Using Total Project Analysis to Compete for Investment Capital

by James E. Gibbons, MAI, and Stephen Rushmore

INTRODUCTION

Over the past 30 years, real estate has been a truly remarkable growth industry, registering continual impressive expansion and profitability with almost negligible trouble, failures, or other difficulties. However, during the late lamented year 1974, cataclysmic economic changes occurred, adversely impacting our investment world, possibly beyond repair. Perhaps for real estate, a most appropriate label is "the year economic feasibility died." For, without doubt, escalation of interest rates and construction costs, without corresponding increases in rents and sales prices, demonstrated that values no longer equaled or exceeded cost. The scenario's villain is inflation, although much responsibility for deteriorating economic conditions must be assigned to measures selected to fight the cad.

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Combating inflation can be—and probably should be—a two-fisted affair. One fist is fiscal policy, involving increased taxes as a means of cooling an economy. The other fist is monetary policy, raising the cost of borrowing and thereby slowing economic activity. Tax increases require action by legislatures, the members of which are "politicians," a species easily identified by manifest nervousness when called upon to take positions thought to be, directly or indirectly, proximately or remotely, distasteful to the electorate. With this group in such a delicate condition, visualizing many dragons along the path to reelection, it was too much to expect that the fiscal policy fist would be used against inflation. However, the other fist, monetary policy, was used in meat ax fashion, dismembering the economy so thoroughly that the nation now has a splendid chance to achieve depression conditions rivaling the best the 1930s could produce. In real estate development, which is a highly leveraged field, sensitive to interest changes, the escalation of borrowing rates wrought extraordinary havoc, producing so many bankruptcies and mortgage foreclosures that the industry ground to a halt. By itself this would be bad news, indeed, but the situation is nothing short of disastrous when one considers real estate's influence on the entire economy. Although among monetary officials there continues to be much preoccupation with inflation, economic indicators reveal that over the past several months a sharp deflationary trend has developed and is evidencing a growing momentum that inflation worriers seem to applaud. Perhaps, when deflation produces absolute negative growth and price factors, inflation will not be successful as a bogeyman. Considering the full combination of economic, political, and social aspects of national existence, it seems safe to say that even with large doses of inflation, survival is probable; however, with persistent deflation, present social and political systems could go down the drain.

ROLE OF INVESTMENT ANALYST: A LOOK AT THE PAST

To appreciate properly the responsibility of investment analysts in today's real estate development field, one must sharpen his perspective with a quick review of the field's evolution over the past 25 or 30 years.

One must recall that in our U.S. real estate industry we were living not so many years ago in a Utopia of abundant capital—all that was necessary. In fact, there were even surplus funds available for export. Capital, therefore, was at hand to undertake any reasonable project, and it could be had at moderate costs that fluctuated within narrow margins. In that climate, one could judge real estate value and investment feasibility by considering only real estate market information.

With post-World War II industrialization of a large portion of the world, the atmosphere rapidly changed, and an environment of capital competition developed. Such huge appetites for capital were generated that the rate of increase of demand soon exceeded the rate of capital creation. This, following

the usual operation of laws of supply and demand, made money generally more expensive, and capital markets exhibited strong competitive characteristics. In such an altered economic world, real estate had to plunge into the arena and compete with all industries throughout the broad economy to attract adequate capital. It had to offer investors returns and rewards that, relative to the quality of risk involved, were deemed competitively attractive. There was no longer a golden era of superadequacy.

This transition made it imperative for appraisers to stop thinking of real estate projects as brick-and-mortar situations and, instead, recognize that a realty investment is essentially an arrangement of segments of debt and equity capital, and that in its creation the key element is an ability to persuade money managers to take positions.

POSITION OF EQUITY PARTICIPANT

In a typical investment, there is a promoter, or equity investor, who commits a little venture capital to the deal and uses borrowed money, or mortgage money as it is termed, to complete capital requirements. This arrangement probably came about because there generally was less risk capital at hand than debt funds, which traditionally enjoyed valuable lien priorities. Structuring investments with thin equity positions spread available venture capital over more projects. Then, too, it was understood that there should be greater velocity in equity money; it was programmed to come back to the investor quickly so it could be used again.

The equity participant in a real estate situation is the venture's active party, who has all the initiative options, but who also has an investment thinness, involving the greatest elements of risk. Logically, he looks for more attractive returns than those flowing to the safer and generally passive debt or mortgage position. Equity rewards comprise net cash earnings over an ownership term, along with any growth or increase of the equity position that may be realized when the property is sold. Appraisers came to use the label "reversionary profit" for equity growth, which element is surely one of real estate's major attractions. Such growth occurs not only because of property value increases, but also because typical mortgage contracts provide that part of a property's earnings must be used to make periodic debt reductions. The debt portion of a real estate investment, therefore, requires large bites of the venture's earnings, because it has both interest and amortization requirements. With the type of equity rewards developed over the years, it was found that these investments could succeed competitively in the task of attracting necessary capital.

ECONOMIC AND MONETARY DEVELOPMENTS

It is appropriate to consider some of the principal economic and monetary developments that occurred along the path leading to the present state of the

real estate world. As competition for capital intensified, it caused interest rate escalations and generated pressures throughout money markets. Because real estate people are generally pragmatic and react to changing economic conditions by developing new variations of fundamental operations, it occurred to them that a seemingly wonderful invention, leverage, was a device that might be employed to get around the rate squeeze. For example, if attractive equity returns had been generated with an investment structure of, say, three parts debt capital and one part equity, and thereafter capital competition caused an interest rate escalation resulting in earnings spreads on the borrowed money being cut in half, it was clear that the simplest offset to such a squeeze would be a doubling of leverage. In the realty investment world, this, in fact, did occur. In such ventures, the ratio of mortgage to total investment went from 50% or 60% to 75%, 80%, 85%, and in some cases, all the way up to 90%. This increased leveraging tended to keep equity returns competitive. Fortunately, there usually was enough debt capital available over the years to incline money managers to tolerate greatly increased debt ratios.

Then, as the scramble for capital went on unabated and interest rates continued to rise, there were inadequate cash returns, even with substantial leveraging, for the risk position of an equity venturer. Again, pragmatism carried the day, and the problem yielded to a solution of sorts. There are income tax laws in the U.S. favorable to real estate, which provide that mortgage interest and building depreciation are deductible from taxable income. These items, labeled "tax shelter," are recognized widely as a real estate venture's more attractive features. Lo and behold, by reason of these shelters from the investment, the equity participant (the good guy with the white hat) is able to earn money that isn't generated by the property involved. He can use an operation's excess tax shelter as an offset against his other earnings and thereby save income taxes. This made it possible to bring "free capital" into realty transactions by having a class of investors, called "limited partners," supply sums of money for returns that are purely tax savings, not property income. Through this device, the real estate investment industry managed to stave off, for some time, the arrival of that fateful day when investments fail to show economic feasibility.

