

Entrepreneurial Return and Risk in Commercial Real Estate

*Capturing the unique risk
and return metrics for this
important asset class requires
a nuanced understanding of
the historical cycle of
real estate returns.*

DAVID ROSENBERG
AJAY BADLANI

TRADITIONAL METRICS fail to give an accurate picture of the risks and returns of alternative asset classes, such as hedge funds, private equity and real estate. Real estate is traditionally characterized as a low-risk asset class because the volatility of real estate returns as measured by standard deviation is low. Using standard deviation as the sole measure of risk, however, gives an incomplete picture because standard deviation underestimates the probability of extreme events and assumes that the range of historical returns is evenly distributed around the mean. Moreover, standard deviation is suspect because the benchmark compiled by the National Council of Real Estate Investment

Fiduciaries (NCREIF) is based on appraisals, not transaction data. As a result, the pattern of returns reported by NCREIF represents smoothed data, which does not reflect the true volatility of the asset class.

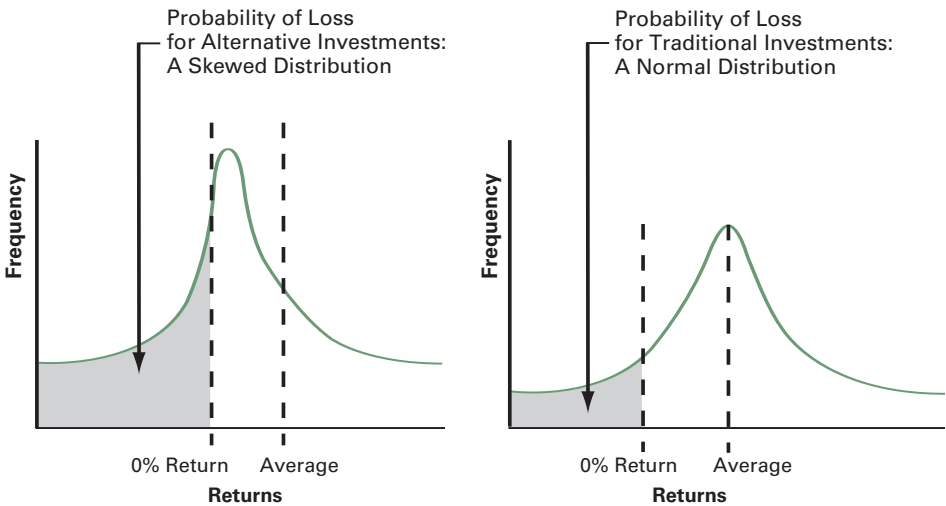
Advanced risk metrics reveal, however, that not only are real estate returns unevenly distributed, but that they are also more likely than traditional asset classes such as stocks and bonds to suffer periods of extreme returns below the average. The industry terms this “event risk,” and, using advanced analytics, we can define both the probability and magnitude of a negative event happening.

What emerges from this more in-depth analysis is that commercial real estate returns are skewed to the downside

and therefore tend to produce negative values more frequently than predicted by a normal distribution (Figure 1). Because of this, commercial real estate is riskier than it appears.

The most significant drivers of the national real estate cycle are economic growth, employment growth, interest rates and inflation. Local or regional cycles are driven largely by big growth swings in a region’s major businesses. In the typical pattern, strong local growth would spark price appreciation for existing properties and lead to additional construction. Rising prices would bring new development, funded by debt that often is enabled by loosened bank-lending restrictions. But other factors also play a role. A significant change in commodity

Figure 1: Commercial Real Estate Returns: Negatively Skewed and Subject to Extreme Loss



