

Capital Expenditures: Be Careful How You Count

by

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Capital expenditures are a hot topic among real estate investment managers, pension plan sponsors, consultants, and researchers. Since capital expenditures are often the largest claim on commercial real estate cash flow, all this attention is well-deserved. However, the way capital expenditures have been reported in recent professional and academic reports gives a false impression of the magnitude of the economic impact. When dealing with capital expenditures from an analytical perspective, we support Fisher's [1995] suggestion to use the median statistic rather than the mean, and offer a new suggestion to treat capital expenditures as cumulative expenditures, just as the path toward total return is cumulative over a property's investment life cycle.

Capital expenditures (CI) have been a part of the NCREIF Property Index data base since its inception in 1978. Recently, NCREIF has considered collecting and reporting major components of CI. CI is a catchall statistic for leasing commissions, capital expenditures that are major repairs or replacement of expensive physical elements of buildings, capital expenditures related to expanding or otherwise contributing to the amount or quality of the space available for leasing, and a host of finance or purchase related items including "earn-outs" and third-party debt forgiveness or similar mortgage-related adjustments. Because these items may not exhaust the array of items that fall under the general heading of CI, NCREIF is examining accounting practices among its member firms before settling on a set of breakouts of the CI category.

NAREIT, the trade organization representing publicly-traded real estate securities, has undertaken a similar effort to understand the ramifications of capital expenditures. There have been several working and discussion papers on the issue of funds from operation, FFO, which involve many of the same issues being discussed at NCREIF.¹

Some corporate and public pension plan sponsors and their consultants have focused on capital expenditures as a likely source of underperformance and as a way of making sense of performance differences among managers dealing in seemingly identical property types and employing similar investment strategies. The hope is that some substantial fraction of the variations can be explained by the differences in capital expenditures. Clearly, some properties require more or less capital over their investment lifetime. Understanding these differences might improve investment decision-making and thereby enhance investment returns.

What Do We Already Know About Capital Expenditures?

Using NCREIF data, Harper and Fiacchi [1996] reported that aggregate capital expenditures as a fraction of aggregate net operating income (CI/NOI) averaged 36.7% per annum over the period 1980 to 1995. The annual averages by property type were: 36.8% for Office, 45.4% for

¹ See Decker [1996] for a history of NAREIT's development of the definition of FFO.

Retail, 31.7% for Warehouse, 29.3% for R&D/Office, and 17.2% for Apartment (over eleven years ending 1995).

Many real estate practitioners have been unpleasantly surprised by these figures: they just seem too high. How could more than one-third of the annual net operating income go toward making major improvements and paying brokers? The reality of NCREIF figures does not match the perceptions of real estate asset managers. This is not to say that the figures are incorrect, but it does leave in the minds of many the impression that the figures must be someone else's problem.

Those who think that the figures give an improper glimpse of reality may find support in Fisher's [1995] study of CI in regional shopping malls. He found that the CI reported by several owners or managers was notably lower than the NCREIF figures for retail property. Fisher also calls attention to the fact that the distribution of CI relative to net operating income is highly skewed.

CI have a natural lower limit of zero dollars, but the upper limit can be quite high, even exceeding net operating income in a month, quarter, or year. The distribution of CI is, in a sense, similar to the distribution of personal incomes. Since a few exceedingly high incomes can skew the average level of incomes in an area, researchers invariably opt for the median income figure as more representative of the general income level. By similar reasoning, Fisher concludes that the median of the CI/NOI distribution should be more representative of CI for properties that do not require extensive renovation or expansion.

We concur with Fisher's analysis and suggest that the apparent discrepancy between reality and perception lies in the summary statistics. In particular, the skewed distribution of CI/NOI among properties argues for use of the **median** rather than the **mean** or the **weighted-average**, which typifies aggregate statistics from NCREIF.²

To overcome another criticism of the way in which CI are analyzed over time, we will suggest an improvement upon the simple median of annual statistics later. First, to understand why investors are so focused on CI, we will take a little detour to discuss the impact of CI on investment performance.

Impact on Performance Measures

While total return may be the ultimate goal of investment programs, real estate investment programs frequently add hurdle rates for first-year cash return on invested capital that presupposes little or no CI based upon today's prices. For example, a pension plan's real estate investment guidelines might call for an 11% total return with an 8% first year cash-on-cash return after operating expenses, CI, and investment management fees. At current commercial property pricing levels the first-year cash-on-cash return requirement effectively eliminates from consideration many properties that otherwise satisfy the total return objective such as properties that have more tenant turnover in the early years or properties with below market rents.