RECENT PAST: PROBLEMS OF 1974

Finally, there came the year 1974, during which there occurred major efforts to fight inflation, an inflation that apparently had been generated largely through financing a war without adequate tax increases. The effort to restrain inflation, however, was limited to the use of restrictive monetary policy. Consequently, interest rates escalated to last year's astronomical levels, and at that time, when real estate projects were analyzed, it was clear that in many ventures economic feasibility had been thoroughly destroyed. In projects involving construction, mortgage money usually had been obtained

on contracts involving variable interest rates. Each time monetary policy was tightened, the nation's general level of rates was jacked up a little, and as a result there occurred substantial building cost increases which had never been budgeted. A typical consequence of this turn of events was for a builder/developer to run out of funds when his job was half finished. As a result, one venture after another ground to a halt.

There was a further interesting, but dismaying, aspect to 1974's high interest rates. All materials, fixtures, appliances, etc., used to create projects, such as apartment houses, office buildings, and shopping centers, are manufactured by organizations formed by a couple of fellows putting a few equity dollars into the business and borrowing enough additional money to operate the venture. If they turn out electrical supplies, hardware, or whatever and are required to pay more for their borrowed funds, they pass the expense through to customers by charging higher prices. So, enormous construction cost escalations were caused by rising interest rates, directly in the form of increased debt service, indirectly in the form of higher materials prices. In a short time there didn't seem to be any way a venture, when finished, could be worth the cost of creating it. The situation might be termed "feasibility zero."

For appraisers in any economic climate, the most interesting consideration is the issue of worth or value. A preponderance of valuators now subscribes to the proposition that value is best described as the present worth of future benefits. In the real estate field, a person makes an investment for the returns he expects to receive over future property ownership; these benefits are net income earnings while he holds the property, and the purchase price realized when he sells it. Appraisers refer to the items as income and reversion. To express their capital value, because they are future collections, they must be discounted to reflect present worth. In discounting, one employs a capitalization rate which, logically, must be the weighted average of the cost of the two types of money that comprise the realty investment equity capital and mortgage funds. Then, because appraisers generally use overall capitalization rates and strive for optimum realism and accuracy, they include in these rates the ingredient of anticipated property value change over projected ownership terms. This procedure is referred to as the Ellwood method. It was sound when first advanced and it is sound today. To obtain accurate results with it, however, one must accord it the fair treatment of making reasonable efforts to select timely and pertinent data for application in this excellent vehicle.

If one looks into the world of 1974, elicits interest rates being charged for various types of capital, and uses them to create overall capitalization rates, it will be apparent that application of such rates to property earnings will produce values far below costs to create the projects involved. So, feasibility died, and when it did, many uncompleted realty projects failed financially and were abandoned. And that is still, unfortunately, a very prevalent situation.

An additional interesting facet of 1974's restrictive monetary policy was the fact that because people could get such high returns on short-term capital, nobody wanted to invest in long-term debt positions. Indeed, why would anyone put money out at, say, 8% for 25 years, when 12% and 14% returns were available for 30- to 90-day debt paper. In these short-term situations, there was a combination of desirable, attractive yield and fast recapture. But, long-term debt funds always had been the guts of real estate investment, representing 75% to 90% of each situation, and the unavailability of such capital was a devastating blow.

During 1974, in addition to problems in construction ventures, existing properties came under pressure from escalations of operating expenses, which cut deeply into net bottom-line earnings. If an owner found himself in the unenviable position of having a building with such a severely reduced net income, yet was under some compulsion to dispose of his property immediately, there was no way he possibly could avoid taking a huge financial bath. In fact, throughout the year, if a prospective purchaser who planned to bring new capital into an existing income property venture employed an appraiser for valuation guidance, the resulting appraised value probably would fail to equal even the mortgage position of the seller's investment.

The gloomy conditions just outlined have to be profoundly distressing to people throughout the valuation and general real estate investment fields. Of course, it should be recognized that there are all kinds of variations and special cases, and the foregoing dark review involves a fair amount of generalization. However, these substantially depressed conditions exist throughout the real estate world today.

BAD TIMES RESULT IN BETTER ANALYSIS?

From the widespread distress and failures, one presumes that some good will result, and that it will take the form of more thorough and sophisticated real estate investment analysis. Although there is nothing new about the industry having to compete for capital, there will be a more demanding attitude on the part of suppliers of equity and mortgage funds, who will require painstaking and comprehensive valuation and feasibility studies before they will be convinced of the probability of suggested investment results. Nothing superficial, such as rules of thumb and rough comparisons, will be acceptable, and conclusions will not be bought without adequate portrayal of, and support for, steps to reach them. In these conditions, one clearly can perceive a challenge and splendid opportunity for real estate appraisers and counselors. Their services will be the essential ingredient without which major investment decisions will not be made. In recent years, appraisers have added many useful procedures to their valuation science, including computer investment analysis, market study and forecasting techniques, and internal rate of return applications. More will come, and, from recent adversity, the pragmatic spirit of

appraisers will generate significant improved procedures and techniques to the end that a broadly accepted form of "total project analysis" may be developed. It no longer will be acceptable to produce an appraisal that merely offers a "number"—a value estimate with only a smattering of supporting data. Investors and money managers will require a full development and support for all appraisal steps, because this information will be critically needed in the making of the full package of investment decisions involved in any real estate project.

Capital for real estate ventures flows from a variety of sources, including real estate investment trusts, pension trusts, insurance companies, commercial banks, savings institutions, wealthy individuals, U.S. and state government agencies, and foreign organizations and governments—particularly oil-producing (OPEC) nations. Organization of these various institutions and their investment objectives are required fields of study for the real estate valuator, because from these sources flow both debt and equity capital, with pricing and availability continually changing in response to broad economic trends. In these days of severe capital shortage, two of the groups—pension trusts and OPEC nations—are notable for possessing rapidly growing pools of investable funds. The near-term future for real estate development will be influenced markedly by conditions of cost and access to these capital sources.

Money managers are under no constraint to allocate funds to real estate. The field must demonstrate solid prospects for attractive earnings; failure to do so will result in a decline of growth and development. Among real estate's competitors are common and preferred stocks, corporate bonds, notes and bills, commodities, and general business ventures. In attracting funds, realty projects have certain important advantages. As mentioned previously, income-tax shelters have been instrumental in attracting capital. Then, too, flexibility in the structuring of investments can create investor appeal. It is now believed widely that money managers appreciate situations in which they can commit funds initially on a debt basis—with all the lien protection and priorities available in mortgage instruments—but have options to convert all or part of the capital to equity, or at least to participate in "down the road" earnings growth. In present competitive capital market climates, every possible innovative or creative element must be explored, and possibly used, to keep real estate development alive and feasible.

As the sophistication of money managers increases, so does the importance of thorough documentation of investment opportunities as well as professional packaging and presentation.

