

Slicing, Dicing, and Scoping the Size of the U.S. Commercial Real Estate Market

Executive Summary. *We use a Census approach to calculate the size of the built commercial real estate market in the United States. We provide estimates of values at the summary level as of mid and late 2009 and relate these to the concentrations observed by state. This likely corresponds to the bottom of the current cycle providing a reference point for future comparisons. At least \$4 trillion has been lost on commercial real estate from 2006 to early 2010. As of the end of 2009, the total value of commercial real estate, excluding parking lots, is about \$11 trillion including owner-occupied property. If we eliminate the specialty property or simply use the midpoint in 2009, it is closer to \$9 trillion. What is truly amazing is that for some property types, these values are about half of replacement cost.*

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In finance we often talk about the “market portfolio” when we discuss the topic of where one might invest. We all recognize that this market portfolio consists of more than stocks, corporate bonds, and government bonds. Over significant stretches of recent history, real estate has outperformed stocks and bonds, especially if the analysis stopped in the right years.¹ Investors missing these real estate returns from their portfolios have berated investment advisors who generally focused on what they knew. Over time real estate became a respectable asset class, and most sophisticated fund managers consider real estate an essential part of their market portfolio analysis. Not only has real estate become part of mainstream investing but in many cases the market portfolio now includes oil and gold and an array of international investment alternatives, not to mention other exotic choices like pork belly or OJ futures. So, to answer the question of what investment choices an investor has today, we certainly must include all established markets. Once you think you have answered the “what” question, we generate more questions that must be answered, such as how many different categories should we consider and how large is that opportunity? In the stock market, we have observed an endless march over time toward further dissection of stock choices starting from value to growth into a range of micro to large, from domestic to international and with basket choices that exceed the number of direct investments.² Similarly in the real estate market, we have geographic and property type delineations securitized (public

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or indirect) and direct (private) and the overall choice of equity or debt positions.

We have seen attempts to quantify the size of the real estate market before and these prior studies will be discussed below, but the question remains: Why does size matter? Assume an analysis of a particular segment of the commercial real estate market, such as private prisons or multi-family property, suggested what in your view provides opportunities for superior or at least market risk-adjusted returns and you wish to allocate some funds to this asset type. Now assume you are CALPERs or Singapore's GIC and you wish to allot 10% of your real estate allocation to this segment. Is there enough of it to go around? Would your purchases dominate the market forcing prices up and expected yields down? What if your focus was office properties or industrial in only primary markets? Is there enough and what is the breakdown by type for the whole market? Commercial real estate values may be more easily estimated for various property types in localized areas, but to date all studies on the size of the commercial real estate market have been estimates based on less data than desirable. See, for example, Miles, Pittman, Hoesli, Bhatnager, and Guilkey (1991), Hartzell, Pittman, and Downs (1994), and Malpezzi, Shilling, and Yang (2001) discussed below.

Here we use the best data set assembled to date to help derive new estimates on the size of the commercial real estate market in the United States. There are essentially three methods for estimating the market capital value of real estate: (1) direct measurement of the stock; (2) perpetual inventory adjustment calculations; and (3) statistical extrapolations based on proxies, such as property tax assessments, income estimates, population or other small samples of well-known values aggregated up to a larger scale with ratios to the real estate values represented.

The decennial Census is perhaps the only example of a real estate estimate that attempts to use direct measurement as it tries to cover the entire population and housing stock in the U.S. Commercial real estate (CRE) data collection has been in the domain of the private sector. To date there has been no direct measurement of CRE capital stock

and the market value of this stock. Commonly-cited estimates for CRE market cap are either perpetual inventory calculations of investment flow (e.g., building permits added to an estimated base), or statistical extrapolations of sample market values and proxies based on other economic variables. While both inventory methods and proxy methods are largely imprecise, they have represented the best estimates possible to date.