In institutional real estate investment performance measurement there is a practice of reporting two components of total return: the income return and the capital return, also known as the appreciation return. As Young, Geltner, McIntosh, and Poutasse [1995 and 1996] noted, the

² NCREIF returns and many summary statistics that are reported by NCREIF are typically computed by first aggregating the variables of all properties and then applying the formula. This aggregation creates weighted-averages rather than equally weighted statistics.

names associated with the components of total return do not necessarily conform to popular notions of income return or appreciation return. In particular, NCREIF's return component formulas deduct CI from the numerator of the appreciation return and use net operating income as the sole variable in the numerator of the income return. To a large extent, the NCREIF income return formula leaves the impression that investors receive more income from real estate than is actually available, which undoubtedly accounts for the high first year cash-on-cash return hurdles mentioned earlier. Conversely, the NCREIF capital return formula leaves the impression that real estate appreciates little in value, that real estate is essentially a wasting asset requiring substantial CI just to stay even.³

Neither of these impressions is correct. Because CI must be made from time to time, net cash flow that can be distributed to investors must be something less than the net operating income. If CI are funded entirely out of periodic cash flow from the property, the distributable cash flow is simply the net operating income minus the cash flow spent on capital improvements.

Active Management is “Positive Spread” Investing

Real estate investment managers spend money on capital items for both “defensive” and “offensive” purposes. On the defensive side, money must be spent to replace worn out parts of the physical plant and to attract and retain tenants. On the offensive side, real estate investment managers actively seek to improve the cash flow and ultimately the value of the assets under their care. Most often this requires money to make space attractive to tenants that can afford higher rents or to add or reconfigure space. Thus, active real estate asset management is an ongoing effort at “positive-spread” investing, that is, investing money in physical and functional improvements that will produce a future return that is marginally higher than the current return.

Real Estate Returns Take Time to Happen

One reasonable criticism of CI studies is that the timing of the expenditures does not coincide with the rewards received from making them. By analyzing quarterly or annual capital expenditures relative to net operating income, we ignore the fact that the rewards from major improvements may not occur until many quarters or even years later. Positive spread investing with a careful program of capital expenditures spread over several years is usually necessary for commercial real estate to live up to the promises made to investors by their managers.

Over the past twenty years, the institutional real estate investment business has used the same, invariable rules-of-thumb to buy commercial real estate and to convince pension plans to invest in it.⁴ The rules are simple: property is purchased at an 8% to 9% capitalization rate (first-year net operating income divided by purchase price) and is expected to produce a total return over the full investment life (typically ten years) of 11% to 12%, the magical IRR.

³ Young, Geltner, McIntosh, and Poutasse show that, in round numbers, the NCREIF income return component **overstates** the actual cash flow that investors receive from commercial real estate by about 2% to 3% per annum. Conversely, the NCREIF appreciation return component **understates** the actual capital appreciation of commercial real estate assets by the same 2% to 3% figure. The authors argue that a simple change in the formulas would bring the income and capital return components more into line with the reality of real estate investment behavior.

⁴ For a first-hand account of the history of the capitalization rate decision rule, see Steppe [1995].

There are several ways to get from **here**, 8-9% on day one, to **there**, 11-12% ten years later. First, you could get lucky with capitalization rates moving downward enough to produce the desired yield from a higher future sales price. Second, you could get lucky with the next buyer overpaying for the property, also known as the “greater fool” theory of real estate investing. Third, you could work to increase the net operating income over time and through skill or luck increase net operating income by 3-4% per annum. Fourth, you could experience some combination of ways one, two, or three.

It should go without saying that counting on luck to produce returns is not a winning strategy for convincing pension plans to invest in real estate. Most real estate investment managers are wise to use a more active, skill-based strategy that goes by the name: “value-added management.” The battle is to increase the net operating income throughout the ownership period; the weapon of choice is CI judiciously applied.

A Better Way to Count

Many people who have seen the figures on CI as a percent of NOI extracted from the NCREIF Property Index data base have been shocked by the magnitude of the annual ratios. Ratios as high as 40% and 50% for office and retail properties are considered far too high by many real estate practitioners.

