

Real Estate Issues

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Real Estate Issues, *Summer, 1979*

The Black Ghetto: New White Frontier

Dempsey J. Travis, CRE, Page 1

Displacement of blacks and other poor people from the central areas of many American cities is a fact of the 1970s. Stimulated by legislation and economic factors, young whites are returning to the cities as the black middle class move to the suburbs and the black poor are displaced from their inner-city homes. Examples are cited from Philadelphia, New York, Chicago, Atlanta, Washington, and San Francisco. The city has become more attractive as increasing transportation costs, expensive suburban housing (of dubious quality), cultural opportunities, and changes in life style bring the white middle class back and the subsequent rising rents, condominiums, increasing market values, and real estate taxes drive the poor out.

Real Estate Values and Inflation:

The Value of Real Estate Versus the Value of Money **Walter R. Kuehnle, CRE, Page 17**

Prospects for a continuing inflationary trend and probable resulting increases in construction costs and prices of well-selected real estate are discussed.

Wrap-Around Mortgage Financing:

Enhancing Lender and Investor Wealth

Richard T. Garrigan, Page 20

The author deals with a unique and highly useful form of mortgage financing, the wrap-around (WA) mortgage loan. While technically a second mortgage instrument, the WA mortgage loan's existence is largely attributable to the significant rise in mortgage interest rates which occurred during the past decade. An in-depth financial analysis shows how a specific WA mortgage loan can enhance the value of a lender's mortgage portfolio, and enable an investor-borrower to increase the wealth contribution of an existing real estate investment.

Landmarks Preservation and the Law:

Private Opportunity and the Public Good

Daniel Rose, CRE, Page 39

"Restoration," "renovation," and "adaptive re-use" represent three significantly different treatments to which older buildings lend themselves; and it is important that governmental bodies, the real estate industry, and the general public understand the different goals in each case. Constraints on a private developer unrelated to the chief goals in mind in a particular case may lessen the economic feasibility of projects whose completion may be strongly in the public interest.

Feasibility Analysis for Mixed-Use

Development Projects

Stephen E. Roulac, Page 44

A model with some 30+ variables is presented to evaluate the subsidy trade-offs of one component of a project to another, with the analysis methodology being especially adaptable to projects involving multiple uses or where the approval process requires concurrent appeal to markedly different market segments within a given land use. The analysis facilitates isolation of the most crucial economic relationships in the development feasibility decision.

*The Pictorial Housing Survey:
A New Method of Measuring
Housing Quality*

Leonard V. Zumpano and Edward R. Mansfield, Page 57

This article describes and evaluates a new and innovative method of measuring local housing conditions. In contrast to traditional on-site inspections that rely on semantic survey techniques, the pictorial housing survey employs a photographic portfolio, indicative of various housing conditions, to evaluate the physical condition of dwelling units. The results of preliminary field testing in Dallas, Texas indicates that this procedure can not only validly discern local housing conditions, but, more importantly, leads to greater consistency in housing quality ratings among field workers than semantic survey techniques.

*Path Analysis and the Need for an
Alternative Approach to the
Investigation of Redlining*

Franklin J. Ingram and Jon R. Crunkelton, Page 65

Most of the available studies on the redlining issue have been undertaken by local community and public interest groups that begin with an expressed bias against institutional lenders. In addition, they usually ignore demand considerations, risk factors, and the interaction of the variables. This article applies path analysis, a methodology borrowed from the behavioral sciences, to demonstrate that a more meaningful analysis of currently available data can be readily accomplished. Using data from a medium-sized SMSA, this research turns up evidence that could be used to refute claims of mortgage lending discrimination on the part of depository financial institutions on the basis of neighborhood quality or racial composition.

*"When Should Real Estate Be Sold?":
A Comment*

Austin J. Jaffe, Page 79

An article by Jack P. Friedman in the Summer 1978 edition of *Real Estate Issues* attempted to provide some rules of thumb and generalizations about the appropriate periods of time investors should hold income-producing property, given our financial and fiscal environment. In response to that paper, this comment attempts to clarify some issues raised in the optimal holding period literature. Included are: an explanation of the optimal holding period, the possibility of developing a general theory of holding period optimality and, ultimately, the benefits, if any, this type of analysis offers decision-makers. The conclusion reached here is that the continued interest in these topics appears to be misdirected and that little can be gained in this persistence. A reply by Mr. Friedman follows.

*Optimal Holding Period Analysis:
Much Ado About Not Much*

Austin J. Jaffe, Page 84

During the past decade, real estate investment analysis has openly embraced the capital budgeting and valuation framework of modern financial management. This orientation has enabled real estate analysts to make much better use of financial information and data when analyzing investment opportunities and when making investment decisions. One of the areas of interest is the analysis of the optimal holding period for income-producing property. This paper reviews some of the work in this area, including the Financial Management Rate of Return (FMRR), and provides some new results about the importance of the determination of the optimal holding period. A major implication is that little information can be gained by an extensive examination of the optimal holding period.

Real Estate Issues

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EDITOR'S STATEMENT

Real estate counselor Dempsey J. Travis, CRE, leads off this edition of *Real Estate Issues* with a broad-front attack on the ideas and the consequences of a long and immensely busy era in the history of urban revitalization. "Displacement" is his rallying cry, and he raises it with sufficient force to lift the eyebrows, stimulate the thoughts, and elevate the blood pressure of the most phlegmatic urbanist. We are proud to be able to offer here the full, uncut version of a piece that attracted national attention when it appeared, much truncated, in *Ebony Magazine*.

Currency fluctuations and double digit inflation have raised serious new questions about the theory and the practice of real estate valuation. Counselor Walter R. Kuehnle, CRE, widely recognized as the father of the basic textbook in the field, shares with us some of his concerns and speculations. They may well serve as the foundation for a completely new approach to the valuation of real estate.

Tight money breeds wrap-arounds, as we have seen in recent crunches. That they are useful to lenders as well as to borrowers has never, at least to our knowledge, been demonstrated as convincingly as it is here by Richard T. Garrigan, whose analysis of the wrap-around goes far beyond the "how-to" articles commonly seen on this subject. Daniel Rose, a CRE and an important factor in New York real estate, follows with some strong and relatively uncommon opinions on the uses of landmark preservation.

The ubiquitous Stephen Roulac returns to *Issues* with a basket article on the feasibility of mixed-use developments, which given their checkered past can only benefit from the intelligence and the close attention he brings to the undertaking. At the more modest level of the single-family home, Messrs. Leonard V. Zumpano and Edward R. Mansfield challenge industry practices by proposing a new and, they say, highly reliable method of analyzing housing quality—which, if they are correct, will render still more house appraisers obsolete.

Although many will feel that redlining, which has been amply discussed in these pages, is more red herring than live issue, it remains a focus of conflict at the national level and is one of the principal concerns addressed by President Carter's commission on the neighborhoods. Franklin J. Ingram and Jon R. Crunkelton propose a new and different way to investigate redlining, making use of path analysis, a sophisticated technique with many applications. Their work, we think, breaks new ground and will generate new ideas in several related fields. It is followed by a sharp if courteous exchange between Austin J. Jaffe and Jack P. Friedman, whose earlier article "When Should Real Estate Be Sold?" provoked Jaffe's comment but not his article on optimal holding period analysis, which closes this number on a faintly Shakespearean note.

Jared Shlaes, CRE/Editor-in-Chief

The Black Ghetto: New White Frontier

by Dempsey J. Travis, C.R.E.

Blacks, browns, and poor whites are being recycled off the prime land in the central areas of many of our oldest cities. Their strong backs and unlettered minds no longer qualify them to be urban guests. They, their parents, and their grandparents had been recipients of invitations extended on three occasions: as strike breakers early in the 20th century and as unskilled laborers in both world wars. But the current recruitment specifications for the urban populace have changed from blue-collar and unskilled to white-collar and computer-oriented.

The task of recycling urban land was a corporate assignment shifted from city councils to Congress when that body passed a displacement law, the Federal Urban Renewal Act of 1949. This act spawned many housing and land banking bills and regulations, most effective of which was HUD's 1972 Site Selection Criteria, the first unclad effort to dislodge blacks from the central areas of major cities. This regulation's on-the-table objective was to relocate the unemployed and underemployed blacks into white middle-class suburban communities. But the hidden agenda of these criteria was captured in Alex Poinsett's September 1972 *Ebony* article, "Countdown in Housing":

"Where are black people supposed to go?" Travis asks audiences at several rallies he has staged to arouse public sentiment against HUD regulations. "They cannot build or rent where they live. They are not welcome in white

An abbreviated version of this article appeared in the September 1978 issue of *Ebony* magazine, and the paper was presented in its entirety at the annual convention of the Federal Home Loan Bank of San Francisco in December 1978. The copyright is retained by the author.

Dempsey J. Travis, CRE, CPM, is president of Travis Realty Company, Urban Research Institute, Inc. and Sivart Mortgage Corporation, all of Chicago. A director of the National Housing Conference, Inc., he was a member of the Presidential Task Force on Inflation in 1974; the Presidential Task Force on Urban Renewal in 1970; and the Federal Energy Administration's Construction Advisory Committee in 1974-75; and was chairman of the HUD PUSH National Housing Task Force in 1975. He serves on the Mayor's Advisory Committee on Building Code Amendments and the Mayor's Commission for Preservation of Chicago's Historic Buildings.

suburbs. It looks to me like this is an attempt to move the niggers back into the swamp."

Unfortunately, this 1972 hypothesis is rapidly shaping into historic fact. To accelerate a push-'em-back-to-the-swamps drive, in January 1973, HUD announced an 18-month moratorium on low- and moderate-income housing. This moratorium is still in effect because of litigation surrounding the site selection criteria. Thus our black communities, where most of the vacant urban land is, become more dismal and more abandoned while HUD and the courts refuse to permit new construction where it is most needed.

In the interim, several municipal displacement tools have been put to work: excessively high taxes, stringent code enforcement, poor schools, and ineffective police protection—which add up to accelerated housing abandonment.

On the other side of the street and sometimes next door, in these central city communities, young white professionals are moving in with front money and unlimited credit for rehabilitating recently deserted shells into Georgetown-like showplaces. There is much evidence for this in Chicago, Washington, Philadelphia, San Francisco, Atlanta, and so forth.

In addition to housing laws and regulations, other legislation and a Nixon directive, Executive Order 11593, May 13, 1971, broadened the federal mandate on historic preservation. Blacks have not realized that much of the property they occupy in old sections of our cities has historic and great monetary value. Most people have not been alerted to the preservation, restoration, and rehabilitation tools provided in the funded Housing and Community Development Act of 1974.

In 1976, more than 1000 districts were registered under the Historic Preservation Act of 1966. Recently, Chicago's Hyde Park-Kenwood Community filed an application for designation as a National Historic District. The Gold Coast and Pullman areas of Chicago, a working-class neighborhood in Minneapolis, a barrio in San Antonio, and Boston's waterfront are among historic districts already approved. The Tax Reform Act of 1976 established important incentives for the preservation and rehabilitation of commercial and income-producing structures located in the designated historic communities.

The group most likely to benefit from the tax shelters are the young white returnees to the city, whom some have variously labeled as "colonizers," "urban homesteaders," "inner-city pioneers," "frontier persons," "municipal carpet-baggers," and "city redeemers." The group least likely to benefit from the incentives and historic designations are the blacks who begin the geographic competition for the cities with a median income of \$9,252, only 60% that of whites. In cities like New York and Washington, one cannot enter this market with an income of less than \$25,000 per year.

Other factors stimulating the back-to-the-city movement among whites and the push-'em-back-to-the-swamps drive against blacks are the high cost of suburban housing, disenchantment with commuting time among working couples, increased cost of transportation, and the variety of activi-

ties in the city for young people seeking new life styles and cultural opportunities. An up-to-date census would reveal a suburban-to-urban movement that rivals the westward movement of the last century.

PHILADELPHIA

"There's a conspiracy afoot to reverse the growth of Philadelphia from black to white. For black people, this is the story of our life since slavery," states Shirley Dennis, managing director of the Housing Association of Delaware Valley.

Society Hill is a classic example of the use of urban renewal program to recycle a community. This section of Philadelphia, where the first black families settled in the 1700s, reflected a 64.2% decrease in black population and a 32.7% increase in white population between 1960 and 1970. An estimated 1976 census reflected an additional 13% increase in higher-income white families in this area.

The white demand for space in downtown neighborhoods is so strong that it is spilling over into Queen Village in South Philadelphia and moving west for several blocks from the Delaware River.

The recycling process at the upper-middle-income level sometimes appears to be economic rather than racial. The Franklin Town Urban Renewal Area, adjacent to Society Hill, experienced an upper-income black population increase of 16.5% compared to 14% increase for whites; however, blacks only constitute 6.8% of the area's population.

Prior to 1963, blacks comprised 45% of all families in the blue-collar Whitman section of Philadelphia. In that year, the area was designated for urban renewal with provision to clear for construction of the Whitman public townhouses. After demolition and clearance, the area was transformed from an integrated community to a 98% white area. To date, the planned urban renewal units for low-income families have not been built because of the opposition of the 98%. The courts have ruled "Yes!" but the mayor said "No!"

Urban renewal's commitment to recycle the city also extends to commercial areas. Federal subsidies paid part of the \$44.5 million for the new 125-store complex, The Gallery, on Market Street East. Gimbels opened a new store at a cost of about \$30 million. These changes, in addition to Strawbridge and Clothier's \$12 million renovation, have collectively created a shopping mecca virtually at the doorsteps of those who live downtown and have reversed some shopping patterns; that is, suburbanites are coming back to the city to shop. The magnetism of the shops will cause many of the suburbanite shoppers to move closer to the attraction.

NEW YORK CITY

A city of seven million people will be as economically obsolete in the year 2000 as a 12-child middle-class family is in 1978. The big family without

subsidy is destitute and the big city with 30 to 40% of its young blacks under- or unemployed is bankrupt. The recycled city must contemplate a planned reduction of its indigent population, because society has not found a mechanism to replace the welfare treadmill that has been rolling with increased acceleration during each of the past 45 years.

It is the movement of the governed and not the government that is setting the tempo for solving the urban housing problem. A recent survey conducted by the Rutgers University Center for Urban Policy Research revealed that 30% of the occupants in recycled vacant commercial and industrial buildings in SoHo, Greenwich Village, and other sections of lower Manhattan moved to their apartments from addresses outside of New York City. Only 13% of the households had children. Half of the individuals in the sample were single, a quarter married, and the remainder divorced, widowed, or separated. More than 80% were between the ages of 20 and 40. Three-quarters had graduated from college. Median income was \$21,783, more than twice the New York City median of \$9,724.

The high earners with small families and the singles who are attracted to New York City with its shortage of housing will hasten the urban depopling process. The urban recycling race will not be won by the city with the highest welfare load.

The riot climate of the 1960s did not stop New York's brownstone revival; it simply slowed it down. Brownstones that sold for \$16,000 in 1966 have a value today ranging from \$90,000 to \$150,000. These post-Civil War structures measure 20' by 50', stand four stories tall, and are covered by a veneer of brown sandstone. Today's demand for Victorian styles has expanded to include period row houses with facades as diverse as granite and wood.

The \$100,000 price tag has excluded most middle-income blacks from ownership in the Central Park West brownstone revival. The 1973 median income of whites in this district was \$12,299, of blacks \$7,355, and of Hispanics only \$5,989. The economic and racial mix in Central Park West is unique, but how long can blacks and browns compete in a tight housing market with 40 to 50% less income than the competition.

Lawrence W. Holland, vice president of Robert W. Jones & Associates of New York City, said, "The ideals of the '60s with urban renewal projects leading the way are being replaced by the realities of the '70s, with the recapture of urban areas the underlying theme."

CHICAGO

Chicago: the city that burned but would not melt. Non-melding ethnic neighborhoods are the political and cultural phenomena of whites running monolithically from blacks. Whole ethnic groups have moved as many as three times since World War II, leap-frogging away from the center of the city. In the ten year period, 1961-1971, 2,000 city blocks (in a city whose blocks are twice as long as blocks in most cities) changed from white to black. By 1975, approximately 50% of the Chicago landscape was occupied by a 30% minority population. Moreover, blacks occupied the prime geog-

raphy, closest in travel time to the Loop (central business district) from the near north, near south, and near west (the near east is Lake Michigan). When most of the ethnic communities were galloping en masse to suburbs made ready by developers and lenders who needed to create a new market, the University of Chicago decided to de-accelerate the exodus from its home communities of Hyde Park and Kenwood.

Since 1952, when the university first launched its program, it has made 926 loans totaling more than \$10 million to faculty families. The Hyde Park-Kenwood area houses 70%; 35% of the 7,000 non-academic staff live within an 18-minute walk or six-minute drive of the campus, which has added \$250 million in real estate improvements since 1959. The university's plan was both a success and a failure. It was a success in creating a national model for stopping urban decay. It failed by not resolving the problem of displacement, as can be noted in a simple chart:

	<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>1975(estimate)</u>
Blacks in Hyde Park	1,727	17,163	10,424	7,877
Percent of total				
Hyde Park population	3.2%	37.7%	31.0%	27.0%

A microcosm of black displacement and white replacement in Hyde Park is dramatically revealed in the membership of a mainline denomination's parish. The black membership of this congregation, which was rapidly approaching 50% in the 1960s, decreased 75% from 1970 to 1977. What was once a church with a significant number of black leaders now has only a 22% black membership and few blacks in leadership positions. The university environment has attracted major Lutheran, Presbyterian, and Jesuit seminaries and some 17 Catholic orders, whose thirst for land and housing has further displaced the neighborhood's poor. What was once a well-integrated urban community is becoming a mostly white, upper-middle class area complete with pockets of students and religious groups, who are also mostly white.

With the influx of whites into Hyde Park, real estate expansion into Woodlawn, the neighborhood bordering the university on the south, is imminent. Woodlawn's population has decreased 36.4% or 26,319 between 1960 and 1975, as a result of fires that produced acres of abandoned buildings and vacant blocks. The Woodlawn Organization's new federally-subsidized housing development, Jackson Park Terrace, is itself built on land leased for 65 years from the University of Chicago for about \$400,000. The university's expansion program will extend one mile south of Hyde Park campus to a natural boundary, the graveyard.

North of Chicago's Loop in the early 1960s came Carl Sandburg Village, a beachhead established on urban renewal land to combat the spread of slums and blight. This \$97 million complex houses 8,000 people in eight high rises, 82 townhouses, and artist studios, with rents ranging from \$250 for a studio to \$570 for a two-bedroom apartment. The complex was named for poet-journalist Carl Sandburg (himself an immigrant from the Swedish settlements of central and western Illinois), who labeled Chicago the "hog

butcher to the world" and "city of the big shoulders." Sandburg's arrival displaced Lorraine Hansberry's "Raisin in the Sun."

Such downtown and Near North vertical precincts as Sandburg Village, Marina City, Lake Point Tower, and Outer Drive East would not have been possible in the early back-to-the-city movement without a pragmatic dreamer and chief catalyst in the person of the late Mayor Richard J. Daley, himself a scion of the Irish bastion of Bridgeport, which has remained a white island in a sea of blacks and Hispanics. Daley, master of detail and budgets, had the eyes, ears, and respect of both labor and business. He understood a balanced budget as the ingredient that makes both a city and a business work.

Since 1971, occupied office space in the Loop has increased 12.9 million square feet, or by 2.3 million square feet per year, which is a 31% increase between October 1971, and May 1977. Eight additional major office buildings were underway in 1978. An office building creates some 4,000 jobs per acre (43,560 square feet). The number of workers in the Loop and the Near North increased 21% from 329,000 to 398,000 between 1963 and 1977. Residential telephones in the Loop increased from 100,000 to 134,000 between 1967 and 1976. Former or potential commuters numbering 34,000 now live in or near the Loop.

According to Chicago Title and Trust Company, 35,000 condominiums were sold in the Chicago metropolitan area in 1977; 80% of these were within the city limits and were concentrated in lake shore communities. The condominium market in Hyde Park and on the north side is so strong that rental units are rapidly disappearing and renters are being forced out of neighborhoods which many have occupied for decades.

An additional 30,000 persons may make their homes within a decade in Dearborn Park, a proposed south Loop development on unused railroad yards. The Dearborn (Chicago 21) Plan is exceptional because no people displacement is required. This railroad development foretells a bright Chicago future for those who can pay the freight.

Parallel to the astonishing development of the Loop and Near North is the satellite rehabilitation of old communities such as Lincoln Park, Old Town, New Town, Ravenswood, DePaul, Lakeview, and the Ranch Triangle where homes are being restored to glories they may never have possessed. Even the public schools, notoriously poor throughout Chicago, have proved acceptable to upper-middle income whites, who send their offspring to Old Town's La Salle School or Hyde Park's Bret Harte School, Ray School, and Kenwood Academy. Somehow, public schools in white middle-class neighborhoods become good schools. Recycled housing begets recycled schools.

SAVANNAH

The Union torches that burned Atlanta spared Savannah. In December 1864, the City of Savannah was offered to President Lincoln as a Christmas gift by Union General William T. Sherman.

Now, 114 years later, we find the descendants of former slaves and slave masters exchanging residences in downtown Savannah. A total of 735 blacks were displaced in three census tracts of the downtown historic district by affluent middle and upper-middle income whites between 1960 and 1975:

HISTORIC DISTRICT CENSUS TRACTS OF SAVANNAH, GEORGIA

Census Tract	Population			Percent Black		Per capita income, 1975
	1960	1970	1975	1960	1975	
3 white	733	1,283	1,331			
black	127	220	52			
total	860	1,503	1,383	14.7	3.8	\$3,037
8 white	1,381	574	1,008			
black	731	339	282			
total	2,112	913	1,290	34.6	21.9	\$2,660
9 white	1,564	886	1,147			
black	236	118	15			
total	1,800	1,004	1,162	13.1	1.3	\$3,867

Sources: U.S. Census of Population and Housing; City Government of Savannah, Georgia, Metropolitan Planning Division.

In the absence of federal assistance in the form of 3% 20-year rehabilitation loans and/or substantial rent subsidies, the adjacent Victorian district of Savannah could lose as many as 1,200 blacks within three years as a result of real estate speculation and escalating rents. Blacks cannot compete in the same housing market where whites have 171% advantage in per capita income. Compare Victorian district census tract 13 below with census tract 9 above as a prime example of black inability to compete:

VICTORIAN DISTRICT CENSUS TRACTS OF SAVANNAH, GEORGIA

Census Tract	Population			Percent Black			Per capita income, 1975
	1960	1970	1975 (est)	1960	1970	1975	
13 white	1,050	313	1,532				
black	1,690	1,388	1,127				
total	2,740	1,701	2,759	61.7	81.6	40.8	\$1,427
15 white	1,757	628	1,098				
black	306	660	492				
total	2,063	1,288	1,590	14.8	51.2	30.9	\$1,039

A clear pattern emerges in Savannah: blacks are leaving the historic and Victorian districts of the downtown and whites are moving in, with astonishing changes in the city's demography. A white or black on the low end of an annual per capita income of \$1,427 cannot sleep comfortably with the expenses included in maintaining a \$50,000 rehabilitated home. Houses occupied by blacks were picked up on option or contracts within the past 15 years for prices varying from \$600 to \$8,000; however, the selling price

today runs on a scale from \$35,000 to \$70,000. Hence, the ghetto ain't the ghetto anymore.

Black dispersement has caused some concern among blacks about its effect on black voting power. An annexation proposal is being discussed by Savannah's mayor and supported by black Senators Bobby Hill and Albert Scott. The mayor would be elected on a city-wide basis, but aldermen would be elected by district. By annexing the suburban communities that are turning black, minority political representation could be kept in balance.

ATLANTA

Atlanta, the city with a hand, has adopted a housing philosophy based on a sentence from Booker T. Washington's 1895 Atlanta Exposition speech that will make it the Cinderella City of the 21st century for both black and white citizens. Washington said: "In all things that are purely social we *can* be as separate as the five fingers, yet one as the hand in all things essential to mutual progress."

The hand for mutual progress symbolizes the neighborhood movement which crosses racial lines in Atlanta where a white neighborhood in the northeast and a black neighborhood in the southwest, though as separate as the fingers, discovered they had a great deal in common. The black area, with a relatively large middle class, had produced through its Atlanta University complex some of America's outstanding scholars and political, civil rights, and business leaders.