Source: The Citigroup Private Bank

Figure 2: Factors that Contributed to Previous Cyclical Episodes

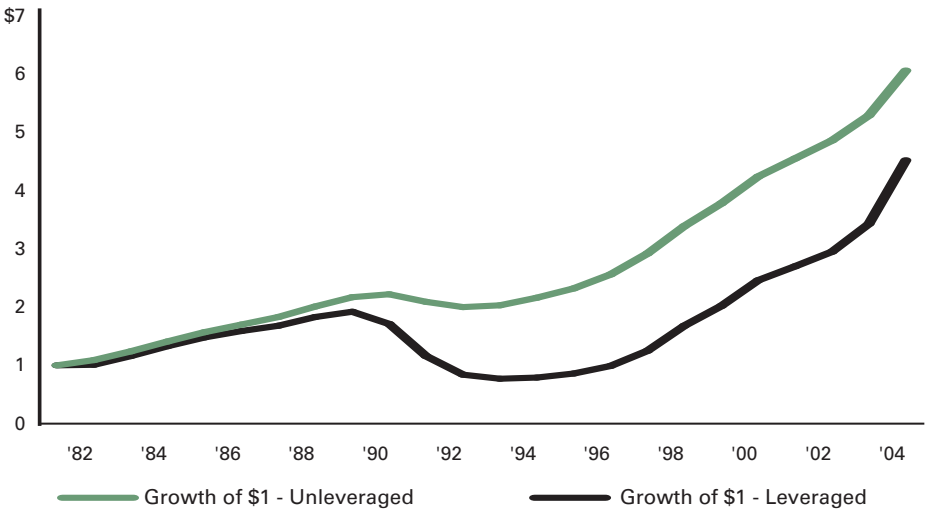
	Changes in Interest Rates	Significant Growth in Local Industries	Inflation	Excessive New Construction	Legislative/Tax/Regulatory Changes	Significant Change in Commodity Prices	Other
Houston: 1982 to 1995	•	•		•	•	•	
Dallas: 1985 to 1989	•	•		•	•	•	
National Boom & Bust 1982 to 1994	•	•		•	•		
Los Angeles: 1982 to 1994	•	•			•		•
Bursting of the Internet Bubble: 2001 to 2003		•		•			•
Hotel Sector Post-9/11/01							•
Current Cycle: 1995 to 2005	•					•	

Source: The Citigroup Private Bank

prices, for example, played a major role in the Texas and Louisiana real estate booms of the late 1970s and early 1980s. Legislative, tax and regulatory changes figured prominently in the flood of capi-

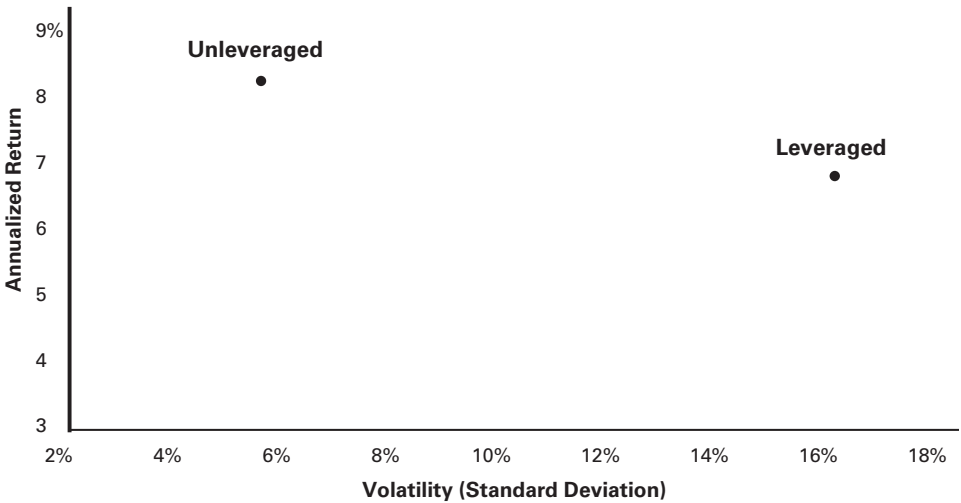
tal invested in commercial real estate during the 1980s—particularly the legislation that allowed commercial banks and savings and loans unfettered access to commercial real estate lending.

