THE INFLATION DEPENDENCY OF LEVERAGED INVESTMENTS

In today's uncertain economic times, the industry adjusts with alternative inflation rates and leveraged assumptions to produce satisfactory rates of return.

by Rocky Tarantello, CRE

For the past 20 years, the U.S. economy has been punctuated with dramatic changes in interest rates, inflation, wage rates and commodity prices. Most sectors of the economy have learned to adjust to the volatility of the marketplace by altering the strategy or form of their previous production formula, however, there have been some notable exceptions. Heavy industries (steel, mining, machinery and equipment) have experienced both a lack of management insight to modernize operations, and labor rigidity allowing wage rates to adjust to world competitive levels. Many farmers failed to perceive the danger of overextended debt to acquire additional land in the face of falling price supports. Financial institutions still suffer from the previous excesses of long-term fixed rate lending during years of galloping inflation.

Only recently have labor unions begun to curb their demands for unjustified wage increases while management seeks new production solutions to meet world competition. The more conservative farmers as well as large agribusiness operations have survived their debacle. Financial institutions have taken to either lending short-term or varying the price of their money. Overall our economy is digesting the changes of the past and sorting out the solutions, but there will be winners and losers as this process takes place. However, real estate income property investors have yet to demonstrate a consistent strategy to deal with rising costs of mortgage debt during periods of lower inflation.

The Real Interest Rate Problem

The "real interest rate" is defined as the difference between the nominal market interest rate minus the current rate of inflation. As such, during periods of rising inflation, fixed rate mortgage debt becomes relatively less expensive to the borrower as the nominal rate of interest remains constant. Even adjustable rate loans may suffer to some degree if the rate does not adjust as rapidly as the rise in inflation. This phenomenon partially accounts for the unusually strong performance of investment real estate during the 1970s[1], and also explains the capital base deterioration of many financial institutions when the deregulation of the industry no longer protected them by forcing depositors to accept artificially constrained deposit rates.

Simply put, two major issues arise when the "real" cost of debt exceeds the "real" rate of return of the investment. During periods of relatively low inflation and relatively high interest rates, can real estate investors expect to increase their wealth in "real" terms? Are real

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investment returns sufficient to compensate the investor for the increase in risk exposure created by the high real cost of debt and slower growth in rental levels?

The ongoing construction and development of virtually all types of property throughout the U.S. suggests the answer is "yes." Apparently, there is no lack of risk takers ready to try their luck on the pretext that adequate returns are still achievable. However, these are uncharted economic times and it may be that the industry is simply slow to adjust to the new reality. This article attempts to shed light on this question by evaluating the performance of a given income producing real estate investment under alternative inflation rates and leverage assumptions. It serves as a beginning for discussion on a very important issue.

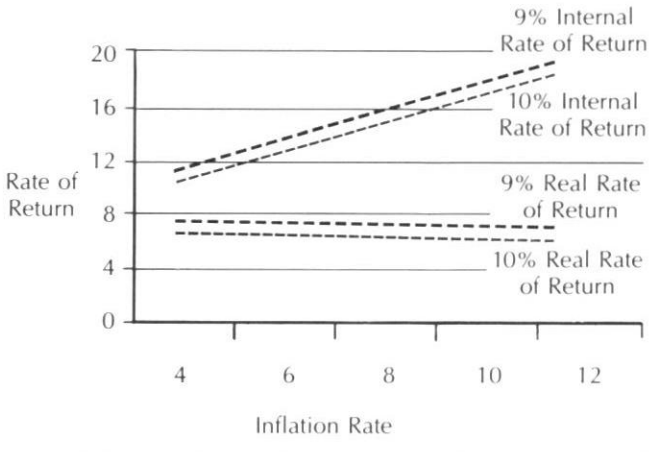
The Foundation For Analysis

Last April, at the American Society of Real Estate Counselors Midyear Meetings in Chicago, a workshop was presented concerning real estate investment fiduciaries and fiduciary services opportunities. This author was fortunate to serve as the moderator for a distinguished panel which included John Bailey, CRE, Landauer & Associates, New York City, now managing director in charge, and Reid Samuelson, president of Coldwell Banker Capital Management Group, Los Angeles. While the program content included a number of topics dealing with various aspects of the changing role of real estate counselors in an increasingly institutionalized world, my interest was especially peaked by panelist observations concerning the impact of inflationary pressure on nonleveraged real estate returns. In fact, the results of some preliminary computer based analysis conducted by Mr. Samuelson surprisingly contradicted the commonly held notion that higher inflation rates contribute to higher rates of return for the income property investor.