The white finger, called Inman Park (only 2.9% black in 1977) realized in the early 1970s that it needed a political fist which could not be achieved with an unfolded hand or with disunited communities, that is, if Inman Park were to stop freeway I-485 from ploughing through it and 30 other white and black neighborhoods across the entire city.

The issue ignited an anti-freeway revolt which was the springboard for organizing a city-wide league of neighborhoods interested in preserving the integrity of the sundry communities. Collectively, the black and white communities were a coalition whose strength could not be ignored. The political potency of this bi-racial movement was instrumental in the elections of both Congressman Andrew Young and Mayor Maynard Jackson. Both had opposed I-485. Atlanta neighborhood power based on mutual co-existence between the races assured that the Cinderella City, once the victim of a civil war among American whites, would not return to urban cinders at the stroke of the 21st century.

Co-incidental with the new politics of Atlanta, the out-migration of both whites and blacks decreased from 6,213 annually between 1960 and 1970 to 5,333 annually between 1970 and 1977, a 14.1% annual decrease for the past seven years. At the same time, we witness a reverse trend in white owner-occupied properties in predominantly white neighborhoods, such as Virginia Highlands, Inman Park, and Ansley Park. Note these figures for Virginia Highlands:

<u>Housing Units</u>	<u>1950*</u>	<u>1960*</u>	<u>1970*</u>	<u>1977**</u>
Owner occupied	1,811	1,492	1,513	1,952
Total units	3,342	3,574	4,228	4,129
% owner occupied	54.2	41.8	35.8	47.2

* U.S. Bureau of the Census

** City of Atlanta Department of Planning

In this white neighborhood, the trend in the 1950s and 1960s was toward conversion and rental units. In the 1970s, the trend reversed to deconversion and homeownership, as a younger white population displaced an older white population.

Eighty percent of the "city redeemers" who purchased old homes in declining neighborhoods were between the ages of 20 and 39, were well-educated, economically mobile, and very representative of the "ins" of the white middle and upper class of the new South. This young group defies the trickle-down theory in real estate and provides an example of inverted filtering-upward motion. But this is a phenomenon which could not occur if the desire and demand to live near the central business district were absent. Indeed, if the demand for inner-city property in Atlanta continues, not only will the older and poorer whites continue to be displaced, but the black areas abutting the older, Victorian neighborhoods will also be under pressure from the in-migration of the aggressive and economically powerful new and young white middle class.

The areas of greatest white in-migration are in close proximity to the central business district, which has shown unprecedented growth in the past 15 years and for which further growth is anticipated, as indicated in this 1971 table:

ATLANTA CENTRAL AREA (NPU M) DEVELOPMENT HISTORY AND PROJECTIONS

	<u>1960</u>	<u>1970</u>	<u>1983</u>	<u>1995</u>
General Office (million square feet)	10.0	17.6	28.9	46.1
Governmental Offices (million square feet)	5.8	6.1	8.1	10.1
Retail Sales Area (million square feet)	4.3	4.1	5.2	6.1
Hotels and Motels (rooms)	3,400	7,700	16,000	32,000
Housing (units)	62,500	51,200	45,200	45,200
Employees	190,000	230,000	320,000	440,000
Assessed value (1970 dollars)	\$827,900,000	\$850,000,000	\$1,260,000,000	\$1,850,000,000

Sources: Central Atlanta Progress, Inc., City of Atlanta, and Hammer, Green, Siler Associates, *Central Atlanta Opportunities and Responses*, 1971.

A pattern emerges in Atlanta which applies to most of our older cities. Decaying inner-city neighborhoods, near the central business district

(subject to urban renewal and new development) become partially vacant as several thousand low-income households are displaced. Until the late 1960s the cleared land is used mainly for commercial development. The hotels and new enterprises that locate in downtown Atlanta act as a magnet attracting young middle-management executives and their families who see that investing in an old house at the right price near the central business district is a risk worth taking, especially when compared with the high-cost and remote suburban housing market.

These young "urban pioneers" attract others who see their friends' advantages in terms of life style and property values. The area gains a reputation for being "in" or "with it" and a flood of in-migration occurs. The poor, both white and black, and often elderly, are forced to locate elsewhere, either in more blighted urban communities or in distant, inconvenient suburbs. Note Atlanta's projections for the year 1995 in this table:

ATLANTA CENTRAL AREA HOUSEHOLDS BY INCOME GROUP 1975, 1985, and 1995 TARGETS

	1975	1985	Change 1975-85	1995	Change 1985-95
Families	(29300)	(38200)		(50000)	
Low	9700	9700	0	9500	-200
Moderate	9400	9400	0	9400	0
Lower Middle	5900	7900	2000	9600	1700
Upper Middle	2000	4700	2700	9000	4300
High	2300	6500	4200	12500	6000
Other Households	(19200)	(20600)		(25300)	
Low	8000	6600	-1400*	6300	-300
Moderate	7900	9500	1600	11600	2100
Lower Middle	1700	2300	600	3800	1500
Upper Middle	600	800	200	1000	200
High	1000	1400	400	2600	1200
Total Households	48500	58800	10300	75300	16500

* Loss is shown based on projected major decreases of households in this group due to rising income.

Source: Central Atlanta Progress, *et. al.*

The officials may chart the decrease in low-income families and households as due to "rising income" but displacement is more likely.

The re-vitalization of old communities like Virginia Highlands, Inman Park, and Ansley Park is a good dose of urban medicine for Atlanta. But the side effects are discomfiting as low-income families are dislodged. The implications are racial because so many of the poor are black. Urban economic integration is creditable, but not workable. The haves will always out-bid the have-nots as the City of Atlanta becomes more attractive. Within a decade, many of the poor will have to commute to see the old homesteads, unless substantial subsidies are made available to make them competitive in the inner-city marketplace.

WASHINGTON, D.C.

If the yearning of blacks to stay in the central area of the nation's capital were stated in a blues lyric, the song would begin:

Momma, Momma, I want to stay in the middle of the District,
but my short money tells me I must go.
The white man is a-coming and there ain't no room for those
like me anymore.
The man has taken my old run-down house and with borrowed cash made
it better than new.
This morning a move to Prince George's County is the only
thing I can do.

Five years ago the only areas in the District that attracted whites were Georgetown and Capitol Hill. Today the in-migration of whites appears to be infectious and spontaneous in many sections. Recent estimates prepared by the D.C. government indicate that the city's white population has started to increase after a 25-year decline. In contrast, the black population began a decline in 1973. The Bureau of the Census estimates that the total population of Washington had declined to 690,000 by July 1, 1977, which is the lowest level since 1940.

The number of households in the District has increased with young white singles and empty nesters, but the total population has decreased with the displacement of black families with children from the central areas. Many black families have been pushed beyond the District line into adjacent Prince George's County, Maryland. An ordinance has been proposed to stop the southeastward movement of low-income blacks by curtailing the building of cheap housing in Prince George's County. At the same time, desperate black renters with large families, making less than \$10,000 per year, are trying to buy run-down homes on 12th Place in Northwest Washington, a neighborhood where some have lived for the past 40 years.

In their eagerness to stay on 12th Place some have resorted to public sale of soul dinners, consisting of such staples as pig's feet, chitterlings, fried fish, and chicken. This kitchen entrepreneurial action, reminiscent of the rent parties of the 1930s Depression, may beget the small downpayment but won't maintain the cash flow to support a \$65,000 home. The fact that blacks win sometime is evident in the intense two-month struggle by five families on 12th Place N.W. and the year-long struggle between developers and nine low-income families on Seaton Street between Florida Avenue and 17th Street. The nine families raised downpayment money through a series of community fund-raisers and won a legal battle with the new owners that permitted the families to buy their homes. However, other houses on the block were sold to professionals and high-salaried newcomers. No government relocation money was made available for the displaced blacks because the development was a private act, committed, in some instances, by public persons.

The under-salaried struggle to stay, while some amply-paid congressional staffers have made dabbling in the black housing market a financial sport.

On the 1400 block of Corcoran Street, just off the riot corridor, \$20,000 row houses are being restored and sold for prices ranging from \$62,000 to \$70,000. The private investor is a public person named Stewart McKinney (Republican Congressman from Connecticut), a liberal House District Committee member and one of the District's blacks' best friends on the Hill. McKinney is just one of numerous examples.

Although some black renters and homeowners are enraged by the dislodgement caused by speculators, there are black owners who laugh all the way to the bank with the new-found wealth realized from the sale of their run-down shells.

In 1977, Perpetual Federal Savings & Loan Association pioneered in developing 11 new two-family structures in the middle of black Washington in the 1400 block of 11th Street N.W. According to the association's black director, Realtor James Harps, white families purchased eight of the first nine structures. The reason for this oddity is probably that the blacks who could afford a \$79,500 sale price were not seeking economic integration.

Robert Linowes, white president of the conservative Metropolitan Board of Trade, the city's powerful business association, says, "In the next decade the District will be solidly middle and upper class, racially balanced, with the poor pushed into the suburbs. The suburbs will inherit the problems—including crime—that the city suffered from so long."

Although blacks have political control of the District, their impotence in economic power is all present. Investment capital is still concentrated in the hands of white banks and savings and loan institutions. Note the comparison in this table:

	<u>Number of businesses</u>	<u>Gross receipts</u>	<u>Percentage of entire city</u>
Blacks	5,000	\$200,000,000	3
Whites	10,000	\$6,600,000,000,000	97

Source: Urban Research Institute, Inc.

William B. Fitzgerald, president of Independence Federal Savings and Loan, one of Washington's six minority-controlled financial institutions, said, "It is the 'haves' against the 'have-nots'—and blacks are two hundred years ahead in the line-up for the 'have-nots'." Twenty years ago, there were no black partners in any major law firm. Today there are three—which is three more than we have in Chicago. Black lawyers, who by necessity 25 years ago were forced to treat law as a hobby and drove taxis as a profession, are in demand in the District today because whites feel that black government officials will respond better to a qualified black barrister.

On the other hand, it appears that the "cross-over dollar" and the "cross-over opportunity" have evaded the other black professions, businesses, and workers. The median salary in the District for a black white-collar federal worker as of November 1976, was \$13,000 or 46% less than the white civil servant whose median earnings were \$24,000 per annum. Black women earned a median of \$11,000 or 8.3% less than white females.

A salary of \$13,000 per annum will not buy much housing in a city where the average market value for the existing 100,000 single family dwellings is \$44,837. Future assessments based on current market values will displace a large number of blacks who became homeowners on low downpayment programs in the 1950s and '60s. Their low salaries cannot be budgeted to compete in a highly competitive real estate market.

The D.C. Legislative Commission estimated that there are currently 20,000 low and moderate income homeowners who are overburdened by real estate taxes and other housing expenses. In addition, there are more than 50,000 renters who are being priced out of the District housing market.

A survey of District real estate brokers, mortgage bankers, and savings and loan officials revealed that there is a decrease in home ownership among blacks and an increase among whites. Georgetown could be the model for the District's transformation because east of Wisconsin Avenue it gradually changed from 90% black in 1940 to 95% white in 1978.

Some black and white statistics for the District of Columbia are compared in the table below. Population estimates from 1975 indicate a slight increase in the white percentage of the total. The dramatic figures, however,

WASHINGTON, D.C.: SELECTED BLACK AND WHITE STATISTICS

Item	Total	Black	% of total	White	% of total
Population					
1970	756,510	547,200	72.3	209,300	27.7
1975 (est)	712,000	511,928	71.9	200,072	28.1
Newcomer Households					
1970-74	42,200	13,500	32.1	26,100	62.0
Professional Technical					
Head of Household	12,660 (30.0%)	1,750	13.8	10,180	80.4
College degrees					
(Head of household)	24,054 (57.0%)	3,780	15.7	18,792	78.1
Income over					
\$15,000	14,348 (34.0%)	2,565	17.9	10,179	70.9
Newcomers in					
Owner units	5,894 (14.0%)	540	9.2	5,220	88.6
Federal Government Employees					
All pay plans	296,717	85,308	28.8	205,841	69.4
Median Salary	16,000	12,000		19,000	
GS Schedule &					
Equivalent	243,691 (82.1%)	57,867	23.7	180,772	74.2
Median GS Grade Level	9	6		11	
Median GS Salary	17,000	12,000		20,000	
Reg. Supervisory	2,445	1,201	49.1	1,232	50.4
Median WS Grade Level	8	5		9	
Median WS Salary	19,000	17,000		20,000	

Sources: U.S. Bureau of the Census; Washington Center for Metropolitan Studies; Civil Service Commission, 1976.

are from the Washington Center for Metropolitan Studies' 1977 report, "Movers to the City," based on a comparison of their 1974 census with the 1970 U.S. Census.

Thus, from the Washington Center's superb study, we learn that newcomers to the city are most likely to be white and most likely to be the households buying homes. Their study of 1970-1974 also revealed:

- 47% of newcomer households were one person
- 67% of the heads of household were under 35 years of age
- 57% of the heads of household had college degrees (compared to 19% of the total D.C. population)
- 80% of the households had no children present under 18 years of age (whereas 56% of the households moving *within* the metropolitan area had children present under 18 years of age)

Because we have every reason to believe that this trend of white movement into the District of Columbia is rapidly increasing, the 1980 Census will show a dramatic change in the capital city's demography.

SAN FRANCISCO

Mass human displacement in the city by the bay has been caused by three separate events in this century: an earthquake, the forced Japanese evacuation, and urban renewal.

The first event was a *vis major* and uncontrollable. However, the latter two were programmed and controllable. The extent to which persons were affected by any one of the three events depended upon both ethnic background and skin pigmentation.

The devastating earthquake of 1906 displaced many white San Franciscans. But all Americans of Japanese ancestry were dislodged by Executive Order #9066 issued on February 19, 1942. Order #9066 was a directive to evacuate Japanese Americans from both city and farm to one of ten inland concentration camps. The time allowed upon receipt of evacuation orders to dispose of businesses, homes, and furnishings was 48 hours.

The housing vacated by the Japanese was inherited by imported black war workers. Many of these blacks were ultimately displaced by both skyrocketing unemployment following World War II and the urban renewal bulldozers that plowed through a ghetto known as the Western Addition.

The Western Addition is a small chunk of geography in the bay city where white, yellow, and black actors have played roles in their respective times. Hence it serves as an excellent stage to observe middle and upper-class whites returning to the district to reclaim and renovate the remaining Victorians. The original Victorians were renovated in 1906 to accommodate wealthy whites from Nob Hill and other sections affected by the earthquake.

These whites were followed by European immigrants, who in turn were followed by Asian immigrants, who were in turn succeeded by blacks. The platform has slowly turned after 70 years, and native whites in increasing

numbers have begun to appear as members of the permanent cast in the Western Addition—this in spite of the area's lagging image of crime, dope, and welfare. The gay community and the art community did not find these factors overwhelming and began the movement to renovate the old Victorian homes of this area. Other whites were quick to follow.

The competition for housing by the affluent new residents has increased rental costs in the area by as much as 200% in the last seven years; indeed in the area north of Geary Boulevard and west of Steiner Street, rents have increased 307% since 1970!

Long-term tenants are being priced out of the market. New owners and speculators are raising their rents from \$150 to \$400 per month. The only act required before the dramatic increase is 30 days' notice. Local real estate people are predicting that if the current speculative cycle in residential properties is not abated, San Francisco could devolve into a \$90,000-one-bedroom condo town before 1985. The new occupants will most likely be white, childless, and earning in excess of \$25,000 per year. The demographic character of the new San Francisco is unfolding in the Western Addition, north of Geary Boulevard, both east and west of Steiner Street. A 1977 survey of the Western Addition area produced these statistics:

ETHNIC MIX OF WESTERN ADDITION SURVEY AREA (1977)

	1960	%	1970	%	1977	%
Black	20213	72.9	12200	56.3	14002	58.1
White	7558	27.1	6929	32.0	6853	28.4
Other	NA		2558	11.8	3230	13.5
Total	27771	100.0	21687	100.0	24091	100.0

ETHNIC MIX OF AREA NORTH OF GEARY AND EAST OF STEINER

Black	5157	73.3	1530	28.3	830	14.7
White	1878	26.7	2642	48.9	3211	57.0
Other	NA		1235	22.8	1591	28.3
Total	7035	100.0	5407	100.0	5632	100.0

The same area also shows dramatic changes in income levels. In 1960, 45.3% of the area's population earned less than \$4,000 per household and only .2% earned over \$25,000. In 1977, 25.3% earned less than \$4,000, and 9.7% earned over \$25,000. Thus income and rentals in the area are both increasing more rapidly than the rate of inflation, which has been 45% since 1970.

San Francisco, like most other American cities, will be inherited by those who have the highest incomes and the fewest children.

SUMMARY

The examples clearly indicate that whites are returning to the central areas of many of our nation's cities. Several factors have been cited as causes of this: transportation costs (which will become even more important as prospects of gas shortages increase), life style, the high cost of suburban homes, cultural opportunities, and the efforts of institutions like universities and government agencies to revitalize or "preserve" neighborhoods and business districts.

Meanwhile, the inner-city communities of our land are being depleted of potential black leadership because many blacks who have the education and the economic wherewithal are leaving and the public schools are failing to educate those who remain. Thus those most able to compete with the new white influx are leaving and those unable to compete will be forced to leave eventually.

Our observations have indicated the need for substantial subsidies to the residents of old inner city neighborhoods. But there has to be some tie between the subsidies which will permit low-income households to remain in the city and the educational opportunities and development of their neighborhoods. Mobility in a technological society is directly related to academic achievement. In the several cases cited in this article, blacks begin with a handicap in the race for urban housing, not only because of lower incomes, but also because of an overwhelming education gap, all of which is compounded by lagging institutional racism.

The present hostility to new subsidy programs grows out of the frustrating experiences of the past 12 years, in which programs failed to solve urban problems. However, it was not the subsidies which were at fault, but the poor administration and monitoring of the programs which doomed the well-intentioned plans of the '60s and early '70s.

The programs are now crippled by freezes, site selection criteria, litigation, and tax-payer revolts. Meanwhile thousands of acres of urban land in black communities lie fallow and undeveloped, precisely where the housing crunch is more severe.

A concerted political effort by the black community is needed to develop this land while the black population is still concentrated enough to wield the clout necessary to break the present barriers against such development.

The alternative is a dispersal of the black population into the suburbs, a loss of the hard-won political gains of the past 30 years, and a new relegation to second-class citizenship without the political power that the inner city once represented.

Real Estate Values and Inflation: The Value of Real Estate Versus the Value of Money

by *Walter R. Kuehnle, C.R.E.*

Market value is usually defined by appraisers as the price in money at which a fully-informed seller and a fully-informed buyer, ready, willing and able to deal, will agree. At the present time a problem stems from the word "money."

As appraisers we express opinions of the value of real estate in terms of our own country's currencies: pesos, cruzeros, bolivars, dollars (U.S. and Canadian), and so forth. In arriving at our value conclusions we usually think of the price which would be paid by prospective buyers in our own respective countries. According to such a market approach to value, a study of sales of comparable properties demonstrates—through the action of buyers and sellers—the probable price that typical buyers would pay for a certain property. In other words, contemporary or past action of buyers in the market indicates the present value of the future benefits of ownership.

However, now comes the complicating factor that challenges the comparative sales approach to value. As a result of accelerating rates of inflation, investors—from the buyers of houses to the buyers of investment real estate—are uneasy with the purchasing power of currency and attempt to exchange it for real estate which they believe will increase rather than erode in money value. Using the same philosophy sellers raise their asking prices which purchasers may pay in the hope of reselling at even a higher

This article is based on a speech presented by Mr. Kuehnle at the annual convention of the Mexican Institute of Valuers, November 1-3, 1978 at La Paz Baja, California.

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price. Accordingly, inflation is making it difficult for the appraiser to estimate the value of real estate in current money.

INTERNATIONAL INVESTMENT

There is another current influence in the real estate market, especially on large investment properties. International investors in countries with strong currencies are attracted to real estate investments in other countries where stable real estate is available in weaker currencies. Here is an opportunity to make bargain acquisitions of inflation-hedging investments and get rid of surplus foreign money. Buying competition from abroad is further encouraged by the foreign dollar powers holding "Euro" dollars. However, there is little evidence that the limited number of purchases to date by "offshore buyers" have had any broad effect on current real estate prices in the United States.

Nevertheless, this existing reserve of foreign held dollars was highlighted by the Deutsche Bank of Frankfurt's recent proposal to purchase the 110-story Twin Tower World Trade Center in New York City. Countries with stable governments and economic policies, but currently weak currencies, have attracted foreign buyers to invest in such real estate as shopping centers, office buildings, hotels, farms, forests, and fisheries.

Prospective investors, both national and foreign, tend to regard current informed opinions concerning proper rates of interest on investment and resulting valuation of experienced local appraisers as not reflecting true value potential. To them a substantially higher price in the local currency is still a bargain compared to investment opportunities currently available in their own countries.

All of this means that, as inflation gains momentum past sales of real estate tend to lose credibility as indications of actual value, a situation that has been occurring in certain Western Hemisphere countries. In those countries most recently affected, many national real estate investors have been reluctant to accept the full implication of an inflationary trend. While long-term interest rates continue to rise, insurance companies still make long-term loan commitments, but at ever increasing interest rates. After all, they are responsible to their policyholders only in currency, regardless of its purchasing power. In some countries with very rapid inflation, lenders require repayment of the amount borrowed, plus the inflation index in addition to interest.

GENERAL CONCERN WITH INFLATION

While inflation is causing great anxiety, we hope for solution by miracle. We are confused by financial writers' and government officials' daily press discussion of causes and solution proposals which keep this hope alive. However, the public does not presently support the theory that reversal of the inflation trend may be achieved only by balanced personal and gov-

ernment budgets. Government does understand that such a program would be generally unacceptable.

REVERSAL—CONTROLLING INFLATION

Therefore, it does not appear logical to expect a successful attempt to wring out the inflation that has been gaining momentum for ten years and reached 9% for 1978. Currently publicized solutions only suggest controlling inflation, which is reaching alarming rates in other countries. Brazil for example, reports a 12-month rate of 42.7% and lenders there may demand indexed repayment of principal (original loan, plus inflation). If I understand the current consensus of economists, such rates need not occur in the United States due to the strength of the economy. It would appear, therefore, that the degree of inflation in future years will depend on decisions made by government, business, and financial institutions and a better understanding by those who influence these decisions.

PROSPECTIVE TREND IN REAL ESTATE PRICES

Given these circumstances, increased inflation is expected, with an attendant upward increase in construction costs and the value of well-selected real estate and other tangibles. No economic trend is universal, however, so the term "well-selected real estate" has a special emphasis. Under influencing pressures certain real estate will escalate in value, some will remain constant, while other parcels will decline. The increases will likely take place on well-located commercial property with percentage clauses and the probability of escalating rents. Value decreases may include property under long-term lease with no revaluation clause and limited prospects for residual value at the end of the lease term, downtown retail business streets with poor prospects for increasing sales volume growth, and, in general, properties in second-class locations.

In other words, the properties that should perform best under an inflationary pressure are those with good locations and a prospect of income which will increase with the inflation rate.

An understanding of current conditions and trends is the stock-in-trade of the real estate appraiser and counselor, and a basis for action by the investor. If we are to be effective real estate practitioners, we must understand what is happening in our country and in others as well. Events taking place elsewhere today may happen at home tomorrow.

Wrap-Around Mortgage Financing: Enhancing Lender and Investor Wealth

by Richard T. Garrigan

During the last decade, interest rates on permanent mortgage loans used to finance income-producing properties have moved irregularly upward and currently are at just below their peak levels. These high levels of interest are a principal reason why many proposed real estate developments are not economically feasible, especially in the case of multi-family residential projects. The continued existence of high interest rates has resulted, however, in more frequent use of an unusual form of second mortgage financing, the wrap-around (WA) mortgage loan.

