast being 100% accurate is quite low.

This by no means implies that market forecasts and analyses using sophisticated models are fruitless exercises. Models should be used in the appropriate context of performing alternative scenario analyses that aim to reduce risk and uncertainty from future market movements. The academic researcher and model-builder knows that the forecast of the dependent variable is only as good as the forecast of the independent variables, which is comprised by the accuracy of the model being used. The model-builder's job therefore is to develop the best possible model for expressing the relationship between the independent variables and the dependent variable (e.g., demand for retail space as a function of population, employment, disposable income, etc.).

A properly specified model then can be used to perform alternative scenario analysis. One can develop the base case forecast from the best available forecast of the independent variables. Because independent variables, such as population and employment, are difficult to forecast with a high degree of accuracy, the next step is to develop a high and a low scenario. A high scenario demonstrates the demand for retail space, given higher than expected growth in population, employment and disposable income. A low scenario shows the likely effect of low growth in these independent variables on the demand for retail space. These analyses establish boundaries around the likely future performance of the market, so the decision-maker can see the likely future movements in the market under a variety of scenarios. These analyses reduce risk and uncertainty on the part of the decision-maker and provide valuable information for the model-builder and market analyst. The layperson or industry practitioner does not usually have the tools necessary to do this type of analysis;



development of such tools therefore can be of great benefit to the decision-maker.

### Submarket Analysis

One of the major drawbacks to the econometric and judgmental models, and indeed to most market analysis techniques, is the difficulty of obtaining, for modeling purposes, adequate data at the subcounty level on critical variables such as employment, population and income. The decennial national census data are available at the block and tract level, but interpolations of the data at the subcounty level by demographic companies usually leave something to be desired. Occasionally, organizations such as local planning agencies estimate population, employment, etc., by census tract between census periods. However, these estimates are not true counts and usually are not made on an annual basis. Some types of real estate data also are not available by subcounty areas.

The problems created by lack of subcounty data and analyses are well known. For example, if one is analyzing the office market in Chicago and data are available only for Cook County, then the analyst may be working at a much too highly aggregated geographic level. An office building located in the North Loop area may be a good investment opportunity, while one in the South Loop area may not. This kind of geographical detail and differential market performance is masked when the analysis can be conducted only with county-level data. As another example, suppose a pension fund was interested in purchasing office buildings in various metropolitan statistical areas (MSAs) and wanted to know which office markets had performed well in the past and which were likely to perform well in the future. Rather than look at aggregate market analyses for 40 MSAs, the pension fund should look at five or six submarkets within each of the 40 MSAs because the individual submarkets might perform differently.

### Geographic Information Systems

A new research tool that can facilitate geographically disaggregated real estate market analysis is geographic information systems (GIS). This is a computer-based mapping and data analysis tool that incorporates many layers of data. Usually, the base map for a GIS includes road networks, political boundaries, rivers and other physical features. On top of this base map, one can add population, employment and other socioeconomic and demographic data that have been geocoded down to the zip code or census block level.

Next, one can add specific real estate data, such as parcel level data from the county tax assessors' office or proprietary databases of office, commercial or residential properties. Other overlays such as the availability of developable land, the presence of zoning constraints and the nature of other supply side considerations can be added. One can add as many data overlays as desired. The GIS facilitates the combined and simultaneous analysis of all data layers for any geographic area. For example, one can

FIGURE 1

Computer-Generated Map of Transportation Arteries in Cherokee County



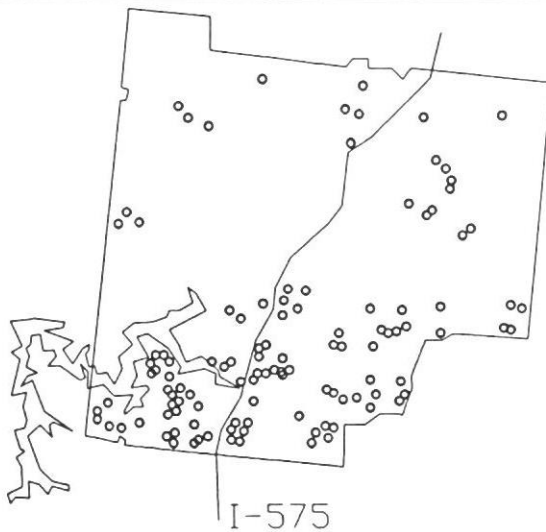
analyze and map the correlation between population and employment growth in terms of wealth measures such as per capita income.

A GIS for residential market analysis in the Atlanta metropolitan area recently was completed. The following discussion describes how GIS was used to analyze the subdivisions in Cherokee County on the northern fringe of Atlanta. Figure 1 is a computer-generated map showing the major transportation arteries and municipalities in Cherokee County. This base map for the Cherokee County GIS was developed using U.S. Census TIGER files, which contain geocoded coordinates for transportation arteries, major political boundaries and physical features such as rivers and lakes. The TIGER files are available on a compact disc for \$250 from the U.S. Census Bureau for an entire state. The procedure for entering the TIGER files into a GIS software package is straightforward. Once this data transfer is accomplished, the analyst has a base map of the major transportation arteries and physical features of the area he is analyzing and a geocoded file for matching addresses.

The first set of data overlaid upon the base map of Cherokee County was residential data obtained from DataBook, Inc., a company in Atlanta that collects quarterly subdivision-specific data on the number of housing starts, houses under construction, houses completed and houses occupied (absorption); the presence of amenities (e.g., pool, tennis courts) for each subdivision; and a variety of other variables. Subdivision-specific data for the past 16 quarters were obtained; the location of the subdivision

**FIGURE 2**

Cherokee County Subdivision Locations

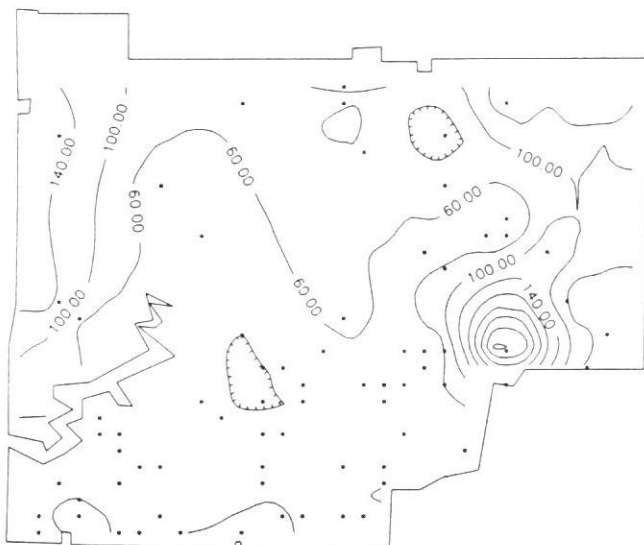


was geocoded by writing an algorithm that converted the DataBook map coordinate of the subdivision to a latitude-longitude coordinate; and these data were then entered into a GIS package called GIS-Plus.

Figure 2 is a simple plot of the location of each of the subdivisions within Cherokee County. The lake in the southwest corner of Cherokee County is a major recreational body of water, Lake Allatoona.

**FIGURE 3**

Contour Map of Platted Acres Per Subdivision  
(July, 1990)



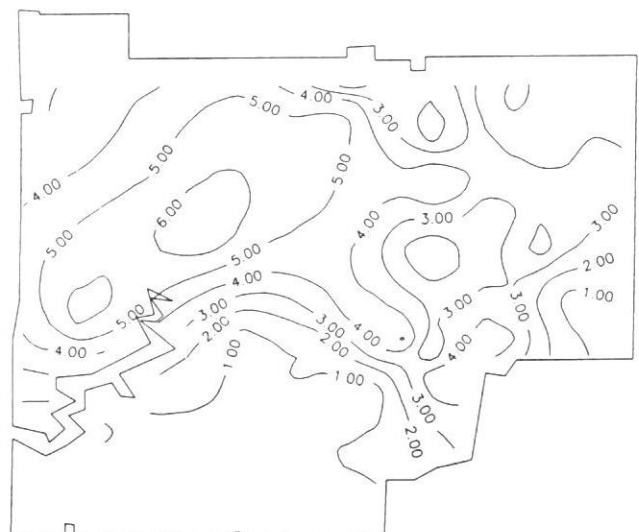
The plot clearly shows that subdivisions are clustered around the southern portion of the lake and that the preponderance of subdivision development is in the southern portion of the county closest to Atlanta along the I-575 corridor. Few subdivisions have been located in the northern party of the county, which is primarily rural.

Given the geocoded subdivisions within the GIS and the relational database attached to each subdivision, the analyst can make numerous spatial inquiries of the GIS and plot maps showing various features of the subdivisions. For example, if a builder or developer were looking for a good location for a subdivision in a certain price range with a particular amenities package, he could use a spatial query to ask the GIS to map the location of the closest competitors.

Figures 3 through 6 illustrate some of the simple spatial analyses that were accomplished with the Cherokee County GIS. Figure 3 is a contour map that shows variations in platted acres per subdivision. The asterisks on the map represent the locations of individual subdivisions. It is clear from this plot that the platted acres per subdivision are higher in the northern, less developed portion of the county. Figure 4 is a contour map of expected lot size which was derived by dividing platted acres per subdivision by number of lots. Once again, it is very clear that the expected lot sizes are higher in northern Cherokee County. These kinds of plots can be useful in analyzing the overall land use pattern in a county, as well as in helping a builder or developer understand how his project fits into the overall spatial pattern.

**FIGURE 4**

Expected Lot Size, Cherokee County  
(July, 1990)



**FIGURE 5**

New Build House Price Spread as  
% of Highest House Price,  
Cherokee County (July, 1990)

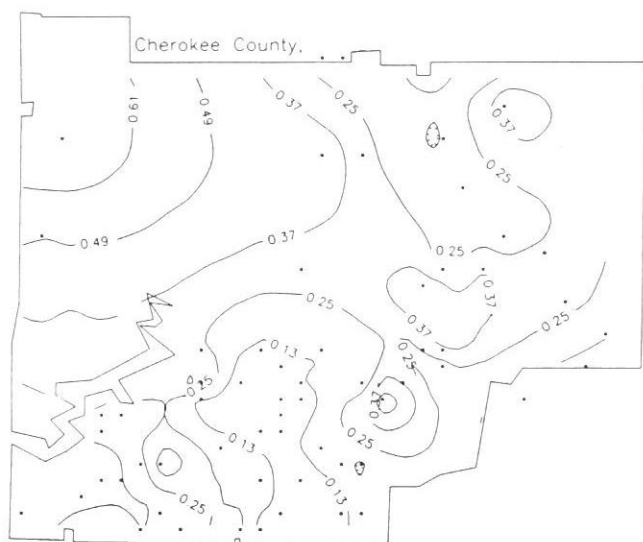


Figure 5 is a contour map of the normalized price spread in each subdivision. Price spread was derived by calculating the difference between the maximum and the minimum house price within each subdivision and dividing that figure by the maximum house price. Figure 5 shows that the average price spread in the subdivisions in the southern part of the county is much lower than the price spread in the northern, much less developed part of the county.

One interpretation of this phenomenon is that, in the more developed southern portion, subdivisions are fairly homogeneous in nature, i.e., the houses are built so they will be fairly close in price. However, in the northern, less developed portion of the county, specialization is more difficult; the subdivisions therefore are developed with a large spread in the price range to serve a thinner market. In other words, because it is more difficult to specialize in the northern portion of the county, subdivisions must include houses with many different price ranges. From the developer's standpoint, a subdivision of houses in different price ranges may be less desirable because the prices of the premium houses will be lowered by the presence of lower priced houses. Because demand is higher and development is greater in the southern part of the county, developers can afford to specialize and build homogeneous subdivisions. This is an untested preliminary hypothesis to explain the spatial price spread phenomenon disclosed in Figure 5.

Figure 6 is a three-dimensional plot of average subdivision price, created using the software

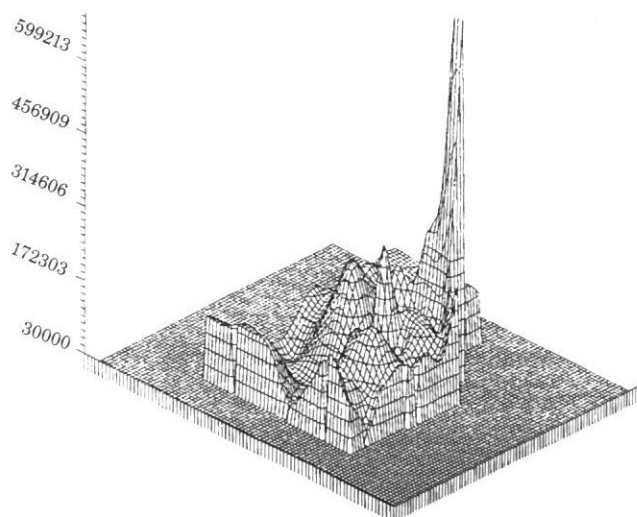
package Surfer. Plots such as this can help the builder or developer locate his or her subdivision within an optimal price gradient and help academic researchers understand the gradient.

Using the GIS system for Cherokee County, and ultimately GIS systems for other counties in Atlanta, a real estate researcher can define residential market areas in terms of functional economic areas rather than in relation to political or other boundaries. Simply by drawing lines on the computer screen, one can divide the county into as many market areas as desired. Then, using the relational database with the subdivision-specific data, one can conduct historical analyses of development trends and forecast future development trends.

Figure 7 shows the total number of housing permits issued in the Atlanta 18-county metropolitan area over the past 20 years. Since 1986, the trend in the number of permits (and absorption) clearly has been down. However, there have been many niches of opportunity for builders and developers in the Atlanta housing market during this time period. Figure 8 identifies some of these niches. The niches were spotted by sorting DataBook data by county and price range and querying the GIS to determine which price ranges and which counties had increased the most in absorption over the past several quarters. Of most interest in Figure 8 is that the leading market niches, by price range and location, occur in different counties and in most price ranges. This illustrates the importance of disaggregated submarket analysis. Lenders in Atlanta also are very interested in how research can help them make sound lending decisions which avoid overbuilt situations. Such analysis can be carried further with other dimensions such as amenities, type of house and architectural features incorporated into the analysis.

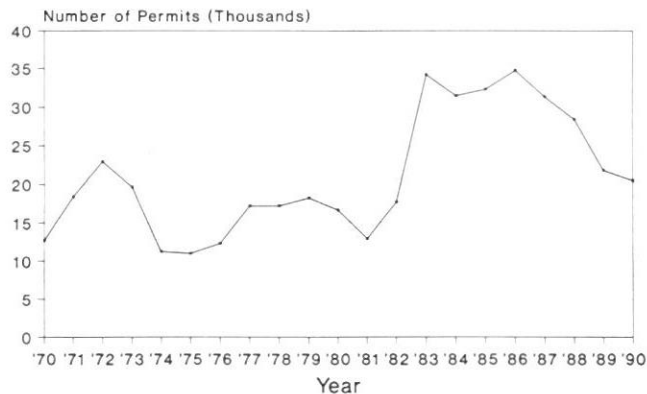
**FIGURE 6**

Midway Price for New Subdivisions



**FIGURE 7**

Single Family Building Permits  
1970–1990, Atlanta Metro Area



Source: U.S. Census Bureau  
Based on 18 County MSA

Good time series data on population and employment by subcounty area would be very valuable for the Cherokee County GIS. One future area of research is to explore the feasibility of obtaining subcounty data from state and local authorities in the Atlanta area to input into the GIS. Some states already publish employment and other key data by zip code for certain time periods.

### Translating Academic Research To Practical Application

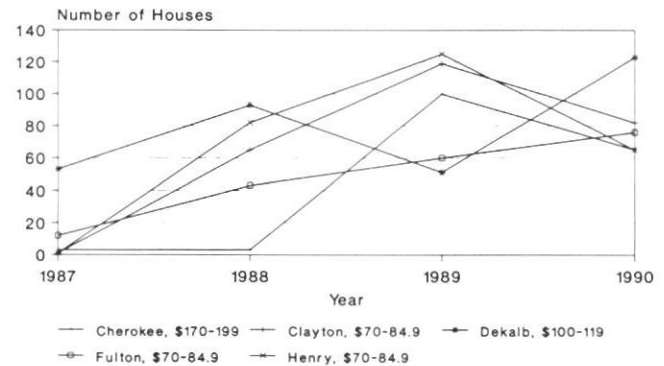
No matter how elegant and rigorous the model or market analysis, the application is severely limited if the translation is not made to the industry practitioners' level. At the present time there are compelling reasons to make this translation and bridge the gap between academic research and industry application.

From the academic perspective, there are signs that some business schools (where most academic real estate departments reside) may be recognizing the need to place more emphasis on research that benefits industry practitioners. In the 1950s, the Carnegie Commission issued an unflattering report of business schools, portraying them as nonrigorous institutions that conducted little sophisticated research. Undoubtedly influenced by this, business schools became more research-oriented institutions that emphasized the publication of formal studies in academic journals.

In a more recent report on business schools, Porter and McKibbin (1988) released the survey results of top corporate executives on the relevance of business school research. They noted that the vast majority of CEOs of major corporations believe the research conducted in business schools is irrelevant to them and to their business activities. In other words, the pendulum has swung too far in the other direction over the past two decades, to the point

**FIGURE 8**

Greatest Absorption Increases  
(by Price Range and County)



Based on ten-county metro area

where business school research stresses rigor at the expense of relevance.

From the industry perspective, new regulations mandate that market analysts and appraisers incorporate better market research into their analyses and reports. Therefore, industry practitioners have an increased need for advanced market research techniques and models. Since industry practitioners require more sophisticated analytical techniques and models for market analysis and academic researchers need more data to test and refine their models, the atmosphere is conducive for a fruitful exchange of market analysis for industry data.

Putting more advanced analytical techniques and models into the hands of industry practitioners will significantly improve the level of rigor of real estate market research performed by industry practitioners. For example, industry appraisers often focus narrowly on the micromarket for a particular property and pay only lip service to the larger issues of the local and regional economies and the specific demographic and economic variables driving the demand for and supply of particular types of real estate. More advanced analytical techniques and market models will help appraisers understand the larger picture and improve the valuation process. A leading regional appraisal company in the nation recently established a wholly owned subsidiary that performs sophisticated market research using judgmental and econometric models. The appraisers in this firm are required to submit their work to the inhouse subsidiary for a thorough market analysis and absorption study (if needed) before they give final valuations. In short, one way to help remedy the lack of data available to academic real estate researchers is to assist industry practitioners with their real estate market analysis and research in exchange for data that will improve research models and techniques.



## Summary And Conclusion

Real estate market research often has a different meaning to the industry practitioner and the academic researcher. It is hoped that these differences will diminish as industry practitioners utilize more sophisticated market research techniques and as academic researchers begin to translate their advanced techniques into useful applications for industry. This development will be mutually beneficial; industry practitioners will be able to utilize academic research techniques and models to improve their market analyses and forecasts, and academic researchers will obtain better data to improve their market research techniques.

Real estate market researchers must focus more directly on submarket analyses because submarkets can vary substantially within an MSA or region. It is difficult, however, to analyze markets at the subcounty level because of the paucity of data. GIS is a tool that can help with subcounty analysis and with the quantification analysis of location factors as they influence real estate.

The current environment is fruitful for academia to exchange its advanced market research techniques for databases from industry. Business schools have been criticized for producing research that is irrelevant to industry needs; real estate departments in business schools can help alleviate this situation by developing techniques that can be readily adopted by industry practitioners to improve their market research. On the other hand, industry practitioners are being encouraged to improve their market research techniques. They can help accomplish this by allowing real estate researchers in academia to use the data they collect for refining research techniques. The idea of exchanging market research techniques and models for industry data is logical.

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# VALIDATION OF BASIC VALUATION MODELS: A MULTI-FAMILY HOUSING EXAMPLE

*Mathematical models used to value income-producing property, such as the income capitalization approach, sales comparison approach, and estimation of expenses, are adequate reflections of the market.*

by Phillip S. Mitchell  
and Gary L. Bernes

**T**here are a number of simple mathematical models used in the valuation of income-producing property. These include the various income multipliers and the overall rate (OAR) which are associated with the income capitalization approach.<sup>1</sup> Similar multipliers are used in the sales comparison approach to value.<sup>2</sup> Expenses often are estimated on a per dwelling unit or per net rentable square foot basis or as a percentage of gross income or effective gross income. All of these mathematical models are directly proportional, almost the simplest models we can imagine.<sup>3</sup> How good are these simple models? They are certainly intuitively appealing and appear to conform with the realities of the market, at least to a first order of approximation over the relevant range of most real estate transactions.

The objective of the study reported in this article was to test and compare the simple, proportional models used in income property valuation. The testing and comparison used a basic statistical technique (multiple linear regression) on a good-quality, relatively homogeneous sample of 30 multi-family transactions in suburban collar areas in the Atlanta, Georgia, metropolitan area for the years 1984 through 1988. Although not large by statistical standards, the sample was of high quality.

## The Database

Each record (transaction) included the number and type of units (DU) for the apartment complex, the annual gross rental income (GR), other income (OI), gross income (GI), vacancy and collection loss (VC), effective gross income (EGI), expenses (EXP), net operating income (NOI) and units by type. In addition, the actual or contract selling price (SP), the year built (YR) and the net rentable area (SF) were included. From these, a number of measures were derived, including age at sale (AGE), gross income multiplier (GIM), gross rent multiplier (GRM), effective gross income multiplier (EGIM), net income multiplier (NIM) and expenses per square foot of net rentable area (ESF), rooms (ERM), units (EDU) and bedrooms (EBD). The selling price also was analyzed as a ratio of square footage of net rentable area (SPSF), rooms (SPRM), units (SPDU) and bedrooms (SPBD).

In this analysis, all figures for income, expenses and selling price were rounded and reported in thousands of constant dollars.<sup>4</sup> In cases where the apartment complex was too new to have an extensive income history, the projected figures for the transaction were used.