The graphs in Figure 1 reflect both adjusted (Real Rate of Return) and unadjusted nominal (Internal Rate of Return)

FIGURE 1

Summary of Discounted Yield Analysis



project returns for alternative rates of inflation (as reflected in assumed changes in rents and expenses pursuant to alternative inflation rates) and net operating income capitalization rates (as reflected in residual sale prices). As the reader can see, given the basic set of cash flows presented in Table 1 and adjusting rents and expenses according to various possibilities for future inflation rates, unadjusted internal rates of return rise consistently with higher rates of inflation. However, to the nonleveraged all cash buyer, the real rate of return consistently declines as higher assumed inflation rates impact project returns. All cash institutional buyers have little to gain from inflation. To the contrary, stable price levels should enhance the inflation-adjusted performance of income producing properties and encourage further diversification into real estate by pension funds, trusts and other institutional cash buyers. These are interesting findings for that segment of the income property buyers market accustomed to dealing on an all cash basis. But what of the more typical leveraged buyer? Private investors, syndicators and others commonly rely on debt to both hypothecate the asset value of their portfolio and simultaneously create tax shelter benefits primarily designed to foster greater after-tax returns. Hence, the purpose of this article is to expand upon the analysis of a hypothetical unleveraged investment by broadening the scope of assumed inflation and capitalization rates. However, the current high level of mortgage interest rates and the resultant real interest rates relative to the current rate of inflation strongly suggests that under current market conditions, only the lender stands to economically benefit from a leveraged real estate investment.

In order to empirically test this hypothesis, the first year cash flows given in Table 1 were extrapolated under an expanded set of inflation rate, capitalization rate and leverage assumptions. A Lotus 1-2-3 spreadsheet program was used to generate the IRRs[2] which then were adjusted for inflation to arrive at the real rate of return. Three general scenarios were considered in the analysis:

1. all cash purchase, non-taxable investor[3];
2. leveraged purchase, non-taxable investor;
3. leveraged purchase, taxable investor (50% bracket).

The assumed investment was an existing multi-tenant suburban office park of less than 100,000 square feet with a purchase price of $6.75 million. The subject property is located in Southern California in an active suburban office market and is currently held for investment by a comingled pension trust. Since most leases were short-term in nature, the inflation adjusted cash flows were assumed to change annually by the rate of inflation throughout the ten-year holding period. The assumptions and results of each scenario are presented separately in the following sections.

Scenario 1: All Cash Purchase, Non-Taxable Investor

Scenario 1 assumptions are rather simple and straightforward. The first year operating cash flows given in Table 1

TABLE 1

Suburban Office Park
(Price: $675,000; Initial Equity: $675,000)

Rent	$645,297
Reimbursements	115,725
Gross Income	761,022
Vacancy	38,051
Effective Gross	722,970
Expenses	
Property Taxes	67,500
Property Insurance	5,424
Water	5,160
Electric	1,440
Parking Lot Sweep	2,340
Parking Lot Strip	452
Parking Lot Repair	2,322
Landscape Maintenance	6,300
Landscape Repair	2,349
Trash	3,600
CAM Repairs and Maintenance	600
Pest Control	300
Lighting Maintenance	420
HVAC Maintenance	1,644
Roof Repairs	420
Building Repairs	420
Other Building Expenses	1,997
Property Management	19,254
Expenses	121,942
PSF	2.41
Net Income	601,028
Cap Rate %	8.9%
Cash Flow	601,028
Spendable %	8.9%
Roof Replacement	0
Mechanical Replacement	0
Parking Lot	0
Common Area	0
TI Cost	0
Commissions	0
Adjustment	0
Total Reserves	0
Net Cash Flow	$601,028
Net Spendable %	8.9%