The WA mortgage loan offers a lender the advantage of an above-market yield while at the same time enabling an investor-borrower to increase the wealth contribution of an existing real estate investment. Just how *both* parties to the transaction can thus benefit has not been previously analyzed in articles dealing with WA mortgage financing. This article, therefore, strives to present the essential financial characteristics of a typical WA mortgage loan from two perspectives: 1) that of a lender seeking to enhance the value of its mortgage portfolio, and 2) that of an investor-borrower seeking to deal with the adverse financial and tax effects of increasingly larger amortization payments on a low interest rate permanent mortgage loan.¹

THE WA MORTGAGE LOAN: ENHANCING THE LENDER'S YIELD

The WA mortgage loan is a second lien which has as its principal amount the sum of 1) the outstanding balance on an existing first mortgage loan

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and 2) the additional funds advanced. After the WA mortgage loan closing, the WA lender receives debt service payments on the total debt and agrees to make principal and interest payments on the existing first mortgage loan, but only to the extent that such payments are received from the borrower. In addition, the WA mortgage lender has the right, subject to the provisions of the existing first mortgage loan, to pay off the existing mortgage debt and succeed to its priority.

The WA mortgage note generally carries an interest rate which is less than the going market rate for first mortgage loans. The WA lender, however, obtains the advantage of financial leverage because the interest rate on the existing first mortgage loan is lower than the interest rate on the WA mortgage loan. For example, assume that a first mortgage loan in the amount of \$1,000,000, carrying a 6% interest rate, exists on a multi-family residential property. Assume further that a WA mortgage loan of \$1,500,000 at 8% is negotiated. At the mortgage loan closing, the WA lender actually advances only \$500,000, and during the first month this lender will earn a 12% annual yield on the net amount advanced.²

The WA lender's yield will change each month as debt service payments reduce the existing mortgage debt. Furthermore, as will be clear from the following example, the net amount invested through a typical WA mortgage transaction (whereby both additional funds are advanced and the amortization term is extended) increases each month until the existing mortgage debt is completely amortized.

A Hypothetical WA Mortgage Loan Transaction

The following assumptions apply to a hypothetical WA mortgage loan transaction.

Existing First Mortgage Loan

Original amount:	\$3,000,000
Unamortized balance:	\$2,290,559
Original amortization term:	25 years (300 months)
Remaining amortization term:	15 years (180 months)
Interest rate:	6%
Monthly debt service payment:	\$19,330

WA Mortgage Loan

Initial	
Amount:	\$3,000,000
Amortization term:	25 years (300 months)
Interest rate:	8%
Monthly debt service payment:	\$23,155
Modifying	
Balloon note provision:	10 years (120 months)

The above listing of assumptions portrays circumstances whereby an existing first mortgage loan in the amount of \$3,000,000 has an unamortized balance of \$2,290,559 following ten years of debt service payments. At this point, it is assumed that a WA mortgage loan is made in the amount of

\$3,000,000, requiring monthly debt service payments based on a 25-year amortization term. The interest rate on the WA mortgage note is 8% while that on the existing mortgage note is 6%. The monthly debt service payments are \$23,155 for the WA mortgage loan and \$19,330 for the existing mortgage loan. Finally, under a modifying assumption, the WA mortgage note provides that the unamortized balance on the WA mortgage loan existing at the end of ten years will be repaid at that time.

Given these assumptions, *Table 1* has been prepared to show the financial flows associated with the hypothetical WA mortgage loan. The information appearing in the table presents financial data for 37 selected months: 1) the first six months, 2) the final month for each of the 25 years of the WA mortgage amortization term, and 3) the six months following the final payment on the existing mortgage loan.

In examining these data, it is useful to evaluate each of the three table segments beginning with the first four columns. The information appearing in these columns consists of an amortization schedule for the existing mortgage loan. As shown, this debt is amortized through level payments of \$19,330 each month, with varying amounts being applied to interest and amortization as the loan is repaid over the remaining 180 months of its term. The next four columns of data are applicable to the WA mortgage loan and consist of an amortization schedule for this loan. The significance of these first two sets of columns lies in their use in interpreting the flow of funds on the WA mortgage investment as presented in the final six columns of *Table 1*.

An examination of these latter columns reveals a unique characteristic of a WA mortgage investment: the net amount invested by the WA mortgage lender is not reduced through amortization during the initial years, but rather increases in amount. For example, during the first month the net funds advanced by the WA mortgage lender total \$709,441, the difference between the \$3,000,000 WA mortgage loan and the \$2,290,559 outstanding on the existing first mortgage debt. The cash flow for this month realized by the WA mortgage lender, however, amounts to only \$3,825, which is the difference between the \$23,155 debt service payment on the WA mortgage loan and the \$19,330 debt service payment required on the existing loan.

A comparison of the interest levels for the two loans, on the other hand, discloses that the net interest earned of \$8,547 on the WA mortgage investment is substantially more than the cash flow of \$3,825; therefore, a large part of the earned interest is deferred. This difference is accounted for as a change in the net funds advanced; in effect, the net investment by the WA mortgage lender increases by \$4,722. Hence for the second month the net funds advanced becomes \$714,163. This fact may be verified by comparing the amounts of amortized debt of \$2,996,845 for the WA mortgage loan and \$2,282,682 for the existing mortgage loan as of the second month. The difference in these amounts is the \$714,163 net investment made by the WA mortgage lender.

As noted above, the principal enticement for a WA mortgage lender to make such a loan is the financial leverage afforded through the existing

TABLE 1

WA MORTGAGE LOAN FINANCIAL FLOWS

Month	Existing mortgage loan				WA mortgage loan			
	Unamortized debt	Monthly payment	Interest	Amortization	Unamortized debt	Monthly payment	Interest	Amortization
1	\$2,290,559	\$19,330	\$11,433	\$ 7,877	\$3,000,000	\$23,155	\$20,000	\$ 3,155
2	2,282,682	19,330	11,413	7,917	2,996,845	23,155	19,979	3,176
3	2,274,765	19,330	11,376	7,956	2,993,669	23,155	19,958	3,197
4	2,266,809	19,330	11,334	7,996	2,990,472	23,155	19,936	3,219
5	2,258,813	19,330	11,294	8,036	2,987,253	23,155	19,915	3,240
6	2,250,777	19,330	11,254	8,076	2,984,013	23,155	19,894	3,261
12	2,201,711	19,330	11,009	8,321	2,964,115	23,155	19,761	3,394
24	2,099,061	19,330	10,495	8,835	2,921,857	23,155	19,479	3,676
36	1,990,080	19,330	9,950	9,380	2,876,091	23,155	19,174	3,981
48	1,874,377	19,330	9,372	9,958	2,826,527	23,155	18,844	4,311
60	1,751,538	19,330	8,758	10,572	2,772,850	23,155	18,486	4,669
72	1,621,123	19,330	8,106	11,224	2,714,717	23,155	18,098	5,057
84	1,482,664	19,330	7,413	11,917	2,651,759	23,155	17,678	5,477
96	1,335,665	19,330	6,678	12,652	2,583,576	23,155	17,224	5,931
108	1,179,599	19,330	5,898	13,432	2,509,733	23,155	16,732	6,423
120	1,013,908	19,330	5,070	14,260	2,429,762	23,155	16,199	6,956
132	837,997	19,330	4,190	15,140	2,343,153	23,155	15,621	7,534
144	651,237	19,330	3,256	16,074	2,250,355	23,155	14,996	8,159
156	452,957	19,330	2,265	17,065	2,151,772	23,155	14,319	8,836
168	242,448	19,330	1,212	18,118	2,037,758	23,155	13,585	9,570
180	18,955	19,050	95	18,955	1,918,613	23,155	12,791	10,364
181					1,908,249	23,155	12,722	10,433
182					1,897,816	23,155	12,652	10,503
183					1,887,313	23,155	12,582	10,573
184					1,876,740	23,155	12,512	10,643
185					1,866,097	23,155	12,441	10,714
186					1,855,383	23,155	12,369	10,786
192					1,789,579	23,155	11,931	11,224
204					1,649,835	23,155	10,999	12,156
216					1,498,493	23,155	9,990	13,165
228					1,334,589	23,155	8,897	14,258
240					1,157,081	23,155	7,714	15,441
252					964,840	23,155	6,432	16,723
264					756,643	23,155	5,044	18,111
276					531,166	23,155	3,541	19,614
288					286,975	23,155	1,913	21,242
300					22,516	22,666	150	22,516

TABLE 1 (Continued)

Month	Flow of funds on WA mortgage investment					
	Net funds advanced	Cash flow	Net interest earned	Interest retained	Change in net funds advanced	Annual yield
1	\$ 709,441	\$ 3,825	\$ 8,547	\$ 3,825	\$ 4,722	14.46%
2	714,163	3,825	8,566	3,825	4,741	14.39
3	718,904	3,825	8,584	3,825	4,759	14.33
4	723,663	3,825	8,602	3,825	4,777	14.26
5	728,440	3,825	8,621	3,825	4,796	14.20
6	733,236	3,825	8,640	3,825	4,815	14.14
12	762,404	3,825	8,752	3,825	4,927	13.78
24	822,796	3,825	8,984	3,825	5,159	13.10
36	886,011	3,825	9,224	3,825	5,399	12.49
48	952,150	3,825	9,472	3,825	5,647	11.94
60	1,021,312	3,825	9,728	3,825	5,903	11.43
72	1,093,594	3,825	9,992	3,825	6,167	10.96
84	1,169,095	3,825	10,265	3,825	6,440	10.54
96	1,247,911	3,825	10,546	3,825	6,721	10.14
108	1,330,134	3,825	10,834	3,825	7,009	9.77
120	1,415,854	3,825	11,129	3,825	7,304	9.43
132	1,505,156	3,825	11,431	3,825	7,606	9.11
144	1,598,118	3,825	11,740	3,825	7,915	8.82
156	1,694,815	3,825	12,054	3,825	8,229	8.53
168	1,793,310	3,825	12,373	3,825	8,548	8.27
180	1,899,658	4,105	12,696	4,105	8,591	8.02
181	1,908,249	23,155	12,722	12,722	-10,433	8.00
182	1,897,816	23,155	12,652	12,652	-10,503	8.00
183	1,887,313	23,155	12,582	12,582	-10,573	8.00
184	1,876,740	23,155	12,512	12,512	-10,643	8.00
185	1,866,097	23,155	12,441	12,441	-10,714	8.00
186	1,855,383	23,155	12,369	12,369	-10,786	8.00
192	1,789,579	23,155	11,931	11,931	-11,224	8.00
204	1,649,835	23,155	10,999	10,999	-12,156	8.00
216	1,498,493	23,155	9,990	9,990	-13,165	8.00
228	1,334,589	23,155	8,897	8,897	-14,258	8.00
240	1,157,081	23,155	7,714	7,714	-15,441	8.00
252	964,840	23,155	6,432	6,432	-16,723	8.00
264	756,643	23,155	5,044	5,044	-18,111	8.00
276	531,166	23,155	3,541	3,541	-19,614	8.00
288	286,975	23,155	1,913	1,913	-21,242	8.00
300	22,516	22,666	150	150	-22,516	8.00

debt remaining outstanding. For the hypothetical loan portrayed through *Table 1*, the annual yield for the first month is $\$8,547 \div 709,441 \times 12 = .1446$, or 14.46%. During the second month, however, while the amount of net funds advanced grew by \$4,722, the net interest earned increased by only \$19 (from \$8,547 to \$8,566). Thus the annual yield declined to 14.39%, a pattern that is shown to continue until the 181st month.

This pattern is attributable, of course, to the fact that the financial leverage afforded the WA mortgage lender undergoes continual change, with the yield declining until the point in time when the existing first mortgage loan is fully amortized. By the 24th month, the net funds advanced has increased to \$822,796 while the existing debt has been amortized to \$2,099,061. The annual yield as a consequence has declined to 13.10%. By the 60th month the annual yield has dropped to 11.43%; by the 120th month it has become 9.43%; and by the 180th month (the final month that the existing mortgage loan is outstanding), the annual yield is only 8.02%.

This yield decline poses a dilemma for the WA mortgage lender. The justification for the lower-than-market-rate of interest on the WA mortgage loan is the financial advantage afforded by the still lower interest rate on the existing loan. However, with a substantial portion of the original term of the existing loan having expired by the time the WA mortgage loan is made, the increasingly heavy amortization of the existing mortgage loan adversely affects the WA mortgage lender's position. Thus, between the 132nd and the 144th months (eleventh and twelfth years) the yield on net funds invested declines to less than 9%.

Were the hypothetical WA mortgage loan to remain outstanding beyond the 180th month, the WA lender would be saddled with an 8% loan for up to another ten years. Further reference to *Table 1* supports this last observation. Beginning with the 181st month, the six columns portraying the flow of funds on the WA mortgage investment essentially duplicate the second set, which presents the WA mortgage loan amortization schedule. As of the 181st month, the cash flow becomes the entire \$23,155 monthly debt service payment, which for this month is comprised of \$12,722 of interest and \$10,433 of amortization. At this point, no interest is deferred and the change in net funds advanced is negative, consisting of the amortization payment. Furthermore, as noted, for this and subsequent months, the interest rate remains level at 8%.

The Balloon Note Provision

Fortunately, the lender's dilemma can be easily remedied through use of a balloon note provision, a frequently encountered means of protecting mortgage lenders against the risk of rising interest rates. In this case, its use would interrupt the continuous annual yield decline noted above. For example, were a balloon note provision to take effect after ten years (this being the modifying assumption specified above), the annual yield on the net funds advanced would decline only to 9.43%, that return associated with the WA lender's investment during the 120th month. As of the begin-

ning of this month, the amount of debt outstanding on the WA mortgage loan would be \$2,429,762, of which \$1,415,854 would represent the net investment made by the WA mortgage lender. Assuming that the value of the property has at least remained at its previous level, refinancing of the unamortized portion of the WA mortgage debt should not present much difficulty. Indeed, the WA mortgage lender's experience with the investor-borrower may cause this lender to be a primary candidate for such financing.³

An Observation on Realized Yields

While the above presentation accurately depicts the annual yields obtained through the WA mortgage lender's net investment in the WA mortgage loan itself, it does not show the realized yield that would obtain *both* from this investment *and* from the reinvestment of the monthly cash flows. The subject of realized yields on WA mortgage loans is largely unexplored in financial literature, and a detailed examination of this question is beyond the scope of this article. However, given the assumption of a ten-year balloon note provision, the \$3,825 monthly cash flows can be treated as an ordinary annuity. Through assuming that this annuity can be invested at, say, a 9% interest rate, compounded monthly, the future value can be easily computed through using 193.5143 as the appropriate interest factor. The future value of the monthly cash flows is thus $\$3,825 \times 193.5143$, or \$740,192. By adding this sum to the \$1,423,158 net WA investment existing after ten years (that is, at the *end* of 120 months), the combined future value is shown to be \$2,163,350. From a financial perspective, this wealth accumulation can be attributed to the original \$709,441 net investment in the WA mortgage loan. To solve for the realized yield, one simply determines the rate of return which equates \$2,163,350 to \$709,441 as a present value. In this case, the solution is a rate of return or realized yield of 11.20%.

Clearly, with reinvestment occurring at only 9%, the relative contribution which the reinvested cash flows make to the realized yield is very modest in comparison to that due to the net investment in the WA mortgage loan itself.⁴ From a lender's point of view, this characteristic is a major advantage of the WA mortgage loan. For while the cash flows are subject to the vagaries of interest rate levels, a properly structured WA mortgage loan permits a growing net investment to be made at consistently high annual yields.

ENHANCING THE INVESTOR'S WEALTH

Until now, this article has been primarily concerned with the financial position of the WA mortgage lender. At this point, three selected financing alternatives facing a prospective investor-borrower (hereafter called the investor) will be considered in determining the wealth contribution poten-

tial of the WA mortgage loan. In making this evaluation, it is first necessary to specify the characteristics of the property to be financed through each of the three mortgage loan alternatives.

A Hypothetical Real Estate Investment

The following cost, depreciation, financing, income, and investor tax assumptions apply to a hypothetical multi-family residential property. These assumptions provide the financial inputs needed to evaluate the investor's position following ten years' ownership, that being the point when financing alternatives including the WA mortgage loan are to be considered.

Cost

Total:	\$4,000,000
Land:	\$ 600,000
Improvements:	\$3,400,000
Undepreciated basis—improvements:	\$2,035,706

Depreciation

Original useful life:	40 years
Method:	Double declining balance

Financing

Original loan amount:	\$3,000,000
Unamortized balance:	\$2,290,559
Original amortization term:	25 years (300 months)
Remaining amortization term:	15 years (180 months)
Interest rate:	6%
Monthly debt service payment:	\$19,330

Net Operating Income

Eleventh year:	\$367,000
Rate of increase:	1% per year

Investor Taxation

Ordinary income tax rate:	40%
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The above assumptions depict a property for which construction was assumed to have been completed in 1968 at a total development cost of \$4,000,000. Following ten years' ownership, the \$3,400,000 of improvements cost has been written down to \$2,035,706 through use of the double declining balance method of depreciation. The financing characteristics shown here were purposely made identical to those shown above for the assumed existing first mortgage loan. As indicated, the original loan was in the amount of \$3,000,000 and thus provided financing for 75% of the property's cost. The loan's terms, assumed to be negotiated in early 1966, called for amortization to occur over a 25-year period at a 6% interest rate. Remaining assumptions depict the anticipated levels of net operating income and the investor's ordinary income tax rate.

The Existing Mortgage Loan Alternative

As alternatives to using WA mortgage financing, the investor could: 1) either retain the existing first mortgage loan as the only debt financing

TABLE 2

INVESTOR FINANCIAL FLOWS FOR OWNERSHIP YEARS 11 THROUGH 20 THROUGH USE OF THE
EXISTING MORTGAGE LOAN ALTERNATIVE

	Year			
	11	12	13	14
<u>Annual Cash Flows</u>				
Net operating income	\$367,000	\$370,670	\$374,377	\$378,120
Less loan interest	134,791	128,798	122,436	115,682
Less depreciation	101,785	96,696	91,861	87,268
Net taxable income	\$130,424	\$145,176	\$160,079	\$175,171
Add depreciation	101,785	96,696	91,861	87,268
Less loan amortization payments	97,158	103,150	109,512	116,267
Before-tax cash flow	\$135,052	\$138,722	\$142,428	\$146,172
Less tax payment	52,170	58,070	64,032	70,068
After-tax cash flow	<u>\$ 82,882</u>	<u>\$ 80,651</u>	<u>\$ 78,396</u>	<u>\$ 76,104</u>
<u>Selected Financial Characteristics</u>				
Depreciation to loan amortization payments ratio	1.05	0.94	0.84	0.75
Net operating income to debt service ratio	1.58	1.60	1.61	1.63
Cumulative after-tax cash flow	\$ 82,882	\$ 163,533	\$ 241,930	\$ 318,033
Undepreciated basis--improvements	\$1,933,921	\$1,837,225	\$1,745,363	\$1,658,095
Unamortized mortgage loan balance	\$2,193,401	\$2,090,251	\$1,980,738	\$1,864,471

source, or 2) prepay such debt through a refinancing transaction whereby a new first mortgage loan would be placed on the property.⁵ The financial results of the first of these alternatives, retaining the existing mortgage loan, have been incorporated into *Table 2*. The financial flows depicted in this table are based on an assumed continuation of the ownership of the above-described property for a second period of ten years. The table itself consists of two parts which together show annual cash flows and selected

TABLE 2 (Continued)

Year					
15	16	17	18	19	20
\$381,902	\$385,721	\$389,578	\$393,474	\$397,408	\$401,382
108,510	100,897	92,814	84,233	75,122	65,449
82,905	78,760	74,822	71,080	67,526	64,150
<u>\$190,486</u>	<u>\$206,064</u>	<u>\$221,942</u>	<u>\$238,161</u>	<u>\$254,760</u>	<u>\$271,783</u>
82,905	78,760	74,822	71,080	67,526	64,150
<u>123,438</u>	<u>131,051</u>	<u>139,134</u>	<u>147,716</u>	<u>156,827</u>	<u>166,499</u>
<u>\$149,953</u>	<u>\$153,772</u>	<u>\$157,629</u>	<u>\$161,525</u>	<u>\$165,460</u>	<u>\$169,434</u>
76,195	82,426	88,777	95,264	101,904	108,713
<u>\$ 73,759</u>	<u>\$ 71,347</u>	<u>\$ 68,853</u>	<u>\$ 66,261</u>	<u>\$ 63,556</u>	<u>\$ 60,721</u>
0.67	0.60	0.54	0.48	0.43	0.39
1.65	1.66	1.68	1.70	1.71	1.73
\$ 391,792	\$ 463,138	\$ 531,991	\$ 598,252	\$ 661,808	\$ 722,528
\$1,575,190	\$1,496,431	\$1,421,609	\$1,350,529	\$1,283,003	\$1,218,852
\$1,741,033	\$1,609,982	\$1,470,847	\$1,323,131	\$1,166,305	\$ 999,805

financial characteristics for the property. The annual cash flows segment follows a familiar pattern whereby each year's net operating income is reduced by mortgage loan interest and depreciation deductions to produce net taxable income. The depreciation expense is then added back and the monthly loan amortization payments are deducted to produce the before-tax cash flow. A tax payment, based on a 40% marginal ordinary income tax rate, is then deducted in computing the after-tax cash flow.

For year 11, the \$367,000 net operating income produces \$135,052 in before-tax cash flow which, after a tax payment of \$52,170, results in an after-tax cash flow of \$82,882. In subsequent years, despite the assumed growth in net operating income of one percent per year, the after-tax cash flows decline steadily to \$60,721 in year 20. This decline occurs because net taxable income is growing at a much faster rate than net operating income and consequently the tax payments are shown to grow to \$108,713 by the 20th year. Further evaluation reveals that this growth in net taxable income is largely attributable to the decline in deductions for both loan interest and depreciation during the second ten-year ownership period.

Continuing with this analysis, reference to the second part of the table discloses that the depreciation deduction exceeds the loan amortization payments only during year 11 and then only by a ratio of 1.05. Consequently, beginning with year 12 the investor pays income taxes on amounts of net taxable income which are greater than the amounts realized as before-tax cash flows. By year 20, the depreciation to loan amortization payments ratio had declined to 0.39. The net operating income subject to tax during this year is \$271,783, but only \$169,434 of this amount is realized as before-tax cash flow. The second ten years' ownership period thus may be described as one where reduced interest and depreciation deductions result in substantial income tax costs which, in turn, cause an uninterrupted decline in after-tax cash flows.

Further reference to *Table 2* discloses much useful added information. Were the existing loan used as the sole source of financing, the net operating income to debt service ratio would increase from a high 1.58 in year 11 to a very high 1.73 in year 20.⁶ From the lender's perspective, this change would represent an improvement in loan quality. Then, as shown, the cumulative after-tax cash flow grows to \$722,528 over the ten-year period and thus averages about \$72,253 per year. The undepreciated basis—improvements is shown to decline to \$1,218,852 at the end of year 20 while the unamortized mortgage loan balance declines to \$999,805 by the end of the 20th year.

The WA Mortgage Loan Alternative

In *Table 3*, the financial flows to be associated with use of the WA mortgage loan alternative are illustrated. As neither the net operating income of the property nor the depreciation deductions are affected by the use of the WA mortgage financing, the amounts given for these items are the same as those shown in *Table 2*. However, as the mortgage financing now consists of a \$3,000,000, 8% interest rate, 25-year amortization term WA mortgage loan, the loan interest for year 11 has increased from the \$134,791 shown in *Table 2* to \$238,581. This expense, together with the depreciation deduction of \$101,785, results in year 11's net taxable income being only \$26,634.