*Phillip S. Mitchell is a real estate consultant associated with Real Estate Sciences, International, a Chicago-based consulting firm. He was a professor of business administration in the California State University System for a number of years before entering the real estate business full time.*

*Gary L. Bernes, president of Bernes & Company of Atlanta, Georgia, has 15 years of commercial real estate experience, specializing in appraising apartments and hotels. He is a member of the International Society of Hospitality Consultants.*

TABLE 1

Descriptive Statistics for Multi-Family Complex Database

Variable	Name	Mean	Minimum	Maximum	Coefficient of Variation
Number units	DU	244.30	64.00	490.00	0.53
Number rooms	RMS	1063.70	336.00	2398.00	0.06
Number Bedrooms	BDRMS	433.60	124.00	974.00	0.60
Number 1 bed, 1 bath	R11	92.60	0.00	406.00	n/a
Number 2 bed, 2 bath	R21	32.70	0.00	126.00	n/a
Number 2 bed, 2 bath	R22	103.90	0.00	350.00	n/a
Number 3 bed, 2 bath	R32	22.60	0.00	136.00	n/a
Net rentable area	SF	258.30	73.90	585.90	0.58
Year built	YR	82.10	75.00	88.00	0.05
Age at sale	AGE	4.60*	0.80*	14.00*	n/a
Selling price	SP	14459.00**	3888.00**	34181.00**	0.61
Gross rental income	GR	1819.50**	493.30**	3958.00**	0.55
Other income	OI	30.80**	4.20**	90.00**	0.69
Gross income	GI	1850.30**	500.60**	4048.00**	0.55
Vacancy and collection loss	VC	76.00**	12.50**	197.70**	0.66
Effective gross income	EGI	1774.30**	487.20**	3850.30**	0.55
Expenses	EXP	625.50**	234.50**	1335.00**	0.50
Net operating income	NOI	1148.80**	252.70**	2759.50**	0.59
Gross income multiplier	GIM	7.62	5.85	8.68	0.08
Gross rent multiplier	GRM	7.75	5.93	8.81	0.08
Effective gross income multiplier	EGIM	7.95	6.15	9.14	0.08
Net income multiplier	NIM	12.62	10.84	15.38	0.07
Expense / SF	ESF	2.62***	1.72***	4.21***	0.23
Expense / room	ERM	633.00***	430.00***	869.00***	0.21
Expense / unit	EDU	2656.00***	1981.00***	3664.00***	0.14
Expense / bedroom	EBD	1598.00***	1007.00***	2510.00***	0.27
Selling price / SF	SPSF	56.95***	42.07***	104.15***	0.24
Selling price / room	SPRM	57.80**	35.30**	73.00**	0.13
Selling price / unit	SPDU	13.70**	10.50**	21.10**	0.19
Selling price / bedroom	SPBD	34.60**	25.00**	60.60**	0.26

\*Years

\*\*Stated in thousands of dollars

\*\*\*Stated in dollars

A summary of some descriptive statistics is reported in Table 1. These statistics include the mean, minimum, maximum and coefficient of variation for each measurement. For example, the smallest complex contained 64 units, while the largest contained 490 units. The mean for the variable "number of units" was 244.30. Annual gross rental income varied from \$493,300 to \$3,958,000 with a mean of \$1,819,500, and so forth.

### Valuation Model Tests

The database was analyzed using ordinary least squares regression techniques as embodied in the BMDP statistical software developed at the University of California, Los Angeles. A series of multiple linear regressions were run initially, with selling price (SP) as the dependent variable against the number of units (DU), age at sale (AGE) and a time (market conditions) variable (T), along with one of the commonly used value indicators listed in Table 1. These value indicators included gross rent (GR), gross income (GI), effective gross income (EGI), net

operating income (NOI), area (SF), rooms (RMS), bedrooms (BDRMS) and number of units (DU).

The first of the analyses regressed selling price (SP) on gross income (GI), units (DU), age (AGE) and time (T).<sup>5</sup> This regression was highly significant and had a coefficient of determination of 99.7%, indicating the regression based on the four variables explained 99.7% of all the variation in the data. The units and age variables each had *student t* values of less than 1.00, while the time variable had a *student t* value of only 0.35. These values indicated that the time, unit and age variables had little explanatory power and could be dropped from the regression model. Most importantly, the intercept was not significant and was dropped by forcing a zero intercept term.

The regression was rerun using only the gross income variable (see Table 2). Similar analyses were performed to regress selling price against each of the remaining principal income-related explanatory variables and size, age at sale and time; these regressions produced similar results (see Table 2).

TABLE 2

Income Approach Model Results: Zero Intercept

Principal Explanatory Variable	Other Explanatory Variables		Explained by Regression	Standard Error of Estimation
	Coefficient (t Value)	Age at Sale Time		
Gross income	7.99 (88.4)		99.6%	1,041
Gross rent	8.12 (85.4)		99.6	1,077
Effective gross income	8.32 (86.8)		99.6	1,060
Net operating income	12.63 (102.8)		99.7	896

Each of the regressions described in this article was examined for potential non-linearities and other statistical problems that would tend to render the regression results statistically unreliable. All of the regression results proved to be statistically reliable.

The regression results for the first four principal variables in Table 2—gross income, gross rent, effective gross income and net operating income—related to value indicators that typically would be used in the income capitalization approach to valuation.

The first line of the table presents the results of selling price regressed against gross income. None of the other independent variables appeared, in any combination, at a significant level. Well over 99% of the variation in the data was explained by this simple regression. Most importantly, since none of the

other variables appeared at a statistically significant level, we concluded that the simple, directly proportional model that related selling price and gross income through a gross income multiplier was an entirely representative and valid approach to valuation based on this data set.

The next three lines in the table illustrate the results for three other regressions based on gross rent, effective gross income and net operating income. The results of these regressions were almost identical to the results of the first. Thus, taken as a whole, the income multiplier approach, in whatever form, appeared to be a valid technique for value estimation. In fact, for this data set, there was no important difference among the four income multiplier techniques.

TABLE 3

Comparable Sales Approach Results: Zero Intercept

Principal Explanatory Variable	Other Explanatory Variables		Explained by Regression	Standard Error of Estimation	Increase in Standard Error
	Coefficient (t Value)	Age at Sale Time			
Dwelling units	62,160 (35.1)	− 4,378 ( − 4.2)	98.9%	1,830	
	60,500 (40.1)		98.2	2,277	24%
Total N.R.A.	55,200 (33.8)	− 12,594 ( − 5.9)	98.8	1,899	
	55,600 (29.9)		96.9	3,037	60%
Total rooms	13,380 (24.7)	− 9,286 ( − 3.1)	97.9	2,574	
	13,500 (29.8)		96.8	3,042	18%
Total bedrooms	31,680 (20.3)	− 11,790 ( − 3.4)	97.0	3,089	
	32,700 (24.9)		95.5	3,622	17%

Table 3 includes regression models based on value indicators commonly associated with the comparable sales approach to valuation. These regressions provided some interesting results. For example, in the first regression shown, dwelling units (DU) proved, not surprisingly, to be the most important explanatory variable. However, both age at sale (AGE) and time (T) also had statistically significant *t* values and therefore played a statistically important, albeit small, role in the model. Thus, it appeared that the number of dwelling units was a good indicator of value (based on the second regression), even as a directly proportional unadjusted indicator. The same could be said for the other physical indicators—area, rooms and bedrooms—but not to the same degree.

The standard error of the regression on dwelling units alone was 24% greater than the standard error of the regression including time and age. The other increases in standard error were 60% for area, 18% for rooms and 17% for bedrooms. For all four regressions, these findings indicated a larger prediction error when the age and time variables were not used. A 17%, 18% or even 24% error could be adjusted for; a 60% higher prediction error was too high to be accepted graciously or adjusted for. Thus, the use of net rentable area, based on these data, could not be recommended. Further, adjustments for time and age at sale should be utilized in order to decrease error.

A final and very important conclusion was drawn by comparing the standard errors of estimate for the regressions in Table 2 and the regressions in Table 3. The standard errors for the sales comparison approach indicators, taken in their directly proportional form, ranged from 2,277 to 3,622 (Table 3), while those associated with the income capitalization approach ranged from 896 to 1,077 (Table 2). Thus, the indicators for the comparable sales approach had about two to three times the prediction error of the indicators for the income approach. This led us to the conclusion that, a priori, the income approach indicators provided value estimates that were considerably superior to those of the comparable sales approach. This result is shown graphically in Figure 1.

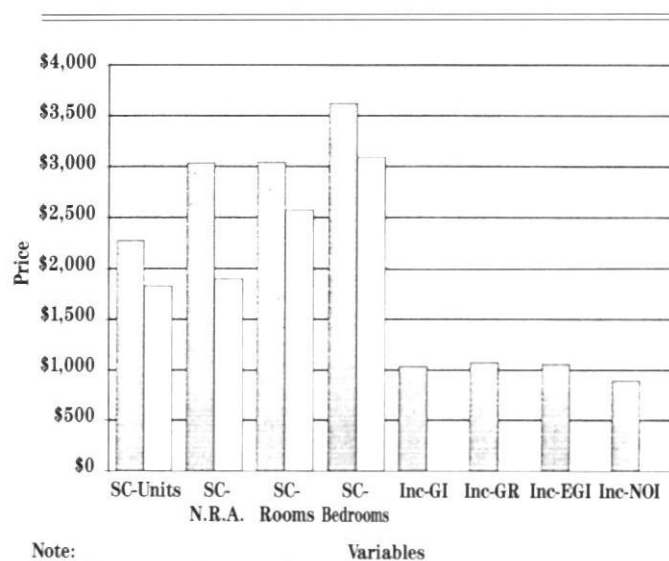
### Expense Model Tests

The simple direct proportionality models described above are often used to obtain valuation conclusions. Direct proportionality models are used to model expenses in the income approach to valuation. Specifically, expenses are estimated as a percentage of effective gross income, gross income or as an amount per dwelling unit; sometimes, they are estimated as an amount per room, bedroom or square foot.

We used simple regression analysis on our database as a means of analyzing and comparing these methods of expense estimation. The analysis proceeded in much the same way as described above and yielded similar results. Expense was regressed against a sequence of principal explanatory variables together with age at sale and time. The intercept in the regressions was never significant, indicating that directly proportional models were

FIGURE 1

Standard Error in Sales Price Prediction Using Alternative Predictors



Note:  
SC designates a variable used in the sales comparable approach; Inc designates a variable used in the income approach.

Variables

Single Variable Predictor  
Additional Predictors Added

meaningful; thus, further regressions were forced to have a zero intercept.

Not surprisingly, time entered the regressions on physical indicators at a significant level, but it was not significant for the income indicators. Age appeared at a significant level with the income indicators, but it was not significant for the physical indicators. However, the time (T) and age at sale (AGE) variables had relatively low impact. The existence of these variables in the regression indicated that appropriate adjustments should be made to the directly proportional models in order to reduce the prediction error increases that would otherwise occur. These increases can be seen in the final column of Table 4, along with the other regression results.

Table 4 also furnishes expected conclusions concerning the relative potential errors among the physical models and the income percentage models. First, the standard error of the regression for the simple, direct proportionality expense model based on dwelling units was much smaller than that for the rooms, area and bedroom models. Stated another way, these latter three models have standard errors which are 63%, 54% and 96% higher. Thus, among the physical expense models, it appears that expense per dwelling unit is superior.

Only two income models were considered, with the gross income regression carrying a 6% higher prediction error. This is hardly enough difference to make comfortable generalities, but the result does not differ from expectations. Thus, we should continue to favor the model based on effective gross income, since it corresponds most closely with experience and theory.



TABLE 4

Expense Regression Summary: Zero Intercept

Principal Explanatory Variable	Coefficient (t Value)	Other Explanatory Variables		Standard Error of Estimation	Increase in Standard Error
		Age at Sale	Time		
Dwelling units	2,361 (37.6)		17,869 (3.35)	66,035	
	2,513 (49.4)			76,789	16%
Total rooms	505 (23.6)		30,463 (3.79)	103,318	
	561 (30.1)			124,891	21%
Total N.R.A.	2.05 (28.8)		34,055 (5.21)	85,442	
	2.31 (31.9)			117,906	38%
Total bedrooms	1,192 (19.8)		37,197 (4.00)	121,936	
	1,355 (24.8)			150,218	23%
Gross income	30.6% (37.9)	− 12,543 (4.5)		74,522	
	32.8% (39.5)			95,835	29%
Effective gross income	32.1% (40.7)	− 12,053 (− 4.6)		69,591	
	34.2% (41.8)			90,494	30%

Finally, the standard error for the expected gross income (EGI), model is 18% higher than the standard error for the dwelling unit (DU) model. This indicates that expenses are probably better predicted on a per dwelling unit basis rather than as a percentage of income.

- Among the *income multiplier models*, the net income multiplier (1/OAR) proved to be superior to the EGIM, GIM and GRM in terms of prediction error, but this superiority was not great. These multipliers appeared to need no adjustments for the time, age at sale or number of units in the complex; so all were valid in their simple, directly proportional form.
- The *per unit multipliers* associated with the sales approach to valuation were valid for the most part in their directly proportional form, but they could be adjusted for time and age at sale to reduce modeling (prediction) error. Dwelling units were the superior predictor, with total bedrooms and total rooms close behind. The total net rentable area had too high a standard error to be an adequate predictor.
- The *income multiplier models* generally were superior to the per unit multipliers by a factor of more than 2. Thus, it appeared that the income approach results should be favored, a priori, over the sales comparison approach results.

- All of the directly proportional *expense* models proved to be adequate, although all could benefit from adjustments for either time or age at sale to lower their prediction error. Estimation of expense based on effective gross income had a slightly lower prediction error than estimation as a percentage of gross income. However, estimation based on dwelling units had the smallest estimation error and, therefore, was the superior estimation method for this dataset.

None of the statistical results was surprising, and all generally supported the adequacy of the simple, directly proportional models that are commonly used by real estate professionals for valuation. These results probably generalize to larger, multi-family complexes under professional management.

#### NOTES

1. The OAR is equivalently and more conveniently represented as a net income multiplier, and it is properly grouped with other income multipliers.
2. Most of these models are applicable only to properties in which operations have been stabilized, although they still have usefulness as rules of thumb. When used as rules of thumb, these simple models require careful application due to comparability problems.
3. Their very simplicity is appealing in the extreme. It is difficult to imagine real estate professionals functioning without answering such questions as "what is the cap rate."
4. All nominal dollar data were converted to *constant* 1988 dollars based on the U.S. All-Urban Consumer Price Index.
5. Many more regressions were run than are reported here. For purposes of brevity, this exposition does not deal with the many relationships that did not prove to be significant.



# VALUATION OF A PROPERTY MANAGEMENT COMPANY FOR ACQUISITION

*In addition to quantitative measures, factors such as the retention of existing accounts and the preservation of their growth potential are key to determining the market value of a management firm.*

by Richard C. Shepard, CRE

**T**he purpose of the counseling engagement reported here was to provide guidelines and comparables from actual transactions that would assist and provide direction to a client's determination of the market value of a property management company. Efforts first concentrated on obtaining interviews with real estate executives who most likely would have addressed this topic or would have actual comparables, coupled with followup of references and sources uncovered through the interview process. The same sources and contacts logically expanded the scope of the interviews to incorporate the larger context of the subject, including not only value and pricing, with comparables in several instances, but also the structure of the transaction and other relevant factors that affect the acquisition or sale of a property management company. While the client relationship and the confidentiality owed the interviewees prevent disclosure of specific comparables, the client for this study graciously has allowed the author to share the study's underlying trends, general guidelines, conclusions and observations with industry professionals.

## The Survey

The survey took place during early 1991. More than 60 real estate executives located throughout the continental United States participated. Each was contacted personally and interviewed by telephone. While the interviews focused on standard areas of inquiry, they encouraged free-flowing conversation to inhibit the interviewees the least and allow them to respond to and explore their agenda for the topic. Executives were eager to participate in the study because of the current interest in the topic in these times of dramatic change in the real estate industry.

## Other Resources

The author reviewed a 1988 research report of a study for the IREM Foundation by Dr. Shannon P. Pratt of Willamette Management Associates, Inc., entitled *Valuing a Property Management Company*. This study's target mirrors that of this engagement. The Willamette study was comprehensive, had a significant response to its initial questionnaire, applied recognized and accepted statistical methods of analysis to a surprisingly large sample of comparable transactions and collected and analyzed the data by a competent team.

While the report was published in early 1988, the period for which transactions were analyzed extended over the previous five years. Some of the numerical factors used in the study characteristically change with time, and they have changed dramatically in today's volatile real estate environment. The author therefore believes current use of

*Richard C. Shepard, CRE, is principal and founder of Real Estate Strategies and Advisory Services, St. Louis. Prior to entering real estate counseling, Shepard was a senior executive in a multicity real estate development and asset management firm for 21 years, eight as its president and CEO. He holds an engineering degree from Washington University and an MBA from St. Louis University.*

the numerical aspects of the Willamette study could lead to overvaluing.

The Willamette study sample was weighted away from the office, industrial and retail categories of property management and biased toward residential management. The survey transactions involved many small companies, combined with a sprinkling of very large companies, some of which were public.

In this counselor's opinion, the generalizations and observations of the IREM-sponsored study, some of which could be logically concluded or confirmed, may be of greater importance than its numerical or mathematical approaches or conclusions. This author agrees with much of Willamette's research report and does not fault its methodology. Although the survey appears to be biased toward smaller residential property management, some of the report's information and conclusions have been reinforced by this more recent survey and the input it generated. However, this counselor is concerned about current application of any such study, his included, without paying close attention to the thought processes and intuitive judgment that a businessman must commit to the valuation process before he can apply any study results to his own business. Willamette's study necessarily focuses on a mathematically quantitative approach to valuation and, thus, on those factors most likely to affect the math. Other more subjective factors also affect the value of a property management business to an acquiring firm or to the owners of the firm that is being acquired in a transaction. Willamette's study suggests and alludes to the factors in several parts of its report.

### **Survey Results On Valuing A Property Management Folio**

Several trends and directions emerged from the survey of real estate executives. The most frequently suggested quantitative approaches were:

- Multiples of current gross revenue or, preferably, current net income, the latter suggesting a capitalization rate applied to the current net income after some reasonable adjustments, for example, altering owner compensation to an amount that would be normal for the position he fulfilled.
- To a much lesser extent, the present worth of an anticipated income stream which requires a discounted cash flow analysis using a projection of the net income from current accounts or operations that have been extrapolated into the future.

Multiples of (or capitalization rates applied to) net income were the preferred route used by experienced real estate executives because this approach directly addresses the bottomline. Some interviewees argued for a multiple of gross revenue, which would make sense when used in a folio of many small management transactions or when reasonable assumptions could be made about eventual profitability. This method may very well be the case for residential property management. Frankly, this counselor feels that the multiples of gross revenue approach tends to inflate value or price to the advantage of the seller.

Larger more sophisticated firms seemed to favor a multiple of earnings, i.e., net income, while smaller firms accepted a multiple of gross revenues. The present worth or discounted value of an anticipated income stream resulting from a discounted cash flow analysis appealed more to those executives whose backgrounds were closely allied with appraisal or accounting, and, in my opinion, has value more as a cross-check or as a sales tool. As those in commercial real estate should know, assumptions regarding projections can significantly affect the value of a projected income stream.

Any quantitative approach, even though mathematically derived through discount factors, capitalization rates or multipliers, recognized the short-term nature of property management contracts, their cancellability and their reliance to the present professional staff. Potential retention of clients and professionals, as well as the caliber of the property management contracts, became paramount. Thus, these influential factors, and the means of evaluating them, became just as important as any quantitative approach to the valuation.

Over the past few years, the numerical multiples applied to gross revenue or net income have declined, and the percentage discounts applied to future anticipated income streams have increased. In either case, the value of the property management company or its portfolio of service contracts has declined. These trends reflect increased uncertainty and competition which have reduced the values of property management portfolios as viewed by prospective buyers. More firms, especially development firms, have aggressively entered the property management competition. Many will likely fail in their efforts, with the odds far worse for those merchant builders who have not managed a portfolio and better for those who have managed for third parties. However, nothing prevents firms from undercutting competition, not just in management fees but in what is provided in return for those fees. Property managers increasingly face competition from owners, primarily institutions that have formed their own property management subsidiaries, over one of the few remaining areas of income in the current real estate environment. Other owners are skimping on property management in these trying times to conserve outflows on already distressed property. Some banks, for example, are trying to manage their REO with their own personnel rather than use professional property managers as they have in the past.

The preference for applying a multiplier to net income accompanied a preference for using net income before taxes, rather than after taxes, and in some cases a real or perceived lack of a difference between the two at least by some executives. They saw income taxes as an exposure that differs depending not only on profitability but also on tax strategy, depreciation, interest exposure, etc. Some executives said that the multiplier is the same or at least similar in either case, that it makes no difference.

Whether right or wrong, perception can become reality.

Recognizing the Willamette study, but relying on this personal contact survey for more recent and comparable insight, the author has come to the conclusion that the multiplier, applied to net income to determine value, declined from a range of three to six times net income, only four to six years ago in the hectic and active acquisition days when the giants tried to get bigger at any costs, to a more recent range of one to three times net income. Some executives even felt that a multiplier of 1.0 is tops, because of the short-term nature of property management contracts, their 30-day cancellation clauses, the turbulence of the industry and the apparent fickleness of some current clients compared to clients of the past. Yet a few other executives, including one who claimed to be in an acquisition mode, still believe in higher multiples. Some of the variance in opinion among executives may relate to the viability and potential of the markets they serve.

These dramatic changes have led to a divergence in the assessment of value between buyers and sellers and frequent failure to reach agreement except when either or both buyer and seller have a unique motivation that affects their view of price. For example, a seller may be facing financial difficulties, divorce, estate settlement, health problems, burnout or have a sincere desire to retire. A buyer may see a particular synergy, an economy of scale, a special fit with his vision of the business, an entry into a desired market or a means of acquiring key accounts and/or professional staff. Such unique motivations can drive or fuel a transaction and heighten the need for a negotiator to put himself in the other person's shoes.

### Factors And Concerns To Consider

In buying a property management firm, agreement on a normalized pro-forma helps clear the air and move negotiations ahead. This focus then brings us full circle to the other factors that significantly determine value.