TABLE 2

All Cash, Non-Taxable Returns

Nominal IRRs

Capitalization Rate	Possible Future Inflation Rates 2%	4%	6%	8%	10%
8.0	11.33	13.40	15.44	17.45	19.44
8.5	10.91	12.97	15.00	17.01	18.98
9.0	10.52	12.58	14.60	16.59	18.57
9.5	10.17	12.21	14.23	16.21	18.18
10.0	9.84	11.88	13.88	15.86	17.82
10.5	9.53	11.55	13.55	15.53	17.48
11.0	9.24	11.26	13.25	15.22	17.17
11.5	8.97	10.98	12.97	14.93	16.87
12.0	8.72	10.72	12.70	14.66	16.60

Real IRRs

Capitalization Rate	Possible Future Inflation Rates 2%	4%	6%	8%	10%
8.0	9.33	9.40	9.44	9.45	9.44
8.5	8.91	8.97	9.00	9.01	8.98
9.0	8.52	8.58	8.60	8.59	8.57
9.5	8.17	8.21	8.23	8.21	8.18
10.0	7.84	7.88	7.88	7.86	7.82
10.5	7.53	7.55	7.55	7.53	7.48
11.0	7.24	7.26	7.25	7.22	6.17
11.5	6.97	6.98	6.97	6.93	6.87
12.0	6.72	6.72	6.70	6.66	6.60

serve as the basis for the 10-year analysis. Gross rental income is assumed to rise at the given rate of inflation. Vacancy is held constant at five percent throughout the holding period. All operating expenses, with the exception of property taxes, also are assumed to rise by the rate of inflation, compounded annually. Property taxes rise by two percent per year which is the maximum annual increase allowable under California law. Our analysis assumes the property is acquired for $6.75 million, all cash, held for 10 years and then sold. Commissions and closing costs were estimated at 2.5 percent of the sale price in Year 10. Sales prices were derived by capitalizing Year 10 Net Operating Income (NOI). The analysis considers inflation rates from 2-10 percent in two percent increments and 10th year capitalization rates of from 8-12 percent in 0.5 percent increments.

Table 2 summarizes both the nominal and real IRRs achieved. It is clear from the analysis that our results confirm the hypothesis that for all cash tax exempt buyers, nominal IRRs rise in conformance with inflation while real IRRs decline slightly. It should further be noted that the general level of real IRRs in our analysis appear to be slightly above those plotted in Figure 2 since our analysis did not take periodic leasing commissions and additional future tenant improvement costs

into account. However, this did not alter the conclusion, merely the estimated level of the returns. Figure 2 graphically depicts the trend in our IRR results assuming nine and 10 percent capitalization rates upon sale at various rates of inflation.

Secenario 2: Leveraged Purchase, Non-Taxable Investor

In order to assess what impact the presence of mortgage debt might have upon a tax exempt buyer given the same office park investment opportunity assumed in Scenario 1, new mortgage loan assumptions were entered into the analysis. A new mortgage of $4,266,300 was derived by assuming a 12.5 percent, 30-year, fully amortized loan all due in 10 years with a tenth year remaining balance payoff of $4,007,640. This loan amount was calculated by applying a 1.1 NOI to debt service annual coverage ratio. A loan origination fee of two points ($85,326) is added to the original capital investment amount considered in the calculation of the IRRs.

Table 3 summarizes both the nominal and real IRRs derived after adjusting for the mortgage loan assumptions. Figure 3 plots the results for the nine and 10 percent capitalization rate results at various levels of inflation. However, unlike the real IRR values in Figures 1 and 2, which seem to decline slightly at higher rates of inflation, Figure 3 shows a gradual, but steady increase in the