Figure 3: NCREIF National Property Index (NPI, 1982-2004)



Source: NCREIF

Figure 4: NPI, Leveraged and Unleveraged (1982-2004)



Source: NCREIF

These cycles are often amplified by bank lending and complicated by long development cycles, both of which can foster excess speculative activity. Summarized in Figure 2 are the factors that figured prominently in the cycles covered in this study.

These episodes underscore the large degree of event risk found in the pattern of historical real estate returns. Moreover, the returns are magnified by the leverage typically employed by most real estate entrepreneurs. Leveraged real estate investments tend to produce higher returns in up markets and lower returns in down markets than the unleveraged investments reflected in NCREIF commercial-property indexes. Figure 3 shows

the growth of \$1 invested in both the unleveraged and leveraged NCREIF National Property Index since 1982. What this shows is that the high cost of debt would have penalized returns during the bull market of the 1980s, and it would have also penalized performance during the downturn between 1990 and 1993. Over the entire 23-year period, then, average annualized returns would have fallen from 8.2 percent a year for the unleveraged index to 6.8 percent a year for the leveraged index. Leverage also boosts the volatility of returns, as shown in the risk-return matrix in Figure 4. Throughout this study, we show historical returns on both a leveraged and an unleveraged basis.

HOUSTON, TEXAS

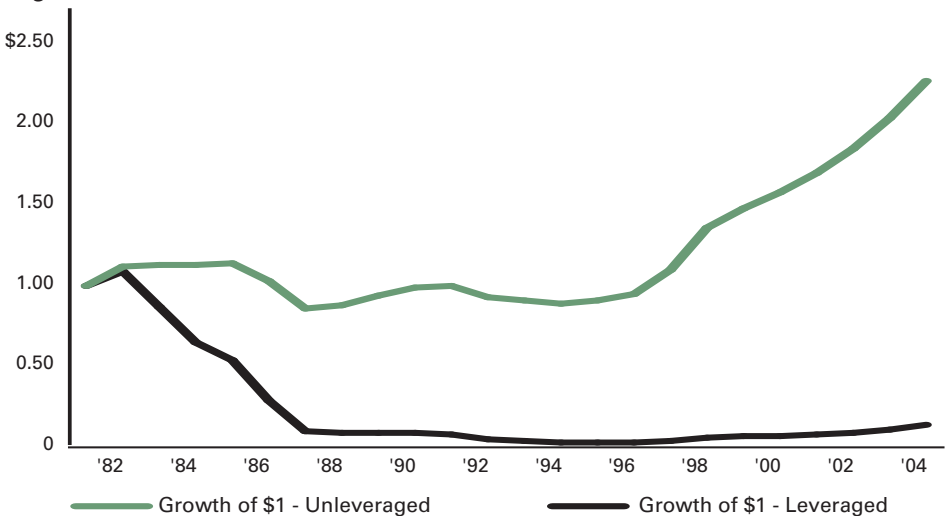
Houston was a boom city in the early 1980s, as a sixteen-fold increase in the price of oil during the 1970s led to a huge buildup in oil-and-gas drilling, processing and refining facilities, particularly in the emerging offshore fields in the Gulf of Mexico. Aided by The Economic Recovery Tax Act of 1981, which significantly boosted the tax incentives to invest in buildings and other capital goods, the entire energy-producing economy of the Texas and Louisiana Gulf Coast took off.

But by 1985, oil prices were wobbling, and in 1986, they plunged by more than 50 percent, triggering a deep recession in the oil economy, particularly along the Gulf Coast. As boom turned to bust,

Houston lost more than 200,000 jobs. Overall commercial real estate values fell 27 percent between the summer of 1986 and the trough in mid-1988 (Figure 5), according to the NCREIF Houston-area unleveraged indexes. The value of downtown office space declined some 46 percent over the next two years (Figure 6), as office vacancy rates peaked at nearly 30 percent. The effects of leverage were particularly evident: By 1988, according to Harold Hunt and M. A. Anari of Texas A&M, some 80 percent of Houston office properties were owned by their bank and thrift lenders.