The most influential factor is the retention of the existing property management accounts and the preservation of their growth potential or protection against any likely loss or shrinkage. Some existing accounts may move solely because of the transaction itself and the changes the client perceives; or the owner may use the opportunity to rebid contracts among existing accounts, especially in these cost-conscious times. An ownership transaction regarding the property management company or the property itself may create an unanticipated exposure. In valuing a property management income stream and the likelihood it will continue, a helpful exercise is to review the probable continuity of income by account and category.

Directly related to this retention of accounts are the management contracts themselves. Unfortunately, in most cases, the contracts are short-term, frequently one to three years, and have cancellation

provisions as short as 30 days. Others flag ownership change by either party as reason for reconsideration of the contracts' terms. Related then are the longevity of the accounts with a specific client and the diversity of the firm's clients.

At the heart of this retention are client relationships. Property management is very much a relationship- and people-oriented business. High on the list of management assets are the caliber and motivation of the employees, the ability to retain employees key to the business and the relationships upon which success depends. Property management is people intensive.

The chemistry or fit of the to-be-acquired business with the present business often can be the final decision-maker. Will the new business conflict with or complement the existing one? Does it add to or detract from the existing business? Will each business enhance the volume and profitability of the other? Will the needed key people in both businesses fit well together?

Potential buyers should look for the ability to generate other earnings, for example, through commissions, tenant improvements and construction management fees or to capitalize on tenant and owner relationships and the future work they can provide. Property management can put an executive team in the middleman slot in closest communications between investors and tenants. Interestingly, most profitable real estate operations require serving both customers, meeting their needs and enhancing their profitability and success. Developers have historically thought of development as creating property management, and many have treated property management as a step-child or a necessary evil. When demand closes the gap on supply, good property management and its excellent client communications lead to development opportunities.

The location of the firm's business is a factor that relates not only to the growth potential of the area, its economy and the competition but also to the assimilation of the new business. Competition in the firm's markets should be evaluated. The size of the firm is important as it relates to the ability to assimilate or digest the acquisition and the resulting potential economies of scale.

The accounting and reporting systems of the firm are other relevant considerations. In reviewing accounting data, buyers should look for any overhead costs that can be reduced, for example, significant travel and entertainment expenses that may be viewed as appropriate or tax efficient for present owners but would be unnecessary and wasteful in the new environment. These savings may take time to achieve tactfully.

The nature and diversity of the ownership and financing of the property that is managed affect the valuation and related decisions.

The character of the firm that is being acquired or valued relative to its pursuit of and involvement in other related businesses is a positive or negative



factor. For example, a profitable and cash-producing tenant finish operation could be a real plus, while the maintenance of a park indentured common area or storm water retention pond on an unprofitable or breakeven basis could be a negative.

The type and size of the projects that are managed, as well as their quality of maintenance and condition, affect profitability, stability and ease of assimilation.

The firm's reputation, not only the sometimes nebulous goodwill factor but also its character, respect, integrity, trust, community acceptance and recognition, acknowledged expertise and performance, prestige and credibility, play a role.

Not to be overlooked is an assessment of liabilities, especially those contingent liabilities that fail to show on a balance sheet. The buyer should seek a satisfactory form of indemnification from the seller regarding undisclosed or hidden liabilities.

Lastly, the status and condition of the firm's physical plant—computers, word processors, telephone system, other office equipment, leased or owned premises, etc. must be determined.

### Structuring The Transaction

The buyer should negotiate up to a maximum price which has been derived on the basis of a low multiple of net income before taxes but after adjusting to normal compensation for the owners active in the business. The net income after taxes may be used as a starting point and a basis that favors a lower price, presuming the seller has tax exposure. Remember, the buyer purchases current, not future, value.

The buyer should propose terms to help create value for the seller as well as to ease financing of the acquisition and provide monetary values tied to contingencies related to the retention of accounts. These contingencies will help maintain and possibly create value for the buyer, too. Depending upon where the price appears to be headed, this counselor suggests resisting any substantial upfront cash payment.

The balance due ideally should be payable over several years, and it should be tied to retention of existing accounts and their related volume. The writer likes the approach of tying in retention through a calculated percentage of the gross revenue from existing account billings which is payable monthly. This approach provides an excellent and responsive incentive for the principals of the acquired firm to retain their present accounts.

This counselor strongly suggests including in the contract non-compete clauses for the present owners in terms of geography, time-frame, clientele and penalties. These clauses should be sufficiently reasonable so they will not be perceived as enforceable deterrents. In judging reasonableness, the sellers must be recognized as prior owners, not just employees.

This author also suggests employment agreements for the sellers and the key employees, if any, that the buyer plans on retaining for a specific length of time. This period of time is long enough at least for the transition to take place or, with some key executives, long enough to wean away their accounts. Employment agreements may be difficult to achieve with employees. These agreements are two-sided and can restrict the buyer's flexibility, too.

Legal and accounting counsel should be employed to make certain that most, if not all, of the purchase price is allocated in the purchase contract to intangible assets that can be amortized as deductible expenses under federal income tax laws.

Obviously, these recommendations represent the ideal, in this counselor's view. Ideal structures may not be practical routes for completing a transaction in a way that best fulfills objectives. Thus, the relative importance of each factor and structural ideal should be taken into account. Other factors that alter a buyer's view or the view from the other side of the negotiating table also should be considered. For example, the buyer's plans for transition certainly should be reflected in the transaction's structure. In structuring and negotiating a purchase, the buyer should recognize that it may be more economical to pirate the key people and accounts rather than buy out the owners. This thought may strengthen the buyer's negotiating posture.

### Summary

The process of valuing or acquiring a property management company provides an excellent example of decision-making based upon the use of analytical approaches that have been appropriately modified by intuitive judgment founded upon experience. As outlined, the valuation requires both analytically derived input as well as intuitive judgments relating to its application and the consideration of a host of relevant factors, both tangible and intangible. Retention of clients and professionals, as well as the caliber of the management contracts, are major factors to be recognized.

Regardless of approach, market value of a property management company, relative to its income stream, has declined due to increasing manager turnover, fickleness of current clients and general turbulence in the industry.

Coupled with and interrelated to the above valuation and the relevant factors and concerns is the structuring of any related transaction to recognize them. The sale structure should complement and reinforce the principles upon which the acquisition is based.

### NOTES

Pratt, Shannon P., Williamette Management Associates, Inc., *Valuing a Property Management Company*, (Institute of Real Estate Management Foundation, 1988).

# REAL ESTATE INVESTMENT YIELD LINKAGES

*Interrelationships among investment yields and the equity dividend influence the profits developers can realize.*

by Robert A. Steele, CRE

*Growth rate is defined in this article as the anticipated increase in net operating income. It also can relate to changes in expenses and/or value. Overall capitalization rate is the market-derived relationship between the selling price or value of a property and its net operating income. The required return (discount rate) and IRR (internal rate of return) are the same thing. The discount rate is used prospectively, and the internal rate of return is derived by equating the present worth of all revenues with the initial investment so that the difference is zero.*

**T**he real estate market uses several measures to equate rates of return, although it is not always clearly recognized that these measures bear a relationship to one another and to the money market. The most commonly used measurements are:

- gross rental multiplier (GRM)
- overall capitalization rate (OAR)
- overall discount rate/internal rate of return (IRR)
- equity yield/internal rate of return
- equity dividend rate (cash on cash;  $R_e$ )
- developers' profit

Each of the above yields are affected by:

- supply and demand
- interest rates
- inflation and growth rates

A series of illustrations may help to illustrate these relationships. The examples that follow have been kept simple deliberately. This article focuses on the interrelationships of yields; it does not treat the complexities of various major property types.

## The Gross Rental Multiplier And The Overall Capitalization Rate And Internal Rate Of Return

Example 1:

Scheduled gross revenue	.....	\$100,000
Operating ratio		
[1 - (vacancy + expense ratio)]	....	.65
Gross rental multiplier		
based on market comparables	.....	7.5
Estimated annual growth		
in revenue and value	.....	.04
Value is being estimated		
on a free and clear basis		
no mortgage is considered		
Valuation by GRM		
$\$100,000 \times 7.5$	.....	\$750,000
Overall capitalization rate analysis		
$.65 \div 7.5 =$	.....	.0867
Valuation by OAR		
$\$100,000 \times .65 \div .0867 =$	.....	\$749,712
	Say	<u>\$750,000</u>

*Robert A. Steele, CRE, is president of Parkcenter Realty Advisors in Los Angeles. He has been an active member of the American Society of Real Estate Counselors serving as vice president and a member of the Board of Governors. Steele is a frequent contributor to the Appraisal Journal and other industry publications.*



## Discount Rate Analysis

In an unleveraged situation, the discount rate/internal rate of return is equal to the overall capitalization rate plus the estimated rate of growth. In Example 1, the overall rate of return is 8.67%, and the estimated growth rate is 4%. Therefore, the discount/internal rate of return is 12.67%. The proof of this is shown in Example 2.

Example 2:

Valuation by 10-Year Discounted Cash Flow Analysis

Year	Cash Flow	Present Worth Factor @ 12.67%	Present Worth
1	\$ 65,000	.887548	\$ 57,691
2	67,600	.787741	53,251
3	70,304	.699158	49,154
4	73,116	.620536	45,371
5	76,041	.550755	41,880
6	79,082	.488821	38,657
7	82,246	.433852	35,683
8	85,536	.385065	32,937
9	88,957	.341763	30,402
10	1,202,698*	.303331	364,816
Total			\$749,842
		Say	\$750,000

\*\$92,515 + [\$750,000 × 1.480244 (future worth of 1 @ 4%)]

To illustrate that the discount rate and internal rate of return are effectively the same, see the analysis in Example 3.

Example 3:

Internal Rate of Return

Time	Cash Flow
0	..... (\$750,000)
1	..... 65,000
2	..... 67,600
3	..... 70,304
4	..... 73,116
5	..... 76,041
6	..... 79,082
7	..... 82,246
8	..... 85,536
9	..... 88,957
10	..... 1,202,698
IRR = 12.67%	

## The Affect Of Mortgage Loan Financing

The next step in the relationship chain is to consider the effect of mortgage loan financing on equity. The analysis in Figure 1 indicates an equity internal rate of return of 15.90% and a cash-on-cash return of 4.60% based on the calculation:

$$(\$65,000 - \$54,167) \div (\$750,000 - \$514,361) = 4.60\%$$

## Band Of Investment Analysis

As indicated previously, the cash-on-cash return in the mortgage loan scenario is 4.60%. With income

and value unchanged, the overall rate of return remains unchanged. With the introduction of mortgage loan financing, the yields are redistributed. This is illustrated in Example 4:

Example 4:

Interest	%	Rate	Weighted Rate
Mortgage	68.58%	10.53%*	7.22%
Equity	31.42%	4.60%	1.45%
Overall	100.00%	15.13%	8.67%

\*Mortgage Loan Constraint, 10%, 30 Years

Table 1 presents capitalization rates based on debt service coverage ratios (DCR) of 1.0 to 1.30. Note that by interpolation with a 1.20 DCR and an overall rate of 8.67%, the cash-on-cash (equity dividend) rate would be approximately 4.60% (see Example 5).

Example 5:

Equity Dividend Rate	OAR	OAR
.05	.0889	.0889
.04	.0828	.0867
.01	.0061	.0022
	and	
.0022	÷	.0061 = .36066
	and	
.05	− (.01 × .36066)	= .04639

## Overall Capitalization, Growth And Equity Discount Rates

With the previous discounted cash flow analysis (which reflected an 8.67% overall rate of return on a 4% growth rate, 15.90% equity discount rate, 1.20 debt service coverage ratio and a 10%, 30-year mortgage), it should be clear that as the growth and equity discount rates change for any given mortgage situation, the overall capitalization rate also will change.

Table 2 presents overall capitalization rate tables reflecting growth rates of 0% to 10% and equity discount rates of 10% to 20%. The table permits analysis of the changes in overall capitalization rates based upon mortgages with a DCR of 1.20 and interest rates of 9.5%, 10% and 10.5%.

## Use Of Capitalization Rate Tables

The most obvious use of capitalization rate tables is to estimate an appropriate overall capitalization rate. This estimate may be obtained by identifying, in the equity discount rate (IRR) column, the row that reflects the estimated growth rate and the intersecting overall capitalization rate. For instance, assume there is a new 30-year, 10% mortgage, with a DCR of 1.20, and that the market driven equity yield is 15% and 4% growth is anticipated. The 10% mortgage interest table at the 15% equity discount rate column and the 4% growth row reveals an overall capitalization rate of 8.40%.

FIGURE 1

## Mortgage Loan Financing and the Internal Rate of Return

Investment Value										
Input Assumptions										
Initial NOI	65000									
Loan information:										
DCR	1.2									
Interest rate	10.00%									
Loan term	30 years									
Payments/year	12 per year									
Growth rates:										
NOI growth rate	4.00% per year									
Overall capitalization rate	8.67%									
Terminal capitalization rate	8.67%									
Estimated NOI (year 10)	\$92,515									
Required return	15.90%									

Calculations based on above inputs:

Loan amount	514361
Annual debt service	54167
Constant	10.53%
Equity investment	235605

Summary loan information:

End of year	1	2	3	4	5	6	7	8	9	10
Payment	54167	54167	54167	54167	54167	54167	54167	54167	54167	54167
Mortgage balance	511502	508343	504854	500999	496741	492037	486840	481099	474756	467750
Interest	51307	51008	50677	50312	49908	49462	48970	48426	47824	47160
Principal	2859	3159	3489	3855	4258	4704	5197	5741	6342	7006

Estimates of cash flow from operations:

	Year									
	1	2	3	4	5	6	7	8	9	10
Before-tax cash flow										
NOI	65000	67600	70304	73116	76041	79082	82246	85536	88957	92515
Less: debt service (DS)	54167	54167	54167	54167	54167	54167	54167	54167	54167	54167
Before-tax cash flow	10833	13433	16137	18949	21874	24915	28079	31369	34790	38348

Estimates of cash flows from sale in year 10

Sales price										1067073
Mortgage balance										467750
Before-tax cash flow										599323

Cash flow summary:

End of year	0	1	2	3	4	5	6	7	8	9	10
Before-tax cash flow											
cash flow	- 235605	10833	13433	16137	18949	21874	24916	28079	31369	34790	637672
Before-tax IRR	15.90%										

Check: should be the same as the required return input above

Total value:

Present value of cash inflows	235605
Initial loan amount	514361
Total present value	749966
Overall capitalization rate	8.67%

Debt coverage ratio:

	Year									
	1	2	3	4	5	6	7	8	9	10
DCR	1.20	1.25	1.30	1.35	1.40	1.46	1.52	1.58	1.64	1.71

TABLE 1

Capitalization Rates Based on Debt Service Coverage

Equity Dividend Rates %	Interest Rate =													
	9%	M	10%	M	11%	M	12%	M	13%	M	14%	M	15%	M
DCR = 1														
1	.0966	1.0000	.1053	1.0000	.1143	1.0000	.1234	1.0000	.1327	1.0000	.1422	1.0000	.1517	1.0000
2	.0966	1.0000	.1053	1.0000	.1143	1.0000	.1234	1.0000	.1327	1.0000	.1422	1.0000	.1517	1.0000
3	.0966	1.0000	.1053	1.0000	.1143	1.0000	.1234	1.0000	.1327	1.0000	.1422	1.0000	.1517	1.0000
4	.0966	1.0000	.1053	1.0000	.1143	1.0000	.1234	1.0000	.1327	1.0000	.1422	1.0000	.1517	1.0000
5	.0966	1.0000	.1053	1.0000	.1143	1.0000	.1234	1.0000	.1327	1.0000	.1422	1.0000	.1517	1.0000
6	.0966	1.0000	.1053	1.0000	.1143	1.0000	.1234	1.0000	.1327	1.0000	.1422	1.0000	.1517	1.0000
7	.0966	1.0000	.1053	1.0000	.1143	1.0000	.1234	1.0000	.1327	1.0000	.1422	1.0000	.1517	1.0000
8	.0966	1.0000	.1053	1.0000	.1143	1.0000	.1234	1.0000	.1327	1.0000	.1422	1.0000	.1517	1.0000
9	.0966	1.0000	.1053	1.0000	.1143	1.0000	.1234	1.0000	.1327	1.0000	.1422	1.0000	.1517	1.0000
10	.0966	1.0000	.1053	1.0000	.1143	1.0000	.1234	1.0000	.1327	1.0000	.1422	1.0000	.1517	1.0000
DCR = 1.1														
1	.0540	.5084	.0564	.4869	.0587	.4670	.0608	.4478	.0627	.4294	.0646	.4130	.0663	.3972
2	.0716	.6741	.0759	.6552	.0800	.6364	.0840	.6187	.0878	.6013	.0914	.5844	.0949	.5686
3	.0803	.7560	.0857	.7398	.0910	.7239	.0962	.7085	.1012	.6931	.1061	.6784	.1108	.6638
4	.0856	.8059	.0917	.7916	.0978	.7780	.1038	.7645	.1096	.7506	.1154	.7378	.1210	.7250
5	.0890	.8380	.0957	.8261	.1023	.8138	.1089	.8021	.1154	.7903	.1218	.7788	.1280	.7669
6	.0915	.8615	.0985	.8503	.1056	.8401	.1126	.8293	.1196	.8191	.1264	.8082	.1332	.7981
7	.0933	.8784	.1007	.8693	.1081	.8599	.1154	.8499	.1227	.8403	.1300	.8312	.1372	.8220
8	.0948	.8926	.1024	.8840	.1100	.8751	.1176	.8661	.1252	.8574	.1328	.8491	.1403	.8406
9	.0959	.9029	.1037	.8952	.1115	.8870	.1194	.8794	.1273	.8718	.1351	.8638	.1428	.8556
10	.0969	.9123	.1048	.9047	.1128	.8973	.1209	.8904	.1289	.8828	.1369	.8753	.1449	.8682
DCR = 1.2														
1	.0395	.3409	.0407	.3221	.0417	.3041	.0427	.2883	.0436	.2737	.0444	.2579	.0451	.2477
2	.0539	.5083	.0616	.4875	.0640	.4667	.0663	.4476	.0684	.4294	.0705	.4132	.0723	.3971
3	.0705	.6085	.0742	.5872	.0778	.5673	.0813	.5489	.0845	.5305	.0876	.5134	.0905	.4970
4	.0781	.6741	.0828	.6552	.0873	.6366	.0916	.6184	.0957	.6008	.0997	.5843	.1035	.5684
5	.0836	.7251	.0889	.7035	.0941	.6862	.0992	.6697	.1040	.6529	.1088	.6377	.1133	.6223
6	.0877	.7569	.0935	.7399	.0993	.7241	.1049	.7082	.1104	.6931	.1158	.6787	.1209	.6640
7	.0908	.7837	.0971	.7684	.1034	.7540	.1095	.7393	.1155	.7251	.1213	.7109	.1270	.6975
8	.0933	.8052	.1000	.7913	.1067	.7781	.1132	.7642	.1196	.7508	.1259	.7379	.1320	.7250
9	.0954	.8234	.1024	.8103	.1094	.7978	.1162	.7845	.1230	.7722	.1297	.7602	.1362	.7480
10	.0971	.8380	.1044	.8261	.1116	.8138	.1188	.8021	.1259	.7904	.1328	.7783	.1397	.7672
DCR = 1.3														
1	.0322	.2565	.0329	.2403	.0335	.2255	.0341	.2125	.0346	.2005	.0351	.1899	.0355	.1921
2	.0513	.4087	.0531	.3879	.0547	.3682	.0563	.3509	.0577	.3344	.0590	.3192	.0602	.3257
3	.0639	.5091	.0667	.4827	.0693	.4665	.0718	.4475	.0741	.4294	.0763	.4128	.0784	.4242
4	.0728	.5800	.0765	.5588	.0800	.5385	.0833	.5191	.0865	.5013	.0895	.4842	.0923	.4994
5	.0795	.6334	.0839	.6129	.0881	.5930	.0922	.5746	.0961	.5569	.0997	.5394	.1033	.5589
6	.0847	.6748	.0897	.6552	.0945	.6361	.0992	.6182	.1037	.6009	.1080	.5843	.1122	.6070
7	.0888	.7075	.0943	.6888	.0997	.6711	.1049	.6537	.1100	.6374	.1149	.6216	.1195	.6465
8	.0922	.7345	.0981	.7166	.1040	.7000	.1097	.6836	.1152	.6676	.1206	.6525	.1257	.6800
9	.0950	.7568	.1013	.7399	.1076	.7243	.1137	.7086	.1196	.6931	.1254	.6784	.1310	.7087
10	.0973	.7752	.1040	.7597	.1106	.7445	.1171	.7298	.1234	.7151	.1296	.7011	.1356	.7336
(M = Mortgage ratio    N = 30 years)														