Literature Review

The official National Income Accounts (NIA) data of real estate capital have historically been estimated based on investment flow using the perpetual inventory method (Young and Musgrave, 1980).³ For durable assets, it is possible to derive estimates of the market cap for a given year by accumulating the past values of investments (flows), adding these to a prior estimate of value and deducting the accumulated values of depreciation.⁴ Over long periods of time the original estimate of value becomes meaningless, but for real estate we know that we would need a time series lasting more than the normal economic life of the most durable real estate assets to rely on such a process and to be accurate. Complicating the estimate is the calculation of depreciation. This includes units that are demolished, burned, blown away, washed away or otherwise taken off the stock of available property in any given period. Lost units are not a trivial matter. Using Components of Inventory Change from HUD (CINCH) data, we discover that for multi-family housing we typically lose more than 1% of the total stock each year to a variety of factors. Sometimes we lose more than 1.5% in a single year.⁵ Malpezzi, Shilling, and Yang (2001) derived an estimate of 1.44% for single-family housing depreciation on an annual basis and much higher rates for other types of real estate. While this flow adjustment method is probably the best available in the absence of direct measurement, it is vulnerable to errors if the assumptions about building permits being exercised to represent flows or building economic longevity and depreciation estimates are inaccurate. Since the 1960s, it has been commonly agreed that periodic Census data are needed to supplement and serve as a check on the perpetual inventory

estimates.⁶ However, the Census has never covered CRE stock, and it has been many years since the federal government collected assessment data from local governments.

Using a method similar to that of the NIA, Malpezzi, Shilling, and Yang (2001) estimated the market cap of non-residential real estate for each of 284 MSAs annually, from 1982 through 1994. Using the 1982 value as the benchmark, the market cap for each subsequent year was calculated as the value of the previous year growing at the inflation rate plus any new investments, based on building construction permits, less depreciation estimates. Depreciation is set at a constant annual rate of 3.4%. It is not clear whether an adjustment was made for the fact that some building permits are not exercised, especially during softer markets, and at the same time depreciation based on units lost (removed or converted) also slows down during softer economic periods. For example, over 2009 through 2014, we will certainly observe less depreciation as the rate of construction will be much lower than in the previous decade. New buildings make older buildings obsolete but if there are few new buildings we can assume the economic life of the existing stock will be extended and not just from better maintenance. These perpetual inventory estimates are therefore subject to the same potential errors as the NIA estimates. Still the Malpezzi, Shilling, and Yang estimates were the best available for many years.

In another set of studies, Miles, Pittman, Hoesli, Bhatnager, and Guilkey (1994) and later Hartzell, Pittman, and Downs (1994) estimated the size of the commercial market using a sampling approach with property tax assessment data as the primary driving force behind the total value estimates. In these two separate studies, they used county level property value aggregated from local tax records by the same private data firm in Florida. Regressions were generated using sample counties' total property value to determine what economic and demographic variables could best explain the value difference across counties. The sample for one study consisted of 27 counties while the sample for the other study consisted of 47 counties. Coefficients estimated from these regressions helped determine the market cap for other counties. More

specifically, estimates for other counties were made by multiplying the coefficients by the identified economic and demographic variables for the counties in question. Further extrapolations were made to determine a total MSA market cap. Given that there are a total of 3,140 counties in the nation (and 67 in Florida alone at the time of the study), the data sample for both studies was far too small. County sizes vary significantly around the nation as do assessment ratios, frequencies of value updates, and general accuracy. Still, it was a creative method for attempting to estimate the total value of the entire U.S. commercial real estate market.

The Census is an invaluable benchmark for estimating the residential market cap because it provides a complete count of the number of housing units and the physical characteristics. Prices may fluctuate over time but the physical units and characteristics change more slowly. If we can use a direct physical count it would negate the need to estimate flows from building permits that may or may not be exercised and depreciation that likely fluctuates over time with technology and general economic conditions.

While we assert that this study is the first direct measurement of several commercial property categories, we also acknowledge some estimation and there is doubt that in the specialty and government category (prisons, golf courses, parks with recreation buildings, and so on), we are woefully short of precise inclusion. We totally leave out land and parking lots, both the surface types and multi-story types. We also note that in some markets we are more likely to have missed buildings than in others, especially those where CoStar has operated for fewer years. But as discussed below, we have a novel mathematical method to adjust for missing data. CoStar is constantly discovering and adding new buildings and while most of these are small, they still represent a non-trivial source of the stock.