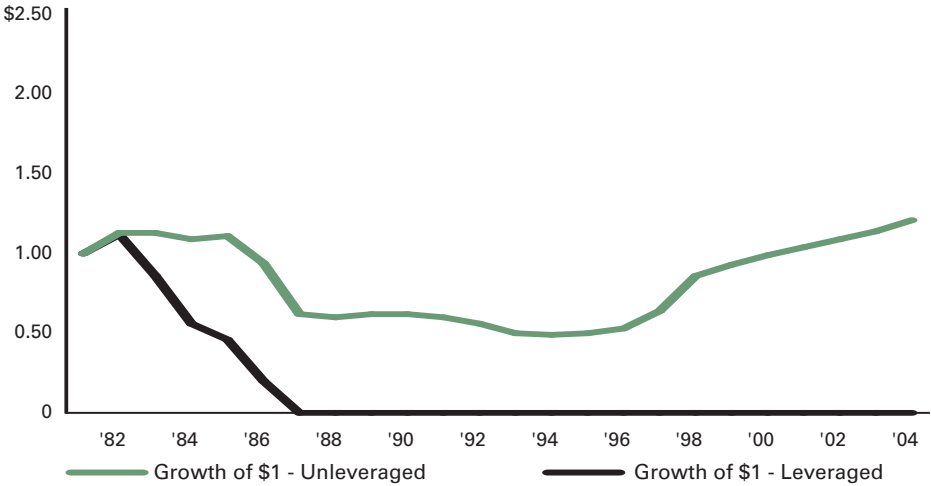
The fallout was not limited to office properties. In 1986, according to Robert Gilmer of the Federal Reserve Bank of Dallas, Houston had 200,000 vacant

Figure 5: Houston – All Commercial



Source: NCREIF

Figure 6: Houston Office Properties



Source: NCREIF

homes, twice the normal level for a city its size. Residential statistics from the Board of Realtors indicate that the value of single-family houses in some neighborhoods fell about 30 percent, while condominium prices dropped as much as 60 percent.

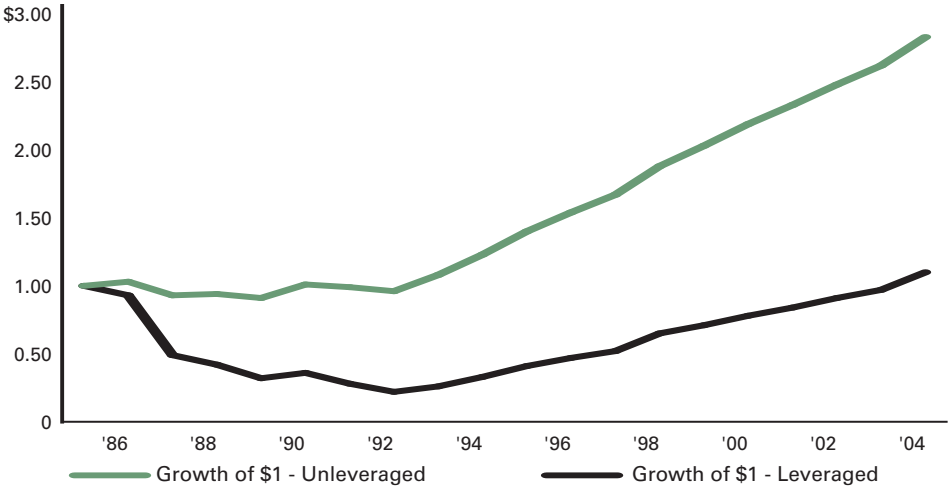
Yet office projects planned during the boom years were still coming online as late as 1990, giving downtown Houston a five-year to seven-year supply of vacant Class A office space, according to Aetna Realty Investors. The value of commercial office buildings dropped another 15 percent between 1991 and 1994, and did not begin to recover until 1995—a full decade after the peak. As Figures 5 and 6 indicate, some leveraged properties suffered a severe loss of equity, and many became insolvent.