Although some deals are structured preliminarily over lunch tables, with terms outlined on cocktail napkins, these numbers ultimately must be backed up and reviewed by numerous individuals and committees. The review procedure usually requires a formal presentation detailing the salient considerations involved in a particular investment opportunity.

TECHNIQUES USED IN INVESTMENT ANALYSIS

In the past, money managers have relied on standard-type appraisals that estimate value by capitalizing a project's "typical" or "stabilized" cash flow. This approach might suffice for existing projects that have survived the initial start-up period, but even in such cases recent operating expense escalations have wrought havoc. However, for new developments, the recent rash of foreclosures surely has demonstrated a need for more complete and elaborate evaluations. Among the investment analysis techniques employed by money managers to evaluate and compare investment alternatives are:

1) Cash flow projections commencing with the project's initial planning stages and extending 20 or more years into the future.
2) Payback period computation.
3) Net present value technique, sometimes termed discounted cash flow.
4) Internal rate of return, or after-tax equity yield.

CASH FLOW PROJECTIONS

Most investment analyses have as their basis a projection of cash flow. The term cash flow has various definitions. The American Institute of Real Estate Appraisers defines cash flow as:

> "Net income, usually annual, which remains after deducting all expenses and debt service . . . before deduction of income taxes."*

Cash flow also may refer to any flow of cash, in or out, in certain investment analysis techniques.

For the income approach, the appraiser projects a "stabilized" cash flow (usually before debt service) and applies the appropriate capitalization rate to estimate market value. Such a single-year projection is a relatively simple procedure requiring a minimal amount of research and computations.

Today, money managers are looking for more complete cash flow projections. A "stabilized" or "typical" year projection has proved insufficient in view of the fact that many investments have failed before the project even reached a "stabilized" position. Ideally, projections of cash flow should show the entire life of the proposed investment. The preliminary planning and construction stages are often as important to a project's overall success as later periods in which income is produced. Refinancing benefits and the eventual sale also must be considered. By studying a complete cash flow projection, money managers are better able to spot possible trouble areas, make adequate provisions to handle contingencies, and evaluate their investment positions accordingly.

Analysis of cash flow is a before-tax computation. As everyone knows, the tax consequences and so-called shelter benefits of a real estate transaction are

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*Study Guide, Course 1-B, "Capitalization Theory & Techniques," pp. 71-72.

major considerations to investors and should be included in a full evaluation. To take the cash flow projection one step further, taxable income is calculated by subtracting tax-deductible expenses (i.e., real estate taxes, mortgage interest, depreciation, etc.) from net income. This difference then is multiplied by the appropriate tax rate to yield either a tax liability (if shown as a positive number) or a tax benefit (if negative). Combining the tax liability or benefit with the cash flow results in after-tax cash and benefits, or the true net return or dividend to the investor.

A chart showing, on a yearly basis, the derivation of both cash flow and after-tax cash and benefits is an extremely useful investment analysis tool. Computer programs now are widely available to compute after-tax cash and benefit charts, enabling the analyst to save considerable time. From the information contained on these charts, several different analysis and comparison techniques can be developed.

PAYBACK PERIOD COMPUTATION

The simplest comparison technique is called the payback period—the number of years it takes to recover the orginal investment out of after-tax cash and benefits.

Example 1

AFTER-TAX CASH AND BENEFITS (PER YEAR)

Year	Investment 1	Investment 2
1	$-500,000	$-400,000
2	-250,000	- 50,000
3	0	+100,000
4	+100,000	+300,000
5	+150,000	+400,000
6	+500,000	+450,000
7	+650,000	+475,000
8	+950,000	+490,000

PAYBACK PERIOD

Investment 1 = 6 years
Investment 2 = 5 years

Although the payback period is simple to calculate, it sometimes can lead to erroneous decisions. For instance, if the project is one maturing in later years, as might be the case with Investment 1 (*Example 1*), the payback period approach may favor quicker-maturing investments whose long-term outlook is not as promising. Secondly, the payback period technique does not account for the interest factor or the present value of money.

Investments 3 and 4 (*Example 2*) both have three-year payback periods. However, considering the present value of money, Investment 3 would be more desirable because it returns the greater amount sooner than Investment 4.

In spite of its obvious drawbacks, the simplicity of the payback technique has made it popular among many investors.

The other analysis techniques to be discussed are somewhat more sophisticated but will yield more convincing results.

Example 2

AFTER-TAX CASH AND BENEFITS (PER YEAR)

Year	Investment 3	Investment 4
1	$-500,000	$-500,000
2	+200,000	+ 50,000
3	+300,000	+450,000

PAYBACK PERIOD

Investment 3 = 3 years
Investment 4 = 3 years

NET PRESENT VALUE TECHNIQUE

The net present value technique, or discounted cash flow, takes into account the fact that a dollar received immediately is preferable to a dollar received at some future date.

To utilize the net present value technique, one finds the present value of the expected after-tax cash and benefits, discounted at the cost of equity capital (equity yield rate), and subtracts from it the initial cost outlay of the project. The project yielding the higher net present value is more preferable. (See *Example 3.*)

In this example, Investment B should be chosen, because its net present value is greater than Investment A.

INTERNAL RATE OF RETURN

The internal rate of return technique is defined as the interest rate that equates the present value of the expected future receipts (positive after-tax cash and benefits) with the discounted cost of the investment outlays (negative after-tax cash and benefits). (See *Example 4.*)

The internal rate of return must be found by trial and error. First, compute the present value of the positive after-tax cash and benefits using an arbitrarily selected interest rate. Then compare the present value so obtained with the present value of the costs (negative after-tax cash and benefits). If the present value of the positive ATC&B is greater than the negative ATC&B, try the procedure again with a higher interest rate. Conversely, if

the present value of the positive ATC&B is less than the negative ATC&B, lower the interest rate and repeat the process. Iterate back and forth until the present value of the positive ATC&B is approximately equal to the negative ATC&B. The interest rate that brings about this equality is the internal rate of return.