TABLE 2

## Overall Capitalization Rate

DCR = 1.20 Interest = 9.50% Projection period = 10 years Mortgage term = 30 years Growth rate = Inc. & Val. @ Same rate											
Equity Discount Rate	10.00%	11.00%	12.00%	13.00%	14.00%	15.00%	16.00%	17.00%	18.00%	19.00%	20.00%
Growth (%)	Overall Capitalization Rates										
0	9.59%	9.79%	9.97%	10.12%	10.26%	10.38%	10.48%	10.58%	10.67%	10.74%	10.81%
1	8.70%	8.99%	9.24%	9.46%	9.65%	9.82%	9.98%	10.11%	10.23%	10.34%	10.44%
2	7.82%	8.19%	8.51%	8.79%	9.04%	9.26%	9.45%	9.63%	9.79%	9.93%	10.06%
3	6.95%	7.39%	7.78%	8.12%	8.42%	8.69%	8.92%	9.14%	9.33%	9.51%	9.66%
4	6.08%	6.59%	7.04%	7.44%	7.79%	8.10%	8.38%	8.64%	8.86%	9.07%	9.26%
5	5.22%	5.79%	6.30%	6.75%	7.15%	7.51%	7.83%	8.12%	8.39%	8.63%	8.84%
6	4.36%	4.99%	5.56%	6.06%	6.51%	6.91%	7.27%	7.60%	7.90%	8.17%	8.42%
7	3.50%	4.19%	4.81%	5.36%	5.86%	6.30%	6.71%	7.07%	7.40%	7.70%	7.98%
8	2.65%	3.40%	4.06%	4.66%	5.20%	5.69%	6.13%	6.53%	6.89%	7.23%	7.53%
9	1.81%	2.60%	3.31%	3.96%	4.54%	5.06%	5.54%	5.98%	6.38%	6.74%	7.07%
10	0.97%	1.81%	2.56%	3.25%	3.87%	4.43%	4.95%	5.42%	5.85%	6.24%	6.61%
DCR = 1.20 Interest = 10.00% Projection period = 10 years Mortgage term = 30 years Growth rate = Inc. & Val. @ Same rate											
Equity Discount Rate	10.00%	11.00%	12.00%	13.00%	14.00%	15.00%	16.00%	17.00%	18.00%	19.00%	20.00%
Growth (%)	Overall Capitalization Rates										
0	9.97%	10.19%	10.37%	10.53%	10.68%	10.80%	10.91%	11.01%	11.11%	11.18%	11.26%
1	9.04%	9.34%	9.61%	9.83%	10.03%	10.21%	10.38%	10.52%	10.64%	10.76%	10.86%
2	8.12%	8.50%	8.84%	9.13%	9.39%	9.62%	9.82%	10.01%	10.17%	10.32%	10.46%
3	7.20%	7.66%	8.07%	8.42%	8.74%	9.02%	9.26%	9.49%	9.69%	9.88%	10.04%
4	6.29%	7.05%	7.29%	7.71%	8.07%	8.40%	8.69%	8.96%	9.10%	9.42%	9.61%
5	5.39%	5.99%	6.52%	6.99%	7.40%	7.78%	8.12%	8.42%	8.70%	8.95%	9.17%
6	4.49%	5.15%	5.74%	6.26%	6.73%	7.15%	7.53%	7.87%	8.19%	8.47%	8.73%
7	3.61%	4.32%	4.97%	5.54%	6.05%	6.52%	6.94%	7.32%	7.66%	7.98%	8.27%
8	2.73%	3.50%	4.19%	4.81%	5.37%	5.88%	6.33%	6.75%	7.13%	7.48%	7.80%
9	1.86%	2.68%	3.41%	4.08%	4.68%	5.22%	5.72%	6.18%	6.59%	6.97%	7.32%
10	1.00%	1.86%	2.64%	3.35%	3.99%	4.57%	5.11%	5.59%	6.04%	6.45%	6.83%
DCR = 1.20 Interest = 10.50% Projection period = 10 years Mortgage term = 30 years Growth rate = Inc. & Val. @ Same rate											
Equity Discount Rate	10.00%	11.00%	12.00%	13.00%	14.00%	15.00%	16.00%	17.00%	18.00%	19.00%	20.00%
Growth (%)	Overall Capitalization Rates										
0	10.36%	10.58%	10.77%	10.94%	11.09%	11.22%	11.34%	11.44%	11.54%	11.62%	11.70%
1	9.38%	9.69%	9.97%	10.20%	10.40%	10.60%	10.77%	10.92%	11.05%	11.17%	11.28%
2	8.41%	8.81%	9.16%	9.46%	9.73%	9.97%	10.19%	10.38%	10.55%	10.71%	10.85%
3	7.45%	7.93%	8.35%	8.72%	9.05%	9.34%	9.60%	9.83%	10.05%	10.24%	10.41%
4	6.50%	7.50%	7.54%	7.97%	8.35%	8.69%	9.00%	9.28%	9.53%	9.76%	9.96%
5	5.56%	6.18%	6.73%	7.22%	7.65%	8.04%	8.40%	8.71%	9.00%	9.26%	9.50%
6	4.64%	5.31%	5.92%	6.46%	6.95%	7.39%	7.78%	8.14%	8.47%	8.76%	9.03%
7	3.72%	4.45%	5.12%	5.71%	6.24%	6.73%	7.16%	7.56%	7.92%	8.25%	8.55%
8	2.81%	3.60%	4.31%	4.95%	5.53%	6.06%	6.53%	6.97%	7.36%	7.73%	8.06%
9	1.91%	2.75%	3.51%	4.19%	4.82%	5.38%	5.90%	6.37%	6.80%	7.20%	7.56%
10	1.02%	1.91%	2.71%	3.44%	4.10%	4.70%	5.26%	5.76%	6.23%	6.65%	7.05%

Another application of the capitalization rate tables is to estimate the equity yield, given an overall capitalization rate and an estimated growth rate. As an example, assume the overall capitalization rate is 8.69%, the growth rate is 4% and there is a new 10.5%, 30-year mortgage with a DCR of 1.20. By looking across the 4% growth row, the 8.69% overall rate can be found in the 15% equity discount rate column.

Finally, the tables can be used to index the required growth rate for a given equity discount rate, overall rate and mortgage situation. The required growth rate for a 9.5%, 30-year mortgage, 1.20 DCR, an overall rate of 8.69% and an equity discount rate of 15%, would be 3%. Incidentally, this process also reveals something about sensitivity, i.e., a 100 basis point difference in interest rates is offset by a 100 basis point difference in the growth rate.

## EXHIBIT I

### Base Case—Cost Analysis

Estimated cost new	
Direct cost	
8,000 sq.ft. @ \$46.00/sq.ft.	\$368,000
Indirect cost	
Financing	
$\$368,000 \times .02 + \$368,000 \times .10 \times .25$	\$ 16,560
Taxes & insurance	
$\$368,000 \times .02$	\$ 7,360
Marketing	
$\$100,000 \times 5 \times .04$	\$ 20,000
Miscellaneous	
$\$368,000 \times .02$	\$ 7,360
Holding costs net of revenue until stabilization	
$\$619,280 \times .10 \times .5 - \$65,000 \times .33$	\$ 9,514
Total estimated cost new	\$428,794
Estimated land value	
20,000 sq. ft. @ \$10/sq.ft.	\$200,000
Total	\$628,794

### Profit Analysis

Estimated sales proceeds based on income approach	
$\$750,000 \times (1 - .06)$	\$705,000
Estimated value by cost approach (before profit)	\$628,794
Estimated developer's profit	\$ 76,206
Estimated developer's profit as a percentage of	
selling price      \$76,206 /      \$750,000	10.16%

## Investment Measures And Development Cost

The developer's profit is the key relationship that links the cost of development to the market value of the investment. Exhibit I is based upon the foregoing analyses and these cost analysis assumptions:

**Direct cost:** The overall cost of the project for structure and site work is \$46.00 per sq.ft. of building area.

**Indirect cost:** It will take six months to build the project. The interest rate is estimated to be 10%; therefore, the effective interest charge will be for one quarter of a year.

Taxes and insurance are estimated to run 2% of direct cost.

Marketing covers the cost of leasing at 4% on a five-year lease at a gross rental rate of \$100,000 per year.

Holding costs are based on an initial vacancy period of six months at a cost of 10%. Interest will be offset by revenue approximately 33% of one year's net operating income.

**Land value:** The 8,000 sq.ft. building will require a 20,000 sq.ft. site which is valued at \$200,000.

**Market value:** The property will have a market value of \$750,000 based upon capitalization of net operating income.

**Developer's profit:** Developer's profit is the difference between the selling price and the total costs of the project. Developer's profit as a percentage is the dollars of profit divided by the selling price.

## Interrelationships

A series of illustrations demonstrate what happens when interest rates change and when the supply and demand situation cause values to rise and fall. The detailed IRR and cost computer analyses have been eliminated to save space. Assumptions are as follows:

Scenario 1: The interest rate changes from 10% to 8%.

Scenario 2: The interest rate changes from 10% to 12%.

Scenario 3: Value changes from \$750,000 to \$800,000.

Scenario 4: Value changes from \$750,000 to \$700,000.

### Scenario 1 (the interest rate changes to 8%)

Gross rental multiplier	
$\$100,000 \times 7.50$	\$750,000
Overall rate of return	
$\$65,000 \div \$750,000$	8.67%
Overall internal rate of return	12.67%
Equity internal rate of return	23.50%
Developer's profit	11.24%

### Conclusions for Scenario 1

In Scenario 1, it is assumed the supply and demand situation is such that the \$750,000 value remains unchanged. The revenue also remains unchanged; therefore, the gross rental multiplier overall rate of return and overall internal rate of return also remain unchanged.

The internal rate of return to the equity does change, however. If the income and other overall yield indicators remain the same, then, when the interest declines to 8%, the equity internal rate of



return increases from 15.90% to 23.50% for an increase of 760 basis points. The developer's profit also improves from 10.16% to 11.24% or 108 basis points. The above analysis changes if the supply and demand situation varies.

#### Scenario 2 (the interest rate changes to 12%)

Gross rental multiplier	
\$100,000 × 7.50	\$750,000
Overall rate of return	
\$65,000 ÷ \$750,000	8.67%
Overall internal rate of return	12.67%
Equity internal rate of return	12.81%
Developer's profit	9.08%

#### Conclusions for Scenario 2

It is assumed in Scenario 2 that the supply and demand situation maintains the overall value of the project at \$750,000 and revenue is unchanged.

The equity internal rate of return then declines to 12.81% from the base case of 15.90% or 309 basis points when the interest rate increases to 12% from 10%. The developer's profit declines to 9.08% from 10.16% (base case) or 108 basis points.

#### Scenario 3 (value increases to \$800,000)

Gross rental multiplier	
\$100,000 × 8.00	\$800,000
Overall rate of return	
\$65,000 ÷ \$800,000	8.125%

Time	Dollars
0	(\$800,000)
1	65,000
2	67,600
3	70,304
4	73,116
5	76,041
6	79,082
7	82,246
8	85,536
9	88,957
10	1,231,161
IRR	= 11.84%
Equity internal rate of return	14.15%
Developer's profit	15.40%

#### Conclusions for Scenario 3

With the value of the project rising to \$800,000 and the interest rate remaining at 10%, the equity yield declines from 15.90% to 14.15% or 175 basis points. The developer's profit increases from 10.16% to 15.40% or 524 basis points.

#### Scenario 4 (value decreases to \$700,000)

Gross rental multiplier	
\$100,000 × 7.00	\$700,000
Overall rate of return	
\$65,000 ÷ \$700,000	9.286%

Time	Dollars
0	(\$700,000)
1	65,000
2	67,600

3	70,304
4	73,116
5	76,041
6	79,082
7	82,246
8	85,536
9	88,957
10	1,088,800
IRR	= 13.02%
Equity internal rate of return	18.39%
Developer's profit	4.17%

#### Conclusions for Scenario 4

With the value declining to \$700,000 and the interest rate remaining at 10%, the equity yield increases from 15.90% to 18.39% or 249 basis points. Developer's profit declines from 10.16% to 4.17% or 599 basis points.

#### Summary

The results of this analysis can be summarized as follows:

Scenario	Interest Rate	Price/Value	GRM	OAR (%)	IRR (%)	Equity IRR (%)	Developer's Profit (%)
Base case	10%	\$750,000	7.5	8.67	12.67	15.90	10.16
1	8%	\$750,000	7.5	8.67	12.67	23.50	11.24
2	12%	\$750,000	7.5	8.67	12.67	12.81	9.08
3	10%	\$800,000	8.0	8.12	11.84	14.15	15.40
4	10%	\$700,000	7.0	9.29	13.02	18.39	4.17

It is clear there is a direct relationship between the gross rental multiplier, overall capitalization rate and overall internal rate of return. There also is a relationship with the equity internal rate of return; however, this measure is affected by the interest rate on the underlying mortgage. This is the well known result of leverage. In fact, the effect on yield is greater from the change in interest rates than from the change in values. On the other hand, the developer's profit is much more heavily affected by the change in value than by the change in interest rates.

These relationships have importance in analyzing the highest and best use and feasibility of an investment property. When analyzing and selecting a discount rate, the counselor/analyst should bear in mind the relationships illustrated in this article (i.e., an 11% discount rate makes sense if the overall capitalization rate is around 8% and the growth rate is around 3%). If the scenario assumes a discount rate of 11% with a growth rate of 5%, something is wrong if overall rates are at 8% and not 6%; the property is being overvalued.

In the period between the beginning of 1990 and the beginning of 1992, we have seen a rise of 100 basis points or more in overall capitalization rates of prime investment properties; yet discount rates have remained largely unchanged. This rise in capitalization rates suggests (and is largely borne out by the market) that income and expense projections are more realistic and growth rate perceptions are down by 100 basis points or more. This article and its tables should be helpful in yield analysis.

# THE IMPACT OF SUPPLY CHANGES ON REAL NET OPERATING INCOME: THE MULTI-FAMILY PERSPECTIVE

*Because of major changes affecting mortgage lenders and constraints on new construction, investment in multi-family residential properties is becoming increasingly attractive.*

by Richard T. Garrigan, CRE,  
and Joseph L. Pagliari, Jr.

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**T**he boom and bust nature of new construction during most of the previous two decades has been due primarily to excessive swings in the amount of equity and debt capital that has flowed into all types of real estate. The unsought but inevitable effect has been steady erosion in the performance of real estate equity investments. This article examines the multi-family property sector by first considering the major forces that have influenced real estate equity investment and significantly expanded multi-family residential mortgage debt. It then explores the statistical relationship between supply increments and inflation-adjusted net operating income, emphasizing the negative impact of excessive supply. The article concludes with a discussion of the potential course of future equity and debt capital flows and their impact on multi-family residential investments.

## Dynamic Market Relationships

Real estate markets reflect the constantly changing interaction between supply and demand. Although demand-side changes are fairly continuous and represent trends in various socioeconomic characteristics, supply-side changes tend to occur in lumpy increments, with new construction often being primarily a function of capital market forces that ignore the dynamics of underlying demand. During the past 20 or so years, boom periods of excessive capital investment have caused additions in supply that overwhelmed actual demand, leading to a decline in effective rents (adjusted by rental concessions) and occupancy levels which adversely affected net operating income. Bust times have caused new construction to contract sharply, enabling slow but steady increases in demand to catch up with excessive supply. Eventually, a tight market was created that was followed by a new boom cycle.

## Historical Capital Market Flows—General

Many debt and equity investors have presumed that real estate would provide inflation-indexed net operating income and that future levels of inflation would be high. These presumptions have led to the specious but ensnaring conclusion that steadily inflating income eventually would justify their investment. Real estate equity investors also have been motivated by the twin delusions that their investments would provide a tax shelter as well as fixed capital costs. Too often, however, the future—when

*Richard T. Garrigan, CRE, is professor of finance in the Graduate School of Business, DePaul University, Chicago, and an instructor for graduate courses in real estate and real estate finance. He is also president of Richard T. Garrigan and Associates, Inc. Garrigan is co-editor of *The Handbook of Mortgage Banking: A Guide to the Secondary Mortgage Market*.*

*Joseph L. Pagliari, Jr. is president of Citadel Realty, Inc., a firm that specializes in all aspects related to multi-family projects, including the turnaround of distressed apartment complexes. He is a chartered financial analyst and a certified public accountant. Pagliari is editor of "The Handbook of Real Estate Portfolio Management" (expected publication, 1993).*

net income catches up with front-end capital costs and rewards investors with positive, real cash flows—never arrives. The problem is that real estate equity investors pay too little attention to inadequate present levels of rental productivity. Absent the economic discipline imposed by sufficient rents at the outset, the forces of supply are not constrained, and oversupply becomes a general condition in the market. In order to assess these impacts, it is useful to employ a macro-approach that is not typically found in the micro-perspective of the market analyst. In the material below, a macro-approach first examines major influences upon real estate equity investments and then evaluates selective characteristics of multi-family residential mortgage debt.

### Historical Capital Market Flows—Real Estate Equity

From the perspective of the individual investor, a confluence of major events in the early 1980s dramatically increased the relative attractiveness of real estate equity investments, particularly those in multi-family residential properties. These factors included the institution of major changes in federal income tax and securities laws, the creation of staged pay-ins of investments in limited partnerships, and a lack of suitable investment alternatives.

#### *Federal Tax Law*

Various tax reform measures incorporated into the Economic Recovery Tax Act of 1981, the Tax Equity and Fiscal Responsibility Act of 1982 and the Deficit Reduction Act of 1984 increased the attractiveness of real estate equities by making the following changes to the Internal Revenue Code:

- the top marginal tax rate decreased from 70% to 50%;
- the capital gains exclusion increased from 50% to 60%, in effect reducing the top capital gains tax rate from 35% to 20%; and
- depreciable lives for real property fell from between 35 and 50 years to between 15 and 19 years and depreciation was accelerated on all property, not just on new construction.

For a leveraged individual investor in real estate equities, the result was to increase the after-tax rate of return to a figure higher than the pre-tax return. Furthermore, these changes led to a “tails I win, heads you lose” mentality in that, on paper at least, the decreased capital gains rate meant that investors had to pay the government a substantially smaller share of any gain from a successful investment. Conversely, if the investment was unsuccessful, the investor could shelter other sources of income with paper losses generated by accelerated depreciation over a shorter depreciable life. Although these deductions eventually would be recaptured, they generally would be taxed at 20%.

#### *Securities Law*

Prior to April 1982, Rule 146 under the Federal Securities Act of 1933 could be used by syndicators looking to privately place the equity requirement of

a real estate investment. Thereafter, with the promulgation of Regulation D, syndicators had considerably less difficulty in complying with federal securities laws. Among its beneficial impacts, Regulation D:

- increased the number of limited partners to 35 non-accredited investors and an unlimited number of accredited investors (previously, there was a total limit of 35 investors);
- eliminated the need to prequalify (in terms of suitability, sophistication and net worth) an investor before making an offer. Investors had to be qualified before making a sale, which gave syndicators much more leeway in locating investors and attorneys who could opine adequately on the securities offering;
- clarified the amount of disclosure required for different types and sizes of offerings; and
- led to a concerted effort by state securities regulators to adopt a fairly uniform set of “blue sky” laws that facilitated inter-state offerings.

Of course, the option of a public offering (in contrast to a private placement) existed before and after the introduction of Regulation D. Generally speaking, however, the large front-end costs associated with a public offering could be justified economically only by a very large equity offering. Thus, Regulation D substantially increased the ability of syndicators to raise funds for limited partnerships for offerings that previously would have been uneconomical.

#### *Staged Pay-Ins*

One of the more innovative but less heralded financing changes of the 1980s was the creation of a new financing technology that permitted equity investors to contribute their capital in installments over a defined period—generally, four to six years. Initially, these deferred equity payments were financed by letters of credit obtained by investors from their own banking sources. Subsequently, these letters of credit were replaced with a more efficient technology: investors’ notes evidencing their obligation to pay their deferred capital contributions were bonded through a surety company; the bonded notes then were sold as securitized assets, and the net proceeds were used to fund the real estate acquisition. Investors now were able to time their payments so their expected tax deductions would be a multiple of their staged capital contributions. In theory, for high-tax bracket investors, the staged pay-in meant that Uncle Sam was writing the check.

#### *Investment Alternatives*

The investor looking for alternatives to real estate had few comforting options in the early 1980s. The five years before 1982 (the effective date of the Economic Recovery Tax Act of 1981) saw<sup>1</sup>:

- a dramatic rise in inflation, with the average annual increase running approximately 10.1%;
- a corresponding decline in the value of long-term, fixed-income securities, with the average annual change in total return at approximately <0.7%>; and

TABLE 1

Amount and Percentage of Multi-Family Residential Mortgage Debt by Type of Lender for Selected Years

Type of Lender:	1975		1980		1985		1989	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Commercial banks	\$ 5,915	5.9%	\$ 12,924	9.4%	\$ 23,373	10.9%	\$ 36,994	12.1%
Savings institutions	39,339	39.1	54,200	39.5	89,739	41.8	108,534	35.3
Life insurance companies	19,629	19.5	19,514	14.2	19,894	9.3	26,646	8.7
Federal & related agencies	12,315	12.2	14,884	10.9	12,170	5.7	23,593	7.7
Mortgage pools & trusts	1,263	1.3	8,267	6.0	13,445	6.3	27,586	9.0
All others	22,140	22.0	27,345	19.9	55,849	26.0	83,299	27.2
Total	\$100,601	100.0%	\$137,134	100.0%	\$214,470	100.0%	\$306,652	100.0%

Sources: Federal Reserve Bulletin (December, 1978): A41

Federal Reserve Bulletin (December, 1983): A39

Federal Reserve Bulletin (December, 1988): A39

Federal Reserve Bulletin (July, 1990): A38

■ an unrewarding stock market, for which the average annual change in total return was about 9.6%—less than the inflation rate; for two years (1977 and 1986), the annual return was negative.

In summary, with stocks and bonds in the doldrums, it took little convincing to make real estate equities the investment darling of the early 1980s. The amount of annual real estate limited partnership investment increased dramatically for all property types, from less than \$1 billion in 1978 to more than \$10 billion in 1984.<sup>2</sup> With this huge infusion of equity capital, the economy by the mid-1980s was witnessing an unparalleled increase in real estate values and construction as developers cashed in on the newly created demand for real estate holdings. Much of this equity investment was in limited partnerships that invested in multi-family residential properties.

### Historical Capital Market Flows—Multi-Family Mortgage Debt

The demand for mortgage debt derives from the desire of equity investors to leverage their real estate holdings. As shown in Table 1 and Figure 1, from 1975 to 1989, the amount of mortgage debt used to finance multi-family residential properties grew from \$100.6 billion to over \$306.6 billion, an increase of slightly more than 200%. Multi-family residential mortgage loans for the years ending 1975, 1980, 1985 and 1989 were grouped by six types of lenders: commercial banks, savings institutions, life insurance companies, federal and related agencies, mortgage pools and trusts, and all others. The activities of each of these lenders now will be discussed.