**DALLAS, TEXAS,
APARTMENTS: 1985 TO 1989**

The strong growth in the oil-patch economy so evident in Houston also touched Dallas, with banks and thrifts becoming aggressive lenders to commercial real estate investors eager to cash in on the immigration and employment boom in Texas. The number of multifamily-building permits skyrocketed from 9,600 in 1980 to nearly 50,000 in 1983, and averaged 27,000 units a year in 1984 and 1985.

Employment growth remained strong and workers immigrated to Texas at a rapid rate. Yet the pace of construction rose so rapidly that, at the peak of the boom, one new apartment was built for every 2.8 new jobs created—nearly twice

Figure 7: Dallas Apartment Properties



Source: NCREIF

the normal rate. As these new units became available, vacancies rose and apartment valuations fell. From 1985 to 1989, the prices of apartment properties tracked by the NCREIF Dallas Apartment Index fell more than 12 percent on an unleveraged basis and 66 percent on a leveraged basis (Figure 7).

**NATIONAL BOOM AND BUST:
1982 TO 1994**

Three important pieces of legislation dramatically changed the landscape for the nation's savings and loans, banks and real estate investors, according to Richard Herring and Susan Wachter of The Wharton School. The first was the passage of the Depository Institutions

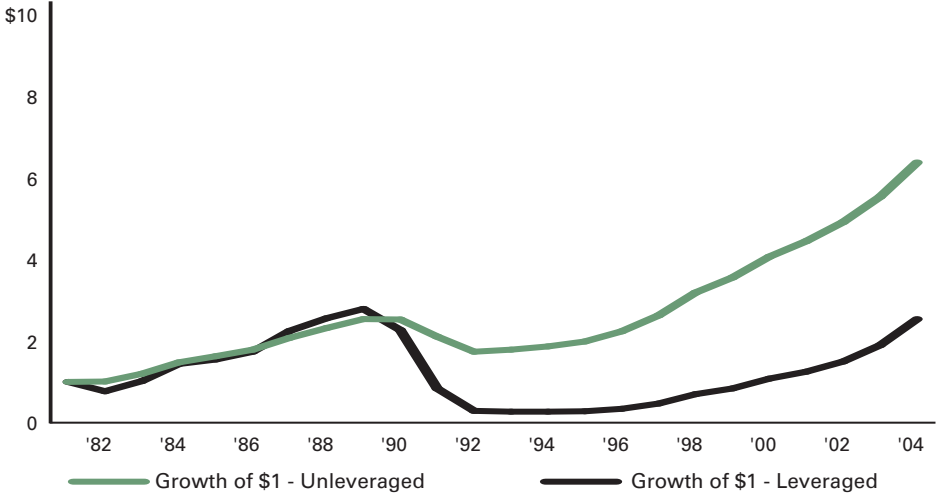
Deregulations and Monetary Control Act of 1980, which created money-market deposit accounts that drew a flood of investor money and also allowed savings and loans into the business of commercial real estate lending for the first time. This was followed by the aforementioned Economic Recovery Tax Act of 1981, and the Garn-St. Germaine Act of 1982, which eased restrictions on the loan-to-value ratios that commercial banks could extend to commercial real estate borrowers. Interest rates fell throughout these years, with the yield on the 10-year Treasury note declining from 13.9 percent in 1980 to under 9 percent by 1985.