After adding back the depreciation expense and deducting the loan amortization payments, before-tax cash flow of \$89,146 is shown to have been generated. This cash flow amount is \$45,906 less than the \$135,052 shown

in *Table 2*, with the difference being entirely attributable to the higher debt service payments required on the WA mortgage loan. While the before-tax cash flow is substantially less than that generated through use of only the existing mortgage loan, the after-tax cash flow of \$78,493 is but modestly less than the \$82,882 listed in *Table 2* for year 11. The reason for so slight a difference, of course, is that the tax payment associated with the WA mortgage loan's use is only \$10,654, far less than the \$52,170 which would

TABLE 3
INVESTOR FINANCIAL FLOWS FOR OWNERSHIP YEARS 11 THROUGH 20 THROUGH USE OF THE
WA MORTGAGE LOAN ALTERNATIVE

	Year			
	11	12	13	14
<u>Annual Cash Flows</u>				
Net operating income	\$367,000	\$370,670	\$374,377	\$378,120
Less loan interest	238,581	235,321	231,791	227,968
Less depreciation	101,785	96,696	91,861	87,268
Net taxable income	\$ 26,634	\$ 38,653	\$ 50,725	\$ 62,885
Add depreciation	101,785	96,696	91,861	87,268
Less loan amortization payments	39,273	42,533	46,063	49,886
Before-tax cash flow	\$ 89,146	\$ 92,816	\$ 96,523	\$100,267
Less tax payment	10,654	15,461	20,290	25,154
After-tax cash flow	<u>\$ 78,493</u>	<u>\$ 77,355</u>	<u>\$ 76,233</u>	<u>\$ 75,113</u>
<u>Selected Financial Characteristics</u>				
Depreciation to loan amortization payments ratio	2.59	2.27	1.99	1.75
Net operating income to debt service ratio	1.32	1.33	1.35	1.36
Cumulative after-tax cash flow	\$ 78,493	\$ 155,848	\$ 232,081	\$ 307,193
Undepreciated basis--improvements	\$1,933,921	\$1,837,225	\$1,745,363	\$1,658,095
Unamortized mortgage loan balance	\$2,960,727	\$2,918,194	\$2,872,131	\$2,822,245

TABLE 3 (Continued)

Year					
15	16	17	18	19	20
\$381,902	\$385,721	\$389,578	\$393,474	\$397,408	\$401,382
223,827	219,343	214,487	209,227	203,531	197,362
82,905	78,760	74,822	71,080	67,526	64,150
\$ 75,170	\$ 87,618	\$100,270	\$113,166	\$126,351	\$139,870
82,905	78,760	74,822	71,080	67,526	64,150
54,027	58,511	63,367	68,627	74,323	80,491
\$104,048	\$107,867	\$111,724	\$115,620	\$119,555	\$123,529
30,068	35,047	40,108	45,266	50,540	55,948
\$ 73,980	\$ 72,820	\$ 71,616	\$ 70,353	\$ 69,014	\$ 67,581
1.54	1.35	1.18	1.04	0.91	0.80
1.37	1.39	1.40	1.42	1.43	1.45
\$ 381,173	\$ 453,993	\$ 525,609	\$ 595,962	\$ 664,977	\$ 732,557
\$1,575,190	\$1,496,431	\$1,421,609	\$1,350,529	\$1,283,003	\$1,218,852
\$2,768,218	\$2,709,707	\$2,646,340	\$2,577,713	\$2,503,391	\$2,422,899

have been paid were the existing mortgage loan used as the sole financing source.

Further reference to *Table 3* discloses similar, but far less disadvantageous, patterns than were observed in *Table 2*. During the second ten years' ownership period, the interrelationships between net operating income and the loan interest and depreciation result in net taxable income growing from \$26,634 in year 11 to \$139,870 in year 20. But the increases in

before-tax cash flow are much smaller, being limited by the growth in net operating income of 1% per year. As a result, tax payments each year increase by more than the increase in before-tax cash flow, causing an uninterrupted decline in after-tax cash flow from \$78,493 in year 11 to \$67,581 in year 20.

Notwithstanding this decline, however, the investor would realize more after-tax cash flow through use of the WA mortgage loan alternative. Over the entire ten-year period, *Table 3* shows that the cumulative after-tax cash flow attributable to the use of the WA mortgage loan is \$732,557, in comparison to that of \$722,528 shown in *Table 2*. This advantage in favor of the WA mortgage loan develops irregularly over the ten-year period. During years 11 through 14, the yearly advantage rests with the existing mortgage loan; at the end of the 14th year, the cumulative after-tax cash flow for the existing mortgage loan is \$318,033 compared to \$307,193 for the WA mortgage loan. Beginning with the 15th year, however, the annual after-tax cash flow associated with the WA mortgage loan exceeds that for the existing mortgage loan; by the 19th year, the cumulative after-tax cash flow listed in *Table 3* also exceeds that for the existing mortgage loan.

The selected financial characteristics segment of *Table 3* provides additional useful information. The declining amounts of depreciation are adequate to cover loan amortization payments in all but the last two years, ranging from a ratio of 2.59 in year 11 to 0.80 in year 20. Furthermore, the net operating income to debt service ratio improves each year, ranging from a satisfactory 1.32 during year 11 to a relatively high 1.45 during year 20. Since depreciation policy does not change, the amounts shown for undepreciated basis—improvements are identical to those in *Table 2*. In comparison to *Table 2*, however, major and very significant differences do occur in the amounts shown as each year's unamortized mortgage loan balance. During each of the ten years, the unamortized balance for the WA mortgage loan exceeds that for the existing mortgage loan to an increasingly greater extent, an obvious result of the WA mortgage loan being for a higher amount and having lower amortization payments. At the end of the 20th year, the \$2,422,899 unamortized balance for the WA mortgage loan exceeds that of \$999,805 for the existing mortgage loan by \$1,423,094.⁷

In analyzing the significance of this difference, four elements would normally be considered: 1) the net amount advanced under the WA mortgage loan, 2) the difference in annual after-tax cash flows, 3) the difference in unamortized mortgage loan balances, and 4) the reinvestment rates required to equate the financial flows involved. The difference between the annual after-tax cash flows is not significant, and on a cumulative basis favors the WA mortgage loan. Therefore, the relative advantage of the WA mortgage loan alternative can be evaluated in terms of items 1, 3, and 4. In making this evaluation, it will be assumed that the WA mortgage loan terms incorporate the balloon note provision described above and that both the WA mortgage lender and investor contemplate a ten-year financing term. Given this assumption, the investor will thus have obtained \$709,441 in additional mortgage funds at a cost of having a mortgage liability which

is \$1,423,094 larger than would have existed had the WA mortgage loan alternative not been elected.

Without considering the question of risk, the attractiveness of the WA mortgage loan can be judged in light of the rate of return which would equate \$1,423,094 to \$709,441 in a present value sense. Through dividing \$1,423,094 by \$709,441, an interest factor of 2.00593 is obtained. This compares to the interest factor of 2.00966 for a 7% compound interest rate, based on monthly compounding over a ten-year period. Thus, if the investor could achieve an after-tax return of 7% on \$709,441 advanced through the WA mortgage loan, it would be economically advantageous to enter into that transaction. A yield of 7%, however, represents only the threshold of acceptability. The following information depicts the financial advantage of investing the \$709,441 at the higher after-tax returns of 8, 9, and 10% based on monthly compounding over a ten-year period:

Percent	Interest factor	Future value	Net additional mortgage liability	Investor financial advantage
8	2.21964	\$1,574,704	\$1,423,094	\$151,610
9	2.45135	1,739,088	1,423,094	315,994
10	2.70704	1,920,485	1,423,094	497,391

Unfortunately, relatively little information is available on the after-tax returns which actually have been achieved through equity investment in real estate. After-tax returns of, say, 9 to 10% would, however, be in line with those on equity capital achieved by many of the larger U.S. corporations. Were the investor able to achieve after-tax returns in this range, choosing the WA mortgage loan alternative would considerably enhance his wealth.

The Refinancing Alternative

Before concluding that the WA mortgage loan is the preferred financing vehicle, it is appropriate to examine the third alternative, the refinancing of the existing first mortgage loan. Here, it is assumed that the available financing consists of a \$3,000,000, 9.5% interest rate, 30-year amortization term mortgage loan. Given these specifications, this alternative will be evaluated through use of *Table 4*.

Examination of this table discloses that neither the net operating income nor the depreciation deductions are affected by the refinancing transaction. An evaluation of the much higher interest expense associated with this transaction, however, reveals that the refinancing would result in much lower amounts of net taxable income than either of the other two alternatives. For years 11 and 12, a net loss would occur with the result (assuming the applicability of a 40% marginal ordinary income tax rate) being tax savings of \$7,597 and \$3,359, respectively.

This financing alternative also has much lower loan amortization payments associated with it, especially compared to the existing mortgage loan

case. Notwithstanding the low loan amortization payments, existence of tax savings during years 11 and 12, and relatively low tax payments in subsequent years, the after-tax cash flow for each year is *less* than that shown in *Table 3* for the WA mortgage loan alternative. Viewed on a cumulative basis, the after-tax cash flow resulting from the refinancing transaction would amount to \$696,768 compared to the \$732,557 attributable to the WA mortgage loan. The reason for the reduced cash flow is the very high interest expense associated with the refinancing alternative.

TABLE 4
INVESTOR FINANCIAL FLOWS FOR OWNERSHIP YEARS 11 THROUGH 20 THROUGH USE OF THE
REFINANCING ALTERNATIVE

	Year			
	11	12	13	14
<u>Annual Cash Flows</u>				
Net operating income	\$367,000	\$370,670	\$374,377	\$378,120
Less loan interest	284,208	282,372	280,354	278,136
Less depreciation	101,785	96,696	91,861	87,268
Net taxable income	(\$18,994)	(\$8,398)	\$ 2,161	\$ 12,717
Add depreciation	101,785	96,696	91,861	87,268
Less loan amortization payments	18,499	20,335	22,353	24,572
Before-tax cash flow	\$ 64,292	\$ 67,962	\$ 71,669	\$ 75,413
Less tax payment	7,597*	3,359*	865	5,087
After-tax cash flow	<u>\$ 71,890</u>	<u>\$ 71,322</u>	<u>\$ 70,805</u>	<u>\$ 70,326</u>
<u>Selected Financial Characteristics</u>				
Depreciation to loan amortization payment ratio	5.50	4.76	4.11	3.55
Net operating income to debt service ratio	1.21	1.23	1.24	1.25
Cumulative after-tax cash flow	\$ 71,890	\$ 143,212	\$ 214,016	\$ 284,343
Undepreciated basis--improvements	\$1,933,921	\$1,837,225	\$1,745,363	\$1,658,095
Unamortized mortgage loan balance	\$2,981,501	\$2,961,166	\$2,938,812	\$2,914,240

*Tax savings.

TABLE 4 (Continued)

Year					
15	16	17	18	19	20
\$381,902	\$385,721	\$389,578	\$393,474	\$397,408	\$401,382
275,697	273,016	270,069	266,830	263,269	259,355
82,905	78,760	74,822	71,080	67,526	64,150
\$ 23,300	\$ 33,945	\$ 44,687	\$ 55,563	\$ 66,613	\$ 77,877
82,905	78,760	74,822	71,080	67,526	64,150
27,011	29,691	32,638	35,878	39,438	43,352
\$ 79,194	\$ 83,013	\$ 86,870	\$ 90,766	\$ 94,701	\$ 98,675
9,320	13,578	17,875	22,225	26,645	31,151
\$ 69,874	\$ 69,435	\$ 68,996	\$ 68,541	\$ 68,056	\$ 67,524
3.07	2.65	2.29	1.98	1.71	1.48
1.26	1.27	1.29	1.30	1.31	1.33
\$ 354,217	\$ 423,652	\$ 492,647	\$ 561,188	\$ 629,244	\$ 696,768
\$1,575,190	\$1,496,431	\$1,421,609	\$1,350,529	\$1,283,003	\$1,218,852
\$2,887,229	\$2,857,538	\$2,824,900	\$2,789,022	\$2,749,584	\$2,706,231

Further reference to *Table 4* discloses depreciation to loan amortization payments ratios which range from 5.50 to 1.48; these relatively high values primarily reflect the low loan amortization payments required on this loan. On the other hand, the net income to debt service ratio takes on a more marginal character in this case, with the value for year 11 being a moderately low 1.21. Were the growth in net operating income to occur at the assumed rate of 1% per annum, however, this ratio would gradually increase to a value for the 20th year of 1.33. The undepreciated basis—improvements schedule remains unchanged.

The unamortized mortgage loan balance schedule conveys the added information needed to conclude that the refinancing transaction is inferior to the WA mortgage loan alternative. Examination of this schedule in comparison to the one presented in *Table 3* reveals that the refinancing alternative has a higher unamortized loan balance during each year than that associated with the WA mortgage loan. At the end of year 20, the difference in unamortized debt amounts to \$283,332 (\$2,706,231 - \$2,422,899). Consequently, since the refinancing transaction has both higher unamortized mortgage loan balances and lower after-tax cash flows than the WA mortgage loan, it is clearly not an economical alternative to the WA mortgage financing.

CONCLUSIONS

This article has provided examples of how a properly structured WA mortgage loan can enhance the wealth of two traditional adversaries, the mortgage lender and the borrower. In the opinion of this author, a WA mortgage loan transaction can also entail less risk than a mortgage loan resulting from a refinancing transaction. For while both loans would provide the same amount of funding, a WA mortgage loan would absorb fewer dollars of a property's income stream than would a mortgage loan arising from the property's being refinanced.

This point is supported by the net operating income to debt service ratios portrayed in *Table 3* and *Table 4*. In the case of the WA mortgage loan alternative, the ratios ranged from 1.32 to 1.45. For the refinancing alternative, the ratios ranged from 1.21 to 1.33. Although there is no uniform industry standard for this particular ratio, clearly a mortgage lender has more protection from default the more comfortably a property's net operating income exceeds the annual debt service payments. Furthermore, the amortization term of the WA mortgage loan may result in there being less debt outstanding as the loan is amortized than would be the case for a refinancing alternative. Finally, in the typical case, the WA mortgage lender obtains the right to cure any default in the existing mortgage loan. Should it be necessary, the WA mortgage lender could ultimately acquire the senior lien position and thus succeed to the role it would have occupied through having initially entered into a refinancing transaction.

Were each of these elements present in the case of a particular WA mortgage loan, a financial anomaly could exist: less risk and more reward.

REFERENCES

1. As this article focuses specifically on the financial characteristics of the WA mortgage loan, the reader may wish to consult other sources for material pertaining to its legal or operational characteristics. Among the more useful articles dealing with these matters are: John E. Cochrane, "Wrap-Around Mortgage Financing," *Legal Bulletin* (September 1971), pp. 185-203; Francis P. Gunning, "The Wrap-Around Mortgage . . . Friend or U.F.O.?" *Real Estate Review* (Summer 1972), pp. 35-48; and Arnold Leider, "Wrap-around Mortgage Financing by a Commercial Bank," *The Journal of Commercial Bank Lending* (April 1974), pp. 2-22.

2. The first month's interest on the \$1,500,000 WA mortgage loan would be \$10,000 ($\$1,500,000 \times .08/12$) while the interest owed on the existing mortgage loan would be \$5,000 ($\$1,000,000 \times .06/12$). The WA lender thus would receive \$5,000 in net interest, or a 12% annual yield.
3. After 20 years, it is likely that the existing first mortgage debt could be repaid without penalty. Alternatively, the WA mortgage lender's net investment could be repaid and the existing mortgage could remain in effect for five more years.
4. Even if the reinvestment rate was 8%, the realized yield nonetheless would still be a high 11.01%.
5. Here it is assumed that no restrictions or penalties exist to preclude prepayment of the existing mortgage loan.
6. Although there is no uniform industry standard regarding the extent to which a property's net rental income should exceed the dollar amount required to service a proposed loan, life insurance companies which finance multi-family residential properties generally seek minimum debt service coverage ratios ranging from 1.25 to 1.33.
7. The examples used in this article were prepared through the use of two separate computer programs which incorporate different procedures for rounding to whole dollar amounts. The \$64 difference between the \$1,423,094 amount presented here and the \$1,423,158 net WA mortgage investment amount described above is a difference in rounding.

Landmarks Preservation and the Law: Private Opportunity and the Public Good

by *Daniel Rose, C.R.E.*

The 19th century American missionaries who set out to proselytize Hawaii were vigorous, effective individuals; in time, when their families came to own or control most of the islands, it was said that "they came to do good and did very well indeed."

In somewhat the same vein, the private developer involved with landmark preservation may have mixed motives and the wisest public policies reflected in law will be those that assure the maximum public good consistent with opportunities for competent and honorable private practitioners to "do well."

INTERPRETATIONS OF PUBLIC GOOD

These are all loaded terms, of course, since "public good", "private practitioners", and "do well" can each mean pretty much what we wish them to mean; and even the term "landmarks preservation" represents substantially different things to different people. To some it means *restoration*, or putting a building of unusual historic or aesthetic interest back into its original state and condition; to others it means *renovation*, which implies a

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physical upgrading while retaining original use; to still others, it can mean *adaptive use* in which older buildings are recycled to new uses in ways or styles that may or may not retain the original character, detailing or aesthetic integrity.

Mount Vernon, a classic *restoration*, is presumably ready for George Washington to resume residence on a moment's notice and is fully equipped for him, down to a new set of his wooden false teeth.

Ghirardelli Square in San Francisco and Boston's Old City Hall, on the other hand, ideal examples of *adaptive use*, have been reincarnated in forms more imaginative and more aesthetically pleasing than in their first lives. And many homes in Washington's Georgetown, Boston's Back Bay, and Philadelphia's Society Hill have been superbly *renovated*, providing identical surroundings for their new residents as for their original owners, only now with steam heat, electricity, and running water.

The old French saying, "the Good is the enemy of the Best; the Best is the enemy of the Good" is clearly applicable here because if pure *restoration* is the goal, *adaptive use* thinking can be destructive.

On the other hand, if *adaptive use* or *renovation* is acceptable, all parties concerned should agree beforehand on the degree of historic authenticity and continuity required because the economic feasibility (therefore the "do-ability") of an otherwise desirable project might be destroyed in the early planning stage.

Common sense and actual experience would seem to limit pure *restoration* activity to those philanthropic groups specifically equipped, financially and technically, to undertake them. Private skills and guidance can be hired on a fee basis as required, but there would seem to be no real place for private sector entrepreneurial involvement.

With pure *restoration* left to eleemosynary groups, *renovation* and *adaptive use* are areas for the most fruitful kind of cooperation between public and private entities.

PUBLIC INTEREST AND PRIVATE DEVELOPERS

The public interest in the effective recycling of desirable older structures is being increasingly acknowledged as it proves an important factor in revitalizing key areas in decaying old center-city locations. As under-utilized properties on strategic sites are brought back to social and economic health, the catalytic effect on adjoining areas becomes evident. Before long, property tax rolls are increased, new jobs are created, fresh purchasing power is attracted back to declining areas, and more efficient use is made of an existing and frequently under-utilized urban infrastructure.

The whole enterprise proves a "positive sum game" in which everyone comes out ahead. Philosophically, it represents a wise and conserving use of existing resources in which we progressively preserve first buildings, then neighborhoods, and finally the city itself. Given the public benefits that

flow from such activity, it follows that legitimate public interest should focus on the problems a private developer faces and on steps that may help overcome them.

To begin with, it is important to realize that the financial analysis a developer performs on a recycling project is precisely the same he applies to any other development, and the three basic equations are quite simple:

$$\begin{array}{r} \text{Gross Development Cost} \\ - \text{Total Financing} \\ \hline \text{"Equity Investment"} \\ \\ \text{Gross Income} \\ - \text{Real Estate Taxes, Operating Cost, and Debt Services} \\ \hline \text{Net Cash Flow} \\ \\ \text{"Net Cash Flow"} \\ \div \text{Equity Investment} \\ \hline \text{"Return on Equity"} \end{array}$$

It follows that anything that lowers the gross development cost or increases available financing cuts down on the developer's own cash required. Similarly, anything that increases income or that cuts down on real estate taxes, debt service, or operating expenses increases the project's cash flow. It also follows that the higher the percent return on equity, the more appealing the project becomes to the developer.

The heart of the legal problem, then, is to devise mechanisms that:

- 1) Determine the appropriate public aims to be achieved.
- 2) Define the private role.
- 3) Make optimum use of those incentives available to the private sector that achieve public aims.

Stringent application of local building codes originally designed for new construction; the superimposing on preservation projects of social goals (such as HUD's "targeting" rule with respect to low-income or minority populations) as a condition for use of a wide array of governmental subventions, grants, and aids; uncertainties and delays caused in one way or another by government added to the uncertainties and delays inherent in preservation work—all these (however justified by other considerations) add to the costs, and therefore lessen the economic feasibility, of projects whose successful completion may be strongly in the public interest.

RISKS VERSUS POSITIVE AIDS

Availability of capital (mortgage and equity) is a problem that persistently plagues the preservation field (and "front end" cash is the most difficult of all to come by). Contractors and architects are reluctant to provide firm bids and guaranteed completion dates involving projects where, for example, structural problems, initially hidden from view, come to light as work progresses and result in delays and cost overruns. The relatively small size of many preservation projects prevents "economies of scale" that might otherwise apply. All are risks and problems the developer faces knowingly.

The taking of risks is indeed a key part of the entrepreneur's role, but in the long run, *society pays for undue risks*, either in the form of worthwhile projects left undone or in the form of higher potential rewards that will be necessary to attract desirable developers.

On the positive side of the ledger, of course, are the impressive and growing array of governmental aids for preservation work. Some are open and obvious but difficult to nail down. The federal government's National Historic Preservation Act (1966), National Environmental Policy Act (1969), and the National Historic Preservation Fund (created 1976) all provide important preservation tools; a variety of HUD programs are aimed at preservation, and the Department of Commerce (through the Economic Development Administration and Small Business Administration) provides several sources of funds. The more accessible these are made to the developer, the better for everyone concerned.

The major federal benefit available to preservation developers involves his allowable depreciation deduction against federal income taxes. Since Section 2124 of the Tax Reform Act of 1976 permits the developer of an appropriate historic structure to write off all his capital expenditures in a five-year period and to sell off in advance his excess tax losses to high-bracket investors, a source of capital thus becomes available to the developer at the crucial early stage.

Local aids to the developer that make preservation appealing vary from locality to locality and most often involve forms of property tax abatement such as New York City J-51 program. TDRs (Transferable Development Rights) by which development densities may be transferred from a preservation location to another site, and "facade easements" where a public body may in certain cases assume the obligation to renovate and maintain a building's outer shell, are other imaginative tools whose appropriate use should be encouraged.

Given the above, it would seem that the meaningful problems of historic preservation law and its relation to the private developer involve fuller and more effective use of current tools rather than the need for the creation of new ones.

First of all, since in "the real world" the implementation of a law is as important as its textual formulation, the application and interpretation of preservation law must be seen as an area of continuing importance to all concerned. Clarity and internal consistency of regulations, and speed and flexibility in administration, are perhaps of even greater importance in this field than in others. The "credibility" of local government, too, in living up to its obligations and promises, is of immense significance in a field involving so many intangibles.

Secondly, in view of the desirability of positive preservation activity, imaginative and creative use of existing tools should be encouraged at all levels of government as being clearly consistent with the underlying legislative intent.

Thirdly, exploration should be made of the thorny and complex question of possible *waivers* (properly reviewed, approved, and controlled) in preservation projects of controls that may otherwise be applicable in such matters as building codes, zoning restrictions, or social engineering.

CONCLUSION

Nothing above should be construed as limiting in any way, of course, the legitimate controls, reviews, and inspections private developers should be subject to, as it should be assumed that developers will tend to do only what is in their clear, immediate financial self-interest and nothing more. When relying on a developer's conscience, one would do well to remember H. L. Mencken's definition of conscience as "the small voice that tells you someone may be looking."

Properly harnessed, however, the private developer represents the best preservation resource we have; and for the public good his appropriate "care and feeding" should be a matter of general public concern.

Feasibility Analysis for Mixed-Use Development Projects

by Stephen E. Roulac

Planners are increasingly called upon to make decisions based on the economic impact of development programs. This discussion centers upon a step-by-step application of a model to a specific project—a suburban city faced with evaluating a development proposal which offers to provide low-income housing in exchange for the opportunity to exploit the substantial demand for commercial office space. How do those responsible for either the adoption or rejection of the plan determine its feasibility and the trade-offs inherent in its public purpose and profit-maximizing components?

THE CRITICAL ISSUE

Economic trade-offs inherent in decisions regarding different types of development, as well as development versus no development, are perhaps the issues most critical to the planning function. Although local land use controls specify precise criteria for new projects, and advocacy politics are highly developed, means for evaluating economic impacts of new proposals are less well advanced.