#### Commercial Banks

Commercial banks have long been the major source of construction financing for large (including, more recently, multi-family residential) development projects. Since the early 1980s, however, income-property loans financed by commercial banks often have taken on a more permanent character through the use of minipermits having terms of, say, five to seven years. With this change in lending practice, commercial banks have become a more significant

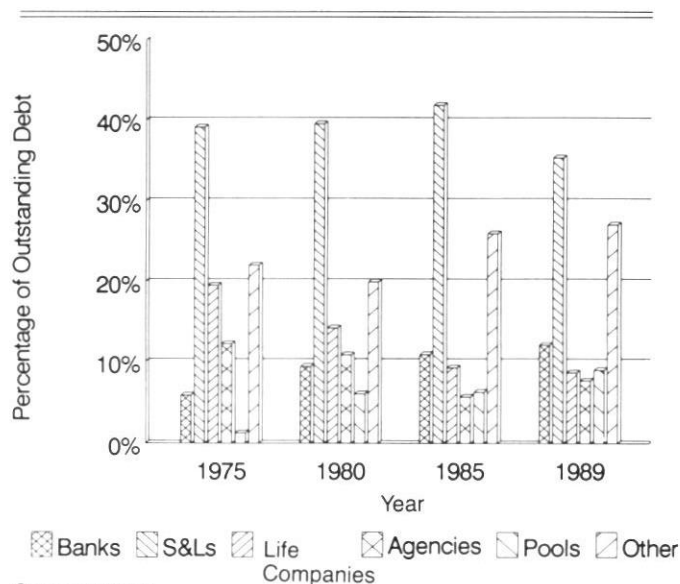
force in multi-family residential property financing. As Table 1 shows, between the end of 1975 and the end of 1989, bank-financed multi-family residential mortgage loans grew from \$5.9 billion to \$36.9 billion. This growth was accompanied by a doubling of banks' mortgage market share from 5.9% to 12.1%.

#### Savings Institutions

Table 1 and Figure 1 also reveal that savings institutions have long held the largest market share for multi-family residential property loans. In part, this role can be viewed as an extension of their specialization as predominantly single-family residential property lenders. The Garn-St. Germain Act of 1982 liberalized income-property lending and enhanced the deposit-gathering capabilities of these institutions. As a result, huge amounts of funds flowed into multi-family residential mortgage loans. In just five

FIGURE 1

Percentage of Multi-Family Mortgage Debt by Type of Lender for Selected Years



Source: Table 1



years (1980 to 1985), multi-family residential loans financed by these institutions grew from \$54.2 billion to \$89.7 billion, an increase of over \$35 billion. However, since other lenders were also funneling increased amounts of mortgage debt into this market, the savings institutions' market share grew modestly from 39.1% in 1975 and 39.5% in 1980 to 41.8% in 1985. By 1989, the growth in multi-family residential mortgage lending by these institutions had slowed considerably; 1989's \$108.5 billion in debt represented a sharply reduced 35.3% market share.

#### *Life Insurance Companies*

Multi-family residential mortgage lending by life insurance companies contrasts dramatically with that of commercial banks and savings institutions. From 1975 through 1985, the amount of multi-family residential mortgage lending by life insurance companies remained stable, at slightly less than \$20 billion, due primarily to the failure of many multi-family residential properties to meet these firms' stringent underwriting requirements. Between 1985 and 1989, however, life insurance companies increased their funding of multi-family residential loans to \$26.6 billion. Market share nonetheless continued to drop to 8.7%, substantially below the 19.5% market share recorded in 1975.

#### *Federal and Related Agencies/Mortgage Pools And Trusts*

The multi-family residential mortgage lending activities of federal and related agencies as direct

lenders and those represented by mortgage pools and trusts (primarily mortgage-backed securities) involve principally the same institutions—the Government National Mortgage Association (GNMA), Federal National Mortgage Association (FNMA), Federal Home Loan Mortgage Association (FHLMC) and Farmers Home Administration (FHA). As shown in Table 1, the relative importance of these sources of funds underwent a remarkable shift between 1975 and 1989. The amount of multi-family residential mortgage loans directly financed by federal and related agencies increased from \$12.3 billion to \$23.5 billion, but market share declined from 12.2% to 7.7%. In contrast, the multi-family residential securitization represented by mortgage pools and trusts grew phenomenally from \$1.2 billion to \$27.5 billion, and market share expanded from 1.3% to 9%.

#### *All Other Lenders*

The share of multi-family residential mortgage loans financed by all other lenders grew irregularly from 22% in 1975 to 27.2% in 1989. This catch-all category of lenders includes individuals, specialized finance companies (including credit companies), real estate investment trusts (REITs), pension funds, mortgage bankers and state and local credit agencies. In 1975, REITs, especially the construction and development type, were an important source of multi-family residential loans; in fact, these firms' lending activities were a principal cause of the

**TABLE 2**

Net Operating Income per Square Foot, Inflation as Measured by the Consumer Price Index and Real Net Operating Income Per Square Foot

Year	NOI		Inflation		Real NOI	
	Amount	Change	Index	Change	Amount	Change
1975	\$1.21		53.8		\$1.21	
1976	\$1.27	4.96%	56.9	5.76%	\$1.20	-0.76%
1977	\$1.41	11.02%	60.6	6.50%	\$1.25	4.24%
1978	\$1.52	7.80%	65.2	7.59%	\$1.25	0.20%
1979	\$1.66	9.21%	72.6	11.35%	\$1.23	-1.92%
1980	\$1.81	9.04%	82.4	13.50%	\$1.18	-3.93%
1981	\$2.00	10.50%	90.9	10.32%	\$1.18	0.16%
1982	\$2.24	12.00%	96.5	6.16%	\$1.25	5.50%
1983	\$2.33	4.02%	99.6	3.21%	\$1.26	0.78%
1984	\$2.44	4.72%	103.9	4.32%	\$1.26	0.39%
1985	\$2.44	0.00%	107.6	3.56%	\$1.22	-3.44%
1986	\$2.48	1.64%	109.6	1.86%	\$1.22	-0.22%
1987	\$2.47	-0.40%	113.6	3.65%	\$1.17	-3.91%
1988	\$2.62	6.07%	118.3	4.14%	\$1.19	1.86%
1989	\$2.73	4.20%	124.0	4.82%	\$1.18	-0.59%
Average		6.06%		6.20%		-0.12%
Standard deviation		3.87%		3.27%		2.67%
Annual growth	5.98%		6.15%		-0.15%	

Sources: Income/Expense Analysis Conventional Apartments, 1990 Edition (Chicago: Institute of Real Estate Management), Table 20, Garden Buildings, p. 18.

Statistical Abstract of the United States 1990 (Washington: Bureau of the Census, 1990), Table No. 762, Consumer Price Indexes, p. 471 and U.S. Bureau of Labor Statistics.



TABLE 3

Number and Percentage Change in Multi-Family Housing Starts and Moving Averages for the Years 1975 through 1989

Year	Multi-Family Housing Starts				
	Number	Change	Moving Averages		
			2-Year	3-Year	4-Year
1975	223.0	-45.07%			
1976	157.0	-29.60%	-37.34%		
1977	196.0	24.84%	- 2.38%	-16.61%	
1978	229.0	16.84%	20.84%	4.03%	- 8.25%
1979	241.0	5.24%	11.04%	15.64%	4.33%
1980	196.1	-18.63%	- 6.70%	1.15%	7.07%
1981	135.3	-31.00%	-24.82%	-14.80%	- 6.89%
1982	117.0	-13.53%	-22.27%	-21.05%	-14.48%
1983	191.5	63.68%	25.07%	6.38%	0.13%
1984	313.2	63.55%	63.61%	37.90%	20.67%
1985	365.2	16.60%	40.08%	47.94%	32.58%
1986	407.6	11.61%	14.11%	30.59%	38.86%
1987	345.6	-15.21%	- 1.80%	4.33%	19.14%
1988	284.5	-17.68%	-16.45%	- 7.09%	- 1.17%
1989	N.A.	N.A.	N.A.	N.A.	N.A.
Average	227.1	5.48%	4.50%	6.80%	7.67%
Standard deviation	105.8	29.18%	26.16%	20.34%	15.96%

Source: Statistical Abstract of the United States 1990; Table No. 1269, *New Apartments Completed and Rented in Three Months*, p. 718.  
For structures of more than 4 units, privately financed, non-subsidized, unfurnished apartments. Measured in thousands.

apartment glut at that time. By the end of 1989, however, REITs were but a modest source of such loans. By then, state and local credit agencies had become the most important lenders in this category, accounting for \$43.1 billion<sup>3</sup> or more than half the amount attributed to all other lenders.

### Analysis of the Multi-Family Market

Attention is now focused upon the multi-family residential market. Although excessive supply has had an impact on all major sectors of the real estate market, fluctuations in newly constructed multi-family residential units have been especially dramatic. The material below analyzes the rental productivity of these properties by determining the impact from changes in the level of new construction on changes in the net operating income of multi-family properties. This analysis first separately examines the demand and supply components of the multi-family residential rental sector and then statistically studies the relationship between supply and demand.

### Demand-Side Considerations

Table 2 estimates the demand for multi-family housing by examining the level of net operating income generated by these properties from 1975 through 1989. The net operating income (as opposed to rental rates) over time captures not only rental levels but also vacancy rates, bad debt losses and operating expenses. Real estate essentially is a cash flow business; thus, the ability of rental and occupancy rates to keep pace with increasing operating expenses is critical. For purposes of this analysis, per-square-foot figures are utilized as a common base.<sup>4</sup> From

these net operating income (NOI) data, nominal increases that are solely attributable to inflation are stripped out. These have been measured by the annual percentage change in the consumer price index (CPI). The result is the percentage change in the real (i.e., inflation-adjusted) NOI per square foot as shown in Table 2.

Notwithstanding the variability in the yearly figures (as indicated by their standard deviation), the data in Table 2 show that real NOI has substantially kept pace with inflation; real NOI in 1989 was \$1.18 per square foot as compared to \$1.21 in 1975. Alternatively stated, the nominal NOI increase to \$2.73 per square foot reflects approximately 97% of the increase in CPI during this period. The table also shows that the annual growth in nominal NOI was 5.98% in comparison to 6.15% for the CPI during this period.

Interestingly, the Institute of Real Estate Management (IREM) reported that actual revenue collections increased by 5.66% between 1975 and 1989, a level of increase greater than the 5.33% rate reported for operating expenses over this same period.<sup>5</sup> Since operating expenses represented approximately 50% of revenue collections, NOI increased faster than revenues and at a rate approaching the increase in the CPI.

### Supply-Side Considerations

Table 3 presents data pertaining to multi-family housing starts for the years 1975 through 1988. Over this 14-year period, new starts ranged from a low of

approximately 117,000 units to a high of approximately 408,000 units. The yearly starts averaged approximately 227,000 units, and the standard deviation from this average was a relatively high 106,000 units.

To a large degree, the impact of new additions on overall supply is cumulative. Consequently, Table 3 not only reflects the percentage change in housing starts in comparison to the level of starts for the previous year, it also depicts moving averages for the level of starts over two-year, three-year and four-year periods. The percentage change data for both the level of starts and those for the moving averages (along with the standard deviations for these data) reflect the high degree of volatility in the construction of multi-family properties.

### Supply And Demand Interaction

Table 4 integrates selected demand data from Table 2 and selected supply data from Table 3 to reveal that the degree of variability in real NOI is far less than that shown for housing starts. The housing start data incorporated in the table are the two-year moving average data which have been lagged one year to allow for the effects of supply additions on net operating income.

A closer examination of the data shows a strong inverse relationship between real NOI and the lagged two-year moving average of housing starts. A year-by-year review of the data, which are graphically displayed in Figure 2, shows that this inverse relationship exists in every year but two, 1984 and 1989. In all other years, when the two-year moving average of multi-family housing starts declined, real NOI per square foot increased the following year. The converse was also true; when starts increased, real NOI decreased.

**TABLE 4**

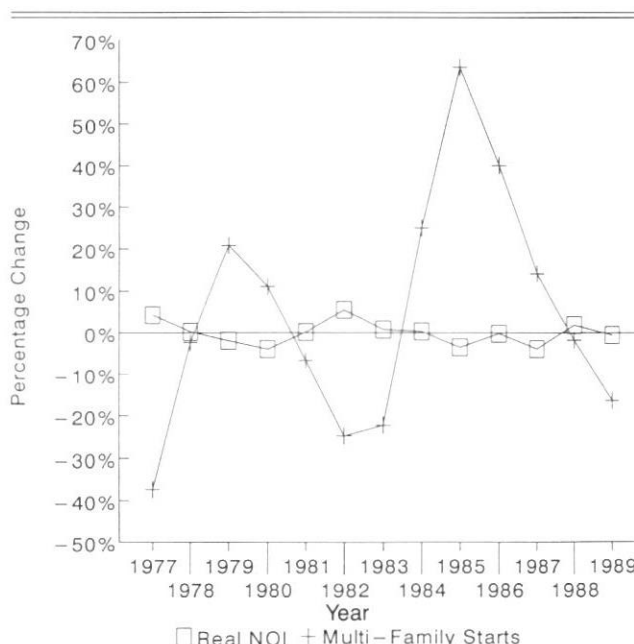
Real NOI and Lagged, 2-Year Moving Average in Multi-Family Housing Starts

Year	Real NOI	2-Year Moving Average (Lagged 1 Year)
1977	4.24%	-37.34%
1978	0.20%	- 2.38%
1979	-1.92%	20.84%
1980	-3.93%	11.04%
1981	0.16%	- 6.70%
1982	5.50%	-24.82%
1983	0.78%	-22.27%
1984	0.39%	25.07%
1985	-3.44%	63.61%
1986	-0.22%	40.08%
1987	-3.91%	14.11%
1988	1.86%	- 1.80%
1989	-0.59%	-16.45%

Sources: Tables 2 and 3

**FIGURE 2**

Relationship of Real NOI to Multi-Family Housing Starts for the Years 1977 to 1989



Sources: Tables 2 and 3

### Statistical Approach

Clearly, there seems to be a time-delayed, inverse relationship between changes in supply and their effect on real NOI. The challenge is to find whether such a relationship is statistically significant.

In order to examine this relationship from a statistical point of view, a simple regression equation (using the ordinary, least-squares approach) is utilized. The nature of this process is to mathematically determine the line that provides the best fit to the data—i.e., one that minimizes the sum of the squared deviations between the regression line and the observations. The equation used to examine how the independent variable (supply, designated as x) affects the dependent variable (real NOI, designated as y) is specified as follows:

$$y = a + bx + e$$

where:

y = the annual percentage change in real NOI per square foot for the current year,

a = a constant,

b = a coefficient that modifies x,

x = the two-year moving average of the annual percentage change in multi-family housing starts lagged by one year, and

e = an error term.

The result of the regression analysis is the following observed historical relationship:

$$y = 0.27\% - .069(x)$$

This relationship states that real NOI per square foot for any given year is expected to increase by 0.27% over the prior year, less .069 of the lagged, rolling two-year average of the percentage change in multi-family housing starts. For example, a two-year moving average of multi-family starts concluded in the prior year at a 10% increase suggests a 0.42% decline in real NOI per square feet in the current year:

$$y = 0.27\% - .069 (10.0\%) = <0.42\%>$$

Viewed from a different perspective, any increase in the two-year moving average of the adjusted multi-family housing starts in excess of approximately 3.9% suggests a real decline in NOI per square foot in the current year:

$$y = 0.27\% - .069 (3.913\%) = 0.0\%$$

The 3.9% "baseline" estimate is comparable in magnitude to the 3.1% real growth in GNP over this time period,<sup>6</sup> suggesting that the percentage change in housing starts in excess of what the inflation-adjusted economy generates may be unsustainable by the multi-family sector.

Before continuing, it is important to examine the statistical system of checks and balances through the following key parameters:

$$r^2 = 45.9\%$$

x coefficients:

$$\text{standard error} = 2.3\%$$

$$t\text{-statistic} = 3.05\%$$

In simple terms, these parameters indicate that new construction accounts for approximately 46% of the variation in real NOI.<sup>7</sup> This degree of explanation seems satisfactory, given that this model does not attempt to incorporate various demand-side variables (such as population size, household formations, household size, household income, age distribution and affordability of owner-occupied housing). Additionally, the error estimates (as measured by the standard error and the t-statistic) associated with the x coefficient suggest that the regression equation should be viewed as statistically meaningful. Assuming that the variables are normally distributed, there is a confidence level of 98% associated with the equation's explanatory value.

From the above data, one may judge that new construction activity has accounted for about 46% of the change in real cash flow as measured by NOI per square foot. This is close to what one may intuitively suspect, based on the assumption that demand and supply each contribute about 50%. During periods of significant levels of new construction, the potential for negative real cash flow is substantial, thereby jeopardizing the real yields investors expect from their investments. Conversely, prolonged periods of declining construction have the effect of substantially increasing real yields.

## Caveat: Local Market Considerations

It should be stressed that macro-based analyses deal with averages; thus, their use and application require care. Before applying the equation developed in this article to a particular submarket, a critical examination of local supply and demand forces is essential.<sup>8</sup> If possible, it would be preferable to use similar statistics for the local market in evaluating the impact of excess supply upon real NOI. Moreover, the multi-family residential sector by its very nature is extremely management intensive; at the same time, it is understaffed by qualified asset and property managers. Consequently, economic analysis of the type incorporated in this article must be evaluated in a context that also focuses upon the effectiveness with which individual properties are being managed.

## Future Capital Market Flows—General

Quite obviously, the flow of debt and equity capital into new construction is a critical element in gauging a property's future ability to generate cash flows that meet or exceed inflationary increases. Moreover, one of the ways to uncover superior investment opportunities is to identify markets that have favorable demographic trends and constraints against future additions to supply.

The multi-family residential sector of the real estate industry is entering a phase during which such investment potential may develop in numerous local markets. On a broad scale, recent additions to supply have slowed markedly; major capital market forces suggest that this trend will continue.

## Future Capital Market Flows—Real Estate Equity

The confluence of major events in the early 1990s, unlike the early 1980s, has dramatically decreased the relative attractiveness of real estate equity investments. These factors include:

### Tax Law

Without question, the most important change on the individual investor landscape has been the Tax Reform Act of 1986 (TRA '86). It included the following provisions:

- the top marginal tax rate effectively declined to 28%;
- the capital gains exclusion was eliminated;
- depreciable lives were lengthened; and
- most importantly, individual investors were no longer able to offset losses generated by their real estate investments against other sources of income.

Perhaps the best way to gauge the impact of these changes is to consider an individual investor's after-tax annual rate of return before and after TRA '86. For example, assuming 71% leverage, the investor's after-tax return under a pre-TRA '86 tax structure would have been 19.8% per annum, using a 40% tax bracket (rather than 50%, which was the highest marginal tax bracket). Using a 28% tax bracket under a TRA '86 tax structure, the after-tax return would decline to 11.9%.<sup>9</sup>



The draconian impacts of this change also are seen in the precipitous decline in annual real estate limited partnership investment. From a high of approximately \$10 billion in 1984, the market plummeted to approximately \$0.6 billion in 1989.<sup>10</sup>

#### *Securities Law And Staged Pay-Ins*

While there have been no substantive adverse changes in the relevant securities law over the past decade, a tremendous decline has occurred in the financing of staged pay-in capital contributions. This decline clearly is a function of individuals' reluctance to invest in real estate equities as well as insurance companies' and banks' concerns about falling real estate values.

#### *Investment Alternatives*

Very importantly, the recent performance of available investment alternatives, unlike the early 1980s, makes many different types of investment opportunities attractive to the individual investor. For instance, for the five-year period ending in 1990:<sup>11</sup>

- inflation averaged 4.1% per annum (an approximate 60% reduction from a little less than a decade earlier);
- fixed-income securities, in large part reflecting a decline in the inflation rate, averaged a total return of 10.8%; and
- despite the steep decline in October, 1987, stocks averaged a total return of 13.2% per annum.

Individuals and institutions therefore have a much broader array of apparently soundly performing investment alternatives.

Obviously, much of the luster of real estate equity investments has been effectively removed for the individual investor because of the changes to the tax codes; it is as if the interest income on municipal bonds suddenly was declared to be no longer exempt from federal taxation. While much of the slack in individual investor demand has been taken up by pension fund investment, the acquisitions made by these institutional investors most often take the form of Class A/trophy properties. Such properties represent only a small portion of the total apartment market.

#### **Future Capital Market Flows—Multi-Family Mortgage Debt**

Just as fundamental changes are having an impact on real estate equity markets, major influences are affecting the potential supply of mortgage debt for multi-family residential properties. In considering the future, recall that over the last 15 years, the market share of multi-family residential mortgage loans held by commercial banks increased, while that held by the savings institutions, life insurance companies and federal-related agencies as direct lenders declined. Mortgage-backed securities became a much more important source of funds, as did funds provided by all other lenders.

What roles are these sources likely to play in the future? Commercial banks, in order to rectify concerns about their capital adequacy, are cutting back on income-property lending. Thus, both commercial

and multi-family residential mortgage loans from these lenders will be more difficult to obtain, while those that are funded will be subject to much more stringent underwriting than in the past.<sup>12</sup> Among other outcomes, the fundings from commercial banks also will be at lower loan-to-value ratios, necessitating added investor/borrower equity capital.

Savings institutions, in part because of major capital deficiencies, will continue to decline in importance as a source of multi-family residential mortgage loans. New capital requirements, as a result of The Financial Institutions Reform, Recovery and Enforcement Act of 1989, not only limit what may be included as capital but also generally restrict loans to one borrower to 15-25% of capital in contrast to the former limit of 100%. Furthermore, capital investments in real estate development subsidiaries must be deducted from capital. This requirement will significantly curtail the activities of development joint ventures, including those that otherwise would develop multi-family residential properties.

Life insurance companies also are being influenced by the deleterious circumstances affecting the quality of income-property loans held by commercial banks. During the last decade, these firms heavily depended on funds raised through guaranteed investment contracts (GICs) for their investments in commercial mortgage loans as well as their acquisitions of non-investment grade, non-mortgage debt. Whether GICs will continue to be so readily available is open to question. In any event, life insurance companies will likely focus on refinancing existing mortgage debt for much of the coming decade. A major reversal of this industry's declining importance as a source of multi-family residential mortgage debt is therefore unlikely during the 1990s.

Table 1 illustrates the remarkable shift from direct multi-family residential lending by federal and related agencies to mortgage pools and trusts. Recently, however, there has been much turbulence in this sector of the market. Problems associated with both the FHA §221(d)(4) and §223(f) programs have resulted in substantial reductions in the levels of GNMA-guaranteed multi-family residential mortgage-backed securities being issued. Major reductions in multi-family residential mortgage funding by FHLMC also have occurred because of defaults and other loan quality problems. Indeed, of the federal and related agencies, only FNMA remains a significant source of securitized mortgage funds in the multi-family residential market, especially for larger properties. Moreover, its participation in the market place is associated with greater underwriting stringencies, thereby reducing the availability of capital.