The result was a surge in bank- and thrift-funded lending to a real estate development industry hungry for capital, particularly for commercial-office build-

ings. Total real estate loans by banks and thrifts soared from \$30 billion in 1982 to \$94 billion in 1984 and to \$122 billion by 1986. The lending frenzy was

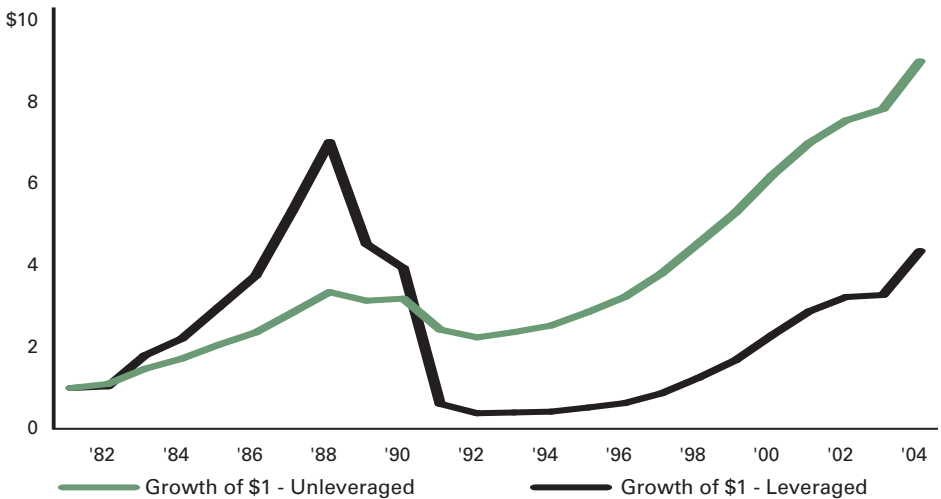
exacerbated by what Wachter and Andrey Pavlov of Simon Fraser University described as widespread underpricing of the risk of default on the

Figure 8: New York – All Commercial Properties



Source: NCREIF

Figure 9: Boston – All Commercial Properties



Source: NCREIF

part of bank lenders, who were being compensated for lending-volume growth and loan fees, rather than for safeguarding their balance sheets.

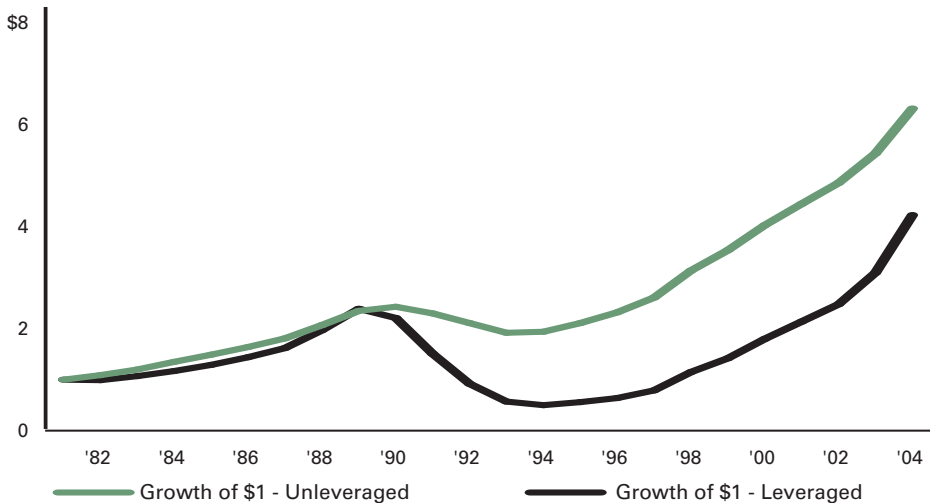
Equilibrium quickly gave way to excess: By 1990, the Wharton Real Estate Index, designed to measure the balance between capital supply and demand in real estate markets, estimated that the oversupply of capital was approaching 50 percent.

Enabling the borrowing was a loosening of underwriting standards, as many banks began financing purchases of raw land and speculative development and approving loan-to-value ratios that often exceeded 90 percent. The returns for the investors who got in early were enormous: The valuations of New York com-

mercial real estate soared 150 percent in the eight years between 1982 and 1990, and those in Boston rose more than 200 percent.