In San Francisco, as in other communities, the economic impact of highrise development has been clearly controversial. Studies argue on the one hand that highrise buildings are uneconomical, that they consume more in services than they contribute in revenues, and on the other hand that the city's best long-run economic interest lies in intensive highrise development. In assessing these divergent positions, it should be recognized that arguments pro and con focus on municipal cost-revenue operating relation-

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ships. Also of concern is the cost-value development economics relationship controlling the private sector decision of whether to initiate the project.

The proliferation of land use controls at multiple levels of government has focused attention on the economic impact of government requirements. As example, a study by the Environmental Protection Agency (as reported in the March 26, 1975 issue of *Appraisal Briefs*) found that the expense involved in collecting and analyzing traffic and air quality data for preparation of an indirect source regulations application was approximately one-tenth of one percent of the total project cost. That research assessed the impact of the EPA requirements for six different projects in terms of total cost and return on investment.

While increased concern with economic impacts of government regulations is commendable, the approaches to date have not been totally satisfactory. It is suggested that many analytical methods are deficient in that they are overly rigid and lack flexibility, concentrate primarily on the impacts on certain actors to the exclusion of others, and have limited application for public policy analysis. The preferred approach is one that focuses on key variables and allows the analyst to manipulate those variables of most direct interest.

PARAMETERS FOR A MODEL

As suggested initially, presentation of a model for evaluating the financial feasibility of multi-objective, mixed-use new development projects is facilitated by its application to a specific project proposal. In our case example, a mature suburban community, committed to a program to redevelop its urban core, desires to evaluate the financial feasibility of different development proposals. While certain basic information is known, much more is not; consequently, there is need for a financial model to test different approaches and different assumptions.

The suburban city in question, with a population of approximately 200,000, has a strong economic dependency on the medical services business. The rapid expansion of medically-oriented services has created tension between the demand for more office space and reluctance of the community to make available land for development in close proximity to the downtown urban area, which now is inefficiently used for run-down single family dwellings. In addition to the pressure for more office space, there is increased demand for close-in residential units, particularly for elderly and lower income persons. The political situation requires that any development of office space concurrently feature development of new low-income housing. Although the provision of low-income housing is an important objective for the city, the city is reluctant to fund such a project directly or to commit its credit rating, in the form of providing guarantees for financing, to the project. Thus, any development must be of mixed use, and it must be economically self-sufficient.

The area under consideration comprises approximately 40 acres and the overall cost for land acquisition and clearing is stated to be \$120,000 per

acre. A strong market exists for commercial space, and it is stipulated that at least 250,000 square feet annually can be absorbed for each of the next six years. Planning restrictions for the commercial development include a floor area ratio of five, a maximum height of 120 feet, and a ground coverage ratio of 50%. The city desires to provide a minimum of 500 residential units, one-half available at rentals of \$165 for three-bedroom units and \$150 for two-bedroom units, and one-half to be sold as condominiums at \$22,500 for three bedrooms and \$20,000 for two bedrooms. For both condominiums and rentals, the three-bedroom units will consist of 1,150 square feet, 1½ baths, and a fully equipped kitchen, and the two-bedroom units will include 960 square feet, one bath, and a fully equipped kitchen. Some studios and larger units will be included with comparable characteristics.

DESCRIPTION OF THE MODEL

The model introduced focuses on the economic relationships inherent in development of property. In this sense, it should be recognized that the costs and benefits implicit over time in terms of revenues provided by the subject development are disregarded. At the same time, to the extent one had specific knowledge of those factors, expanding the subject model to incorporate this additional dimension would be straightforward.

As described above, the community in question desires to evaluate an urban redevelopment plan which will include both commercial and residential space. The residential housing is intended primarily for low-income households and, consequently, will be priced below market rates. The planning question, then, is: what amount of subsidy is required from the commercial space to offset the deficit on the residential space? Also, can the commercial space carry the residential space? Will the combined project show a surplus or a deficit? The model presented here provides insight to these questions.

Fundamental to the model is the belief that it is possible to identify, from the perspectives of private sector developers and investors, the anticipated value to be realized from developing and owning the project, as well as the costs required to create this value. If value exceeds costs, there is an extraordinary profit, or "quasi-rent" in classic economic terms. This extraordinary profit represents a premium above the economic returns necessary to motivate the participation of developers and investors since it is stipulated that where value equals cost, which necessarily includes a "normal" profit, adequate incentive exists to motivate the participants to proceed with the project. If costs exceed value, a deficit exists and the private sector will not proceed unless this deficit is offset by a direct transfer payment or by profit realized on some other component part of the total project.

Once the net surplus or deficit for each component part of the total project is known, it is a simple matter to determine the surplus or deficit for the overall project. Where a deficit exists, the community in question may well

be willing to cover the deficit because of the indirect non-financial benefits, such as the addition of new low-income housing, it realizes by the project. Alternatively, if a surplus exists, then the project participants have the opportunity to use this element of economic value as they choose.

The model can be shown symbolically as follows:

$$(V_o - C_o) + (V_r - C_r) - X - CT$$

Where:

V_o = Value of office development

C_o = Cost of office development

V_r = Value of residential development

C_r = Cost of residential development

X = Total project surplus (deficit)

CT = Cost of land for public purposes

In turn, each of the component elements of the above equation can be expressed in terms of variables, with the variables used to calculate that particular term. The equation for this next step is shown in *Exhibit 1*.

Considering first the value of the project, it is equal to the present value of the anticipated income to be realized from leasing and selling space in the new development. Thus, value is a function of the amount of space available for sale or lease, the selling price or lease rate per unit of space, and the cost of providing continuing services for leased space. The expression for V_o , then, is as follows:

$$V_o = M_o (1 - E_o) (R_o S_o)$$

Where:

M_o = Net income multiplier for office space

E_o = Ratio of expenses, vacancy and reserves to scheduled gross revenue for office space

R_o = Scheduled gross revenue per foot for office space

S_o = Total office space available for rent.

The net income multiplier is the inverse of the capitalization rate, and in effect is a measure of how the market values a dollar of income from the proposed development. How much of the scheduled income must be allocated for operating expenses, replacement reserves, and allowance for vacancy and collection loss determines the ultimate value of the project. Clearly, the lower the claim on scheduled income for such factors, the higher the value of the property. The amount of space available, and the rate at which such space can be leased, are clearly highly significant in determining the property's value.

V_r (value of residential development) consists of two component elements because part of the residential space is for sale condominiums, rather than rental space. Thus, the value of the residential space is a function of the present value of anticipated income from that space which is rented plus the "for sale" housing which has a value today equal to what it can be sold for. The first component of V_r is identical to that used for V_o with the modification that a new factor, P_r , which indicated the proportion of total

EXHIBIT 1

MIXED USE DEVELOPMENT FINANCIAL FEASIBILITY MODEL

$$|V_o - C_o| |V_r - C_r| = X + C_t$$

$$(|M_o[1 - E_o] |R_o S_o| - |1.265 K_o S_o + W_o L_o + Y_o|)$$

$$(|(M_r[1 - E_r] |R_r S_r P_r|) +$$

$$(\frac{S_r(1 - P_r)G_r}{N_r})| - (|1.265 K_r S_r + W_r L_r + Y_r|) = X + |J - W_t|L_t|$$

Where:

$V_o - C_o$ is equal to the value of office development

$V_r - C_r$ is equal to the value of residential development

$X = C_t$ is equal to the value of the overall project

The above quotation can be simplified by factoring to facilitate calculation. The result of this process is as follows:

$$S_o[R_o M_o(1 - Z_o)(1 - E_o) - (1.265 + i_o B_o + T_o)K_o] -$$

$$(1 + T_o)(W_o L_o) + S_r[R_r M_r(1 - E_r)(P_r - Z_r) + (\frac{1 - P_r}{N_r})G_r -$$

$$(1.265 + i_r B_r + T_r)K_r] - (1 + T_r)(W_r L_r) =$$

$$X = |1_t(J - W_t)|$$

Notes Explaining the Various Symbolic References

V_o, V_r	=	Value of office/residential development
C_o, C_r	=	Cost of office/residential development
X	=	Total project surplus (deficit)
C_t	=	Cost of land for public purpose
M_o, M_r	=	Net income multiplier for office/residential
E_o, E_r	=	Ratio of expenses, vacancy and reserves to scheduled gross revenue for office/residential space
R_o, R_r	=	Scheduled gross revenue per foot for office/residential space
S_o, S_r	=	Total space (in feet) of office/residential development
W_o, W_r, W_t	=	Acres used for specific development of office/residential/total. See below for derivation of acres used for development.
L_o, L_r, L_t	=	Land acquisition and clearing cost per acre for office/residential/total project
Y_o, Y_r	=	Development costs for interest, property taxes, marketing for office/residential. See below for derivation of these costs.
P_r	=	Proportion of residential space rented
N_r	=	Average square foot size of residential "for sale" units
G_r	=	Average selling price of residential "for sale" units
J	=	Total acres in project

residential space rented, is introduced to reflect the amount of space which is actually available for rent. The second component of V_r , that which relates to the "for sale" condominium housing, can be expressed as follows:

$$\frac{S_r (1 - P_r) G_r}{N_r}$$

Where:

- S_r = Total residential space in square feet
- P_r = Proportion of total residential space rented
- G_r = Average selling price of residential "for sale" units
- N_r = Average square foot size of the residential "for sale" units

The expression $(1 - P_r)$ is equivalent to that proportion of total residential space that will be offered for sale as opposed to offered for lease.

Now attention can be directed to the component elements of C_o and C_r . First, the expression for C_o from *Exhibit 1* is as follows:

$$C_o = 1.265 K_o S_o = W_o L_o + Y_o$$

Where:

- K_o = The construction costs per foot for office space
- W_o = Acres used for office development
- L_o = Per acre land acquisition and clearing costs for office development
- Y_o = Costs incurred for interest and property taxes during construction plus marketing and holding costs for office development

The 1.265 factor is used to reflect a 10% profit allowance to the general contractor on construction, and a 15% profit allowance to the developer for the total cost of the development project. As seen in *Exhibit 1*, the expression used for C_r is similar to that for C_o .

The amount of acreage required for a particular development depends upon floor-area ratios and coverage ratios. The amount of acreage used for office development is calculated as follows:

$$W_o = O_o \frac{S_o}{H_o} \frac{I_o}{Q_o} \quad 43,560$$

Where:

- O_o = Ground coverage ratio
- I_o = Average floor size
- H_o = Maximum building height
- Q_o = Building height per floor
- F_o = Floor-area ratio

The relationships expressed above allow the planner to designate the ground coverage ratio, the floor-area ratio and the maximum building

height, which factors define the amount of acres that will be required. Calculation of the acreage requirement for the residential component is as follows:

$$W_r = \frac{S_r}{A_r U_r}$$

Where:

A_r = Average size of units
 U_r = Units per acre

Although the residential constraints deal only with units per acre, it is an easy matter to add other planning constraints if desired.

The formulas used to calculate construction costs do not include construction interest and property taxes during the construction period. Further, the formulas used to calculate the value of the different elements of the development project do not provide an allowance for marketing and rent-up costs or for holding costs incurred during the rent-up and marketing period. Consequently, the Y_0 term is used to reflect these costs and its component parts are as follows:

$$Y_0 = i_0 (S_0 K_0) (B_0) + T_0 ((S_0 K_0) + (W_0 L_0)) + Z_0 (M_0 (1 - E_0) R_0 S_0)$$

Where additionally:

i_0 = Construction interest rate
 B_0 = Number of years of construction (weighted to reflect effective loan amount)
 T_0 = Property taxes as a % of construction cost and land cost (weighted to reflect multiple periods as appropriate)
 Z_0 = Initial rent-up and marketing costs as well as holding costs during rent-up and marketing, as a percent of property value (reflects revenue not realized in case of rentals and delay in realization of revenue in case of for sale space)

The formula for Y_r is similar. No differentiation is made in marketing, rent-up and holding costs between rental and for-sale housing, although such adjustment is easy to make if desired.

The model just described is a fully integrated, pre-tax valuation model based upon multiplier factors, which are intended to reflect market behavior in the form of capitalization rates. Since such a model will likely be more often used for large development projects than for small ones, the associated substantial dollar size of investment suggests that such projects will most probably attract institutional investors, particularly pension funds and foreign investors, who will likely invest on an all-equity basis. In the case of pension funds, an all-equity investment negates tax considerations. At the same time, it is suggested that the analyst using the subject model can make appropriate allowances for tax considerations in the selection of his multiplier values. A preference for a more direct approach to valuing the tax factor can be accommodated relatively easily

since the primary tax factor in question is the right to take depreciation deductions. To the extent greater detail is desired, the model can be appropriately modified.

As with any model, the output can be no better than the quality of the input. It is suggested that particular emphasis be directed to verifying the reasonableness of assumptions regarding costs and revenues. If the market is unwilling to consume space or to proffer services at the prices and costs assumed, the model will be for naught. Indeed, these are the very conditions that lead to problem real estate ventures with associated foreclosures and bankruptcies.

DESCRIPTION OF THE MODEL

Of the some thirty plus variables in the model, not more than half are specified by the project participants. Consequently, the remaining factors must be estimated. Rather than viewing this condition as a deficiency of the model, it should be recognized that it in fact is a fundamental strength of the model. The flexibility of the model facilitates testing various sets of assumptions as well as the sensitivity of important assumptions in alternative development programs. This model can be effectively used to show impact of changing planning controls, and cost-revenue relationships on overall project value.

The ultimate use of this model is to generate overall guidelines for assessing development projects and to test various proposals. To reach this goal requires further specificity of objectives as well as increased sophistication of the model. The extra input needed can be of considerable importance, however, since it makes it possible to evaluate several different assumptions. Particularly desirable is the addition of probabilities to reflect ranges of values for key items. This is essential because the present assumption of certain items being fixed is unrealistic. The values for operating economics—especially effective revenues—need to be manipulated to reflect the different possible outcomes. At the same time, great care must be devoted to determining the goals and values which underlie the planning controls.

Values for the different components of the model, including both those specified by the municipality as well as those assumed for purposes of illustration are presented in *Exhibit 2*. In *Exhibit 3* the result of using these assumptions in the model is shown.

Based on these values, the total project has an overall deficit of \$7,451,000. While the value of office space exceeds the costs incurred to create it, this surplus value is more than offset by the significant deficit resulting from the fact that the residential space costs much more to create than it generates in revenue. Residential development is not inherently uneconomic; here the space is purposely priced below the market so as to subsidize the housing needs of those unable to pay market rates for the quality of housing that is to be provided in this project. At the same time, it must be recognized that development economics today do not favor new projects.

EXHIBIT 2

STANDARD ASSUMPTIONS USED IN MIXED USE DEVELOPMENT FINANCIAL FEASIBILITY MODEL

E_r	= .5	Q_o	= 12
M_r	= 10	F_o	= 5*
M_o	= 10	P_r	= .5*
E_o	= .5	N_r	= 1000*
R_o	= \$10*	L_r, L_o	= 120,000*
R_r	= \$2*	G_r	= 21,000*
S_o	= 1,500,000*	A_r	= 1000*
S_r	= 500,000*	U_r	= 40*
K_o	= \$30	J	= 40*
K_r	= \$20	i_o, i_r	= .1*
O_o	= 2*	B_o, B_r	= 1
I_o	= 43,560	T_o, T_r	= .04
H_o	= 120*	Z_o, Z_r	= .1

*Note—Specified by municipality; others assumed for purposes of illustration. These assumptions are intended merely to show the application of this model, as they are materially different from costs and prices.

Among the alternative assumptions that can be considered are increasing the amount of office space, eliminating rental housing, eliminating for-sale housing, increasing the net income multiplier, decreasing the size of residential units, and increasing the amount of residential space. The implications of manipulating these primary variables are shown in *Exhibit 4*. Changes in space size do not materially improve the project value, reflecting that the basic revenue-cost relationship does not feature meaningful quantity elasticity. Changes that involve manipulation of size, thereby effecting both revenue and cost, result in less overall impact than those which adjust only one element of the equation. Not surprisingly, the rental housing is less efficient in an economic sense than the "for-sale" housing. In fact, the rental rate for residential space must be increased from the stipulated \$2 per foot to \$6.94 per foot, if it is to be economically self-sufficient. Similarly, the selling price of "for-sale" units must be raised from the specified \$21,000 level to \$32,220.

Reviewing standard assumptions for the values of various components in the model, it is possible to isolate certain critical economic relationships. Among the significant economic relationships of the data used in this illustration are the following:

- 1) *Density*—While planning parameters allow a five-floor-area ratio for commercial development, the equivalent allowed floor-area ratio for residential units is approximately 1, based on a limit of 40 units per acre and assuming an average unit size of somewhat more than 1,000 feet. The effect of this difference is to reduce on a per rentable foot basis the cost of land for commercial uses as compared to residential.

EXHIBIT 3

APPLICATION OF STANDARD ASSUMPTIONS TO MIXED USE DEVELOPMENT FINANCIAL FEASIBILITY MODEL

1	$S_2 \left[R_2 M_2 (1 - \alpha_2) (1 - R_2) - (1 - \alpha_2) + (1 - R_2) + R_2 \right]$	$(R_2 - R_2) + \left[R_2 M_2 (1 - \alpha_2) (1 - R_2) + \left(\frac{1 - R_2}{R_2} \right) \right]$	$- (1 - \alpha_2) + (1 - R_2) + R_2$	$= 0$
2	$1,500,000 \left[(1 - \alpha_2) (1 - \alpha_2) - (1 - \alpha_2) + (1 - R_2) + R_2 \right]$	$+ \left(\frac{1,500,000}{R_2} \right) (1 - \alpha_2) + 1,500,000 \left[(1 - \alpha_2) (1 - R_2) + \frac{1 - R_2}{R_2} \right]$	$- (1 - \alpha_2) + (1 - R_2) + R_2$	$= 0$
3	$1,500,000$	$+ 1,500,000$	$= 3,000,000$	$= X + 1,500,000$
4	$1,500,000$	$+ 1,500,000$	$= 3,000,000$	$= X + 1,500,000$
5	$2,550,000$	$+ 1,500,000$	$= 4,050,000$	$= X + 1,500,000$
6	$1,500,000$	$+ 1,500,000$	$= 3,000,000$	$= X + 1,500,000$
7	$1,500,000$	$+ 1,500,000$	$= 3,000,000$	$= X$

EXHIBIT 4

SUMMARY OF PROJECT VALUES UNDER ALTERNATIVE ASSUMPTIONS

Description of Assumptions	Value of Revenue from Office Space	Construction Cost of Greater Office Space	Cost of Office Space Land	Value of Revenue from Residential Space	Construction Cost to Greater Residential Space	Cost of Residential Space Land	Net Project Value	Cost of Public Land	Project Surplus (Deficit)
	$S_o (K_o M_o) (1-E_o) (1-E_r) [1]$	$S_o (1.265 + 1.8_o B_o + T_o) K_o (1+T_o) (W_o L_o)$	$(1+T_o) (W_o L_o)$	$S_r [K_r M_r (1-E_r) (P_r - Z_r) + (\frac{1-P_r}{N_r}) C_r]$	$S_r (1.265 + 1.8_r B_r + T_r) K_r (1+T_r) (W_r L_r)$	$(1+T_r) (W_r L_r)$	$X + [1.5 (1-W_r)]$	$1.5 (1-W_r)$	X
(1) Standard Assumptions-- 1,500,000 feet of office space	67,500,000	- 63,225,000	- 1,719,600	+ 7,250,000	- 14,950,000	- 1,560,800	+ 5,804,600	- 1,646,400	+ 7,451,000
(2) Standard Assumptions-- 2,000,000 feet of office space	89,000,000	- 84,700,000	- 2,140,800	+ 7,250,000	- 14,950,000	- 1,560,800	+ 5,804,600	- 1,646,400	+ 5,057,600
(3) Standard Assumptions-- 2,500,000 feet of office space	110,500,000	- 105,375,000	- 2,561,600	+ 7,250,000	- 14,950,000	- 1,560,800	+ 5,804,600	- 1,646,400	+ 3,853,400
(4) Standard Assumptions-- 3,000,000 feet of office space	132,000,000	- 126,450,000	- 2,982,400	+ 7,250,000	- 14,950,000	- 1,560,800	+ 5,804,600	- 1,646,400	+ 2,649,200
(5) Standard Assumptions-- 1,500,000 feet of office space $P_r = 1.0$ (all residential space rented)	67,500,000	- 63,225,000	- 1,719,600	+ 4,900,000	- 14,950,000	- 1,560,800	+ 3,334,600	- 1,646,400	+ 1,748,000
(6) Standard Assumptions-- 1,500,000 feet of office space $P_r = 0$ (all residential space sold as condominiums)	67,500,000	- 63,225,000	- 1,719,600	+ 20,500,000	- 14,950,000	- 1,560,800	+ 20,554,600	- 1,646,400	+ 19,908,000
(7) Standard Assumptions-- 1,500,000 feet of office space $M_o M_r = 12.5$ (lower capitalization rate assumed to value project income)	84,375,000	- 63,225,000	- 1,719,600	+ 7,250,000	- 14,950,000	- 1,560,800	+ 11,570,400	- 1,646,400	+ 9,924,000
(8) Standard Assumptions-- 1,500,000 feet of office space $A_r N_r = 800$ (average size of residential units reduced from 1000 feet to 800 feet)	67,500,000	- 63,225,000	- 1,719,600	+ 7,435,000	- 14,950,000	- 1,451,200	+ 6,384,400	- 1,210,800	+ 7,651,600
(9) Standard Assumptions-- 1,500,000 feet of office space 750,000 feet of residential space	8,000,000	- 63,225,000	- 1,719,600	+ 11,142,500	- 14,950,000	- 1,446,000	+ 9,707,500	- 46,400	+ 9,661,100
(10) Standard Assumptions-- 1,500,000 feet of office space 1,000,000 feet of residential space	17,500,000	- 63,225,000	- 1,719,600	+ 14,472,500	- 14,950,000	- 1,446,000	+ 13,794,500	- 146,400	+ 13,648,100
(11) Standard Assumptions-- 1,500,000 feet of office space 1,500,000 feet of residential space	27,000,000	- 63,225,000	- 1,719,600	+ 17,802,500	- 14,950,000	- 1,446,000	+ 17,354,500	- 1,110,800	+ 16,243,700

* Positive value for public land indicates that the amount of land required for the designated assumptions exceeds that which is available. This can be resolved by making more land available, increasing density or reducing space until equilibrium is achieved.

- 2) *Rentable Space*—The commercial element has approximately three times more rentable space than does residential. This is premised upon some 1,500,000 square feet of commercial space, reflecting six years demand of 250,000 square feet per year, as compared to approximately 500,000 square feet residential space, based on some 500 units of approximately 1,000 square feet each.
- 3) *Revenue*—Commercial space generates approximately five times the revenue per rentable space as does residential. Whereas the commercial space is projected to rent for approximately \$10 per foot, the residential rate is approximately \$2, reflecting approximately 16¢ per foot monthly rents. Assuming similar ratios of expenses, vacancy, and reserves to revenues, the net operating income per foot for commercial space will be five times that for residential.
- 4) *Construction Costs*—Construction costs for commercial space exceed those for residential space. The precise measure of this relationship depends upon a number of factors, some of which are controllable and others of which are not.
- 5) *Tax Considerations*—Residential space enjoys more favored tax treatment than commercial space in that double declining balance depreciation may be elected for the former while the latter is limited to 150% declining balance depreciation. As an offset, though, it should be remembered that commercial space, because of its higher density pattern, enjoys a higher ratio of depreciable assets to total project cost than does residential space.

CONCLUSION

As suggested, the model described here is a tentative means of assessing mixed use development projects. It is suggested that the overall surplus or deficit is determined by the combined surpluses or deficits of the component parts of the total project. In the situation examined here, the project surplus or deficit for office space is defined as the value of revenue per foot (the capitalized net income less marketing and holding costs), less the costs to create the space (the construction cost inflated by a factor to reflect C & D profit as well as interest and property taxes during construction), less the cost of the land and its related holding costs during construction. Similarly, the project surplus or deficit for residential space is defined as the value of revenue per foot from both leasing (the capitalized net income less marketing and holding costs) and sales (the selling price per unit times the number of units), less the costs of creating the space (construction cost inflated by a factor to reflect a C & D profit as well as interest and property taxes during construction), less the cost of the land and its related holding costs during construction.