The all-other-lender category in recent years has been dominated by state and local credit agencies. This role will lessen in the future because of the virtual elimination of the potential for using tax-exempt revenue bonds to finance multi-family residential properties. While not likely to supplant



the role played by state and local credit agencies, pension funds, REITs and other specialized finance companies including credit companies may emerge as more important lenders. These less regulated institutions have the flexibility that banks and savings institutions lack. Their roles largely will be determined by the prospective yields available on mortgage debt used to finance multi-family residential properties.

When all these forces are considered, it appears that a major structural change has occurred. The prospect of another debt-financed boom is unlikely.

## Conclusions

Clearly, if new construction continues to abate, notwithstanding a slowdown in demand, a major window of opportunity for multi-family property investment is at hand. The capital-driven investment environment prevalent for much of the last generation (going back to the REITs in the 1970s followed by the syndicators, S&Ls and commercial banks in the 1980s) lacked a braking mechanism; inevitably, boom and bust cycles occurred. However, given the new stricter capital requirements for both S&Ls and commercial banks, coupled with more stringent mortgage loan underwriting and the mass exodus of the individual investor, multi-family property investments are becoming attractive. More importantly, a prolonged period of decreased construction portends strong rates of increase for rental rates and real NOI. Greater constraints placed on new construction should, in time, restore the financial attributes of real estate equities in providing both a hedge against inflation and stable, high risk-adjusted rates of return.

The capital market contractions likely will have a favorable impact on the ability of apartments to generate real increases in NOI. However, one key to uncovering superior long-term investments is to identify the situations that have additional barriers (i.e., beyond the capital market forces), to future competition. These constraints often take the form of restrictions imposed by local municipalities with an aversion to multi-family development (based on slow/no-growth policies, a bias against high-densities, "not in my backyard" thinking, or other perceived self-interests which outweigh the incremental tax revenue generated by the development). Or they involve prohibitive land costs that preclude multi-family property development. Communities that substantially restrict new construction and/or possess prohibitively high-priced land will create a

scarcity of supply that will be favorable to existing properties and those few that are newly developed.

New construction, albeit on a much reduced scale, nevertheless will occur in growing markets. The key to achieving enhanced productivity and favorable increases in real NOI is to find those localities where the barriers to new construction are high enough to keep demand and supply in equilibrium once the capital markets recover.

## NOTES

1. Ibbotson, Roger G. and Brinson, Gary P. *Investment Markets: Gaining the Performance Advantage* (New York: McGraw-Hill, Inc., 1987) pp. 75, 131, 157.
2. *Real Estate Capital Flows - 1989*, prepared by The Roulac Group of Deloitte & Touche for Equitable Real Estate Investment Management, Inc., pp. 28-29.
3. "Survey of mortgage lending activity 1989," U.S. Department of Housing and Urban Development Office of Public Affairs News Release HUD No. 90-43 (April 23, 1990) Table 1.
4. Two limitations pertaining to the use of per square foot data should be noted. First, per square foot rental rates typically increase as the square footage within apartment units decreases, and the general construction trend has been toward smaller units. Second, the composition of the database changes over time. Existing properties are aging, and new developments (presumably at a higher, on average, NOI per square foot) are added to the database. This changing composition suggests that not all properties, particularly older properties, have enjoyed the rate of NOI increases indicated in the table.
5. See the 1990 edition of the *Income/Expense Analysis Conventional Apartments* (Chicago: Institute of Real Estate Management, 1990) p. 18.
6. According to the *Statistical Abstract of the United States, 1990* (Washington: Bureau of the Census, 1990), the average annual compounded growth in the gross national product (as measured in constant 1988 dollars) over the time period of 1975 to 1988 was 3.13% per annum. See Table No. 690, p. 425.
7. It should be noted that the authors also analyzed the possibility of replacing the independent variable with either the percentage of multi-family housing starts to the then total existing apartment stock or the aggregate annual vacancy rate. Neither approach had the explanatory power of the independent variable used here.
8. As an example of regional difference with regard to rental rates, see Louargand, Marc A. "Apartment earnings and regional economic diversification," Massachusetts Institute of Technology Center for Real Estate Development, Working Paper FP #4 (June, 1989).
9. Lillard, John S. "Overview of the real estate market," in *Real Estate: Valuation Techniques and Portfolio Management* (Chicago: The Institute of Chartered Financial Analysts, 1989) p.11.
10. Roulac, Stephen E. and Dimick, Neil F. "Real estate capital markets undergo fundamental changes," *Real Estate Finance Journal* (Winter, 1991) p. 13.
11. Zipser, Andy. "Consider the alternatives: comparing the performance of 16 different investments," *Barron's* (May 20, 1991) p. 12.
12. Roulac and Dimick, p. 8.

# COMMERCIAL REAL ESTATE LOAN EVALUATION IN THE INSURANCE INDUSTRY

*Underwriters in one insurance company weigh variables related to property and real estate market more highly than other factors when evaluating loan applications.*

by Daniel M. Norris

*The author would like to express his appreciation to Becky Bolen and Mark Nelson for their invaluable assistance with this study.*

**B**anks and thrift associations are not the only institutions that provide commercial mortgages in this country. The life insurance industry holds slightly more than 25% of all outstanding commercial mortgages, and its total mortgage holdings exceed \$231 billion, according to Federal Reserve statistics.<sup>5</sup> Within the life insurance industry, mortgage holdings are concentrated among 30 to 40 life insurance companies.

The commercial mortgage problem in the life insurance industry first became evident in 1986, when delinquencies and foreclosures rose for the first time since the mid-1970s' recession. There was a 1,500% increase in the proportion of holdings of large life insurance companies that constituted commercial loan foreclosures during the 1980s.<sup>5</sup> Reflecting a continuing problem, the proportion of outstanding commercial loan balances classified as either delinquent or in the process of foreclosure has increased more than fourfold.<sup>5</sup> These and similarly alarming figures have fueled a concern in recent years over the financial soundness of the insurance companies that count commercial real estate mortgages as a significant portion of their assets. The increase in foreclosures and commercial loan delinquencies has put intense pressure on the profits and long-term viability of the life insurance industry. As a result, life insurance companies like banks and thrifts, are facing significant asset-quality challenges in the first half of this decade.

One way of averting commercial loan losses is by effectively screening loan applicants to assess creditworthiness. To the extent that loan losses are correlated with specific property and applicant factors that are detectable before loan approval, an effective screening process may reduce commercial loan losses. Alternatively, the screening process may identify applicants who should be charged a higher interest rate or given stricter loan terms to compensate the lender for assuming a higher risk of loan default. Ideally, such a screening process would be mechanized to reduce loan approval costs and ensure consistent application. However, loan officers never will completely bypass the need for making subjective judgments concerning the probability that a loan will be repaid.<sup>1</sup>

The purpose of the study reported in this article was to determine how important certain variables were to underwriters who evaluated and approved (underwrote) commercial real estate loans in one large insurance company. The results may help guide other commercial real estate mortgage providers in the development of a loan approval model by identifying variables that may be used to screen loan applicants' creditworthiness.

## The Study

The commercial real estate loan underwriting department of a large insurance company that agreed

*Daniel M. Norris is an associate professor of accounting at Iowa State University. He teaches and conducts research in the accounting information systems area.*

to participate in this study manages a multibillion dollar portfolio of commercial real estate loans. Like loan underwriters in other institutions, the underwriters in this department incorporate all important facts and analyses about a commercial real estate loan onto a loan information sheet. If an underwriter believes that a proposed transaction meets criteria for a good mortgage, he presents the loan information sheet to a loan approval committee which decides whether to grant credit. The underwriter is held accountable for the completeness and accuracy of all the facts and analyses included on the loan information sheet.

The loan information sheet as well as interviews with underwriters were employed here to identify 19 specific variables used by the underwriters to evaluate a real estate loan. The 19 factors were grouped into four categories (loan, borrower, property and market) which correspond to classifications employed in other studies of grouped loan variables.<sup>2,4,5</sup> Although this study focused on individual factors, it also determined the importance of group factors.

### Definitions Of Variables

Several variables had meanings that may not be obvious. For example, among the loan variables, when the amortization schedule was longer than the term of the loan, a balloon payment was set at the end of the term. The amortization period typically ranged from five to 30 years and could be an interest-only schedule. The amount of the loan was used to measure the magnitude of the commitment by the insurance company. The interest rate combined with other loan variables determined the payment amount that must be supported by cash flow from the property.

The property category contained the largest number of variables since, in essence, the actual or potential cash flow generated from commercial property creates value and is the source for mortgage payments. The property type variable included a detailed description of the property that supported the mortgage loan, for example, hotel, department store, apartment, medical office, etc. The loan per square foot variable allowed the underwriter to compare properties of different size. The lease rollover variable indicated the percentage of the square footage that would be subject to lease expiration in a particular year; it provided a clue to the effect on cash flow from the property and the ability of the borrower to meet mortgage payments if leases were not renewed. The micro-location variable was an assessment of the specific neighborhood in which the property was located and of the uses of surrounding properties. The loan-to-value ratio compared the loan amount to the appraised value of the property and measured the risk of borrower default; presumably, the smaller loan-to-value ratio, the less chance of default by the borrower. The contract debt service coverage ratio indicated how many times the yearly principal and interest payments could be paid by the yearly net operating cash flow from the property.

The personal liability of the borrower for the mortgage ranged from 0% to 100% and affected the overall riskiness of the loan. The borrower classification variable used codes to specify the nature of the borrower, namely: individual borrower, corporation, partnership, joint venture, etc. The total assets, net worth and liquid assets of the borrower were relevant if the borrower was assuming any personal liability on the loan (as with recourse loan).

The real estate market group of variables included factors that were not specific to a particular piece of property. The macro-location variable was a broad assessment of the region of the country in which the property was located. The metropolitan statistical area reflected forces that could affect the value of the property, such as the real estate market downturn in Boston. The economic debt service coverage was similar to the contract debt service coverage variable except that the economic debt service coverage variable used current rental and vacancy rates in the market area to calculate the possible cash flow from the property. Market vacancy was a measure of the vacancy percentage of similar properties in the area and attempted to capture aspects of the overall market in which the property was located.

The respondents were asked to list other factors that might be important in evaluating a loan. Several mentioned that the credit or financial strength of tenants should be an underwriting factor. One underwriter stated that the loan amount in relation to reproduction cost should be examined. Another underwriter declared that the attitudes and recent actions of the loan approval committee should be taken into account. However, none of the additional factors was mentioned frequently enough to be significant.

### The Results

Questionnaires were sent to 40 members of the underwriting department of the insurance company; 36 (90%) were returned. In the questionnaire respondents were asked to complete the following sentence: "This factor is \_\_\_\_\_ important when I underwrite a real estate loan," with responses numbered as follows: 1 = not; 2 = slightly; 3 = moderately; 4 = very; and 5 = extremely. The scores for each factor in each category were summed across all respondents and divided by the number of factors in that category to provide an overall category score. The most important category was the property factors group (3.91) followed by market factors (3.84), loan factors (3.59) and borrower factors (3.24). Table 1 presents the descriptive statistics regarding the 19 variables and the four variable categories (loan, borrower, property and market factors).

### Borrower Category

The lack of importance of the borrower category may be related to the structure of the mortgages. Mortgages usually are structured so the lender can foreclose on default; therefore, the lender's primary concern centers on the property's sustained value and its ability to generate rents. In fact, most loan

agreements are structured without recourse, which means the lender cannot require any assets other than property from the borrower in foreclosure. Thus, the borrower's financial condition is much less important than that of the property used to secure the loan.

### Loan Amount

The most important of the 19 variables was the amount of the loan (4.36). Four of the seven factors that received at least a 4 rating were property factors. The only two variables to receive a mean rating of less than 3.00 were total assets of the borrower (2.75) and the personal liability of the borrower (2.17). These results were not surprising considering that most loans are structured without recourse.

### Underwriter Experience

Table 1 also correlates each individual variable and each variable group with the years of experience of the underwriter. The average for the study respondents was 6.2 years of experience (standard deviation of 3.6 years) with a range of one to 18 years. A relationship between experience and factor ratings suggests that less experienced underwriters may need training to model their assessments more in keeping with those of experienced underwriters since expertise has been defined as a convergence of opinion with other experts.<sup>3</sup> Of the four groups, the property factors category had the largest correlation

coefficient (-.32), which suggests that more experienced underwriters provided less weight to variables in this group than did less experienced underwriters. In addition, more experienced underwriters provided less weight to the personal liability of the borrower and the amortization schedule than did less experienced underwriters. More experienced underwriters seemed to focus more on the term of the loan and the borrower classification.

### Underwriter Job Category

Table 2 breaks down the mean scores for variables by three job categories of the underwriters (entry level underwriter, mid-level underwriter and senior underwriter). These job categories reflect the experience and competence of the underwriter as shown by the average years of experience for each classification: 3.3 years for entry level, 5.5 years for mid-level, and 9.2 years for senior underwriter. A one-way ANOVA was run for each factor and factor grouping. At a significance level of  $p \leq .05$ , only the amount of the loan and the loan-to-value ratio were significantly different among the underwriter job categories. The entry level underwriters rated the amount of the loan much lower (3.67) than the other two types of underwriters did (4.70 for mid-level and 4.67 for senior underwriters). The mid-level underwriters rated the loan-to-value ratio higher (4.60) than other underwriters (3.83 for mid-level and 3.67 for senior underwriters).

TABLE 1

Commercial Real Estate Loan Underwriting Factors

Type of Factor	Mean (n = 36)	Standard Deviation	Range	Experience r
<b>Loan factors</b>	<b>3.59</b>	<b>.48</b>	<b>2.25 - 4.25</b>	<b>.00</b>
Amount of loan	4.36	1.02	2 - 5	.08
Amortization schedule	3.64	.80	2 - 5	-.58**
Interest rate on loan	3.22	.72	2 - 5	-.08
Term of loan	3.14	.59	2 - 4	.27
<b>Borrower factors</b>	<b>3.24</b>	<b>.46</b>	<b>2.20 - 4.00</b>	<b>-.05</b>
Liquid assets of borrower	4.00	.79	2 - 5	-.13
Net worth of borrower	3.78	.72	2 - 5	-.15
Borrower classification	3.50	.70	2 - 5	.29
Total assets of borrower	2.75	.65	1 - 4	-.11
Personal liability of borrower	2.17	.65	1 - 3	-.25
<b>Property factors</b>	<b>3.91</b>	<b>.44</b>	<b>2.43 - 5.00</b>	<b>-.32*</b>
Micro-location	4.11	.75	2 - 5	-.27
Loan to value ratio	4.06	.89	1 - 5	-.26
Type of property	4.03	.81	2 - 5	-.09
Percent leased	4.00	.59	2 - 5	-.33*
Lease rollover	3.92	.84	2 - 5	-.07
Contract debt service coverage ratio	3.64	.80	2 - 5	-.17
Loan per square foot	3.63	.91	1 - 5	-.27
<b>Market factors</b>	<b>3.84</b>	<b>.45</b>	<b>2.67 - 4.67</b>	<b>-.10</b>
Economic debt service coverage ratio	4.03	.70	2 - 5	.12
Macro-location	3.83	.77	3 - 5	-.07
Market vacancy	3.67	.63	2 - 5	-.17

\*  $p < .01$

\*\*  $p < .05$



TABLE 2

Mean Scores by Underwriter Job Category

Type of Factor	Entry Level (n = 12)	Mid- Level (n = 10)	Senior (n = 9)*	Anova	
				F	P
Years of experience	3.3	5.5	9.2		
Loan factors	3.38	3.80	3.56	2.16	.13
Amount of loan	3.67	4.70	4.67	3.99	.03
Amortization schedule	3.75	3.90	3.22	2.00	.15
Interest rate on loan	3.17	3.40	3.00	.90	.42
Term of loan	2.92	3.20	3.33	1.59	.22
Borrower factors	3.18	3.42	3.18	.85	.44
Liquid assets of borrower	3.75	4.40	3.89	1.96	.16
Net worth of borrower	3.83	3.90	3.78	.06	.94
Borrower classification	3.42	3.40	3.78	.82	.45
Total assets of borrower	2.83	2.90	2.56	.69	.51
Personal liability of borrower	2.08	2.50	1.89	2.56	.10
Property factors	3.92	4.07	3.71	1.38	.27
Micro-location	4.33	4.00	4.11	.57	.57
Loan to value ratio	3.83	4.60	3.67	3.42	.05
Type of property	4.08	4.30	3.78	.98	.39
Percent leased	4.00	4.30	3.78	1.90	.17
Lease rollover	3.75	4.20	3.78	.94	.40
Contract debt service coverage ratio	3.83	3.40	3.78	.92	.41
Loan per square foot	3.58	3.70	3.38	.28	.76
Market factors	3.89	3.93	3.89	.04	.96
Economic debt service coverage ratio	4.17	4.20	4.11	.05	.95
Macro-location	3.83	3.90	3.89	.02	.98
Market vacancy	3.67	3.70	3.67	.01	.99

\* Two had an "other" job classification, and three were not included.

The divergence of scores may be the result of influences other than underwriters' experience or job classification. Underwriters in this insurance company are assigned to evaluate loans for properties within certain regions of the country. Since real estate market conditions vary across the country, the variables that may be important for an underwriter's particular loan evaluation may vary accordingly. The diversity of scores also may be the result of differences in the personal experiences of underwriters with different types of property. An experienced underwriter from this department stated that these disparities were not at all surprising.

### Summary

Thirty-six real estate loan underwriters at a large insurance company participated in a study to determine the importance of 19 variables in the commercial real estate underwriting process. Four of the seven variables most heavily weighted by underwriters were property-specific factors, which reflect the importance of a property's characteristics when a commercial loan is structured without recourse. The overall market variables category was heavily weighted, which may reflect underwriters' response to cyclic real estate markets and the need to diversify mortgages from seemingly hot markets.

Given that the insurance industry is experiencing problems with real estate loans along with the banking and thrift industries, assessment of the creditworthiness of loan applicants deserves close scrutiny to protect the U.S. economy from further deleterious shocks. One suggestion for extending research in this area is a study that constructs a prediction model for loan default using data supplied by the same insurance company surveyed here. The analysis may compare the factors underwriters think are important in evaluating real estate loans and the factors that predict loan default.

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# DEVELOPER'S DISEASE CAN BE HAZARDOUS TO YOUR HEALTH

*A developer's inability to acknowledge bad news about a project can lead to business disaster.*

by David C. Bamberger

**R**eal estate developers typically are an optimistic lot. Get a group of developers together, and you will hear little bad news. Even in today's turbulent economic climate, developers are upbeat. In Colorado, developers already are talking about a market turnaround. Real estate developers are like skilled rock climbers who can spot a viable route to the top of even the most obscure and difficult crag. They see opportunities long before the future has come into focus for most of the rest of us. The developer's imperative is, "I build; therefore, I am."

Many of us believe that optimism is one of the necessary ingredients for success in the development business. It is important to be positive about the market when talking to anyone about a proposed development project. Can you imagine a developer telling his lender nothing but bad news about a proposed project and its prospects for success? Developers must be effective salesmen, and the best sales strategy is to emphasize the good points and hide the bad points, right?

Wrong. As important as optimism is to developers, it can be one of the most likely causes of their failure. Combine optimism with someone else's money, and you have the ingredients for a potential business disaster. The recent failure of many of the savings and loan institution-financed real estate projects is a good example. Optimistic developers, skilled at selling development projects, teamed up with the S&L money machine in a classic case of "skilled incompetence." Despite the best of intentions of many of the players, the projects had disastrous, unplanned outcomes.

## Developer's Disease

In my years of experience as a consultant, I frequently have encountered a phrase that characterizes the "skilled incompetence" of some developers. The phrase is "developer's disease," and it reflects a developer's inability to look objectively at market and financial facts and act on those facts accordingly. A developer with developer's disease typically brushes aside any information that suggests his proposed project may not work and then unintentionally covers up the fact that the information even exists.

What is really behind this malady called "developer's disease?" Several researchers, including Chris Argyris, a Harvard University professor, have demonstrated that human beings are not very good learners, especially when they are dealing with threatening situations.<sup>1</sup> Research has shown that, when faced with difficult issues, people protect themselves from threat by applying action strategies that involve:

- looking for evidence to support their views
- ignoring evidence that indicates they may be wrong

*David C. Bamberger is an independent consultant with a practice in applied economics and real estate research. He is affiliated with Joseph Farber and Co., Inc., a real estate appraisal and consulting firm in Denver, Colorado.*

- skewing inferences in self-protective directions
- failing to test their views publicly
- discouraging any open discussion

A developer uses these same strategies to protect himself from the threat of losing his project. Putting together a development project is no easy task. Acquiring land, drawing up plans, securing financing and obtaining the necessary land use entitlements and permits takes many months, sometimes even years, and requires strong advocacy of the project's merits by the developer. Good news sells development projects in today's approval system; bad news does not. It is no wonder that developers must be optimistic to survive.

This same optimism that leads to the success of one project can lead to the failure of another. The strategies used by the developer to protect a project from being killed before it gets off the ground are "anti-learning" because they close the developer's mind to facts and prevent him from learning. These behaviors generally lead to what is called "self-sealing logic" which is employed by people who think things are true simply because they wish them to be true.

A developer who has developer's disease is not difficult to spot; he is always selling his project with very persuasive arguments and elaborate dialog. In order to protect his project from any bad news, he does not test his reasoning about the project's true merits either privately or publicly. Some developers are so heavily affected by developer's disease that their staff are afraid to bring them any bad news. Optimism about the project is the norm, which is scrupulously enforced around the office. Consequently, there is no talk of the negatives. Staff often thinks the developer knows something about the merits of the project that they do not. Staff also is unwilling and unable to test the developer's knowledge. They avoid upsetting the developer by not asking difficult questions and discussing bad news.

### Productive Reasoning

Fortunately, not every developer has developer's disease; in fact, many seem to be immune from it. I have known and worked with a number of developers who do not enter the marketplace with poorly timed and ill-planned projects. Many of these people are in business today despite the difficult time the industry has faced over the past cycle. What do these developers have that others do not?