We agree that the widely-reported annual figures produce a misleading impression of the impact of CI for the entire real estate asset class.

One way to handle this problem is to monitor and analyze CI over a property's or portfolio's full investment life. By keeping track of the **cumulative CI** relative to the **cumulative NOI**, we may produce a better picture of the cost/benefit relation. Also, cumulative ratios tend to smooth the relation and may help avoid unwarranted concern over short-term volatility in the statistic.

Exhibit 1 shows the difference that we might expect between periodic and cumulative calculations of the CI/NOI ratio. CI, NOI, and the CI/NOI ratios are shown for five hypothetical properties over three periods. The aggregate figures corresponding to the way in which the figures are computed in Harper and Fiacchi are shown below the five samples. Finally, the means and medians of the sample CI/NOI ratios are shown at the bottom. The three columns under the heading “Cumulative Periods” are derived from the three columns under the heading “Individual Periods.”

These simple examples highlight the differences in sample and aggregate statistics that we expect to find in actual data. In particular, periodic and aggregate CI/NOI ratios are volatile and positively skewed when viewed period by period. The cumulative results are far less volatile but still exhibit skewness, albeit less than in the period-by-period example. In most cases, due to skewness, the median CI/NOI ratio is lower than the mean. We suggest that the cumulative CI/NOI ratio provides a reasonable representation of the progression of the statistic toward the long-term expected value for each property and for the portfolio aggregate, something that cannot be said of the individual period statistics.

Some Actual Results

We have analyzed cumulative CI/NOI ratios for actual properties owned by RREEF on behalf of its pension plan sponsor clients. These statistics are derived from monthly financial data going back to January 1988. The mean and median year-end rolling cumulative CI/NOI ratios by

property type are shown in Exhibit 2. Notice that the median is always lower than the mean reflecting the distinct skewing in the data for properties grouped by type. From time to time an individual property will undergo a major renovation or have a need for replacement of important and costly building components. But this is not the normal, long-term pattern during the life span of the property. Thus, we believe that the median statistics are more representative of a property's or portfolio's long-term characteristic CI/NOI ratio.

The distributions of CI/NOI ratios by property type are quite disperse. Exhibit 3 is a set of "candlestick" graphs showing in the center rectangle the 75th to 25th percentile of the distribution of year-end rolling cumulative CI/NOI ratios by property type among RREEF properties. The "wicks" of the candles extending up and down represent the 90th and 10th percentile ranges for the same statistics. The positive skewing of the distribution (longer wicks at the top than at the bottom) is clearly evident in each graph. As one might expect, the interquartile range, the 75th to 25th percentile range, for Apartment properties is relatively narrow. Retail properties are next with an interquartile range of about 20% on average. Industrial properties, which in the RREEF portfolio includes a large number of business parks with many small tenants, show an interquartile range of about 25% on average. Finally, Office properties show the greatest range of CI/NOI ratios in both the interquartile and 90th-to-10th percentile ranges.

Individual Properties Matter

When considering the impact of CI on real estate investment performance, statistical aggregates such as those that have been produced with NCREIF data can lead to distortions because of the wide variation of expenditures among individual properties. Dealing in aggregations of properties into portfolios is not a solution either. There is no easy way around the fact that variations among properties in CI relative to NOI are so great as to require individual property assessment rather than falling back on statistical generalities. Further, we recommend that cumulative CI/NOI ratios are superior to annual or other periodic assessments.

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Exhibit 1

Comparison of CI/NOI Ratio between Individual Periods and Cumulative Periods
Five Hypothetical Properties

Property		Individual Periods			Cumulative Periods		
		period 1	period 2	period 3	period 1	period 1+2	period 1+2+3
1	CI	10	0	15	10	10	25
	NOI	100	80	115	100	180	295
	ci/noi	10%	0%	13%	10%	6%	8%
2	CI	15	25	15	15	40	55
	NOI	100	100	120	100	200	320
	ci/noi	15%	25%	13%	15%	20%	17%
3	CI	20	10	35	20	30	65
	NOI	100	120	125	100	220	345
	ci/noi	20%	8%	28%	20%	14%	19%
4	CI	25	35	50	25	60	110
	NOI	100	50	120	100	150	270
	ci/noi	25%	70%	42%	25%	40%	41%
5	CI	80	150	50	80	230	280
	NOI	100	200	120	100	300	420
	ci/noi	80%	75%	42%	80%	77%	67%
Totals	CI	150	220	165	150	370	535
	NOI	500	550	600	500	1050	1650
	ci/noi	30%	40%	28%	30%	35%	32%
CI/NOI Stats for 5 Properties:							
	Mean	30%	36%	27%	30%	31%	30%
	Median	20%	25%	28%	20%	20%	19%