FIGURE 2

All Cash/Non-Taxed

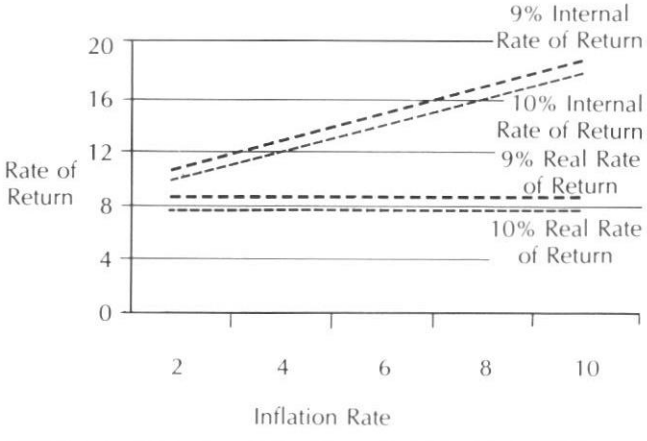


FIGURE 3

Leveraged/Non-Taxed

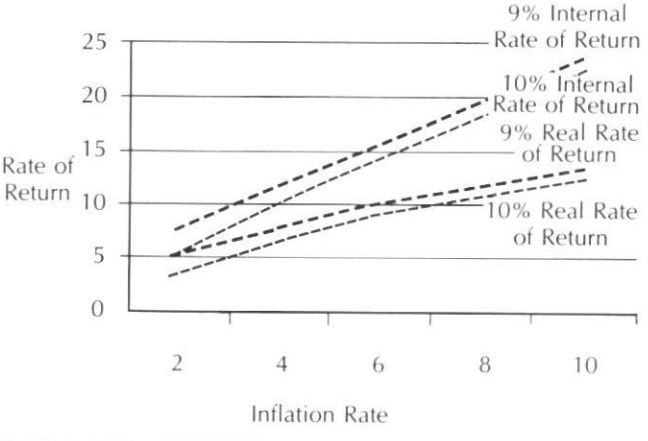


TABLE 3

Leveraged, Non-Taxable

Nominal IRRs

Capitalization Rate	Possible Future Inflation Rates 2%	4%	6%	8%	10%
8.0	9.30	13.91	17.89	21.47	24.77
8.5	8.25	13.02	17.09	20.73	24.07
9.0	7.22	12.16	16.33	20.03	23.41
9.5	6.22	11.34	15.61	19.38	22.79
10.0	5.23	10.54	14.92	18.75	22.21
10.5	4.24	9.77	14.26	18.16	21.66
11.0	3.28	9.03	13.63	17.59	21.14
11.5	2.30	8.29	13.02	17.04	20.64
12.0	1.32	7.58	12.43	16.52	20.16

Real IRRs

Capitalization Rate	Possible Future Inflation Rates 2%	4%	6%	8%	10%
8.0	7.30	9.91	11.89	13.47	14.77
8.5	6.25	9.02	11.09	12.73	14.07
9.0	5.22	8.16	10.33	12.03	13.41
9.5	4.22	7.34	9.61	11.38	12.79
10.0	3.23	6.54	8.92	10.75	12.21
10.5	2.24	5.77	8.26	10.16	11.66
11.0	1.28	5.03	7.63	9.59	11.14
11.5	.30	4.29	7.02	9.04	10.64
12.0	−.67	3.58	6.43	8.52	10.16

real rate of return as inflation rises. It is important to recognize that notwithstanding the rise in real IRRs, two critical points arise. First, from Table 2 to Table 3, real IRRs decline substantially at all possible future rates of inflation as the high real interest costs of the new mortgage loan of 8.5 percent (12.5 percent nominal rate—approximately 4% current estimated rate of inflation) impact a gross rental stream which is rising at a slower pace. Secondly, in order for the investor to earn a real rate of return equal to that of the lender, the anticipated rate of inflation must be at least six percent or above. Moreover, real IRRs to the investor show great improvement as future anticipated inflation rises to pull up current rents at a pace fast enough to offset the negative impact of the debt. Clearly, unless the investor anticipates a resurgence of inflation to previous levels of the 1970s, he bears an inordinate risk that he may not achieve his investment goals.

Seenario 3: Leveraged Purchase, Taxable Investor

The final adjustment to our set of assumptions attempts to demonstrate the after-tax results of the investment. It was felt that by integrating the tax benefit derived from the depreciation and mortgage interest deductions, IRRs might improve enough to help compensate the investor for the risk he undertakes by agreeing to a high real cost of debt. The following additional assumptions were put into the analysis. The building land ratio is 75 percent giving a depreciable building value of $5,062,500. Depreciation expenses were taken on an 18-year straight-line basis. Our imaginary investor occupies the 50 percent marginal tax bracket and may expect to pay maximum capital gains taxes at 20 percent of the taxable gain on sale.