Study of the valuation model can yield insights into the significant economic relationships between cost and revenue factors. This model allows the planner to determine the economic impact of specific controls and enables the private sector participants to precisely "price" various features of the project. With properly considered objectives, such a model can contribute to more rational land use and development decisions.

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The Pictorial Housing Survey: A New Method of Measuring Housing Quality

By Leonard V. Zumpano and Edward R. Mansfield

Despite the significant increase in the quantity of housing data now available, problems of data comparability and the paucity of housing information at the local and neighborhood levels continue to hamper housing research efforts and community development planning. The purpose of this paper is to inform readers about a new method of measuring local housing conditions developed for the Texas Department of Community Affairs and, more importantly, to report on the reliability and applicability of the technique for other communities.

LIMITATIONS OF EXISTING SOURCES OF HOUSING DATA

For over 30 years, the decennial Census of Housing had been the only source of housing statistics. Consequently, little information was available with which to assess changes in the nation's housing stock or evaluate the effectiveness of on-going housing programs during the years between census publications. With the introduction of the Annual Housing Survey in 1973, however, this sizeable gap in our statistical knowledge has been substantially bridged. Through such publications as *Current Housing Reports* and *Construction Reports*, housing analysts and researchers now have more information at their disposal than ever before.¹ This is not to say, however, that data problems no longer persist. The lack of statistical continuity and definitional differences among these reports makes time

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series or temporal comparisons not only difficult, but subject to serious misinterpretation.

Although the Bureau of the Census, the source for most of our housing data, presents various statistics for evaluating the condition or quality of the nation's housing, the census no longer defines quality. Past difficulties with attempts to arrive at universally acceptable definitions² (the 1950 and 1960 Census of Housing) have led to enumeration of those physical characteristics (i.e. plumbing facilities, number of rooms, types of heating systems, etc.) that can be measured with some degree of accuracy. Tabulations of neighborhood conditions, such as noise levels, adequacy of public services and the like, are included in the Annual Housing Survey, but there is significantly less respondent agreement on these aspects of housing quality (Bureau of the Census, 1976). Effectively then, it is left to the users of these reports to interpret these "broad indicators" as best they can in order to arrive at some understanding of the conditions that currently prevail in the housing market. Although this is not necessarily an insurmountable obstacle, revisions, modifications, and definitional differences among these various reports render much of the data non-comparable.³ Consequently, conclusions drawn from such data could prove erroneous.

Another problem confronting users of Census Bureau reports is that not enough of the annually published data are sufficiently disaggregated to permit detailed investigation of local and neighborhood housing conditions. In light of the new focus of federal housing assistance programs which now require local officials to identify community housing problems and implement workable solutions, ready access to such local data takes on added significance. Up until quite recently, however, there were no satisfactory ways to ascertain local housing needs which did not entail expensive and time consuming on-site inspections by local housing officials.

Because of these inadequacies, the state of Texas initiated a research effort for the development of an inexpensive, quickly administered, and reliable method of assessing local housing conditions. The result of this research is the *Texas Pictorial Housing Survey*, a technique that is currently being employed successfully by the Dallas Department of Housing and Urban Rehabilitation in the preparation of annual applications for community development block grant funding and for targeting neighborhoods eligible for rehabilitation and low-cost home improvement loans (Schwabe, 1978).

DESCRIPTION OF THE PICTORIAL HOUSING SURVEY

The pictorial housing survey⁴ represents an innovative departure from previous approaches to measuring housing conditions and is unique in two important respects. First, the enumerator is not required to make an overall quality judgment of the dwelling unit being surveyed. Rather, the enumerator is only required to observe and then individually rate on a scale of 1 to 7 ten separate characteristics of the housing unit. These individual characteristics are then weighted and summed to produce an

overall composite character rating, *W*, during the data processing stage.⁵ Not only does this procedure minimize the tasks of the enumerator in the field, but it is also presumed to lead to more consistency among observers by obviating the necessity of summary value judgments. The weights are scaled such that the composite *W* scores range from 1 to 7, which coincide with the rating scale for the individual character components.

The second unique aspect of the housing survey is the criteria by which individual housing components are judged. When rating an individual component of a house, such as a roof, the enumerator does not compare the roof in question to semantic concepts such as "sound" or "deteriorating." Rather the enumerator, equipped with a booklet of photographs, compares the roof under investigation to a series of pictures which depict a range of various roof conditions. Three sets of photographs are arranged in descending order from "2" (best pictorial condition), to "6" (worst pictorial condition). Interpolation between sets of pictures generates the seven-point value scale. In other words, the seven-point scale is referenced by sets of photographs at points 2, 4, and 6 on the scale.

If an observed characteristic of the house being rated looks better than the photographs corresponding to 4, but not as good as the photographs corresponding to 2, then the enumerator would score the component as a 3. Such interpolation is intentional and affords the field worker realistic latitude in rating the physical characteristics of a dwelling unit when the reference photographs do not exactly coincide with an observed characteristic. Sets of pictures, rather than just one photograph, are employed at each point to portray the same physical condition in order to make the pictorial survey inclusive enough to cover situations where housing styles, construction methods, and building materials differ.

The ten housing characteristics included in the pictorial survey are:

- 1) Neighborhood appearance
- 2) Appearance of property boundaries (i.e. sidewalks and curbs)
- 3) Appearance of lawn and shrubs
- 4) Condition of the roof
- 5) Condition of interior wall surfaces
- 6) Condition of porch (if any) and front entryway
- 7) Condition of doors and door trim
- 8) Condition of windows and window trim
- 9) Evidence of electricity
- 10) Evidence of plumbing

The last two characteristics, electricity and plumbing, are scored only as being present or absent and assigned a value of 1 or 7, respectively.

In order to assess the usefulness of the pictorial housing survey, two questions must be answered. First, is it reliable? Will replication of the survey procedure by different enumerators yield substantially the same results? Secondly, what is actually being measured by the numeric ratings and how should the composite score be interpreted? Preliminary testing of the pictorial housing survey directed at obtaining answers to these questions has been quite promising.

FINDINGS

Reliability of Measurement

One of the major problems the Bureau of the Census encountered using semantic survey techniques to evaluate the quality of housing was the inconsistency in enumerator quality ratings, especially with respect to the identification of substandard dwellings. Follow-up studies after the 1950 and 1960 Census indicated that of all the dwellings classified as dilapidated by post census enumerators, less than 50% (48% in 1950 and only 38% in 1960) had been similarly characterized by the original enumerators (Social and Economic Statistics Administration, Bureau of the Census, 1972).

In order to test the reliability of the pictorial housing survey, the study reported here (Schucany, Mansfield, Woodward, and Hess, 1978) administered the pictorial survey on a randomly-selected sample of dwellings in Dallas, Texas. Because the identification of substandard housing conditions is one of the major concerns of housing officials, the study incorporated a disproportionally large number of low-quality housing units by limiting the sample areas to old, low-income neighborhoods.

In order to include a sufficiently large number of houses and field workers, and still remain within the economic constraints of the study, a balanced, incomplete block design was used. The objective was to estimate the amount of variation in the scores given to a house by the population of field workers. The specific design used 105 houses and 21 field workers. Each house was evaluated by five field workers who each rated a total of 25 houses. This design has the property that each pair of enumerators would rate a common dwelling five times.

A particular evaluation was modeled as:

$$W_{ij} = \mu + \beta_i + \alpha_j + \epsilon_{ij}$$

where W_{ij} is the composite score given to the j th house by the i th field worker, μ represents the mean score for all dwellings, β_j is the effect of the particular house being rated and α_j gives the additive contribution to the score attributable to a particular field worker. The means of the populations of all β_j and all α_j are zero. The last term, ϵ_{ij} , represents the random error or unexplainable effect.

The estimates of the variance components of this random-effects model provide information about the reliability of the pictorial housing survey. The actual estimates of the variances of the three terms in the model are given below.

TABLE 1
ESTIMATED VARIANCE COMPONENTS FROM BIBD

<u>Effect</u>	<u>Estimated Variances</u>
Due to different houses	.4186
Due to different field workers	.0653
Due to random fluctuations	.1933

The relatively large value of the variance due to different houses is indicative of the substantial cross-section of the housing stock captured in the sample and reflects the different housing conditions encountered and identified by the enumerators. In contrast, the small estimated value of the variance due to field workers shows that enumerator eccentricities played a very small part in the determination of the final quality ratings of the dwelling units.

The best assessment of the validity of the pictorial housing scales is the standard deviation of the measurement of the condition of a particular housing unit. This value is a combination of the variation due to field workers, α_j , and the variation due to unexplained sources, ϵ_{ij} . The point value of this estimator is $\sqrt{.0653 + .1933} = .5086$ (a 95% confidence interval is .4610 to .5617). This suggests that one would expect a single measurement of the condition of a given dwelling to be within one unit of the real condition (i.e. $\mu - \beta_j$) of that unit.

Validity of Measurement

The validity of the pictorial housing survey was investigated by comparing the composite W scores with professional housing inspectors' reports on a sample of 566 single family and duplex housing units in Dallas, Texas (Schucany, Mansfield, Woodward, and Hess, 1978). The housing inspections, filed by experienced housing inspectors of the Dallas Department of Housing and Urban Rehabilitation, characterized each sample unit as either in good condition (no repairs or only minor repairs needed) or in substandard condition (needing major repairs or dilapidated). Non-professional personnel, trained by the Dallas Department of Housing and Urban Rehabilitation, administered the pictorial survey.

A contingency table analysis was performed with the W scores categorized into seven groups and cross tabulated with the dwelling unit's condition, as reported by the housing inspectors. *Table 2* illustrates the ranges of the seven W categories as well as the cell frequencies and marginal totals. *Table 2* indicates that as the W score increases, the number of dwelling units rated in good condition by housing inspectors decreases. Only 3% of the dwelling units deemed in poor condition have a W score as low as 2.5. In contrast, almost 70% of the units with W scores of 5 or greater were rated

TABLE 2
COMPARISON OF PICTORIAL SCALE AND
HOUSING INSPECTOR RATINGS

Condition of Housing Unit	W Score							
	1.0- 2.5	2.5- 3.0	3.0- 3.5	3.5- 4.0	4.0- 4.5	4.5- 5.0	5.0- 7.0	
Satisfactory	97	118	104	86	33	23	7	467
Substandard	3	10	20	26	12	12	15	98
	100	128	124	112	45	35	22	566

substandard. It can be easily seen that there is indeed a definite relationship between W scores and the condition of dwelling units sampled in Dallas, and that the pictorial survey is able to discriminate among dwellings on the basis of physical condition.

THE USES AND LIMITATIONS OF THE PICTORIAL HOUSING SURVEY

Time, Cost Advantages

Preliminary testing and actual field use in Dallas have shown the pictorial survey to be a reliable and valid method of ascertaining local housing conditions. Because it can be quickly and easily administered by non-professionals such as college students and local residents seeking part-time or temporary employment, the pictorial housing survey offers considerable cost saving advantages over traditional survey methods which require the services of highly-trained housing inspectors. Equally important, skilled manpower thus freed could be assigned more complex and demanding tasks where their skills could be employed more productively.

Program Implementation

The pictorial housing survey can be of invaluable assistance in the design and implementation of locally-initiated housing assistance programs. The numeric scale, which ranks dwelling units by their physical condition, would enable housing officials to not only identify neighborhoods with high concentrations of substandard housing but also determine the relative severity of these conditions. In this way, the pictorial survey can be used to formulate housing policy priorities and allocate funds to those neighborhoods where housing problems appear most severe.

Program Assessment

As part of a comprehensive community development program, the pictorial housing survey can help policymakers monitor annual changes in the condition of their community's housing stock and thereby provide important feedback with which to assess the operational effectiveness of ongoing housing assistance programs. In this regard, the city of Dallas administers the pictorial housing survey in conjunction with a citizen profile, which gathers socio-economic and demographic data on city residents who reside in surveyed dwellings. The citizen profile also samples citizen satisfaction with public services and their assessment of various housing policies. Survey results are then used to modify or re-design public policies found to be ineffective.

For example, when the results of a recent survey indicated that residents were extremely concerned about the overall appearance of their neighborhoods, the city responded by re-directing local and revenue sharing funds to up-grade housing code enforcement and develop a home repair training program.⁶ When another survey showed greater citizen demand for street lighting in neighborhoods than on major thoroughfares, city officials de-

cided to reduce thoroughfare lighting, found to be redundant, and increase neighborhood lighting. The city, as a result, was able to reduce operating costs by \$100,000. Equally important, the next year's citizen profile indicated a marked increase in citizen satisfaction with neighborhood lighting conditions (Schwabe, 1978). In fact, because of such successes the city now, as a matter of course, incorporates the results of both the pictorial housing survey and the citizen profile directly into the annual budgetary process in order to help determine future expenditure allocations (Schwabe, 1978).

Initial Screening Tool

The pictorial housing survey will not substitute for detailed housing inspections directed at housing code enforcement or the detection of code violations. However, as a preliminary screening device, the pictorial housing survey can serve as an initial cost-saving step in the inspection and code enforcement process. By identifying those housing units most likely to fail city housing standards, it would obviate the need for a more detailed and time-consuming 100% inspection of all the dwelling units within neighborhoods designated for concentrated code enforcement. A suggested procedure would be to administer the pictorial survey on all the housing units within a subject neighborhood. Next, select a threshold W value and inspect only those dwellings units whose pictorial scores exceed this cutoff value. The threshold W score chosen would depend upon the degree of detection desired relative to the amount of time and money available for detailed inspections.

As an example, we can use the sample of 566 dwelling units in Dallas to illustrate the procedure. If a threshold score of 3 were chosen, only 60% of the dwelling units would have been inspected (those units with composite W scores of 3 or greater) but almost 90% of the units rated as substandard by housing inspectors would have been detected. A complete inspection of all units would have done little to improve the degree of detection, but would have involved significantly greater cost.

Multi-Family Unit Use

The applicability of the pictorial survey to multi-family dwellings remains indeterminate. Although the original Dallas housing sample included multi-family units, their number was too small to allow any meaningful statistical analysis. While the pictorial survey may validly discern the condition of apartment units, it is also not unreasonable to conjecture that the exterior appearance of these dwellings would not be as indicative of interior condition as would be the case with single-family homes. Alternatively, it is also possible that exterior physical characteristics, other than those included in the photographic portfolio, may be superior discriminators of multi-family housing conditions. Additional field testing and analysis, however, is needed before definitive answers to these questions can be attained. Certainly the encouraging test results so far achieved, and the successful operational use of the pictorial housing survey in Dallas, justifies continued research in these areas.

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4. The pictorial housing scale was developed by Curtiss C. Grove, Grove and Associates, Inc., Dallas, Texas.
5. The composite character rating, W, is the first principal component which consists of the linear combination of the ten individual rating characteristics, which account for more of the variance in the data than any other linear combination.
6. This information was obtained from a case study of Dallas, Texas, prepared by Charles J. Schwabe. The case study was developed through a contract with the Office of Policy Development and Research, U.S. Department of Housing and Urban Development, and conducted jointly by the International City Management Association and the American Institute of Planners.

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Path Analysis and the Need for an Alternative Approach to the Investigation of Redlining

by *Jon R. Crunkelton and Franklin J. Ingram*

INTRODUCTION

At the time our national housing goal was articulated over a quarter century ago, an estimated six million Americans were ill-housed. Ironically, after the passage of nearly three decades and the expenditure of billions of dollars of public and private funds to improve housing conditions, the latest estimate of the number of Americans still lacking a decent home and living environment remains at or slightly above that six million level, indicating no absolute improvement.¹ Under such conditions, the prevention of unjustified withholding of mortgage loans from declining neighborhoods is important if progress is to be made. However, it is equally important to prevent the dissipation of scarce capital in home loans that are likely to go into default.

The ways in which the issue of "redlining" has been defined heretofore have been as varied as the viewpoints of the interested parties. For the purposes of this discussion, "redlining" is taken to be the alleged practice by financial institutions of prior designation of certain neighborhoods within an urban real estate market in which mortgage loans will not be made when risk differentials do not justify such action. This definition includes making the terms of such loans so unappealing that housing loans become

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effectively unobtainable. The great difficulty, and the source of most of the contention surrounding the redlining issue, is differentiating between discrimination and sound business judgment in the mortgage lending practices of financial intermediaries.

PURPOSE

The primary purpose of this analysis is to demonstrate in a rigorous manner that the existence of redlining and other forms of mortgage lending discrimination have, as yet, not been satisfactorily established. No attempt is made to model redlining because, as will be indicated, much data collection and study remain to be done before the presence of redlining can be objectively determined. In accomplishing this purpose, a research methodology known as path analysis is employed. Path analysis lends itself to consideration of the complex of interrelationships among variables that are relevant to the urban real estate environment.

BACKGROUND

To carry out the objective of the study, research was conducted to secure data from each institution covered by the Mortgage Disclosure Act with offices in a particular medium-sized, growing, southern SMSA (Standard Metropolitan Statistical Area). The original survey included the four largest savings and loan associations and the four largest commercial banks in that SMSA.

At each institution, a copy of its disclosure statement was requested and voluntarily provided. *Exhibit 1* summarizes the disclosure report forms of the four savings and loan associations and two commercial banks whose

EXHIBIT 1 TEST SMSA FINANCIAL INSTITUTIONS MORTGAGE LENDING July 1-Dec. 31, 1976

Area	Population	% Black (PB)	Median Family Income (MFI)	% Sub- Standard Housing Units (PSHU)	Single Family Mortgages		
					Number	\$ Amount	Mortgage Loans Per Thousand Population (MLPT)
Central City	113,542	30%	\$7,612	3%	184	\$ 5,603,000	1.6
Balance of Urban Area	120,326	33	\$9,170	5	439	15,341,776	3.6
Urban Sub-Total	233,868	31	\$8,542	4	620	20,944,776	2.7
Suburban Sub-Total	89,012	13	\$8,756	4	533	16,163,995	6.0
SMSA Totals	322,880	26	\$8,617	4	1156	37,108,771	3.6

Note: Columns may not add to totals and sub-totals due to rounding.

primary service areas covered both the central city and the suburban ring. *Exhibit 1* also includes census data considered relevant to the analysis.

THE AVAILABLE EVIDENCE

A wide range of redlining studies has been undertaken in recent years by states, communities, and public interest groups. While space limitations do not allow a thorough review of all these efforts, the interested reader is referred to the Urban-Suburban Investment Study Group's recent summary report produced for the Department of Housing and Urban Development.² The important point is that included in that report is a critique of the redlining literature in which two researchers in the field, Agelasto and Listokin, conclude that "the (available) studies of redlining commence with an expressed bias against lenders . . . and prejudge the banks to be arbitrary and discriminatory, and search for evidence to prove this view. Other drawbacks . . . are that they are often isolated, have limited analysis, and contain questionable assumptions. . . ."³

Agelasto and Listokin also question the assumption of certain studies which contend that a low or reduced volume of loans in a particular neighborhood is evidence of discriminatory lending patterns. Instead, they suggest that a limited volume of loans might be a function of risk factors or demand. Moreover, as Brimmer points out in his review of the redlining debate, there is ample indication of substantially greater risks in central city—as compared with suburban—mortgage lending. Brimmer notes, for example, that a seven-year (1968-1974) study of minority group-owned financial institutions turned up the following facts:

- 1) Minority-owned associations hold a somewhat larger fraction of their assets in a combination of cash, demand deposits, and investment securities. (In 1974, the figures were 10.3% in minority associations and 9.4% for white-owned associations).
- 2) The ratio of mortgages to total assets was lower at minority-owned associations—79.9% versus 81.5% for white-owned associations in 1974.
- 3) Conventional mortgages represented a smaller fraction of total mortgages (88.0%) at minority-owned institutions than at their white counterparts (93.9%) in 1974. In contrast, VA-guaranteed and FHA-insured loans represented 12.0% of total mortgages at minority-owned associations versus 6.1% at those controlled by whites.
- 4) Foreclosed real estate (reflected in properties owned and in judgment plus loans and contracts to facilitate sale) represented 2.0% of total outstanding mortgages at minority-owned institutions in 1974, compared with 0.5% at white-controlled associations.

These data suggest an important conclusion: minority-owned depositories, which concentrate on inner-city lending and which cannot be accused of practicing racial discrimination, face substantially more risk of loss than do their white counterparts. Consequently, these minority-owned institutions seek to avoid or minimize such risk by a cautious lending posture (reflected in a fairly high liquidity ratio) and by relying much more heavily on mortgages underwritten by the federal government.

The first official recognition of the practice of discriminatory mortgage lending by financial institutions came as recently as 1974 when an Ohio couple successfully sued a Cincinnati savings and loan association under the Civil Rights Act of 1968 for redlining the racially-mixed Avondale section of that city.⁵ This case, along with mounting pressure from around the nation, spurred Congress to pass the Mortgage Disclosure Act of 1975 in which all depository institutions that make mortgage loans in SMSAs are required to report their mortgage lending activity by census tracts. As the data generated under this law have not as yet been fully gathered and summarized, the existing evidence is entirely local in nature.

All the studies in the literature possess at least one of the following serious deficiencies:

- 1) They ignore or assume away the interrelationships among the causal factors.
- 2) They fail to take demand into account explicitly.
- 3) They do not give risk factors adequate consideration.

In spite of these shortcomings, most of the studies conclude that urban financial institutions do practice redlining. The result has been a spate of laws and government regulations which are rapidly institutionalizing costly anti-discrimination mechanisms which lend themselves to misinterpretation and fail to generate the data required for a completely unambiguous statistical screening device.

THE CONVENTIONAL WISDOM

A simplistic analysis of the data in *Exhibit 1*, of the type that has become traditional among local government agencies and/or public interest groups, might lead to the conclusion that there is strong evidence to suggest both geographic and racial discrimination on the part of the banks and savings and loan associations studied. The data reveal the following preliminary results on apparent lending discrepancies between the central city area vis-a-vis the suburbs:

- 1) Residents of census tracts within the central city district received 16% of the mortgage loans made during the period, although 35% of the sample SMSA's population resided in this area.
- 2) The balance of the urbanized area accounted for 38% of the mortgage loans and 37% of the population.
- 3) Individuals financing homes in suburban neighborhoods attracted 46% of the mortgages, although only 28% of the population resided in such areas.

With respect to the racial undertones which are an important aspect of the redlining question, the following relationships are revealed by the analysis:

- 1) Residents of predominantly black neighborhoods received only 3% of the mortgage loans made by the sample SMSA's financial institutions during the period, although 19% of the population lived in these neighborhoods.
- 2) The correlation coefficient (r) between the percentage of blacks in a neighborhood and the number of mortgage loans was $-.33$, which implies that there is a statistically significant (at the 99+% confidence level) inverse relationship between minority concentration and mortgage lending.

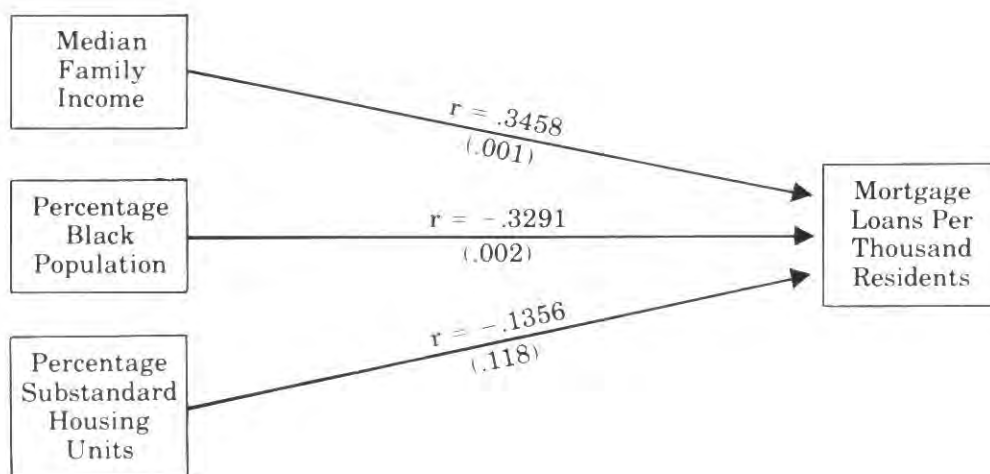
Ignoring the critical interrelationship problem, these factors could be interpreted as an indication of a clear pattern of discrimination in mortgage lending by the area's depositories.