When the music stopped, the property markets faced a glut of capacity, and the fallout was severe. The valuations of unleveraged New York office properties fell more than 33 percent from the peak in the fall of 1990 to the bottom in early 1993. Valuations in Boston dropped 48 percent. And the downturn was not isolated to office buildings: Commercial property of all types in New York averaged a decline of more than 33 percent from 1990 to 1993, and those in Boston averaged a decline of more than 38 percent. As Figures 8 and 9 show, leveraged properties fared far worse. Yet both metropolitan areas have been

Figure 10: Los Angeles – All Commercial Properties



Source: NCREIF

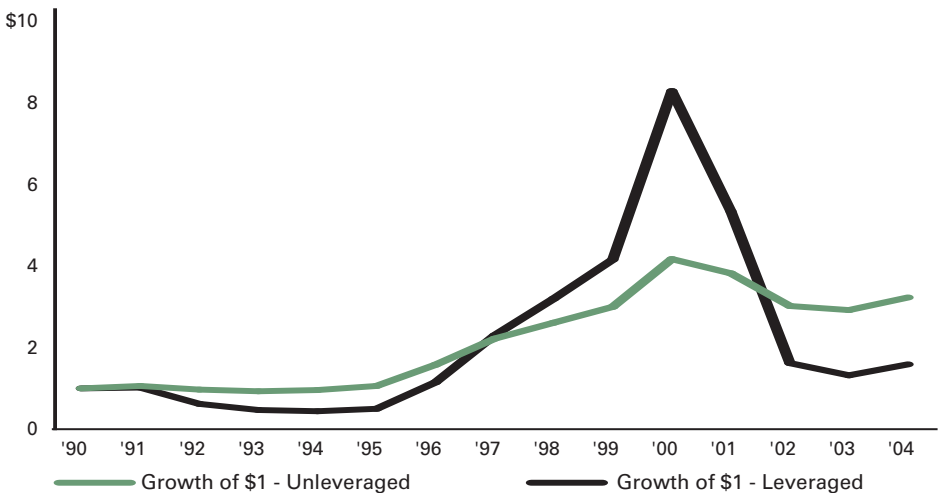
among the strongest performers in the latest bull market: New York City valuations have risen about 240 percent during the past 10 years, on average, while those in Boston have risen about 250 percent. A real estate entrepreneur using leverage could have experienced increases in valuations of more than 800 percent by investing at the bottom of the New York commercial-property cycle, and more than 900 percent in Boston.

LOS ANGELES

California real estate enjoyed the boom of the 1980s. Returns were magnified by strong immigration and the Reagan defense buildup, which directly benefited

Southern California's large aerospace industry. Commercial-property values rose 140 percent in Los Angeles between 1982 and 1990. As values peaked in 1990, however, Los Angeles was beset by a host of calamities, including the collapse of the aerospace industry in the early 1990s, the Los Angeles riots of 1992 and the Northridge earthquake of 1994. In those four years, Los Angeles commercial properties lost 23 percent of their value on an unleveraged basis and 77 percent on a leveraged basis (Figure 10). Valuations of downtown office buildings were hit especially hard by post-riot concerns, falling some 37 percent. Despite the steep downturn, Los Angeles commercial-property values more than tripled between the lows of 1994 and today.