Successful developers employ "productive reasoning" to provide sure-fire protection from the disease. Productive reasoning is not a new concept. Most of us claim to use it in business and even in our daily lives. The ingredients of productive reasoning are:

- collecting and using hard data
- reasoning open to public inspection
- connecting conclusions with data
- publicly testing inferences and conclusions

The process of productive reasoning involves a chain of activities that starts with the collection of hard data. To make sense of the data, models are built, and an analysis is performed. This analysis may involve simple, back-of-the-envelope techniques or powerful and sophisticated quantitative methods. Inferences about the data and analysis are then drawn, and conclusions are developed that lead to action.

Productive reasoning is not a purely data-driven process; there is more to it than just science. Successful developers implement productive reasoning through the following action strategies:

- searching for and acting on disconfirming information
- continuously checking logic both publicly and privately
- remaining open to constructive confrontation
- encouraging others to test their reasoning
- considering mistakes as part of learning

Productive reasoning is built on a foundation of hard data, clear thinking and continuous testing of inferences and conclusions. Developers who employ productive reasoning govern their actions by acquiring and acting on valid information. They do not become mired in a position of advocacy but are always on the lookout for data that may prove them wrong. Developers who employ productive reasoning encourage their staff to confront their logic, to dig for the facts, to constantly question the project's merits and continuously search for the right strategy to make it work. Developers who employ productive reasoning are not afraid to modify their position and their project in the service of learning; they create an atmosphere of inquiry around the office.

### Defensive Reasoning

The opposite of productive reasoning is defensive reasoning, the primary cause of developer's disease. Defensive reasoning uses soft data or no data at all, and the reasoning process is kept hidden in a black box, unavailable for public inspection and testing. Developers who employ defensive reasoning discourage any serious questioning in order to protect themselves from the possibility that they may be wrong; they do not discuss bad news around the office; they seal themselves from the reality of the marketplace and conclude that, "If we build it, the market will come."

### Conclusion

A chronic case of developer's disease is usually terminal. Although productive reasoning is not a guarantee that a developer will flourish in the turbulent 1990s, it will increase his chances for survival. The lesson for anyone with even a mild case of developer's disease is to learn to adopt productive reasoning before it is too late.

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# MACRO- DETERMINANTS OF TIME ON THE MARKET

*How financing costs, business conditions  
and housing inflation extend the time a  
property spends on the market.*

by Paul K. Asabere  
and Forrest E. Huffman

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**T**he first step in any real estate transaction is for the seller to estimate the listing price of the property being sold. Brokers, appraisers and counselors assist the seller in making this determination.<sup>1</sup> Errors in list pricing can lead to suboptimal sales prices. However, the counselors who advise sellers have few methods for determining the appropriateness of any past pricing decision because they do not have access to true market values.

One signal that is available to counselors is the length of time a property remains on the market. A result of supply and demand interactions, time on the market (TOM) is a measure of real estate market activity. Perhaps more importantly, TOM also sheds light on the pricing decisions made by sellers and their advisors.

Sellers tend to set high listing prices (Miceli, 1986 and Zorn and Larsen, 1989), reasoning that only by setting high listing prices can one be assured of receiving high bids. However, high listing prices may keep a property on the market for a lengthy period while the seller rejects supposedly below-market offers. Such pricing errors may be revealed in abnormally long selling periods (long TOM).

Of course, sellers may set listing prices too low; however, low listing prices preclude the possibility of obtaining high bids. Such a pricing error may be revealed in abnormally short selling periods (short TOM).

Empirical analyses of the determinants of TOM therefore add to the understanding of real estate markets and aid counselors in determining listing prices on behalf of sellers. Unfortunately, studies of TOM are few, and the results of these analyses are mixed and inconclusive. The lack of study of this topic is surprising, given the importance of TOM to the brokerage and counseling industries and to the efficient operation of real estate markets.

Of the prior work, the seminal and still most relevant study was conducted by Belkin, Hempel and McLeavey (1976). According to these authors, in the absence of mispricing, time on the market is equal for all properties in a similar market.<sup>2</sup> If abnormal TOM is the result of mispricing, then any statistically significant housing characteristic or neighborhood quality is evidence that the item has been mispriced. The authors concluded, however, that "in general, . . . housing features . . . do not provide a satisfactory basis for predicting TOM."<sup>3</sup>

*Paul K. Asabere is associate professor of real estate at Temple University. He has authored numerous academic studies; his particular areas of interest are real estate investment, appraisal and real estate markets.*

*Forrest E. Huffman is associate professor of real estate and director of Temple University's Real Estate Center. A former contributor to Real Estate Issues as well as other journals, he deals with historic preservation issues and urban land markets.*

Cubbin (1974) found that large ratios of actual selling price to 'true quality price' result in increased turnover of lower TOM, i.e., "higher priced houses sold faster." The result, which was predicated upon the accuracy of 'true' market values as estimated by a hedonic pricing model, is somewhat suspect in that the ratios used in the study, may not have correctly measured the higher prices the author assumed.

Miller (1978) also examined the relationship between selling price and TOM and discovered a statistically significant positive relationship to TOM with both the real and the nominal selling price. Unfortunately, Miller used TOM as an independent variable and produced results that are not useful for TOM estimation.

Haurin (1988) examined the effect of atypical housing features on TOM. The author assumed that the greater the atypicality, the greater the variance of offers and therefore the longer TOM required. Haurin found that unusual houses do take longer to sell; however, the paucity of evidence on normal housing markets suggests that analyses of variables that affect all housing are preferable.

Housing attributes that are familiar to counselors, such as physical features and location advantages, may pose less of a pricing problem than more unpredictable macro-economic factors, such as changes in interest rates, inflation and business conditions. We add to the studies on TOM by including analysis of macro-economic variables that have been noted as important to real estate markets and TOM. We use a stratified sample which includes rural and suburban transactions as well as urban sales. We account for pricing decisions by including a listing price variable and the ratio of selling price to listing price.

### **The Importance Of Macro-Determinants Of TOM**

As Miller noted, residential property values are a function of three primary sets of variables: housing services, informational and exchange factors (as influenced by brokers) and financial conditions. Unfortunately, in Miller's study, "financial conditions which may influence value have been assumed stable."<sup>4</sup> The traditional theory is that if markets are efficient, then variations in TOM for similar properties should either be random events or they should be explained by broker/seller mispricing. Macro-economic activity will affect time on the market if broker/seller pricing decisions do not adjust in a timely fashion to changes in economic climate. Specifically, deteriorating business conditions should lengthen TOM as purchasers postpone making "move up" decisions and curtail spending. Brokers and sellers, unaware of potential or real income losses and possibly reduced expectations of potential buyers, fail to adjust asking prices during such periods. As a result, property remains on the market longer. Ultimately, sellers must take greater discounts from the listing price in order to sell their properties. The imbalance associated with falling

demand may be countered when potential sellers pull housing from the market. Such supply adjustments may minimize the long-term impact of high unemployment rates. However, less active markets, even in equilibrium, may increase TOM as transaction costs increase to find suitable buyers.

The ability to obtain financing at suitable rates also may have a direct impact on TOM. High mortgage loan rates should increase TOM as buyers find it more difficult to obtain financing. TOM should increase as it becomes more difficult for buyers to qualify for loans and as marginal borrowers/buyers drop from the market.

Finally, inflationary pressures may play a role in the length of time required to find a buyer. Increasing inflation rates, specifically in housing, have two possible impacts. To the extent that housing is perceived to be a hedge against inflation, demand should increase, and TOM should fall as inflation increases. However, as inflation rates drive up prices and mortgage interest rates, buyers will find it more difficult to afford and finance new purchases. Thus, the ultimate effect of housing inflation may be to increase TOM once unaffordability levels have been breached.

### **The Data And Methodology**

We examined the potential impacts on TOM from national unemployment rates, mortgage interest rate changes and housing inflation by using TOM as a dependent variable in a conventional linear regression analysis. Our study assumed that macro-economic variables had a direct impact on the marketing time of residential real estate.

We used 337 residential sales over the time period December, 1986 to June, 1990, that had been obtained from three separate multiple listing services covering the Pennsylvania counties of Philadelphia, Montgomery and Chester. Separate MLS data sets were used to derive sales from three geographic markets: urban, suburban and rural. One-hundred-twenty-five sales occurred in the city of Philadelphia, 100 in outlying suburbs (Montgomery) and 112 in rural areas of Chester County. Additional information collected from the MLS included lot size (SQFT), number of bedrooms (BEDR) and baths (BATH), gross sales price (SALESP) and sales price per square foot (SALESSF), date of sale (CMONTH), listing price (LP) and days on the market (DAYS). Neighborhood conditions were proxied by data from the 1980 U.S. Census and applied by census tract location. The variables were: percent boarded up (BOARDED), median household income (HHINCOME) and average monthly rent (RENT). We also used a dummy variable to separate sales into two price categories, those less than or equal to \$200,000 (SIZE = 0) and those above (SIZE = 1), to account for submarkets based on price. We accounted for possible effects of the time of sale by translating each date of sale into sequential months with December, 1986, as the base month.<sup>5</sup>

We used these variables for control only; coefficient interpretation was not critical for the purposes



of this study. Our primary interest was to determine the impact of macro-economic variables including financing terms, business conditions and inflation. We used monthly, seasonally adjusted unemployment rates compiled by the U.S. Department of Labor (UNEMPLOY), the housing component of the monthly Consumer Price Index as compiled by the U.S. Department of Commerce (HCPI) and the average monthly mortgage contract rate (RATE) as calculated by the Federal Reserve Board. We examined the potential effects of selected variables on TOM by using a standard hedonic pricing model, with days on the market (DAYS or TOM) as our dependent variable. Independent variables included the measures of housing attributes, neighborhood condition, geographic location and the economic variables mentioned previously. In order to detect for any partial effects, the following specifications were employed:

$$\text{LogTOM} = \beta_0 + \sum_{i=1}^n \beta_i X_i + \sum_{j=n+1}^k \beta_j Z_j + e$$

where:

LogTOM = number of days on market (TOM)

$X_i$  = conventional variables for housing attributes, neighborhood conditions and geographic location

$Z_j$  = macro-variables in monthly form

$\beta_0$  = constant term

$e$  = random error

The functional form and log transformation allowed for the use of ordinary least squares to estimate parameters.

## Estimation Results

The explanatory power of the estimated equations was rather low, ranging from 0.16 to 0.25. Such low values suggested that we did not capture all possible variables that may have had an impact on TOM. However, many additional variables worthy of consideration could be difficult, if not impossible, to

measure, given the data currently available. We would have liked to include, for example, variables that would measure broker efficiency and productivity, but such data is not collected. The macro-economic variables of concern in this study nevertheless generated rather interesting results.

The descriptive statistics for all variables are presented in Table 1. This table shows the greatest variance among variables that measure housing size. Of 337 sales, 55 involved two bedrooms, 177 involved three bedrooms, 95 involved four bedrooms and the rest involved five bedrooms and up. To control for differential results associated with size, we performed separate regressions for three- and four-bedroom home sales.

Equations 1 and 2, which were presented in reduced form (Table 2), demonstrated that the impact of the property-specific variables (BEDR, BATH and SQFT) was statistically insignificant. However, equations 3 and 4 indicated that the number of bathrooms was significant, suggesting that the presence of housing amenities, as proxied by bathrooms, reduced TOM. In the context of pricing error, these results also suggested that sellers were probably underpricing this item for three- and four-bedroom sales.

Neighborhood variables were statistically insignificant in all equations. Listing price and sales price divided by listing price, measures of broker pricing hypothesized to affect TOM, were insignificant and positive. However, variables that accounted for sales outside the city (SUBURB and RURAL) were significant and negative with the single exception of suburban sales of four-bedroom properties. Thus, residential real estate located outside the city sold quicker than property inside the city. Translating the coefficient for suburban sales in equation 1 into its antilog effect ( $e^{-0.3956} - 1$ ), we discovered that a suburban location decreased TOM by nearly one-third (32.7%); property located in rural areas reduced TOM by 58%. These results may be peculiar to our study area (Philadelphia); they can be explained by city policies that have made the purchase of city properties less attractive (higher property taxes, wage taxes and higher property transfer taxes)<sup>6</sup> than the purchase of properties in suburban and rural areas. These advantages, in addition to the presence of other suburban and rural amenities such as better school districts, less traffic and reduced crime, may not have been fully capitalized into listing prices by suburban and rural sellers.

All macro-variables had the effects we hypothesized. Although the mortgage interest rate variable (RATE) was statistically insignificant at conventional levels in equation 1, it was significant and positive in the reduced-form equation 2 and for three- and four-bedroom sales, respectively. A one-point increase in mortgage rates increased TOM overall by over 42% in equation 2. Mortgage rates affected larger houses more severely than smaller houses, increasing TOM for four-bedroom homes by 119% but increasing TOM for three bedroom homes

TABLE 1  
Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
DAYS	125.039	81.632	2	661
SQFT	45916.246	99766.960	632	1165230
BEDR	3.436	.974	2	9
BATH	2.051	.858	1	6
SALESP	181441.276	129437.261	19000	925000
LP	193562.047	140096.414	26500.00	1100000
BOARDED	.001	.005	0	.008
HHINCOME	21333.356	5648.517	6210	54016
RENT	234.733	67.391	70	454
UNEMPLOY	5.347	.250	5	7
RATE	9.617	.355	9	10
HCPI	123.376	3.575	112	128

TABLE 2

Estimation Results (Dependent Variable—LogTOM)

Variable	Combined Data		Three Bedroom Homes		Four Bedroom Homes	
	Equation 1	Equation 2	Equation 3	Equation 4	Equation 4	Equation 4
LP	7.018E-07 (1.256)	SPLP -0.2390 (-0.412)	SPLP 0.251 (0.253)	SPLP -1.816 (-1.461)		
BEDR	0.0471 (0.860)	BEDR 0.0585 (1.071)	— —	— —		
BATH	-0.0483 (-0.664)	BATH -0.0089 (-0.128)	BATH -0.235 (-1.877)**	BATH -0.259 (-1.873)**		
SQFT	4.6349E-07 (0.854)	— —	SQFT 7.024E-07 (0.883)	SQFT 7.109E-07 (1.156)		
BOARDED	8.5339 (0.868)	— —	— —	— —		
HHINCOME	-1.2286 (-1.045)	— —	HHINCOME -1.699E-05 (-1.113)	HHINCOME -6.695E-06 (-0.377)		
RENT	0.0012 (1.037)	— —	— —	— —		
SIZE	0.2226 (1.509)	SIZE 0.3464 (3.232)***	SIZE 0.497 (2.786)**	SIZE 4.637 (0.065)		
CMONTH	0.0022 (0.447)	CMONTH 0.0094 (2.262)**	CMONTH 0.007 (1.160)	CMONTH 0.0005 (0.065)		
SUBURB	-0.3956 (-3.013)***	SUBURB -0.3020 (-2.463)**	SUBURB -0.519 (-2.527)**	SUBURB -1.816 (-1.461)		
RURAL	-0.8688 (-5.777)***	RURAL -0.7804 (-6.734)***	RURAL -1.057 (-5.536)***	RURAL -0.644 (-2.437)**		
RATE	0.2080 (1.244)	RATE 0.3561 (2.275)**	RATE 0.425 (1.990)**	RATE 0.785 (2.761)***		
UNEMPLOY	0.6640 (2.833)***	UNEMPLOY 0.5661 (2.719)***	UNEMPLOY 0.736 (2.521)**	UNEMPLOY 0.250 (0.698)		
HCPI	0.0619 (2.653)***	— —	— —	— —		
CONSTANT	-8.6829 (-2.698)***	CONSTANT -2.1269 (-0.998)	CONSTANT -3.059 (-1.071)	CONSTANT -3.041 (-0.811)		
r <sup>2</sup>	0.22	r <sup>2</sup> 0.22	r <sup>2</sup> 0.25	r <sup>2</sup> 0.16		
Cases	337	337	177	95		

t-ratios are shown in parenthesis

\*\* significant at the 95% level of confidence

\*\*\* significant at the 99% level of confidence

by about 53% on average. The evidence suggested that larger houses were more difficult to sell during periods of high rates and that significant price discounts must be made to generate lower TOM.

The business conditions variable (UNEMPLOY) was highly significant in both equations 1 and 2 and significant in equation 3 for three-bedroom sales; however, it was insignificant for four-bedroom sales. The transformed coefficient associated with the business conditions variable in equation 1 suggested a rather high 94% increase in TOM associated with a one-percent increase in the unemployment rate.

The interest rate variable may have suffered from the effects of colinearity with the housing component inflation index in equation 1; the housing inflation variable was dropped from equations 2, 3 and 4. However, the results seemed to suggest that, although deteriorating business conditions and financing costs affected housing markets overall, purchasers of larger homes were somewhat insulated from the effects of employment changes.

The housing inflation index variable (HCPI) also was positive and significant at the 99% level in equation 1. Here housing inflation increased TOM by

about 6% with each percentage increase in the housing inflation index. This positive relationship seemed to counter the conventional wisdom that inflationary pressures cause buyers to seek out real estate as a hedge. *Ceteris paribus*, an unexpected increase in demand would lower TOM; however, in our study area, prices had risen throughout the 1980s so significantly that sellers and brokers might have run into an unexpected wall of unaffordability. This conclusion was supported somewhat by evidence of more recent price declines in the Philadelphia area which many brokers maintained were reflective of a 1980s buildup and a resultant excess supply.

Listing price and the ratio of sales prices to listing price were not significant at conventional levels and had no consistent impact on TOM. Other forms of broker mispricing measurement also were significant. Therefore, we found no measurable relationship between listing price and TOM. However, these inconclusive results, in the face of the significance of other variables, illustrated the difficulty of measuring broker efficiency and productivity. The results might also point to the need for a refinement of the dependent variable, TOM (i.e., further study should be performed using a suitable measure of optimal TOM which would more effectively measure mispricing).

Still, if brokers are the major source of pricing information (as maintained by Belkin, Hempel and McLeavey), then these results could be interpreted to mean that brokers were able to efficiently price housing attributes and neighborhood conditions since TOM remained unaffected by these factors. The lower TOM generated by nonurban locations might mean that brokers overpriced these properties in the city of Philadelphia. In the same context, brokers did not correctly account for the effects of increasing interest rates, changes in business conditions and inflation rates. As a result, these conditions extended TOM. Confirmation of this interpretation, however, might require a detailed analysis of sales prices relative to listing prices and a more accurate measure of the effect of mispricing.

## Conclusions

Our analysis of the impact of macro-variables on TOM produced significant results. Financing costs, business conditions and housing inflation extended time on the market. Therefore, brokers, appraisers and counselors must pay closer attention to such conditions in the marketing of residential real estate, and sellers must be prepared to make necessary trade-offs. To the extent that sellers face substantial opportunity costs associated with lengthy selling periods, adjustments in listing prices and selling prices may be necessary.

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## NOTES

1. For discussions of buyer and seller behavior, see Belkin, Hempel and McLeavey (1976), Miller (1978), Chinloy (1980) and Haurin (1988).
2. The authors reason that "if two houses are identical and equally priced within a submarket of comparable demand and supply conditions, then the houses should remain in the market for approximately the same duration. If houses are not identical but are made so by price, they should have the same time on the market" (p. 57).
3. Therefore, "brokers do a good job in negotiating list price" relative to housing and neighborhood features (p. 74).
4. Miller, (p. 167).
5. We first adjusted by aggregating sales into quarterly components of each year; next by season. We could discern no effects from these forms and therefore utilized the more detailed monthly variable.
6. Philadelphia has the highest real estate transfer tax in the nation (approximately 5%). City wage taxes average about 5% of income, but wage taxes also are collected at slightly lower rates (4.3%) from nonresidents who work in the city.

## CRE's VIEWPOINT

### Appraisal Thoughts From A Non-Appraiser

by Bruce P. Hayden, CRE

Many years of reviewing appraisals for a major financial institution and of conducting appraisals inhouse from time to time, have led this non-qualified appraiser—at least in the MAI sense—to a number of conclusions:

- Too many users of real estate appraisals are unwilling to pay appraisal fees commensurate with the time and skills needed by the appraiser to do a thorough, professional job.
- Too many appraisal users insist, as a condition of engagement, that the resulting appraisal be “usable.” This term usually means that the appraisal should support the mortgage loan the users are seeking or the results of negotiation, arbitration, assessment appeal, etc. (Such engagements may take the form of a stipulation to “do your numbers and discuss your results with us. We will tell you then if we want you to finish your report. If not, we will pay you for your work to date.”)
- Too many financial institutions want appraisals to fit their purposes—such as to meet a “loan to value” test.
- Too many appraisers, facing these pressures, work backwards from the assessment of value to the accumulation of supporting data or otherwise compromise their professional skills or integrity.
- Too many appraisers do not have the slightest idea of how to evaluate the separate interests in commercial real estate—such as lessors’ interests, lessees’ interests, mortgagees’ interests, “sandwich positions,” remainder interests and the like.
- Too many well-qualified appraisers, who know how to value fractional interests, nonetheless do not insist on starting where every appraisal should start: with the value of the land and its improvements—as if it were held in fee simple, unencumbered by a mortgage or other lien or leases of any sort but subject to natural or regulatory conditions affecting value.
- Too many appraisers assume that the value of both a mortgagee’s and a mortgagor’s interests are the same as the unpaid balance due on the mortgage. Often, this assumption is correct; however, equally often the value of the two interests differ, and neither is equal to the unpaid balance.

For example, consider the values to the mortgagor and to the mortgagee of a 7% mortgage in a 10% market with 11 years to maturity. The value of the mortgagor’s position in this example is substantially *greater* than the unpaid mortgage balance, while the value of the mortgagee’s position is substantially *less* than the unpaid balance. Likewise, an option to prepay the mortgage at 101 is substantially more valuable to the mortgagor than an option to prepay at 110 or no option to prepay.

While these generalities apply to appraisals of all real estate, this treatise looks only at appraisals of income property—apartments, shopping centers, office buildings, etc.—and leaves the condominium, single family home, industrial and special use property fields to other papers.

#### Appraisal Scenarios

Let us look at the appraisal of an office building, erected on a site owned by a Catholic diocese, which has entered into a long-term ground lease with the developer/owner of the building. Who are the parties at interest? What are their relative priorities of claim on the building’s net operating income?