However, lending institutions have contended that among the variables considered in this study, family income is the major criterion in mortgage loan evaluation. The correlation between median family income and the number of mortgage loans made in a neighborhood was $+.35$, which implies that a positive, statistically significant (at 99+% confidence level) relationship does exist between the two factors. Furthermore, investigation of the interdependence between percent substandard housing within a census tract and mortgage loans showed a correlation coefficient of $-.14$, which indicates a statistically significant (at the 88% confidence level) inverse relationship.

Thus, one might argue that racial discrimination in housing finance exists because of the negative correlation between racial composition and loans extended. But at the same time, lending institutions could just as easily maintain that family income is the primary consideration, rather than race, basing their assertion on the positive correlation between income and mortgage loans. Additionally, a case could be made for the presence of discrimination due to the correlation between the quality of housing stock and mortgage lending volume. All these relationships and the relevant correlation coefficients are depicted in *Exhibit 2*. The problem with these arguments lies in the fact that each ignores or assumes away the influence of demand, risk, and the complex interdependencies among the variables.

The correlation coefficients shown in *Exhibit 2* are an index of the direction and magnitude of a relationship between two ordered sets of variables.

EXHIBIT 2



Note: Numbers within parentheses indicate level of significance and r correlation coefficient.

However, this relationship consists of both the direct effect of the variable taken as causal and also the indirect effect through other variables. What is needed to rigorously demonstrate the internal weaknesses and methodological problems of the bulk of the studies that claim to prove the existence of redlining is a method of decomposing and isolating linear relationships among a set of variables. Path analysis is such a method.

PATH ANALYSIS

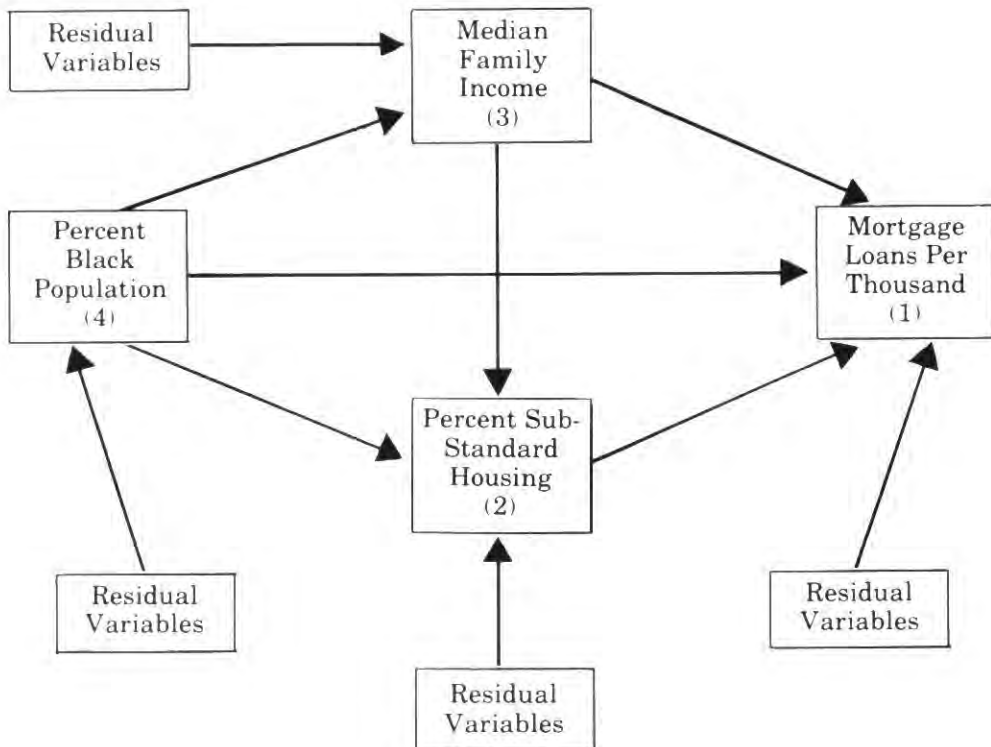
Path analysis is a technique used to study the direct and indirect effects of causal (or independent) variables on variables taken as effects (or dependent variables). This methodology is applied to an explanatory model which has been formulated on the basis of knowledge and theoretical considerations. Path analysis is utilized for testing cause and effect relationships in a formulated theory, rather than in the generation of the theory.⁶ The method dichotomizes the correlations between variables into direct and indirect effects. However, path analysis is not a procedure for demonstrating causality; rather, it is a method for tracing out the implications of causal relationships which the analyst is willing to impose upon a system of relationships.⁷

Path analysis is used in this study specifically to divide correlations into direct and indirect effects, but the technique is also an important analytical tool for theory testing. Kerlinger and Pedhazur⁸ show that path analysis can be used to determine whether or not a pattern of correlations for a set of observations is consistent with a specific theoretical formulation by attempting to use the path coefficients to reproduce the original correlation matrix (R) for all the variables in the system. If a researcher proposes a more parsimonious model he, in effect, deletes some of the paths on the theory that the correlation between the variables is due to the indirect rather than the direct effects. Kerlinger and Pedhazur show that if, after the deletion of these paths, it is possible to reproduce R, or closely approximate it, the pattern of correlations in the data is consistent with the simpler model. For further insight into alternative uses of path analysis, the interested reader is referred to the Kerlinger and Pedhazur text.⁹

However, the objective of this paper is to study the relationships among redlining variables. While partial and semi-partial correlation analysis could also be used for this purpose, path analysis is especially appealing as it lends itself to the use of diagrams, thus facilitating understanding.

To demonstrate how the use of path analysis can divide a correlation into both direct and indirect effects, thereby adding more reality and clarity to the study of redlining, the model outlined in *Exhibit 3* was formulated. Mortgage Loans Per Thousand (MLPT) is hypothesized to be dependent upon the following three variables for which data are available from the decennial census: Median Family Income (MFI), a proxy for default risk; Percentage Black population (PB); Percentage Substandard Housing Units (PSHU), a proxy for neighborhood quality; and other undefined residual variables for which data are not currently accessible.

EXHIBIT 3



The following relationships were also assumed:

- 1) PB has an inverse, direct effect upon MFI; that is, family income is inversely related to the percentage of blacks in a neighborhood.
- 2) PB has a positive, direct effect on PSHU.
- 3) PSHU has an inverse, direct effect on MLPT.

In *Exhibit 3*, the unidirectional arrows are called *paths* and are drawn from the variables taken as causes (independent variables) to those taken as effects (dependent variables). The path from MFI to PSHU indicates that the percent of substandard housing units is likely to be affected by the median family income for a particular census tract. The major dependent variable of interest, MLPT, is hypothesized to be a function of MFI, PB, PSHU, and other unknown residual variables as indicated by the arrows. The variables have been numbered for ease in labeling; for example, MFI is variable 3.

Several important assumptions underlie the application of path analysis as used in this study.¹⁰ The first assumption is that the relationships between the variables in the model are linear, additive, and causal. This means that curvilinear relationships and others are excluded. The second assumption is that the residual variables are not correlated with variables preceding them in the model or among themselves. This implies that all relevant

variables are included in the system. The third assumption is that the model is recursive; i.e., the causal flow is uni-directional. This means that MFI is taken as a cause of PSFU but PSFU has no causal effect on MFI.¹¹ The fourth assumption is that all of the variables are measured on either the interval or ratio scales.

After setting up the model, the second step in path analysis is the calculation of path coefficients. The developer of path analysis, Sewall Wright,¹² defines a path coefficient as:

The fraction of the standard deviation of the dependent variable (with the appropriate sign) for which the designated factor is directly responsible, in the sense of the fraction which would be found if this factor varies to the same extent as in the observed data while all others (including the residual factors . . .) are constant.

The path coefficient denoted with the symbol "p" indicates the amount of expected change in the dependent variable as a result of a unit change in the independent variable. It indicates the direct effect of an independent variable upon a dependent variable. Along with the symbol "p," two subscripts are used to identify a particular path. The first subscript indicates the effect or dependent variable while the second indicates the cause or independent variable. Thus, the path indicated by P_{43} indicates the direct effect of variable 3 (PSFU) upon variable 4 (MLPT). There is a path coefficient for each unidirectional arrow indicating this direct effect.

Given the assumptions previously discussed, the solution for the path coefficients is simply the ordinary least squares solution for the standardized regression coefficients (β 's). When a dependent variable is hypothesized to be dependent upon only one variable and possibly a residual variable, the path coefficient is equal to the zero-order correlation coefficient. For variables such as variable 1, (MLPT), hypothesized to be directly affected by more than one variable, the path coefficients are equal to the β 's calculated by applying the least squares solution to the regression of variable 1 upon variables 2, 3, and 4. Thus:

$$P_{14} = \beta_{14.23}$$

Path coefficients for residual variables associated with a dependent variable are estimated by $\sqrt{1 - R^2}$ where the R^2 (coefficient of determination) is from the regression equation in which all causally prior variables are used as predictors.

There is, however, an important difference between regression analysis and path analysis. In regression analysis, one regression is conducted; i.e., the dependent variable is regressed upon all of the other variables in the model. In path analysis, however, more than one regression may be needed. At each stage, a variable hypothesized as being dependent is regressed upon just the variables upon which it is assumed to be dependent. In the model presented, two regressions were performed. PSFU was regressed upon MFI and PB. Then MLPT was regressed upon MFI, PB, and PSFU.

One of the important applications of path analysis is in its ability to determine what part of a correlation between two variables is due to the

direct effect and also an indirect effect. Indirect effects may occur in several ways. For example, when causes are correlated, each cause has a direct effect on the dependent variable as well as an indirect effect through the correlations with the other causes. As an example, PB might have indirect effects upon MLPT through PSHU, through MFI, or through the path MFI and PSHU. The calculation of indirect effects is more complex and is described fully by Turner and Stephens.¹³ A short example utilizing variables 1, 2, and 3 will demonstrate how the indirect effects are calculated. All variables are expressed in standard form (z score) and the e's represent residual variables not in the model. These three variables can then be expressed as follows:

$$z_1 = e_1 \quad (1)$$

$$z_2 = p_{21}z_1 + e_2 \quad (2)$$

$$z_3 = p_{31}z_1 + p_{32}z_2 + e_3 \quad (3)$$

The calculation of the two paths leading to variable 3, p_{31} and p_{32} , starts with the calculation of the correlation coefficient for variables 1 and 3, as seen in formula 4 below:

$$r_{13} = \frac{1}{N} \sum z_1 z_3 \quad (4)$$

Substituting for z_3 and dropping the residual variables for simplification because the covariance between p_3 and z_1 and p_3 and z_2 is zero, the following is obtained:

$$\begin{aligned} r_{13} &= \frac{1}{N} \sum z_1 (p_{31}z_1 + p_{32}z_2) \\ &= p_{31} \frac{\sum z_1^2}{N} + p_{32} \frac{\sum z_1 z_2}{N} \\ \frac{\sum z_1^2}{N} &= 1 \\ \frac{\sum z_1 z_2}{N} &= r_{12} \\ r_{13} &= p_{31} + p_{32}r_{12} \end{aligned} \quad (5)$$

Formula 5 states that the effect of variable 1 upon 3 consists of two parts. p_{31} represents the direct effect and $p_{32}r_{12}$ represents the indirect effect through variable 2.¹⁴

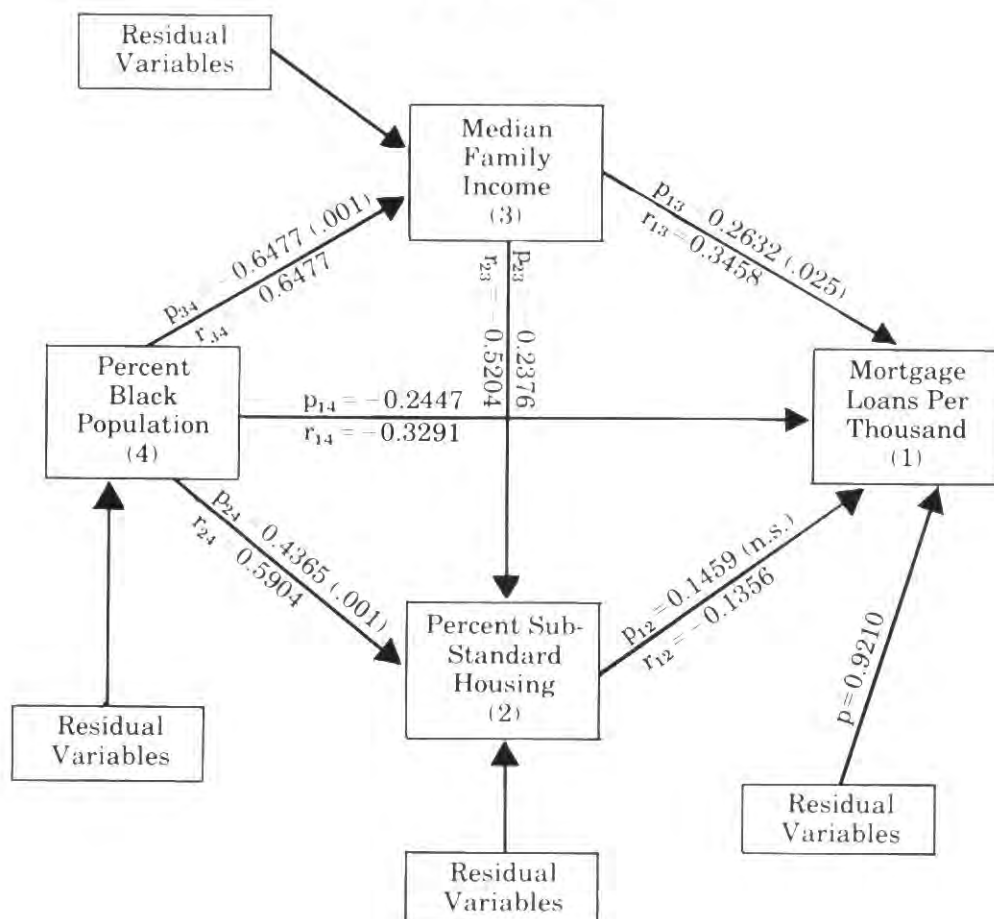
The relationship between two variables can also be decomposed into causal and noncausal or spurious components. This dichotomy is accomplished in a similar manner to the breakdown into direct and indirect effects and is explained more thoroughly in the Statistical Package for the Social Sciences.¹⁵

APPLICATION OF PATH ANALYSIS

Given the proposed model, path analysis was utilized to test whether neighborhood quality and racial composition were factors in determining

lending patterns of the financial institutions analyzed. Based on the analysis of the data, the results are displayed in path diagram form in *Exhibit 4*. This exhibit also shows the correlation coefficients between the

EXHIBIT 4



variables while *Exhibit 5* gives a complete analysis of the relationships between the variables using path analysis.

An examination of the path coefficients in *Exhibit 3* shows the direct effect of the variables upon MLPT. The two variables in the model having the greatest direct effect upon MLPT are Median Family Income with $p_{13} = 0.2632$ and Percentage Black population with $p_{14} = -0.2447$. This means that the direct effects of MFI and PB have about the same impact but in opposite directions. The Percentage of Substandard Housing Units has a statistically insignificant direct effect upon MLPT.

EXHIBIT 5

CAUSAL AND NONCAUSAL EFFECTS

Bivariate Relationship	Total Covariance (correlation coefficient)	Causal Effects			Noncausal Effects
		Direct	Indirect	Total	
PB-MLPT (4 to 1)	-0.3291	-0.2447	-0.0844 (4-3-2-1)=.0224 (4-3-1)=-0.1705 (4-2-1)=0.0637	-0.3291	None
MFI-MLPT (3 to 1)	0.3458	0.2632	0.0347	0.2979	0.1173
PSHU-MLPT (2 to 1)	-0.3156	0.1459	None	0.1459	-0.4615
PB-MFI (4 to 3)	-0.6477	-0.6477	None	-0.6477	None
PB-PSHU (4 to 2)	0.5904	0.4365	0.1538	0.5904	None
MFI-PSHU (3 to 2)	-0.5204	-0.2376	None	-0.2376	-0.2831

A note of caution is needed regarding the inferences made from the path coefficients. The model shows that PB is likely to affect MLPT; however, the variation in the variables in the whole model is associated with only 15% of the variation in MLPT. The path coefficient of 0.0210 from the residual variables to MLPT may indicate that other major variables of importance such as demand, property characteristics, and additional risk factors, are omitted. Thus, analysis of this particular model indicates that MFI and PB are relatively minor factors in the determination of mortgages granted per thousand population, that is, the unknown residual variables account for the levels of the variance in MLPT.

While *Exhibit 4* reveals that the model does not "explain" much of the variation in mortgage lending, *Exhibit 5* offers some important insights in that it shows not only the direct effects, but the indirect effects as well. The interesting point is that if total causal effects are considered, PB and MFI still have about equal, but opposite effects upon MLPT. However, part of the effect of PB is an indirect effect (-.1705) through MFI or the path 4 to 3 to 1. This means that MFI is a moderating variable for the influence of PB upon MLPT. Thus, it can be justifiably argued that the reason blacks are receiving a disproportionately low number of mortgage loans appears to be due not so much to discrimination in lending practices, but to the high inverse correlation between Percentage Blacks and Median Family Income. Likewise, when the impact of income on neighborhood conditions is considered, the influence of PSHU on MLPT becomes negligible. Thus, the apparent discrimination found in many of the available studies is subject to

serious question in the light of this analysis and it appears that attention should be focused on identifying and quantifying the residual variables.

LIMITATIONS OF STUDY

As in any study, several caveats are required regarding the methodology, sample, and the data utilized. The limitations of the method of path analysis lie in the assumptions previously discussed. Another limitation of the method is that a determination of causality is attempted in a descriptive study that can only portray relationships between variables. The information obtained from path analysis does not prove causality, but may be used to draw inferences concerning the relationship between the variables involved. Therefore, the correlation and path coefficients can be used only to infer, and not to establish, a causal relationship. However, measures of the extent to which the change in the level of one variable is associated with a change in the level of another is one basis for inferring causal relationship.

A possible limitation exists in the use of census data from the 1970 population statistics. Data from the financial institutions may be more recently extracted, but this causes only minimal concern, as Hoyt¹⁶ has shown that neighborhoods change slowly, particularly in relation to other areas of the same community. While several census tracts in this study showed high growth rates, no significant changes in the variables, such as Percentage Black or Percentage Substandard Housing Units, are believed to have occurred.

The summary of data must be regarded, at best, as only suggestive of the actual mortgage lending patterns because of the following:

- 1) Some lending institutions reported by zip code, rather than census tract, and the two classifications are not perfectly resolvable.
- 2) The time period (the last half of 1976) may be too limited to allow a clear pattern to develop.
- 3) Not all the lending activities of the institutions appear because several are affiliated with mortgage banking houses who handle most of their FHA and VA loans.

Nevertheless, it is the considered opinion of the analysts that the data fairly reflect the lending patterns of the community's depository institutions.

CONCLUSION

The key conclusion of this preliminary analysis is that there is no conclusive evidence of discrimination in mortgage lending by urban financial institutions. To understand the mortgage lending patterns of our major lending institutions, an approach is required that concentrates on identifying and isolating the influence of the residual variables discussed in this study. Such a methodology would also provide a tool for assessing the extent of all types of discrimination in institutional lending and therefore

serve as a useful aid in determining how well an institution is serving the credit needs of its community as required in the Community Reinvestment Act of 1977.

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“When Should Real Estate Be Sold?”: A Comment

by Austin J. Jaffe

Jack P. Friedman's recent article entitled “When Should Real Estate Be Sold?”¹ attempts to solve what he (and others) have presumed is “a major concern of realty owners, property managers, investment counselors, and mortgage lenders.” The determination of the optimal holding period for income-producing property appears to be one of the most appealing and yet elusive butterflies in the real estate forest. Other recent work has also aimed at answering the optimal holding period question.² This growing body of literature, specifically Friedman's recent paper in *Real Estate Issues*, warrants these comments.

The major issue raised here must be clarified. The derivation and definition of the optimal holding period tends to split researchers into two camps. The first camp selects the period in which the internal rate of return (usually on equity) is the greatest for the project in question. Cooper, Pyhrr, Friedman, and others have been the leading exponents of this approach. Another view is that holding period selection according to the internal rate of return criterion may not be sufficient for wealth maximization although this condition can be satisfied by selecting the period with the highest geometric mean rate of return. Messner, Findlay, Howson, and others have made these arguments by which the author has been convinced. However, the major point raised by this comment goes beyond the conceptual and theoretical issue.

If the determination of the optimal holding period is a critical estimate for the real estate analyst, however derived, then the results must yield valu-

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able information which, when translated into policy, can significantly affect decision-making. Or viewed differently, in the event of a sub-optimal choice regarding holding period, the investor or lender or manager has a great deal at stake in terms of his financial objectives. Therefore, the major concern raised here is the importance and significance of this determination, given our valuation techniques and methods.

CRITIQUE OF FRIEDMAN

The development of a financial theory must, by necessity, remain general enough to be able to solve problems and produce results given any parameter values. The determination of the optimal holding period is a part of a general real estate investment theory. In spite of this impetus for generality, Friedman persists with statements like the following:

And, since each parcel of realty is unique and so is its owner, generalization about income-producing realty can be quite misleading. (p. 68)

(It is obviously dangerous to apply a general rule in suggesting a holding period for all income-producing real estate. (p. 70)

Since determining the best year of sale is a complex matter, that determination is better performed on a case-by-case basis. . . (p. 74)

After all, a reader is left to wonder "when should real estate be sold?" Perhaps this question remains unanswered by Friedman, except on a "case-by-case basis."

It has been argued, however, that the potential gains for the analyst at the beginning of the planning period of the appropriate amount of time to own the income property are quite small.³ Furthermore, this result seems to hold true for various definitions of optimal holding period and for various data sets.⁴ Finally, it has been shown that the analysis of changes in other variables have a significantly greater impact on value and return than do changes in the expected holding period.⁵ This result is dramatic enough to suggest that the issue raised by Friedman and others is almost a moot point, even in a world of market inefficiency and imperfection.*

Despite warnings to the contrary, Friedman persisted to identify periods in which the internal rate of return is the greatest for different "types" of property. He identified conditions which resulted in short and long "average suggested holding periods." Once again, if the market value of income-producing property is truly a function of expected future net operating income, then the analysis of expectations on length of holding period becomes meaningless. A similar argument could be made regarding the analysis of the "effect of income tax brackets."

* Given competitive market conditions, the notion of an "optimal holding period" becomes suspect as buyers and sellers will trade at the end of each period for prices that reflect future declining (or rising) values.

But perhaps the most curious analysis is the discussion of the two turning points in income-producing property. These refer to hypothetical periods when principal reduction equals depreciation charges in that year and when the after-tax cash flow becomes zero for the year. Obviously, these recommendations are contingent upon presumptions about growth rates and cash flow patterns used in his model. The generality of these "rules of thumb" are certainly questionable if not dangerous in this context.

Finally, Friedman makes a plea for the analysis of "anticipated future project income" in attempting to make the hold or sell decision. "Past performance does not give this information," he says, "it is the expected future income that is important." Certainly this statement, although quite basic to most students of discounted cash flow techniques, is one of the most important in the article. However, instead of recognizing the significance of changes in income or expenses, even in his own study, Friedman spends his efforts analyzing changes in significantly less consequential variables such as depreciation methods, depreciable lives, and mortgage amortization terms.⁶

CONCLUSION

Although the development of optimal holding period theory for the discounted cash flow framework of real estate projects is a welcome addition to a growing theory, the potential gains now available to real world users are quite small. It is hoped that real estate analysis can be directed toward those areas where significant improvements can be made in implementing the decision-making process. It seems that the determination of the optimal holding period does not appear to be a very significant matter.

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by Jack P. Friedman

A real estate investor, before he plunges into another acquisition, should have a feeling for resale prices and holding spans. When combined with pro-forma operating data, the information results in an "investment life cycle," allowing a yield-to-maturity computation. The importance of such a computation has been previously emphasized.¹ The approach requires that a fixed holding period be considered. Sensitivity analysis can be used to consider several holding periods. This provides useful information to the investor.