Example 3

AFTER-TAX CASH AND BENEFITS (PER YEAR) AND REVERSION

(COST OF EQUITY CAPITAL = 15%)

Year	Discount Factor 15%	Investment A	Present Value After-Tax Cash and Benefits	Investment B	Present Value After-Tax Cash and Benefits
1	.870	$ - 700,000	$-609,000	$ - 500,000	$-435,000
2	.756	- 450,000	-340,200	- 350,000	-264,600
3	.657	- 150,000	- 98,550	- 100,000	- 65,700
4	.572	+ 100,000	+ 57,200	+ 100,000	+ 57,200
5	.497	+ 150,000	+ 74,550	+ 200,000	+ 99,400
6	.432	+ 500,000	+216,000	+ 475,000	+205,200
7	.376	+ 650,000	+244,400	+ 540,000	+203,040
8	.327	+ 800,000	+261,600	+ 610,000	+199,470
9	.284	+1,000,000	+284,000	+ 650,000	+184,600
10	.247	+1,900,000*	+469,300	+1,900,000*	+469,300
Total net present value			$ 559,300		$ 652,910

*Includes reversion

Example 4

AFTER-TAX CASH AND BENEFITS (PER YEAR) AND REVERSION

Year	Investment A	Investment B
1	$- 700,000*	$- 500,000*
2	- 450,000*	- 350,000*
3	- 150,000*	- 100,000*
4	+ 100,000	+ 100,000
5	+ 150,000	+ 200,000
6	+ 500,000	+ 475,000
7	+ 650,000	+ 540,000
8	+ 800,000	+ 610,000
9	+1,000,000	+ 650,000
10	+1,900,000**	+1,900,000**
Internal rate of return	22.9%	26.8%

*Investment outlays (equity capital)
**Includes reversion

Example 5 is an illustration of the internal rate of return calculation using the after-tax cash and benefits from Investment A of the preceding example.

Note that at a 22.9% interest rate the present value of the outflows is approximately equal to the present value of the receipts and reversion (last receipt).

Example 5

CALCULATION OF INTERNAL RATE OF RETURN

Year	After-Tax Cash and Benefits	Present Value Factor at 22.9%	Present Value of After-Tax Cash and Benefits
1	$- 700,000	.8137	$-569,590
2	- 450,000	.6621	-297,945
3	- 150,000	.5387	- 80,805
Present value of outflows			$-948,340
4	$+ 100,000	.4383	$+ 43,830
5	+ 150,000	.3567	+ 53,505
6	+ 500,000	.2902	+145,100
7	+ 650,000	.2361	+153,465
8	+ 800,000	.1921	+153,680
9	+1,000,000	.1563	+156,300
10	+1,900,000*	.1272	+241,680
Present value of inflows and reversion			$+947,560
Internal rate of return = 22.9%			

*Includes reversion

The primary difference between the net present value technique and the internal rate of return is the reinvestment presumption. The net present value technique presumes that after-tax cash and benefits will be reinvested in other projects at the *estimated* cost of equity capital or equity yield rate. The internal rate of return presumes that after-tax cash and benefits will be reinvested at the internal rate of return.

In theory, the internal rate of return computed using after-tax cash and benefits should equal the cost of equity capital (after-tax equity yield). However, in practice, when the internal rate of return is unusually high it is not practical to expect that an equity investor will be able to reinvest the after-tax cash and benefits at such extraordinary high yields each year. The analyst in this instance may use either the net present value technique with a lower equity rate or a variation of the internal rate of return, called the adjusted internal rate of return, which allows for the reinvestment of the after-tax cash and benefits at a lower rate.

ADJUSTED INTERNAL RATE OF RETURN

The adjusted internal rate of return is calculated by 1) discounting all outlays to their present value at a presumed reinvestment rate, and 2) calculating the future value of all receipts at the reinvestment rate. The adjusted internal rate of return then is calculated to be the rate that will compound the

present value of all outlays to equal the future value of all receipts; or, it can be calculated as the rate that will discount the compounded value of the receipts to equal the present value of all outlays.

Using the preceding internal rate of return example, the adjusted internal rate of return, presuming a reinvestment rate of 10%, is 18.2%. This is calculated as in *Example 6*.

Example 6

CALCULATION OF ADJUSTED INTERNAL RATE OF RETURN

Year	After-Tax Cash and Benefits	Present Value Factor = 10%	Present Value of Outflows
1	$- 700,000	.9091	$- 636,370
2	- 450,000	.8264	- 371,880
3	- 150,000	.7513	- 112,695
Total present value of outflows			$-1,120,945

Year	After-Tax Cash and Benefits	Compound Interest Factor = 10%	Present Value of Receipts
4	$+ 100,000	1.771 (6 years)	$+ 177,100
5	+ 150,000	1.611 (5 years)	+ 241,650
6	+ 500,000	1.464 (4 years)	+ 732,000
7	+ 650,000	1.331 (3 years)	+ 865,150
8	+ 800,000	1.210 (2 years)	+ 968,000
9	+1,000,000	1.100 (1 year)	+1,100,000
10	+1,900,000	1.000 (0 years)	+1,900,000
Total present value of receipts			$+5,983,900

At an interest rate of 18.2%:

Amount of 1 at compound interest = 5.3413
Present value of reversion of 1 = .18722

Therefore, solving both ways:

$1,120,945 X 5.3413 = $5,987,303
(compounds present value of all outlays to equal future value of all receipts)

$5,983,900 X .18722 = $1,120,305
(discounts compound value of the receipts to equal present value of all outlays)

Internal rate of return = 22.9%
Adjusted internal rate of return presuming reinvestment @ 10% = 18.2%

When money managers compare and rank varied investment alternatives, it would appear that they might tend to favor the internal rate of return technique. Although the net present value and the internal rate of return are similar in theory, the net present value is dependent upon not only an accurate projection of after-tax cash and benefits, but also a realistic and supportable estimate of the cost of equity capital. This cost will vary with the type of

investment and other factors, such as risk and liquidity. The internal rate of return is based on the same projection of after-tax cash and benefits, without presuming a specific cost of equity capital. The relative simplicity of the presumptions for the internal rate of return is the major factor in its frequent selection.

DEMONSTRATION PROBLEM

The following case study has been designed to demonstrate the creation of a cash flow and after-tax cash and benefits chart (*Table 1*), as well as the calculation of the internal rate of return for a proposed real estate development project.

Although the presumptions and data used in this study are typical of today's market, the primary objective is to demonstrate a presentation and analysis technique currently used by money managers.

The case study involves a 16-acre tract of land improved with an old office building and a vacant industrial building. The tract has been leased recently to a developer who intends to demolish the existing improvements (in stages) and construct two new office buildings.

To obtain financing and better analyze the investment, the appraiser has prepared a 22-year cash flow and after-tax cash and benefits chart (Table 1). Although a 22-year period may be regarded by some as a "crystal ball" operation, one must recognize that value is the present worth of *futures*. The appraiser/analyst must project expectations on the basis of the best available information concerning trends and probabilities throughout real estate and the entire economy. In this connection he is the same as investment analysts in all other fields. He cannot enjoy the luxury of basing his valuation conclusions on observable present conditions. The following is a description of the data, presumptions, and predicted schedule of events used in preparing the chart:

DESCRIPTION OF EXISTING CONDITIONS

(LAND)

Area:

Office building land,	536 X 275 ft. = 147,400 sq. ft.
Industrial building land,	536 X 1,025 ft. = 549,400 sq. ft.
Total land	= 696,800 sq. ft.
	= 16 ± acres

Value:

Indicated value from adjusted comparable sale = $200,000/acre.
Total land value = $3,200,000

Ground rent:

Owners who lease their land subordinate to financing require an 8% return.