In one situation, the diocese’s interest is *superior* to the mortgagee’s interest as follows: The diocese’s interest ranks first; the mortgagee’s is second; the developer/owner’s is third; and the tenants’ is fourth.<sup>1</sup> In another situation, the diocese’s interest is *subordinate* to the mortgagee’s interest. In this case, the mortgagee’s interests come first; the diocese’s second; the developer/owner’s third; and the tenants’ fourth.

Now let us move to a more complex, more typical office building situation that involves multiple interests: ground lessor and lessee; a first mortgage loan on the lessor’s interest in the ground; another first mortgage loan on the lessee’s interest in the ground and on the improvements; a ten-year lease on half the office space to a major corporate tenant; short-term leases on the remainder of the office space with a number of other tenants.

#### What Is The Appraiser’s Task?

First of all, the appraiser must identify the various legal entities involved and the priority of the claim of each interest. Priority should be determined both in terms of each interest’s legal

*Bruce P. Hayden, CRE, elected in 1971 to take early retirement from his position as vice president of real estate investments for Connecticut General Life Insurance Company (now a part of CIGNA) in order to begin a career in real estate counseling. He became a CRE (Counselor of Real Estate) in 1973. He currently is chairman of Hayden, Tolzmann, Inc., of Bloomfield, CT, and is a past president of the American Society of Real Estate Counselors.*



position and claim on cash after operating expenses and taxes. (Usually, these two factors are the same, but occasionally they are not.)

Second, the appraiser must clarify which interest or interests he is engaged to appraise.

Third, the appraiser must appraise the whole property, including the site, all current improvements and the right to make further improvements, as if the property were held in single ownership and in fee simple. *This value becomes the total of the values of each fractional interest in the appraised premises.*

Fourth, the appraiser must determine the priority of the claim of each interest that is superior to the interest he is valuing.

Fifth, the appraiser must successively value each interest that is superior to the interest he has been engaged to appraise. The appraiser then subtracts the value of each senior interest from the value of the whole property less the values that have been already subtracted.

Sixth, the appraiser must consider as immaterial the value (as a group) of all interests that are junior to the interest he is appraising. (In litigation involving the property, the appraiser may consider junior interests for their nuisance value).

As to the determination of the value of each of these interests, the appraiser must decide which approach is most significant—both to the value that is sought and to the purposes for which the appraisal is being made. For example, the manager of a pooled investing group of corporate pension funds may instruct his appraisers to rely primarily on the economic approach to valuation rather than either the comparable sales approach, or the replacement value less depreciation and obsolescence approach. Why? Most pension funds are net present value oriented; therefore, the fund must rely most heavily on net present value

calculations. The basics for such calculations, of course, must be substantiated by comparables.

### Summary

Assume the value of a particular parcel of real estate, as if it were held in fee simple and was unencumbered, is represented by W. Assume the limited interests in W are in the following order of priority: A, B, C, D, E, F. The appraiser's assignment is to value the limited interest C.

The appraiser's basis determination should be:

$$C = W - A - B^2$$

Different approaches may be needed to determine the value of each subinterest. For example, if A has a first mortgage on W, the appraiser may reason: "A's unpaid balance is less than 50% of W; the interest rate and other terms approximate present market levels. Therefore, I can safely value the subinterest at the unpaid balance." Or the appraiser may find that the unpaid balance of A is 85% of W and that B (who leases the property as a whole and is responsible for making the mortgage payments) has had a tax lien filed on the premises by the Internal Revenue Service. The value of A under these circumstances may be speculative and range between 20% and 50% of the unpaid balance. The value of all other interests, of course, also are highly speculative.

### Conclusion

It should be recognized that real estate appraisal is at least as much an art form as it is a matter of science. The appraiser, accordingly, must be a person of judgment, integrity and experience. The appraiser consequently should be well paid for his services, not bought at any price.

### NOTES

1. Non-disturbance agreements, etc., would alter tenant position in the pecking order.
2. (D + E + F) may have nuisance value.

# How Long Is a Long-Term Lease?

by Roy P. Drachman, CRE

If a man doesn't learn anything during nearly 50 years of experience in the real estate business, he was either extremely knowledgeable at the beginning or too dumb to recognize the important facts he encountered along his lengthy journey.

I fall into the latter group. I have learned many, many things as I wended my way through a melange of real estate deals that included shopping centers of all sizes, office buildings, residential developments and industrial projects.

One thing I learned early on was that if you had no capital but a good idea, for a shopping center, for example, about the only way to put the package together was to find a property that could be leased with the right of first mortgage to provide funds for construction.

Another thing I learned was that it was not difficult to find such properties and owners who would permit that kind of arrangement for financing a project. I will not bore you with the techniques used to make such deals. That story has been told many times by many people.

The most important thing I have learned about leasing the land on which a development will be placed concerns the length of the lease term. I, and many other developers, have long believed that a 50- or 60-year lease was long enough to accomplish almost any kind of development.

"Why not?," the thinking has been. "I'll be 85 or 90 years old by the time the lease runs out, and I won't care after that. Furthermore, all the buildings will be worn out by then anyway," the dialogue continued.

Well, let me tell you how wrong we who have thought and acted that way were. I am one of those 85-year-old guys who is now aware of having made a gross error.

A partner and I leased a parcel of land on which we built a neighborhood strip center of 100,000 square feet. We had the right to encumber the land on a first mortgage which provided all the money needed to cover development costs.

The length of the land lease was 60 years, which certainly seemed long enough to us at the time. The length of the mortgage was 20 years. The shopping center opened in March of 1957. My age at that time was 50. I believe that almost anyone consulted at that time would have agreed that my partner and I had made a good deal.

The shopping center was a success from the time it opened. We paid off the mortgage in 20 years

and held the property free and clear. The income from the development has been acceptable and steady. We remodeled the center a few years ago and have been attentive regarding the maintenance of the property. As a result, it has been quite productive.

Competition has emerged in the form of other shopping centers in the trading area, but it has not seriously affected the volumes that our tenants enjoy, and there has been practically no decrease in the amount of rent we collect.

So, one might say: "What problem do you have? What is wrong with what has happened to that property?" Obviously, the answer is: "Nothing seriously is wrong with the property; but the problem is with the ground lease that was negotiated in 1956 and will terminate in 2016." We have only 24 years left on the ground lease. At that time, the ownership of the buildings will revert to the owner of the land.

Our key tenant, one of the large food chains, occupies a store of approximately 25,000 square feet in our shopping center and wants us to increase the size of the store to 40,000 or 50,000 square feet to make it more competitive with the other new supermarkets in this area that have 40,000 to 50,000 square feet.

We can either ignore the request of our present tenant, whose lease has just a few years before it expires, or face the prospect of increasing the size of the store to suit the tenant for the relatively short period of 24 years.

Financing today, under the best of conditions, is not easy to obtain. Even under what might be called normal conditions, would it be wise to build a new building knowing that we will have to give it away in 24 years? Furthermore, our tenant may not accept a lease with such a short term.

I have had some experience with other ground leases that ran 50 or 60 years. While I sold my position in these properties, I continue to think about what must be happening to the present owners. I must come to the conclusion that a 50- or even 60-year lease is hardly long enough; the lessee must have some option to extend the lease to somewhere around 90 to 100 years.

The years slip by very quickly, and when you reach my age, you can look back and see very clearly that a long-term investment that pays good returns is a very valuable asset. It is one that you do not wish to give up but may be forced

*Roy P. Drachman, CRE, is co-owner of Roy Drachman Realty Company in Tucson, Arizona. A national authority on shopping centers and urban land development, he is a co-developer of numerous shopping centers in Arizona and California. Drachman is a past president of the American Society of Real Estate Counselors.*

to because the title of the buildings will flow to another owner when the lease term for the ground is not long enough.

As for the buildings wearing out, that can happen, of course. But, on the other hand, a going business can operate in a very old building for a very long time, as many of us can attest.

So, a bit of free advice from someone who has made the journey over the hills and through the valleys: If you must make a lease that has no more than 50 or 60 years for its term, be sure to have the option to extend the actual term of control of the land to 90 or 100 years.

I have been told that in England it is not unusual for lease terms to be for 1000 years; I heard of one lease for 2000 years. I do not think anyone would have the temerity to project a value for property that many years ahead. But at least the developer of the property will own something he can pass on to his grandchildren, and they to theirs.

# REAL ESTATE ISSUES

# INDEX

## Volume 16 1991

REAL ESTATE ISSUES presents an update for 1991 on its index covering Volume 16. To assist the reader in finding articles, two alphabetical listings are included, by subject and by author.

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## TOPICAL INDEX

### *Subjects:*

Capital Markets  
Cities  
Development  
Environment  
Feasibility Analysis  
Financing  
Industrial Real Estate  
Internal Rate of Return  
Investment Analysis  
Land Use  
Legal Issues  
Market Analysis  
Property Management/Values  
Public/Private Sector  
Real Estate Counseling  
Real Estate Investment  
Real Estate Valuation  
Regulation  
Rent Control  
States  
Suburbs  
Taxation

## CAPITAL MARKETS

Understanding the Internal Rate of Return Used in Commercial Real Estate Transactions. Leonard R. Sliwoski. Vol.16, no.1 (Spring/Summer 1991), pp.43-45.

## CITIES

Industrial Real Estate: Go Figure! Donald J. Hartman. Vol.16, no.1 (Spring/Summer 1991), pp.23-27.

Interested Bystanders: The Real Estate Profession and Behemoth Public Works Projects. Frank J. Parker, CRE. Vol.16, no.1 (Spring/Summer 1991), pp.11-16.

## DEVELOPMENT

Growth Management and the Concept of Concurrency: Florida's Experience. Robert C. Apgar and H. Glenn Boggs, II. Vol.16, no.1 (Spring/Summer 1991), pp.17-22.

How a Garbage Dump Became a Post Office. John J. Wallace, CRE. Vol.16, no.2 (Fall/Winter 1991), pp.20-24.

Industrial Real Estate: Go Figure! Donald J. Hartman. Vol.16, no.1 (Spring/Summer 1991), pp.23-27.

Interested Bystanders: The Real Estate Profession and Behemoth Public Works Projects. Frank J. Parker, CRE. Vol.16, no.1 (Spring/Summer 1991), pp.11-16.

Landfills Aren't All Bad: Considerations for Real Estate Development. John P. Norman; Michele Robbins Norman and Michael L. Robbins, CRE. Vol.16, no.2 (Fall/Winter 1991), pp.11-19.



## **ENVIRONMENT**

A Case for an Environmental Real Estate Market. Donald C. Wilson. Vol.16, no.2 (Fall/Winter 1991), pp.44-49.

Current Legal Issues Raised by Environmental Hazards Affecting Real Estate. Ralph W. Holmen. Vol.16, no.2 (Fall/Winter 1991), pp.37-43.

The Effects on Residential Real Estate Prices From Proximity to Properties Contaminated with Radioactive Materials. Mary Beth Geckler and William N. Kinnard, Jr., CRE. Vol.16, no.2 (Fall/Winter 1991), pp.25-36.

Environmental Counseling Cases. Max J. Derbes, Jr., CRE. Vol.16, no.2 (Fall/Winter 1991), pp.5-10.

How a Garbage Dump Became a Post Office. John J. Wallace, CRE. Vol.16, no.2 (Fall/Winter 1991), pp.20-24.

Interested Bystanders: The Real Estate Profession and Behemoth Public Works Projects. Frank J. Parker, CRE. Vol.16, no.1 (Spring/Summer 1991), pp.11-16.

Landfills Aren't All Bad: Considerations for Real Estate Development. John P. Norman; Michele Robbins Norman and Michael L. Robbins, CRE. Vol.16, no.2 (Fall/Winter 1991), pp.11-19.

Lenders' Perspectives on Environmental Issues. John J. Healy, Jr., CRE and Patricia R. Healy. Vol.16, no.2 (Fall/Winter 1991), pp.1-4.

Rationalizing Environmental Cleanup. Maurice Freedman, CRE. Vol.16, no.2 (Fall/Winter 1991), pp.55-57.

The Valuation of Contaminated Properties. Peter J. Patchin, CRE. Vol.16, no.2 (Fall/Winter 1991), pp.50-54.

## **FEASIBILITY ANALYSIS**

A Case for an Environmental Real Estate Market. Donald C. Wilson. Vol.16, no.2 (Fall/Winter 1991), pp.44-49.

The Effect of Intertemporal Dependence in Cash Flows on Project Risk. Christos P. Koulamas and Stanley R. Stansell. Vol.16, no.1 (Spring/Summer 1991), pp.28-33.

The Effects on Residential Real Estate Prices From Proximity to Properties Contaminated with Radioactive Materials. Mary Beth Geckler and William N. Kinnard, Jr., CRE. Vol.16, no.2 (Fall/Winter 1991), pp.25-36.

Lenders' Perspectives on Environmental Issues. John J. Healy, Jr., CRE and Patricia R. Healy. Vol.16, no.2 (Fall/Winter 1991), pp.1-4.

## **FINANCING**

The Effect of Intertemporal Dependence in Cash Flows on Project Risk. Christos P. Koulamas and Stanley R. Stansell. Vol.16, no.1 (Spring/Summer 1991), pp.28-33.

The Effects on Residential Real Estate Prices From Proximity to Properties Contaminated with Radioactive Materials. Mary Beth Geckler and William N. Kinnard, Jr., CRE. Vol.16, no.2 (Fall/Winter 1991), pp.25-36.

Lenders' Perspectives on Environmental Issues. John J. Healy, Jr., CRE and Patricia R. Healy. Vol.16, no.2 (Fall/Winter 1991), pp.1-4.

Recent Changes in Individual Investors' Attitudes Toward Real Estate. Gaylon Greer and Phillip T. Kolbe. Vol.16, no.1 (Spring/Summer 1991), pp.6-10.

Understanding the Internal Rate of Return Used in Commercial Real Estate Transactions. Leonard R. Sliwoski. Vol.16, no.1 (Spring/Summer 1991), pp.43-45.

## **INDUSTRIAL REAL ESTATE**

Industrial Real Estate: Go Figure! Donald J. Hartman. Vol.16, no.1 (Spring/Summer 1991), pp.23-27.

## **INTERNAL RATE OF RETURN**

Understanding the Internal Rate of Return Used in Commercial Real Estate Transactions. Leonard R. Sliwoski. Vol.16, no.1 (Spring/Summer 1991), pp.43-45.

## **INVESTMENT ANALYSIS**

Recent Changes in Individual Investors' Attitudes Toward Real Estate. Gaylon Greer and Phillip T. Kolbe. Vol.16, no.1 (Spring/Summer 1991), pp.6-10.

## **LAND USE**

A Case for an Environmental Real Estate Market. Donald C. Wilson. Vol.16, no.2 (Fall/Winter 1991), pp.44-49.

Current Legal Issues Raised by Environmental Hazards Affecting Real Estate. Ralph W. Holmen. Vol.16, no.2 (Fall/Winter 1991), pp.37-43.

The Effects on Residential Real Estate Prices From Proximity to Properties Contaminated with Radioactive Materials. Mary Beth Geckler and William N. Kinnard, Jr., CRE. Vol.16, no.2 (Fall/Winter 1991), pp.25-36.

Environmental Counseling Cases. Max J. Derbes, Jr., CRE. Vol.16, no.2 (Fall/Winter 1991), pp.5-10.

Growth Management and the Concept of Concurrency: Florida's Experience. Robert C. Apgar and H. Glenn Boggs, II. Vol.16, no.1 (Spring/Summer 1991), pp.17-22.

How a Garbage Dump Became a Post Office. John J. Wallace, CRE. Vol.16, no.2 (Fall/Winter 1991), pp.20-24.

Landfills Aren't All Bad: Considerations for Real Estate Development. John P. Norman; Michele Robbins Norman and Michael L. Robbins, CRE. Vol.16, no.2 (Fall/Winter 1991), pp.11-19.

Lenders' Perspectives on Environmental Issues. John J. Healy, Jr., CRE and Patricia R. Healy. Vol.16, no.2 (Fall/Winter 1991), pp.1-4.

Rationalizing Environmental Cleanup. Maurice Freedman, CRE. Vol.16, no.2 (Fall/Winter 1991), pp.55-57.

The Valuation of Contaminated Properties. Peter J. Patchin, CRE. Vol.16, no.2 (Fall/Winter 1991), pp.50-54.

## **LEGAL ISSUES**

Current Legal Issues Raised by Environmental Hazards Affecting Real Estate. Ralph W. Holmen. Vol.16, no.2 (Fall/Winter 1991), pp.37-43.

## **MARKET ANALYSIS**

A Case for an Environmental Real Estate Market. Donald C. Wilson. Vol.16, no.2 (Fall/Winter 1991), pp.44-49.

The Effect of Poison Pill Securities on REIT Stock Prices. Willard McIntosh. Vol.16, no.1 (Spring/Summer 1991), pp.34-38.

Recent Changes in Individual Investors' Attitudes Toward Real Estate. Gaylon Greer and Phillip T. Kolbe. Vol.16, no.1 (Spring/Summer 1991), pp.6-10.

## **PROPERTY MANAGEMENT/VALUES**

The Valuation of Contaminated Properties. Peter J. Patchin, CRE. Vol.16, no.2 (Fall/Winter 1991), pp.50-54.

## **PUBLIC/PRIVATE SECTOR**

Interested Bystanders: The Real Estate Profession and Behemoth Public Works Projects. Frank J. Parker, CRE. Vol.16, no.1 (Spring/Summer 1991), pp.11-16.

## **REAL ESTATE COUNSELING**

Environmental Counseling Cases. Max J. Derbes, Jr., CRE. Vol.16, no.2 (Fall/Winter 1991), pp.5-10.

## **REAL ESTATE INVESTMENT**

The Effect of Poison Pill Securities on REIT Stock Prices. Willard McIntosh. Vol.16, no.1 (Spring/Summer 1991), pp.34-38.

A Proposal for Simplification of Tax-Deferred Exchanges. Mark Lee Levine. Vol.16, no.1 (Spring/Summer 1991), pp.39-42.

Whatever Happened to Rent? Richard T. Garrigan, CRE. Vol.16, no.1 (Spring/Summer 1991), pp.1-5.

## **REAL ESTATE VALUATION**

The Valuation of Contaminated Properties. Peter J. Patchin, CRE. Vol.16, no.2 (Fall/Winter 1991), pp.50-54.

## **REGULATION**

Growth Management and the Concept of Concurrency: Florida's Experience. Robert C. Apgar and

H. Glenn Boggs, II. Vol.16, no.1 (Spring/Summer 1991), pp.17-22.

A Proposal for Simplification of Tax-Deferred Exchanges. Mark Lee Levine. Vol.16, no.1 (Spring/Summer 1991), pp.39-42.

## **RENT CONTROL**

Whatever Happened to Rent? Richard T. Garrigan, CRE. Vol.16, no.1 (Spring/Summer 1991), pp.1-5.

## **STATES**

Growth Management and the Concept of Concurrency: Florida's Experience. Robert C. Apgar and H. Glenn Boggs, II. Vol.16, no.1 (Spring/Summer 1991), pp.17-22.

## **SUBURBS**

Industrial Real Estate: Go Figure! Donald J. Hartman. Vol.16, no.1 (Spring/Summer 1991), pp.23-27.

## **TAXATION**

A Proposal for Simplification of Tax-Deferred Exchanges. Mark Lee Levine. Vol.16, no.1 (Spring/Summer 1991), pp.39-42.

### *Authors:*

Apgar, Robert C. and Boggs, H. Glenn II. Growth Management and the Concept of Concurrency: Florida's Experience. Vol.16, no.1 (Spring/Summer 1991), pp.17-22.

Boggs, H. Glenn II and Apgar, Robert C. Growth Management and the Concept of Currency: Florida's Experience. Vol.16, no.1 (Spring/Summer 1991), pp.17-22.

Derbes, Max J., Jr., CRE. Environmental Counseling Cases. Vol.16, no.2 (Fall/Winter 1991), pp.5-10.

Freedman, Maurice, CRE. Rationalizing Environmental Cleanup. Vol.16, no.2 (Fall/Winter 1991), pp.55-57.

Garrigan, Richard T., CRE. Whatever Happened to Rent? Vol.16, no.1 (Spring/Summer 1991), pp.1-5.

Geckler, Mary Beth and Kinnard, William N., Jr., CRE. The Effects on Residential Real Estate Prices From Proximity to Properties Contaminated with Radioactive Materials. Vol.16, no.2 (Fall/Winter 1991), pp.25-36.

Greer, Gaylon and Kolbe, Phillip T. Recent Changes in Individual Investors' Attitudes Toward Real Estate. Vol.16, no.1 (Spring/Summer 1991), pp.6-10.

Hartman, Donald J., CRE. Industrial Real Estate. Go Figure! Vol.16, no.1 (Spring/Summer 1991), pp.23-27.

Healy, John J. and Healy, Patricia R. Lenders' Perspectives on Environmental Issues. Vol.16, no.2 (Fall/Winter 1991), pp.1-4.

Healy, Patricia R. and Healy, John J. Lenders' Perspectives on Environmental Issues. Vol.16, no.2 (Fall/Winter 1991), pp.1-4.

- Holmen, Ralph W. Current Legal Issues Raised by Environmental Real Estate Market. Vol.16, no.2 (Fall/Winter 1991), pp.37-43.
- Kinnard, William N., Jr., CRE and Geckler, Mary Beth. The Effects on Residential Real Estate Prices From Proximity to Properties Contaminated with Radioactive Materials. Vol.16, no.2 (Fall/Winter 1991), pp.25-36.
- Kolbe, Phillip T. and Greer, Gaylon. Recent Changes in Individual Investors' Attitudes Toward Real Estate. Vol.16, no.1 (Spring/Summer 1991), pp.6-10.
- Koulamas, Christos P. and Stansell, Stanley R. The Effect of Intertemporal Dependence in Cash Flows on Project Risk. Vol.16, no.1 (Spring/Summer 1991), pp.28-33.
- Levine, Mark Lee. A Proposal for Simplification of Tax-Deferred Exchanges. Vol.16, no.1 (Spring/Summer 1991), pp.39-42.
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- Norman, John P.; Norman, Michelle Robbins and Robbins, Michael L. Landfills Aren't All Bad: Considerations for Real Estate Development. Vol.16, no.2 (Fall/Winter 1991), pp.11-19.
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