Figure 11: San Jose Office Properties



Source: NCREIF

**BURSTING OF THE INTERNET
BUBBLE: 2001 TO 2003**

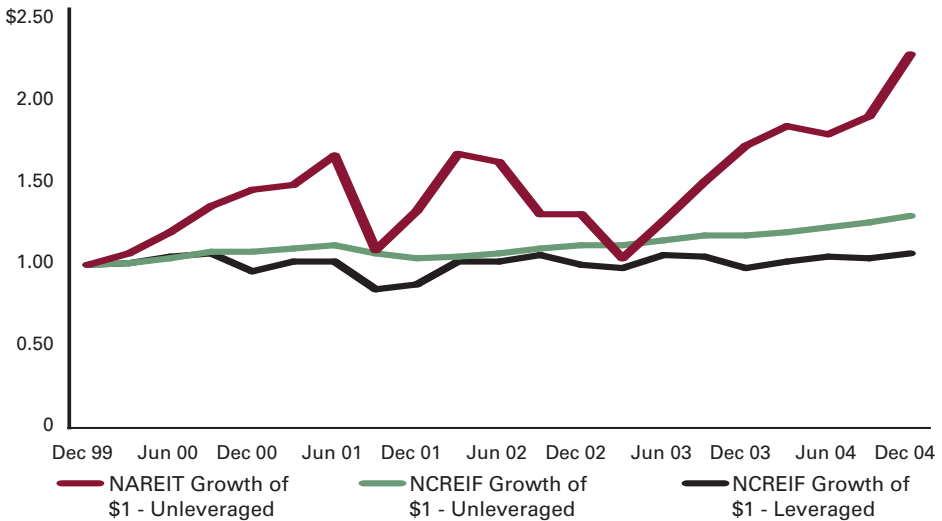
The buildup of the Internet economy in the mid-to-late 1990s sparked a comparable rise in real estate prices in the areas known as “technology corridors,” including Silicon Valley and offshoots such as Silicon Alley in New York and Multimedia Gulch in San Francisco. The hottest part of the market was centered on metropolitan San Jose office properties, whose valuations rose 300 percent on an unleveraged basis between 1990 and 2001, and climbed more than 700 percent on a leveraged basis (Figure 11). When the shares of Internet companies began collapsing in the spring of 2001, however, San Jose office prices quickly followed, falling nearly one-

third on an unleveraged basis over the next three years, and over 80 percent on a leveraged basis. Once the downturn ran its course, however, San Jose property values began to recover and have posted strong gains since the bottom in 2004.

THE HOTEL SECTOR POST-9/11

Although the U.S. economy experienced widespread consequences from the terrorist attacks on September 11, 2001, few industries suffered as much from the investor response as the U.S. hotel industry. Prices of publicly traded hotel real estate investment trusts tracked by the National Association of Real Estate Investment Trusts, or NAREIT, fell 38

Figure 12: Hotel Properties Post - 9/11



Source: NCREIF

percent between September 10, 2001, and their post-9/11 lows on September 21, and prices remained volatile through the fourth quarter of 2003 (Figure 12).

The NCREIF hotel sector index presents a more muted picture. The index recorded a slight decline of only 4.2 percent in the third quarter of 2001, and another 3.0 percent drop in the fourth quarter. According to this benchmark, appraisal-based hotel valuations recovered to pre-9/11 levels by the fourth quarter of 2002. No matter how they are measured, however, it is clear that the valuations of hotel properties declined significantly in the post-9/11 environment as tourism dried up, although they have since recovered some of their decline. Hotel REITs have performed particularly well, rising 150 percent over the past two-and-a-half years.

S U M M A R Y

Gaining an accurate picture of the risks and returns experienced by commercial real estate entrepreneurs is complicated by the shortcomings of traditional benchmarks and analytical techniques. Real estate risk and return data have three fundamental characteristics that investors must be aware of. First, benchmark-index data is smoothed because it is derived from a backward-looking appraisal process.

Second, unlike bonds and equities, commercial real estate returns are negatively skewed. Third, there is a higher probability of extreme events with real estate. That is why measuring risk using the one-dimensional measure of standard deviation provides an inaccurate picture of the event risks inherent to this asset class.

Applying multidimensional risk analysis provides a more complete picture of commercial real estate returns. Understanding these issues is essential, given the fact that most real estate investors use a leveraged capital structure and focus on a particular city or region, where strong local or regional real estate cycles magnify the risks.

A research contribution was made by Stephen Coyle of Citigroup Property Investors.