Indicated ground rent:

$3,200,000 X .08 = $256,000/year.

Rent is adjusted every 10 years to conform to changes in Consumer Price Index.

(BUILDINGS)

Office building: 50,000 square feet.

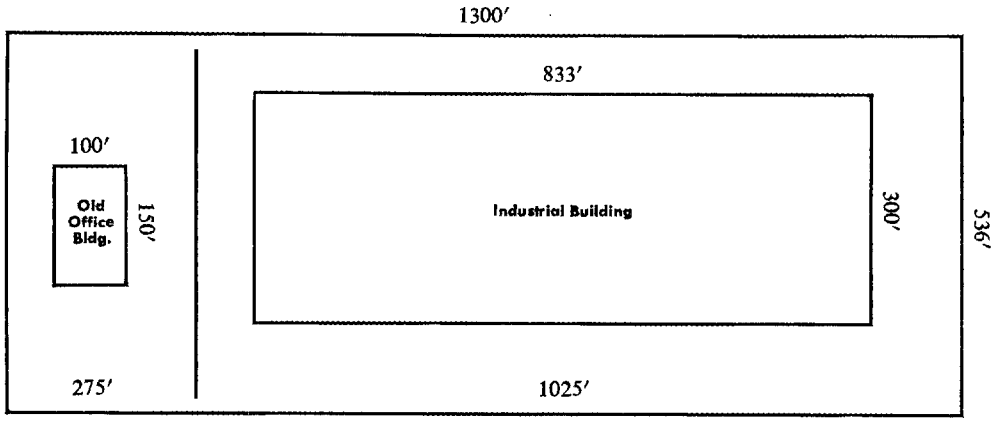
This two-story, 45-year-old building is in fair condition but requires extensive modernization. The existing lease expires at the end of two years.

Industrial building: 250,000 square feet.

Lease has just expired and the tenant has vacated this single-story building. Prospects for leasing this amount of space in the near future are poor.

Plot Plan 1

EXISTING IMPROVEMENTS



Plot Plan 2

PROPOSED IMPROVEMENTS

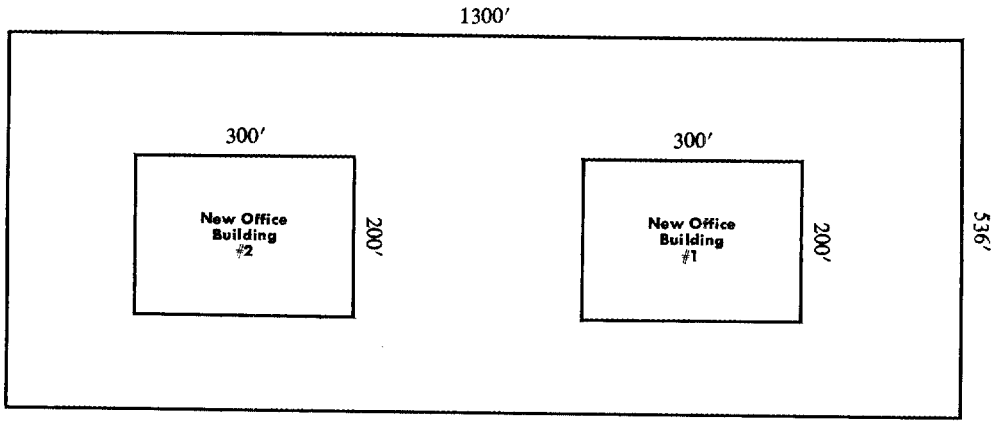


Table 1

CASH FLOW AND AFTER-TAX CASH AND BENEFITS CHART FOR PROPOSED OFFICE DEVELOPMENT

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11
CONSTRUCTION:											
Demolition & Clearing	100,000		100,000								
Land Development Cost	100,000		75,000								
Construction Costs	2,000,000	5,500,000	4,000,000	3,500,000							
On-Site Improvements	150,000	100,000	150,000	100,000							
Project Administration	20,000	50,000	60,000	45,000							
Eng., Arch. Fees & Insurance	200,000	125,000	75,000	50,000							
Total	2,570,000	5,775,000	4,460,000	3,695,000							
RENTAL INCOME:											
Old Office Building	197,000	197,000	—	—	—	—	—	—	—	—	—
New Office Building #1	—	—	761,000	1,627,000	1,689,000	1,689,000	1,689,000	1,689,000	1,689,000	1,689,000	1,689,000
New Office Building #2	—	—	—	—	761,000	1,627,000	1,689,000	1,689,000	1,689,000	1,689,000	1,689,000
Total	197,000	197,000	761,000	1,627,000	2,450,000	3,316,000	3,378,000	3,378,000	3,378,000	3,378,000	3,378,000
EXPENSES (CASH):											
Ground Rent	256,000	256,000	256,000	256,000	256,000	256,000	256,000	256,000	256,000	256,000	384,000
Real Estate Taxes	144,000	275,000	438,000	564,000	628,000	628,000	628,000	628,000	628,000	628,000	628,000
Mortgage Interest	167,000	709,000	1,375,000	1,905,000	1,643,000	1,627,000	1,608,000	1,588,000	1,567,000	1,542,000	1,515,000
Mortgage Fees	330,000	—	330,000	—	495,000	—	—	—	—	—	—
Leasing Costs	—	198,000	247,000	247,000	247,000	50,000	—	—	—	—	—
Total	897,000	1,438,000	2,646,000	2,972,000	3,269,000	2,561,000	2,492,000	2,472,000	2,451,000	2,426,000	2,527,000
AMORTIZATION	—	—	—	—	156,000	172,000	191,000	211,000	232,000	257,000	284,000
TOTAL EXPENSES & AMORTIZATION	897,000	1,438,000	2,646,000	2,972,000	3,425,000	2,733,000	2,683,000	2,683,000	2,683,000	2,683,000	2,811,000
CASH FLOW	(700,000)	(1,241,000)	(1,885,000)	(1,345,000)	(975,000)	583,000	695,000	695,000	695,000	695,000	567,000
ACCUMULATED CASH FLOW	(700,000)	(1,941,000)	(3,826,000)	(5,171,000)	(6,146,000)	(5,563,000)	(4,868,000)	(4,173,000)	(3,478,000)	(2,783,000)	(2,216,000)
EXPENSES (TAX DEDUCTION)											
Ground Rent	256,000	256,000	256,000	256,000	256,000	256,000	256,000	256,000	256,000	256,000	384,000
Real Estate Taxes	144,000	275,000	438,000	564,000	628,000	628,000	628,000	628,000	628,000	628,000	628,000
Mortgage Interest	167,000	709,000	1,375,000	1,905,000	1,643,000	1,627,000	1,608,000	1,588,000	1,567,000	1,542,000	1,515,000
Mortgage Fees	82,000	82,000	248,000	248,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Leasing Costs	—	10,000	22,000	35,000	47,000	49,000	49,000	49,000	49,000	49,000	49,000
Depreciation	—	—	275,000	266,000	532,000	514,000	497,000	480,000	464,000	449,000	434,000
Total	649,000	1,332,000	2,614,000	3,274,000	3,156,000	3,124,000	3,088,000	3,051,000	3,014,000	2,974,000	3,060,000
TAXABLE INCOME	(452,000)	(1,135,000)	(1,853,000)	(1,647,000)	(706,000)	192,000	290,000	327,000	364,000	404,000	318,000
INCOME TAX (50%)	(226,000)	(568,000)	(927,000)	(824,000)	(353,000)	96,000	145,000	164,000	182,000	202,000	159,000
REFINANCING SURPLUS	—	—	—	—	—	—	—	—	—	—	—
AFTER-TAX CASH & BENEFITS	(474,000)	(673,000)	(958,000)	(521,000)	(622,000)	487,000	550,000	531,000	513,000	493,000	408,000
CONSTRUCTION LOAN ADVANCE	2,570,000	5,775,000	4,460,000	3,695,000							
CONSTRUCTION LOAN BALANCE	2,570,000	8,345,000	12,805,000	16,500,000							
PERMANENT LOAN BALANCE	—	—	—	16,500,000	16,344,000	16,172,000	15,981,000	15,770,000	15,538,000	15,281,000	14,997,000