Table 4 summarizes the nominal and real IRR results after adjusting for assumed tax effects. Figure 4 plots the IRR values again assuming nine and 10 percent capitalization rates on the sale of the property in Year 10. Unlike

TABLE 4

Leveraged Taxable

Nominal IRRs

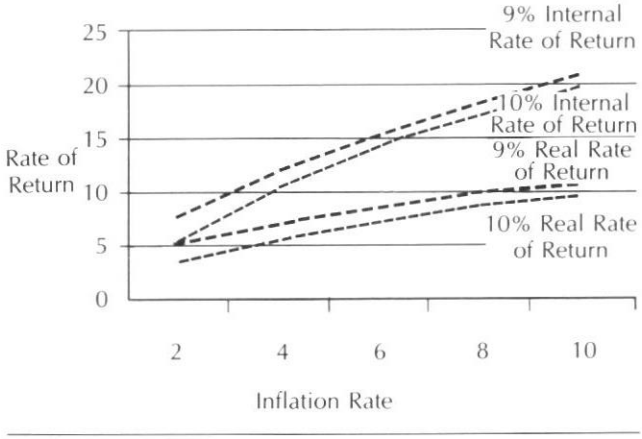
Capitalization Rate	Possible Future Inflation Rates 2%	4%	6%	8%	10%
8.0	9.07	12.89	16.25	19.31	22.15
8.5	8.08	12.02	15.45	18.55	21.43
9.0	7.12	11.19	14.69	17.85	20.76
9.5	6.17	10.39	13.97	17.17	20.11
10.0	5.24	9.62	13.29	16.53	19.51
10.5	4.32	8.86	12.62	15.92	18.94
11.0	3.42	8.13	11.98	15.34	18.39
11.5	2.50	7.42	11.36	14.78	17.86
12.0	1.58	6.71	10.76	14.24	17.36

Real IRRs

Capitalization Rate	Possible Future Inflation Rates 2%	4%	6%	8%	10%
8.0	7.07	8.89	10.25	11.31	12.15
8.5	6.08	8.02	9.45	10.55	11.43
9.0	5.12	7.19	8.69	9.85	10.76
9.5	4.17	6.39	7.97	9.17	10.11
10.0	3.24	5.62	7.29	8.53	9.51
10.5	2.32	4.86	6.62	7.92	8.94
11.0	1.42	4.13	5.98	7.34	8.39
11.5	.5	3.42	5.36	6.78	7.86
12.0	−.42	2.71	4.76	6.24	7.36

FIGURE 4

Leveraged/Taxed



the results presented previously, the assumptions used in Scenario 3 most closely resemble a more typical taxpaying investor who would ordinarily finance the acquisition. When compared to the results of Scenario 2, a slight diminution in both nominal and real IRRs results from the ordinary income taxes paid on operating profits as well as the capital gains tax liability on the sale proceeds. Note however, that the investor is unlikely to achieve currently acceptable nominal IRRs unless the future rate of inflation is at least 5-6 percent. This is the point at which nominal IRRs cross over the 12-13 percent range. In real terms, the future anticipated inflation

rate must approach eight percent before the real IRR earned by the investor equals the real cost of mortgage debt of 8.5 percent.

Conclusion

Except for certain institutional non-taxable investors, more traditional developer/investors have not demonstrated a strategic adjustment to the realities of the current marketplace. For the most part, little attention has been paid to the current discrepancy between the real cost of mortgage debt and the real rate of return achievable by the investor. To the extent that real interest rates exceed real IRRs, any rational investor would probably choose to be a lender before choosing to be a borrower. All-cash non-taxable investors enjoy a clear advantage so long as future anticipated rates of inflation remain in the range below five percent. Perhaps this is an unrealistic expectation, perhaps not. Over the period 1975-1985 this was certainly not the case. If future inflaton rates do return to the levels of the 1970s, then typical taxpaying and leveraged investors are acting quite prudently and their gamble will pay off. Unfortunately no one knows where the future lies. Meanwhile it appears that the value of leveraged investments remains dependent upon future rates of inflation well beyond what we currently observe.

NOTES

1. Artificially low real borrowing rates were a major factor in explaining real estate returns. However, rising demand for real property as an inflation hedge and environmentally induced supply constraints often contributed to the rise in real estate returns.
2. Notwithstanding its many shortcomings, the internal rate of return (IRR) has become the current standard by which real estate investment performance is measured. See John McMahan, "Measuring Real Estate Returns," *Real Estate Issues*, Volume 9, No. 2, Fall/Winter, 1984, p. 33.
3. These were the same assumptions utilized in the Samuelson analysis presented in Figure 1.