Exhibit 2
 Year-End Rolling Cumulative CI/NOI by Property Type
 RREEF Properties, 1988 to 1996

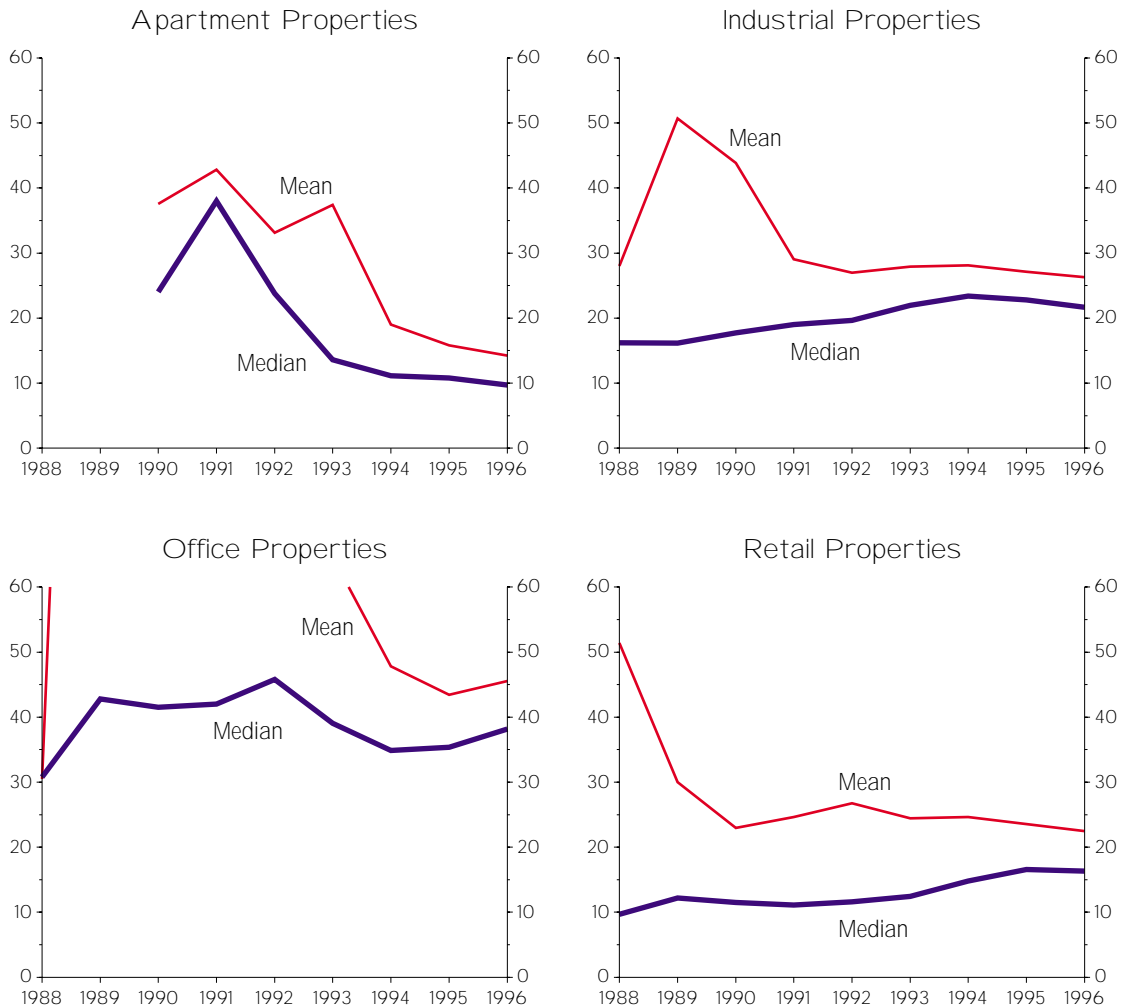


Exhibit 3
 Distribution of Year-End Rolling Cumulative CI/NOI
 90th, 75th, 25th, and 10th Percentiles
 RREEF Properties, 1988 to 1996