Table 1 (Continued)

CASH FLOW AND AFTER-TAX CASH AND BENEFITS CHART FOR PROPOSED OFFICE DEVELOPMENT

	YEAR 12	YEAR 13	YEAR 14	YEAR 15	YEAR 16	YEAR 17	YEAR 18	YEAR 19	YEAR 20	YEAR 21	YEAR 22
CONSTRUCTION:											
Demolition & Clearing											
Land Development Cost											
Construction Costs											
On-Site Improvements											
Project Administration											
Eng., Arch. Fees & Insurance											
Total											
RENTAL INCOME:											
Old Office Building	—	—	—	—	—	—	—	—	—	—	—
New Office Building #1	1,689,000	2,278,000	2,531,000	2,531,000	2,531,000	2,531,000	2,531,000	2,531,000	2,531,000	2,531,000	2,531,000
New Office Building #2	1,689,000	1,689,000	1,689,000	2,278,000	2,531,000	2,531,000	2,531,000	2,531,000	2,531,000	2,531,000	2,531,000
Total	3,378,000	3,967,000	4,220,000	4,809,000	5,062,000	5,062,000	5,062,000	5,062,000	5,062,000	5,062,000	5,062,000
EXPENSES (CASH):											
Ground Rent	384,000	384,000	384,000	384,000	384,000	384,000	384,000	384,000	384,000	512,000	512,000
Real Estate Taxes	628,000	628,000	628,000	628,000	628,000	628,000	628,000	628,000	628,000	628,000	628,000
Mortgage Interest	1,485,000	1,452,000	1,416,000	2,639,000	2,612,000	2,583,000	2,551,000	2,516,000	2,477,000	2,433,000	2,386,000
Mortgage Fees	—	—	—	795,000	—	—	—	—	—	—	—
Leasing Costs	—	—	—	—	—	—	—	—	—	—	—
Total	2,497,000	2,464,000	2,428,000	4,446,000	3,624,000	3,595,000	3,563,000	3,528,000	3,489,000	3,573,000	3,526,000
AMORTIZATION	314,000	347,000	383,000	250,000	277,000	306,000	338,000	373,000	412,000	456,000	503,000
TOTAL EXPENSES & AMORTIZATION	2,811,000	2,811,000	2,811,000	4,696,000	3,901,000	3,901,000	3,901,000	3,901,000	3,901,000	4,029,000	4,029,000
CASH FLOW	567,000	1,156,000	1,409,000	113,000	1,161,000	1,161,000	1,161,000	1,161,000	1,161,000	1,033,000	1,033,000
ACCUMULATED CASH FLOW	(1,649,000)	(493,000)	916,000	1,029,000	2,190,000	3,351,000	4,512,000	5,673,000	6,834,000	7,867,000	8,900,000
EXPENSES (TAX DEDUCTION)											
Ground Rent	384,000	384,000	384,000	384,000	384,000	384,000	384,000	384,000	384,000	512,000	512,000
Real Estate Taxes	628,000	628,000	628,000	628,000	628,000	628,000	628,000	628,000	628,000	628,000	628,000
Mortgage Interest	1,485,000	1,452,000	1,416,000	2,639,000	2,612,000	2,583,000	2,551,000	2,516,000	2,477,000	2,433,000	2,386,000
Mortgage Fees	50,000	50,000	50,000	79,000	79,000	79,000	79,000	79,000	79,000	79,000	79,000
Leasing Costs	49,000	49,000	49,000	49,000	49,000	49,000	49,000	49,000	49,000	49,000	49,000
Depreciation	420,000	406,000	392,000	379,000	366,000	354,000	342,000	336,000	330,000	330,000	330,000
Total	3,016,000	2,969,000	2,919,000	4,158,000	4,118,000	4,077,000	4,033,000	3,992,000	3,947,000	4,031,000	3,984,000
TAXABLE INCOME	362,000	998,000	1,301,000	651,000	944,000	985,000	1,029,000	1,070,000	1,115,000	1,031,000	1,078,000
INCOME TAX (50%)	181,000	499,000	651,000	326,000	472,000	493,000	515,000	535,000	558,000	516,000	539,000
REFINANCING SURPLUS	—	—	—	12,547,000	—	—	—	—	—	—	—
AFTER-TAX CASH & BENEFITS	386,000	657,000	758,000	12,334,000	689,000	668,000	646,000	626,000	603,000	517,000	494,000
CONSTRUCTION LOAN ADVANCE											
CONSTRUCTION LOAN BALANCE											
PERMANENT LOAN BALANCE	14,683,000	14,336,000	13,953,000	26,250,000	25,973,000	25,667,000	25,329,000	24,956,000	24,544,000	24,088,000	23,585,000

Net income before debt service:

Office building	= $147,000
Industrial building	= $187,500*

*Prior to expiration of the lease

GENERAL PRESUMPTIONS

Inflation:

Consumer Price Index will increase at the rate of 5 points per year.

Investor's tax bracket: 50%

Capital gains tax: 32%

SCHEDULE OF EVENTS

Year 1:

Property currently improved with occupied office building (45 years old) and unoccupied industrial building.

Owner leases property to developer for 99 years at yearly rental of $256,000, adjusted every 10 years to changes in Consumer Price Index. Lease is subordinate to construction and permanent financing.

Developer obtains $16,500,000 construction loan at following terms:

Interest: Floating 4% over prime lending rate (say 13%), payable monthly on the monies advanced.

Fees: 2 points ($330,000) payable at closing.
2 points ($330,000) payable upon ground breaking of New Office Building #2.