Austin Jaffe states that the determination of the optimal holding period "appears to be one of the most . . . elusive butterflies in the real estate forest"² and suggests that continued interest in this topic is misdirected. He correctly points out that net operating income (he separates effective gross income from operating expenses) and purchase and resale prices are far more important than many other variables; so he emphasizes the need for good property management.³ I concur. He has captured the thrust of "When Should Real Estate Be Sold?"⁴ in his statement that "the question remains unanswered by Friedman except on a case-by-case basis."⁵ Though Jaffe has put me in fine company with Cooper and Pyhrr, he has failed to acknowledge significant differences within both "camps."

It is puzzling that, while Jaffe emphasizes the importance of a general real estate investment theory, he fails to recognize the non-uniform results of theory application. That is, the same theory, when applied to different data sets, will offer different results.

More important, Jaffe errs in stating that "the issue (of optimal holding periods) is almost a moot point."⁶ As support he cites his own article, which states that "potential gains (for the analyst) . . . are quite small,"⁷ and that "this seems to hold true for various definitions of optimal holding periods and for various data sets."⁸ The matter of holding periods is not to be taken lightly. It frequently accounts for the difference between negative yields on equity and high yields.

Note: Mr. Friedman wrote this reply, after examining Mr. Jaffe's manuscript, "When Should Real Estate Be Sold?: A Comment," but without reviewing "Optimal Holding Period Analysis: Much Ado About Not Much."

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For example, after-tax yields on highly levered, rapidly depreciated property are likely to be negative if the property is sold within five years of acquisition. This is especially true for property that is subject to 1) net leases, 2) local rent controls, or 3) HUD-FHA regulatory agreements. Early "turnover" of such property will cause a huge taxable gain, and taxes must be paid from a nominal amount of sales proceeds. Such tax payments are likely to leave no after-tax proceeds from a sale and to erase financial benefits received earlier. But longer holding periods ameliorate this by 1) deferring the tax on the gain, 2) possibly changing ordinary income to capital gain, and 3) possibly eliminating the tax on the gain at the investor's death. (The third possibility, though once thought to be eliminated by the 1976 Tax Reform Act, is still viable at this time.) Under the fixed-income conditions described—and they are not uncommon—holding periods of fifteen years or more may result in high after-tax yields, as opposed to negative yields for disposition within five to seven years. Under other conditions, an immediate profitable sale, with or without an accompanying lease-back, could provide the best results. It might free up capital for profitable reinvestment when such opportunities are favorable. There are still other data sets which, if properly analyzed, would suggest alternative holding strategies.

So a case-by-case approach is the best method of determining when to sell real estate, at least in my opinion. Property management, important as it is, cannot be substituted for investment or portfolio management which is of major concern to owners and their advisors.

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8. *Ibid.*

Optimal Holding Period Analysis: Much Ado About Not Much

by Austin J. Jaffe

INTRODUCTION

One area in real estate investment analysis that has recently come under close scrutiny has been the analysis of the appropriate period of time an investor should maintain his interests in real property. Optimal holding period analysis, although not a new concept,¹ has generally been by-passed by most researchers seeking more fruitful vineyards. However, a series of recent articles has emphasized the selection of the "optimal planning horizon" as an important consideration the decision-maker must face. Although the horizon designated as "optimal" tends to vary according to the criteria used, the effective decision-maker implicitly has much to gain (or lose) if he considers (or fails to consider) the analysis presented.

This paper will review the literature analyzing holding period considerations for real estate projects. Most recently, several studies have begun to directly discuss "optimal holding period analysis," proposing that the process increases accuracy and reliability of investment analysis." It should be pointed out that a difference exists between analysis of holding periods of real estate projects from the investment point of view and from the market valuation perspective (and consequently a different impact on appraised value). It is also generally felt that optimal holding period analysis, if vital at all, offers significantly more benefit for the investor-client than for the market appraiser.

Finally, this paper will present additional results which cast new light on this misunderstood subject. It will show that although the optimal holding period is frequently misunderstood by many students, researchers, and decision-makers, the recent interest in selection of an optimal holding period is misdirected in terms of potential benefits for decision-makers. In a

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sense, this paper questions the usefulness of optimal investment period analysis, since the costs of implementing the analysis may outweigh the expected benefits.

It will be argued that in terms of investment planning and analysis, the estimation of the optimal holding period is a relatively unimportant and insignificant endeavor. This statement will be supported by results of an analysis of the potential gains in wealth portions permitted by the optimal choices, as well as comparisons of the relative potential gains to changes in other variables.

Although a number of writers have presumed certain holding periods for investment planning purposes, a survey by Wiley suggested that most analysts have not agreed on the optimal holding period for real estate investment projects.²

TABLE I
WILEY'S (1976) SURVEY RESULTS ON PLANNED
HOLDING PERIODS FOR REAL ESTATE
"EQUITY INVESTORS"

Years	% of 70 Insurance Cos.	% of 48 REITS	% of 33 Corporations	% of 151 Total
5	4	17	15	11
10	33	29	33	32
20	13	12	24	15
All other time period(s)	50	42	28	42
	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>

Note: Only data available; results by property type unavailable.

Source: Robert J. Wiley, "Real Estate Investment Analysis: An Empirical Study" *The Appraisal Journal* 44 (October 1976), table 7, p. 592.

Wiley's results suggested that a lack of agreement exists as to the appropriate holding period which real estate investors anticipate or project for income-producing property. His results also pointed out the strongly expected use of ten years as the most appropriate planning horizon.

Ellwood's text and methodology apparently presumed a ten-year projection period. Although the analysis is not clearly specified, Ellwood attempted to justify the use of confining mortgage-equity analysis to a ten-year period.

... Optimum terms of ownership have tended to become shorter in recent years because of changes in the monetary side of the market and the ever-increasing impact of income taxes on take-home income.

Public records pertaining to many thousands of conventional income properties indicate that on average this type of real estate changes hands or recasts its financing within ten years of purchase.³

Ellwood also numerated the advantages of a short-term projection period.

The short projection will produce the same total value as a longer one, regardless of the capitalization technique so long as we assume the same income stream, the same rate of value change, and the same rate of interest. . . .

The short-term projection offers a better chance for accuracy not only because the estimate of periodic income can be based on current facts and well-remembered experience but also because total value will not be attributable to income alone. . . . The law of compensating errors favors short projections. . . .

The normal net cash flow stream . . . does not follow a straight line path in either direction. A reasonably reliable estimate of average, annual net cash flow for a term of ten years or less can be treated as a level annuity with no significant error in the result. . . .⁴

Therefore, Ellwood concluded that projections using his method should be confined to ten years. The obvious implication is that Ellwood presumed that the "optimal holding period" was about ten years or, if not, this consideration was not very significant in terms of valuing income property.

Textbook treatment of the issue is very limited and follows the traditional presumptions. Most of the writers failed to discuss this consideration. Cooper,⁵ Roulac,⁶ and Wiley⁷ addressed this question although Cooper apparently presumed the investor "knows" how long he will desire the property (typically ten years, or perhaps, up to and including the year when the internal rate of return is greatest). Roulac is less clear and dismissed the subject in one paragraph.

Investment value is derived as the result of a careful study of the property's projected operations over an assumed holding period. This holding period is indicated by the objectives of the particular real estate investor proposing to acquire the property.⁸

Wiley devoted an entire chapter to "holding period strategy" but failed to develop the necessary analysis or theory as to why a "ten-year planning horizon is often appropriate for the newly constructed property as well as used property."⁹ He suggested that since most of the interest on the typical mortgage will be paid and deducted within the ten-year period, and since accelerated depreciation allowances are expended in the early periods, "a planned holding period in the general area of ten years is appropriate."¹⁰

However, Wiley proposed that the knowledgeable investor might also choose one of the following strategies:

. . . A particular investor may, of course, acquire a variety of real estate projects (a portfolio) for which he has various planning horizons.¹¹

The planning horizon for an investment made in anticipation of a changed use of the property would logically be set as the time that is estimated will pass before the property will be desired for the new use.¹²

. . . An alternative approach would be to make the planning horizon equal to the number of years in which *positive* cash flows are expected to be received.¹³

. . . Another possible choice would be the number of years during which tax-shelter benefits are expected to be received.¹⁴

. . . The investor may plan to *refinance* the investment, rather than to dispose of the property at a time when it appears that the after-tax cash flows will drop to a relatively low level.¹⁵

Based upon Wiley's recommendations, it seems the determination of the optimal holding period tends to vary according to one's definitional preference, and then, it appears to be based only upon general principles and considerations. His presumption of a necessity of a careful understanding of the factors that influence the selection of the appropriate period seems to beg the issue.

HOLDING PERIOD ANALYSIS AND ITS CRITICS

A number of authors have attempted to analyze the effects of changes in holding periods on valuation and rate of return. Shenkel, using a mortgage-equity capitalization approach, analyzed the effects on investment value of varied "investment terms."¹⁶ He concluded that "the investment period, for the problem at hand, has less bearing on the final results than did changes in other variables."¹⁷

His results showed the insensitivity of value to changes in the planned investment period. Using his example, a 10% change in the holding period resulted in less than a 1% change in value. By extending the holding period from ten to 20 years, this would result in only a 2.89% change.¹⁸ It should be noted that in this framework, since the discount rates tend to be static, the effects of inflation over the holding period tend to be ignored. This study, like many others, presumes *ceteris paribus* changes in the holding period. Therefore, Shenkel's early article (1969) suggested relatively little could be gained by very careful and expensive analyses of the holding period. This paper may be viewed as one of the first sensitivity analyses tests, in which one holding period is one of the variables.

In 1971, Ricks attempted to analyze the effects of changing the planned holding period from five to ten years under growth or no growth conditions on rates of return.¹⁹ He also analyzed the effect of financial leverage on return. His sensitivity analysis showed that the effect of increasing the holding period from five to ten years had little or no effect on the expected rate of return.

TABLE 2
SUMMARY OF RICKS' 1971 RATE OF RETURN RESULTS

		Expected Holding Period	
		5 Years	10 Years
Expected	.00	4.3 (7.2)	4.4 (7.4)
Growth Rates (%)	.03	6.4 (15.9)	6.4 (13.8)

Note: All results are calculated rates of return with 100 % and 20% equity contributions.

Source: Adapted from R. Bruce Ricks, "Computers and the Real Estate Investment Process," *Real Estate Computerization*, ed. David W. Walters (Berkeley, Ca.: Center for Real Estate and Urban Economics, Research Report #35, 1971), p. 159.

Therefore, Ricks also implied an unimportance for holding period analysis.

In the same volume, Walters analyzed various holding periods on a before-tax basis and reported that the importance of the holding period is a function of the projected property growth in the future.²⁰ Furthermore, he found that in the absence of growth in the reversion, the analysis of the holding period yields little information.

It is clear that if no property growth is assumed the analyst or investor can be almost indifferent as to the length of time he holds the piece of income property.²¹

He suggested that the investor should analyze the holding period expectation only when growth is expected.

However, while changes in holding periods are not significant when the analyst assumes no project growth or decline, they become very important when some project growth or decline is assumed. The analyst should note that depending on whether an increase or a decrease in value is projected, the attractiveness of the different holding periods changes.²²

Given our experience during the past quarter century with rapidly increasing property values, Walters' criticisms appear to be unrealistic. However, his paper (and others) attempted to isolate changes in value as a result of changes in expected holding period. If the analyses were to examine changes in value *given* a rate of growth in the reversion, then the results could not be distinguished between changes in holding period or reversion growth rate or both.

In 1973, Walters argued that the effect of changes in the holding period for appraisal reports of market value has far less impact than do changes in some of the other input parameters. Thus, he suggested that "less attention can be spent on determining the optimum holding period than in estimating other variables."²³

While an accurate estimate of the holding period is certainly important to income capitalization methods, the analyst can provide a better overall appraisal by devoting less time to estimating the optimum holding period and more time to estimating other variables.²⁴

An additional paper by Walters substantiated these findings.* This paper found a 10% change in the holding period resulted in only a .5 of a percentage point change in yield.²⁵ He recommended the property management variables (income and expenses) as those more worthy of careful analysis.

THE PROPONENTS OF HOLDING PERIOD ANALYSIS

In 1973, Cooper and Pyhrr investigated the effects of different holding periods on the internal rates of return on equity and total capital.²⁶ In attempting to determine the optimal holding period as "that holding period

* It should be noted that a portion of Ellwood's technique deals with changes in income and property values during a given holding period. The use of Ellwood's "j" factor may be applicable in this area.

over which the internal rate of return is the highest," they suggested that when taken in conjunction with expected changes in other variables, changes in the holding period will have significant effects on yield. They concluded that the optimal length of the holding period would depend upon the investment criterion used (i.e., for IRR on equity, a short holding period would be "optimal" and for IRR on total capital, a longer holding period would maximize yield on total capital).²⁷

The most adamant defense of holding period analysis can be found in an important 1975 paper by Messner and Findlay.²⁸ After introducing the Financial Management Rate of Return (FMRR) model and its superiority over the IRR model and criterion, they demonstrated that this model can be used to determine "correct" optimal holding periods. They also suggested that few investigators have thought about the selection of the optimal holding period.

Although it would appear that almost nobody buys real estate with the intention of holding it forever, it would also appear that very little consideration is given to the timing of sale when a commitment is undertaken. More specifically, the notion that such information can be of value in an investment decision does not appear to be widely held (except for tax effects).²⁹

Their results showed differences in FMRR as a result of various holding periods for the project used as an example. In this case, the FMRR after an eight-year holding period would be 10.85%, and after ten years, 11.11%. The FMRR peaked after holding the property for 15 years at 11.35%, before slowly declining back to 10.84% after a proposed 20-year holding period. Thus, Messner and Findlay reported that the true optimal holding period is 15 years in this example, and this determination is a significant feature of the FMRR.

The objection raised here is not with the mechanics of the method or with the derivation of the optimal period, but rather with the significance of the finding. The differences between years 10 to 15 is only .24 of a percentage point (or only a 2.16% change). In fact, the "worst" holding period selected would result in only a 4.49% change in return.³⁰ Therefore, the importance of the optimal holding period selection appears to be somewhat nebulous.

To this point, Messner and Findlay quantify their analysis.

From this analysis, we can say that an investor planning to hold the property 15 \pm three years would optimize his position The greater the spread in years, the less important are exact knowledge of the investor's circumstances or market conditions at the optimal moment of disposition.³¹

This, of course, is precisely the issue. If the rate of return or value is insensitive to changes in the holding period, then the analysis of optimal holding periods is a futile endeavor. Similarly, if "the return is not very sensitive to holding period," as some investigators have found, then the analyst would become better off by examining those variables that are influential in impacting return. Finally, if the sensitivity of changes in one variable is small compared to the sensitivity of another variable on return or value, then it appears that the effective decision-maker should discard

the analysis of the changes in the insignificant variable as he optimized his time and resources.

Friedman's Pull Factor (1976) is a technique which purported to enable potential investors "to determine whether to hold or sell income-producing real estate in any given year."³² Although Friedman has defended this technique as an extension of the traditional internal rate of return calculation, Messner and Findlay have questioned its worth and ability to determine the optimal holding period.³³ Friedman has also reported that an analysis of depreciation methods, depreciable lives, and amortization terms had little or no effects on the optimal holding period for income property.³⁴ In general, the gains available from use of the Pull Factor appear to be relatively small for the analyst.

Two additional papers require identification. A paper by Findlay and Howson (1975) used mathematical programming to extend the FMRR "for richer and fuller information in market equilibrium."³⁵ This paper showed how abandonment considerations might be taken into account in order to arrive at an "optimal holding pattern." A paper by Findlay, Messner, and Tarantello (1976) intended the FMRR to include simulation of returns.³⁶ An alleged attraction of this FMRR simulation model is its ability to enable the "evaluation of multiple holding periods."

The work cited above typically is of high quality and is quite rigorous. Certainly many students and researchers have not emphasized optimal holding period analysis as a primary tool for investors and appraisers. In addition, however, the papers that have attempted to provide a framework for the analysis of optimal holding period considerations have largely been based on proper methodology and theory. The questions raised here relate to the direction and impetus of some of these papers. The question which remains unanswered is, how significant is the analysis of the optimal holding period? This question will hopefully be answered in the remainder of this paper.

THE IMPORTANCE OF HOLDING PERIOD ANALYSIS

If the determination of the best time to sell income property can be shown to be important in terms of enabling potential investors to plan for a specific holding period which would maximize their wealth positions, then it can be argued that optimal holding period analysis may be important enough to warrant the attention it has been receiving in the recent literature. One way to test this hypothesis is to examine the percentage changes in output using a well-known and generally accepted discounted cash flow model for real estate investment valuation.³⁷ Thus, this analysis may tend to be more important for investment purposes rather than market appraisal purposes.

The property selected as a "typical project" and the computations made were based upon data selection procedures and techniques discussed elsewhere.³⁸ The data sources came from a variety of services and series. Based upon this analysis, *Table 3* summarizes the inputs used in the study.

TABLE 3
SUMMARY OF TYPICAL INPUTS FOR SENSITIVITY ANALYSIS

<u>Variables</u>	<u>Values</u>
Effective Gross Income (EGI)	\$4103 per month
Operating Expenses (OE)	53.4%
Cost (COST)	\$20.00 per square foot
Required Rate of Return on Equity (r)	10%
Interest Rate on Mortgage (COUP)	7.25%
Loan-to-Value Ratio (L/V)	74.2%
Length of Mortgage (TERM)	25 years
Depreciation Method (DEP)	Straight-Line Method
Effective Tax Rate on Increase (TRATE)	35%
Depreciable Life of Improvements (LIFE)	40 years
Expected Holding Period (HP)	10 years

Using the following after-tax equity valuation model and the estimates found in *Table 3*, the valuation of equity was found to be \$62,585.12 and the internal rate of return was 9.85%.

$$E = \sum_{i=1}^n \frac{R_i - I_i - A_i - T_i}{(1+r)^i} + \frac{SP - UM - GT}{(1+r)^n}$$

where

- E = Equity Value
- R_i = Net Operating Income in the i th period
- I_i = Interest Payment in the i th period
- A_i = Principal Reduction Payment in the i th period
- T_i = Income Taxes in the i th period
- SP = Net Selling Price
- UM = Unpaid Mortgage Balance
- GT = Capital Gains Tax
- r = Required Rate of Return on Equity

The results of this sensitivity analysis are presented in *Table 4*. This table shows the effects of changes in the expected holding periods (from five to 20 years).

It can easily be seen that the sensitivity of value or return to changes in the holding period, in this case, is very insignificant. For example, 50% decrease (from ten to five years) in the expected holding period, resulted in less than a 1% change in value and about a 1.5% change in return. Therefore, holding period analysis would offer relatively few rewards for those seeking the optimal period.

TABLE 4
HOLDING PERIOD SENSITIVITY RESULTS

$\% \Delta$ in Holding Period	Present Value (\$)	$\% \Delta$ in Present Value	Internal Rate of Return (%)	$\% \Delta$ in Internal Rate of Return
-50	63,100.57	0.98	10.00	1.52
-40	63,136.18	0.88	9.98	1.32
-30	63,043.46	0.73	9.97	1.22
-20	62,921.07	0.54	9.92	0.71
-10	62,768.41	0.29	9.89	0.41
0	62,585.12	0.00	9.85	0.00
10	62,371.70	(0.34)	9.82	(0.30)
20	62,128.68	(0.73)	9.78	(0.71)
30	61,856.97	(1.16)	9.74	(1.12)
40	61,557.86	(1.64)	9.69	(1.62)
50	61,232.65	(2.16)	9.65	(2.03)
60	60,882.76	(2.72)	9.60	(2.54)
70	60,509.86	(3.32)	9.56	(2.94)
80	60,115.44	(3.95)	9.51	(3.45)
90	59,701.21	(4.61)	9.46	(3.96)
100	59,268.94	(5.30)	9.41	(4.47)

As a word of caution, it should be pointed out that these results are presented under one presumption—that the change in holding period is the only change contemplated. Certainly this may not be realistic in some cases and is a limitation of deterministic sensitivity analysis. Therefore, these results must be viewed *ceteris paribus* although changes in property values and return may occur as a result of many dynamic changes in many factors.

However, the results reported in *Table 4* are particular to the input series used. The problem of data sensitivity might preclude the generality and implications of the results. Further testing has found that the magnitude of the results will tend to vary according to the parameters of the case, but that the relative rankings of variables according to their sensitivities will remain the same.³⁹ In other words, the actual results of any sensitivity analysis must remain limited to the case studied, but the relative size and impact of each variable will remain constant for most projects. Therefore, the small impact that holding period changes have on value and return will be small for most income producing projects, although the precise effects will tend to vary.

It has been shown that the ranking of holding period changes was found to be typically ninth out of eleventh in its potential impact on return.⁴⁰ Similar findings were also reported for rankings of sensitivities of value.⁴¹

Table 5 presents some of the results which show the relatively small impact that changes in holding period have on return.

TABLE 5
SUMMARY OF SENSITIVITY RESULTS:
CHANGES IN INTERVAL RATES OF RETURN^a

Changes in Input \ Variable Changed	EGI	OE	COUP	TERM	TRATE	HP
-40	0.37 (-96.24)	19.84 (101.42)	13.76 (39.70)	8.72 (11.47)	11.18 (13.50)	9.98 (1.32)
-20	5.63 (-42.84)	14.80 (50.25)	11.90 (20.81)	9.39 (-4.67)	10.52 (6.80)	9.92 (0.71)
+20	14.16 (43.76)	5.02 (-49.04)	7.65 (-22.34)	10.18 (3.35)	9.19 (-6.70)	9.78 (-0.71)
+40	18.53 (88.12)	-1.45 (-114.72)	5.30 (-46.19)	10.41 (5.69)	8.53 (-13.40)	9.69 (-1.62)

^a Initial internal rate of return was 9.85%, given values found in *Table 3*. Percentage changes reported below each result in parenthesis.

Therefore, given the results reported in *Table 5*, it appears that changes in expected holding period impact far less on return due to changes in most of the other variables. Thus, a major conclusion from this analysis is that the relative importance of holding period analysis is small in a real estate investment framework based upon the potential gains available for users.

CONCLUSION

Since changes in the holding period have been found to be relatively insignificant, the recent attempts to identify, measure, and analyze the optimal holding periods for real estate projects nearly becomes a futile exercise. Given these results, the rewards from these analyses can be expected to be very limited. Analysis of the more influential variables and the changes in their values would seem to provide more information for the decision-maker.

However, as has been pointed out in a different context, "even minor deviations of the rules of thumb . . . imply uncompensated departures from optimality."⁴² The proponents of optimal holding period analysis are quite correct in arguing that the selection of the optimal period for real estate investment planning would result, *ceteris paribus*, in the best choice among alternatives. The objection raised in this paper centers around the cost savings to the investor.

In other words, is optimal holding period analysis cost-effective (i.e., relative to the gains to be made)? Is this analysis worth the costs of acquisition? Finally, is the analysis of optimal holding periods feasible given the analyst is selling to optimize his time, energy, and resources? Clearly, this

paper attempts to argue "no." This determination becomes especially critical in view of the fact that much more can be gained by analyzing more influential variables.

In the final analysis, the results presented here attempt to demonstrate that the marginal product to one investor of optimal holding period analysis is very small. In consideration of its cost and in comparison to the possible returns from closer analysis of other variables, the usefulness of optimal holding period analysis may be even further diminished.

In the end, it may be true that this consideration cannot be very helpful to the analyst.*

Ideally, the decision-maker seeking wealth-maximization would employ an optimal holding period in his investment planning for each specific real estate investment project. This analysis would be combined with the myriad other analyses believed to be helpful in making the investment decision. Based upon the investor's goals and objectives, financial theory, and real world experience, he would implement a decision.

This paper has attempted to place an area of recent interest in real estate investment analysis into its proper perspective. Optimal holding period analysis may have a place in the analysis of investment decisions. The results presented here suggest that perhaps the importance of this analysis for decision-making is far less than the recent literature has presumed. At least, the suggested benefits appear to be largely illusory.

* It has been often suggested that the optimum holding period selection may be most useful in terms of advance planning and expected portfolio duration. The author agrees in that regard. The results presented here suggest relatively small benefits in terms of valuation and rate of return effects.

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