Industrial building is demolished at cost of $100,000 (demolition and clearing).

The 12.6 acres under industrial building are graded and leveled. Additional utility capacity—gas, electric, water, sewer—brought to proper location on site. Test borings made and evaluated. Cost $100,000 (land development costs).

Construction commences on New Office Building #1. Foundation poured and by end of Year 1 building is approximately 25% complete. Cost $2,000,000 (construction costs).

Parking lots, roads, sidewalks, curbs, and drainage started. Cost $150,000 (on-site improvements).

Management of project. Cost $20,000 (project administration).

Preliminary drawings for overall project prepared and approved. Working drawings and specifications drawn for New Office Building #1. Cost $200,000 (engineering, architectural fees, and insurance).

Old office building generates rental income of $197,000 before real estate taxes.

Ground rent $256,000.

Real estate taxes on old office building and partially completed New Office Building #1 $144,000.

Interest on construction loan $167,000.

Mortgage fee of $330,000 paid when construction loan closed.

Leasing started on New Office Building #1, but no commissions paid during Year 1.

Construction loan advances totaled $2,570,000.

Year 2:

Construction on New Office Building #1 complete by end of year. Cost $5,500,000 (construction costs).

Parking lots, roads, sidewalks, curbs, drainage completed for New Office Building #1. Cost $100,000 (on-site improvements).

Management of project. Cost $50,000 (project administration).

Working drawings and specifications started for New Office Building #2. Architectural and engineering supervision of New Office Building #1 complete. Cost $125,000 (engineering, architectural fees, and insurance).

Old office building generates rental income of $197,000 before real estate taxes.

Ground rent $256,000.

Real estate taxes on old office building and New Office Building #1 $275,000.

Interest on construction loan $709,000.

During Year 2, 100,000 square feet of office space in New Office Building #1 leased for 20 years at yearly rental of $9 per square foot, adjusted every 10 years to Consumer Price Index and yearly adjustment to changes in real estate taxes. Leasing cost for space $198,000.

Construction loan advances totaled $5,775,000.

Year 3:

Old office building demolished at cost of $100,000 (demolition and clearing).

The 3.4 acres under old office building graded and leveled. Additional utility capacity—gas, electric, water, sewer—brought to proper location on site. Cost $75,000 (land development costs).

Construction commences on New Office Building #2. Foundation poured and by end of year building approximately 50% complete. Cost $4,000,000 (construction costs).

Parking lots, roads, sidewalks, curbs, drainage started for New Office Building #2. Cost $150,000 (on-site improvements).

Management of project. Cost $60,000 (project administration).

Final drawings complete, architectural and engineering supervision commences on New Office Building #2. Cost $75,000 (engineering, architectural fees, and insurance).

New Office Building #1 partially occupied, generates rental income of $761,000 before real estate taxes.

Ground rent $256,000.

Real estate taxes on New Office Building #1 and partially completed New Office Building #2 $438,000.

Interest on construction loan $1,375,000.

Mortgage Fee of $330,000 paid upon ground breaking of New Office Building #2.

During Year 3, 125,000 square feet of office space in New Office Building #1 leased for 20 years at yearly rental of $9 per square foot, adjusted every 10 years to Consumer Price Index and yearly adjustment to changes in real estate taxes. Leasing costs for space $247,000.

Construction loan advances totaled $4,460,000.

Year 4:

Construction on New Office Building #2 complete by end of year. Cost $3,500,000 (construction costs).

Parking lots, roads, sidewalks, curbs, drainage completed for New Office Building #2. Cost $100,000 (on-site improvements).

Management of project. Cost $45,000 (project administration).

Architectural and engineering supervision of New Office Building #2 complete. Cost $50,000 (engineering, architectural fees, and insurance).

New Office Building #1 partially occupied, generates rental income of $1,627,000 before real estate taxes.

Ground rent $256,000.

Real estate taxes $564,000.

Interest on construction loan $1,905,000.

During Year 4, remaining 25,000 square feet of office space in New Office Building #1 and 100,000 square feet in New Office Building #2 leased for 20 years at yearly rental of $9 per square foot, adjusted every 10 years to Consumer Price Index and yearly adjustment to changes in real estate taxes. Leasing costs for space $247,000.

Construction loan advances totaled $3,695,000. Construction loan now fully funded.

Negotiations in progress to secure permanent financing.

Year 5:

Permanent financing obtained and construction loan paid. Terms of permanent loan as follows:

Amount	$16,500,000
Interest	10%
Amortization schedule	25 years
Term	10 years
Constant	.1090
Yearly payment	$1,799,000
Amount due at maturity (balloon)	$13,953,000
Fees (3 points, payable at closing)	$495,000

New Office Building #1 fully rented, generates stabilized rental income of $1,689,000 before real estate taxes.

New Office Building #2 partially occupied, generates rental income of $761,000 before real estate taxes.

Ground rent $256,000.

Real estate taxes on New Office Building #1 and New Office Building #2 $628,000. With tax stops written in leases, these real estate taxes will remain stable.

Mortgage interest $1,643,000.

Mortgage amortization $156,000.

During Year 5, 125,000 square feet of office space in New Office Building #2 leased for 20 years at yearly rental of $9 per square foot, adjusted every 10 years to Consumer Price Index and yearly adjustment to changes in real estate taxes. Leasing cost for space $247,000.

Year 6:

New Office Building #1 rental income $1,689,000.

New Office Building #2 partially occupied, generates rental income of $1,627,000 before real estate taxes.

Ground rent $256,000.

Real estate taxes $628,000.

Mortgage interest $1,627,000.

Mortgage amortization $172,000.

During Year 6, last 25,000 square feet of office space in New Office Building #2 leased for 20 years at yearly rental of $9 per square foot, adjusted every 10 years to Consumer Price Index and yearly adjustment to changes in real estate taxes. Leasing cost for space $50,000.

Year 7:

New Office Building #1 rental income $1,689,000.

New Office Building #2 fully rented, generates stabilized rental income of $1,689,000 before real estate taxes.

Ground rent $256,000.

Real estate taxes $628,000.

Mortgage interest $1,608,000.

Mortgage amortization $191,000.

Years 8 through 10:

Same as Year 7, except allocation of mortgage interest and amortization.

Year 11:

Ground rent adjusted upward to $384,000, reflecting 50% increase in Consumer Price Index during preceding 10 years.

Year 12: No change.

Year 13:

Gross rent adjusted upward for 175,000 square feet in New Office Building #1, reflecting 50% increase in Consumer Price Index during preceding 10 years.

Year 14:

Gross rent adjusted upward for 75,000 square feet in New Office Building #1, reflecting 50% increase in Consumer Price Index during preceding 10 years.

Year 15:

Gross rent adjusted upward for 175,000 square feet in New Office Building #2, reflecting 50% increase in Consumer Price Index during preceding 10 years.

New permanent financing obtained to pay mortgage that came due at end of Year 14. New financing based on 75% of $35,333,000 appraised value. Refinancing results in refinancing surplus of $12,547,000. Terms of new permanent loan as follows:

Amount	$26,500,000
Interest	10%
Amortization schedule	25 years
Term	10 years
Constant	.1090
Yearly payment	$2,889,000
Amount due at maturity (balloon)	$22,409,000
Fees (3 points, payable at closing)	$795,000

Year 16:

Gross rent adjusted upward for 75,000 square feet in New Office Building #2, reflecting 50% increase in Consumer Price Index during preceding 10 years.

Years 17 through 20: No change.

Year 21:

Ground rent adjusted upward to $512,000, reflecting 50% increase in Consumer Price Index during preceding 10 years.

Year 22:

Property sold for $49,500,000, based on continuation of favorable earnings. Price represents $25,915,000 cash over mortgage balance of $23,585,000.

TAX CALCULATIONS

For the purpose of calculating the taxable income, the tax-deductible expenses are subtracted from the rental income:

Ground rent, real estate taxes, mortgage interest: fully deducted during the year in which they occurred.

Mortgage fees: amortized over the life of the mortgage.

Leasing costs: amortized over the term of the lease.

Depreciation: each building has a basis of $8,250,000 and is depreciated over a 45-year life, using the 150% declining balance method. Depreciation commences upon issuance of the Certificate of Occupancy.

The taxable income is multiplied by 50% (investor's tax bracket) to obtain the tax benefits (if result is negative) or tax liability (if result is positive).

The after-tax equity reversion based on sales price of $49,500,000 is calculated as follows:

Resale price		$49,500,000
Mortgage balance		23,585,000
Equity reversion		$25,915,000
Original cost	$16,500,000	
Accumulated dep.	7,896,000	
Depreciated basis	$ 8,604,000	
Resale price	49,500,000	
Depreciated basis	8,604,000	
Capital gains	$40,896,000	
Tax rate	.32	
Capital gains tax		13,086,000
After-tax equity reversion		$12,829,000

AFTER-TAX CASH AND BENEFITS

The after-tax cash and benefits is the yearly summary of ownership benefits. It is calculated by combining the cash flow with either the tax benefits or the tax liabilities.

For example, in Year 1, the $700,000 negative cash flow was partially offset by tax benefits of $226,000, resulting in negative after-tax cash and benefits of $474,000 ($-700,000 + $+226,000 = $-474,000). In Year 6, the $583,000 positive cash flow was decreased by a $96,000 tax liability, resulting in positive after-tax cash and benefits of $487,000 ($+583,000 + $-96,000 = $+487,000).

INTERNAL RATE OF RETURN

The internal rate of return is calculated from the after-tax cash and benefits plus the after-tax equity reversion. Although a computer saves considerable time in making this computation, the internal rate of return can be calculated by hand, using the trial and error process.

The internal rate of return for the office development investment is 20.5%. The proof is as in *Example 7.*

Although some investors may be able to reinvest their after-tax cash and benefits consistently at 20.5%, we have calculated an adjusted internal rate of return using several reinvestment rates:

Reinvestment Rate	Adjusted Internal Rate of Return
15%	17.8%
12%	16.4%
10%	15.5%
8%	14.6%
6%	13.7%
5%	13.3%

The payback period method shows that it will take over 12 years to recapture the entire investment on a dollar-for-dollar basis.

The net present value technique, using a 15% cost of equity capital, indicates a net present (equity) value of approximately $1,500,000.

Example 7

INTERNAL RATE OF RETURN CALCULATION (PROOF)

Year	After-Tax Cash and Benefits	Present Value at 20.5%	Present Value of After-Tax Cash and Benefits
1	$ -474,000	.8294	$ -393,135
2	-673,000	.6879	-462,956
3	-958,000	.5705	-546,539
4	-521,000	.4732	-246,537
5	-622,000	.3925	-244,135
Total present value of outflows			$ -1,893,302
6	$ +487,000	.3255	$ +158,518
7	+550,000	.2700	+148,500
8	+531,000	.2239	+118,890
9	+513,000	.1858	+95,315
10	+493,000	.1540	+75,922
11	+408,000	.1278	+52,142
12	+386,000	.1060	+40,916
13	+657,000	.0879	+57,750
14	+758,000	.0729	+55,258
15	+12,334,000	.0604	+744,973
16	+689,000	.0501	+34,518
17	+668,000	.0416	+27,788
18	+646,000	.0345	+22,287
19	+626,000	.0286	+17,903
20	+603,000	.0237	+14,291
21	+517,000	.0197	+10,185
22	+13,323,000*	.0163	+217,165
Total present value of receipts			$ +1,892,321

*Includes after-tax equity reversion.

INTERPRETING THE RESULTS

Standing alone, statistics such as an internal rate of return of 20.5% and an adjusted internal rate of return of 17.8% have limited utility. However, when these techniques are combined with a complete cash flow analysis and are used to compare several investment alternatives, the data then become significant.

The interpretation of results, particularly with respect to risk, is important. Just because a particular investment shows the highest internal rate of return when compared with other investment alternatives does not necessarily mean it warrants selection. Various risk factors may influence the money manager's decision.

Risk and uncertainty are synonymous and relate to the likely variability of returns on an investment. The more likely it is that the returns will vary, the greater the risk. Some of the factors that affect risk include:

1) Certainty of yield.
2) Marketability and liquidity.
3) Management and supervision requirements.
4) Potential for appreciation.

During the selection process, money managers relate investment risk to the internal rate of return. For instance, if two investments show similar internal rates of return, but one is considered AAA quality and the other has an A risk rating, the AAA investment should be selected. On the other hand, if the A investment shows an internal rate of return considerably higher than the AAA investment, the potential for return might offset the greater risk relative to the A investment.

As previously discussed, the limitations of the techniques themselves also must be considered. The payback period technique is simple to calculate but does not account for the time value of money. The net present value hinges on the proper cost of capital estimate. The internal rate of return sometimes presumes an unobtainable reinvestment rate.

SUMMARY

In today's competitive money market, both the real estate developer and the appraiser are expanding their investment analysis and presentation techniques to satisfy the demands of increasingly sophisticated money managers.

A total project analysis, utilizing a complete and well-documented cash flow and after-tax cash and benefits chart, along with an appropriate comparison technique, is becoming part of the standard data contained in investment presentations. To compete against a broad assortment of investment opportunities, especially after the real estate depression of 1974, the developer and appraiser will have to understand and utilize these tools in an effective manner. Hopefully, with a more thorough approach to investment analysis, two

important results can be accomplished. First, developers and lenders will have more complete information relative to overall investment requirements and feasibility, so that poorly structured and poorly capitalized projects should be recognized quickly and either corrected or eliminated. Secondly, through total project analysis, the real estate industry will influence the decisions of money managers favorably and remain a competitive entity in the quest for investment capital.