This study is long overdue. With data that can separate the measurements of building space by property type, and the average price for these spaces, the results from this study not only provide a more accurate measurement of the CRE market cap by

size if not by value, but also serve as a new benchmark for the industry.

Data Collection Process

Real estate transactions include permits, sale contracts, leases, and debt contracts to name a few. Each real estate transaction has multiple participants and multiple information requirements, and in order to facilitate transactions, industry participants must have extensive, accurate, and current information and analysis. Market research (including historical and forecast conditions) and applied analytics have also become instrumental to the success of commercial real estate industry participants operating in the current economic environment. There is a strong need for an efficient marketplace, in which commercial real estate professionals can exchange information, evaluate opportunities using standardized data and interpretive analyses, and interact with each other on a continual basis. With the genesis of CoStar, founded in 1987, this need is now being serviced.

Over 975 researchers and outside contractors maintain the CoStar database, which includes information on leasing, sales, comparable sales, tenants, and demand statistics, as well as digital images. As of January 29, 2010, the database included nearly 3 million U.S. properties and over 9.5 million digital attachments, including photographs, plat maps, and floor plans. This database is comprised of hundreds of data fields, tracking such categories as location, mortgage deed information, size and zoning, building characteristics, financing, income and expense data, demographic data, space availability, tenant names, ownership, lease expirations, and much more.⁷

CoStar researchers collect and analyze commercial real estate information through millions of phone calls, emails, Internet updates, and faxes each year, in addition to field inspections, public records review, news monitoring, and direct mail. Each researcher is responsible for maintaining the accuracy and reliability of database information. As part of their update process, researchers develop cooperative relationships with industry professionals, which allow them to gather useful information.

Because of the importance commercial real estate professionals place on quality data, many of them routinely take the initiative and proactively report available space and transactions to CoStar researchers.

CoStar utilizes 146 high-tech field research vehicles in 39 states for reconnaissance work. Of these vehicles, 99 are custom-designed energy efficient hybrid cars that are equipped with computers, proprietary Global Positioning System tracking software, high-resolution digital cameras, and handheld laser instruments to help precisely measure buildings, geo-code them, and position them on digital maps. Some of the researchers also use custom-designed trucks with the same equipment, as well as pneumatic masts that extend up to an elevation of 25 feet to allow for unobstructed building photographs from “birds-eye” views. Each vehicle uses wireless technology to track and transmit field data. A typical site inspection consists of photographing the building, measuring the building, geo-coding the building, capturing “For Sale” or “For Lease” sign information, counting parking spaces, assessing property condition and construction, and gathering tenant information.

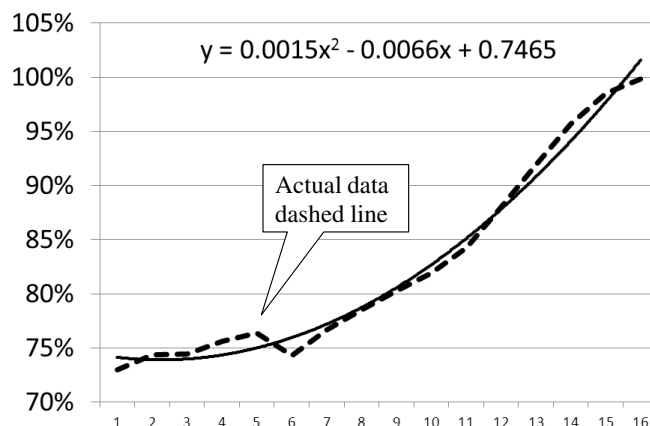
While the vast majority of the data shown here are based on direct counts as of the end of 2009, for hotels and multi-family data populations we employed some additional tests to size the market. In particular we adjusted those multi-family markets where we had a shorter time period of data collection and compared them to the populations and data saturation time required in other more established markets. We adjusted these markets up to the level of established market size as follows. Each time CoStar moves into a new market it takes time to reach total market penetration. In fact, one may argue that total market penetration is never reached. Yet, the pattern is surprisingly similar for most markets. Twenty-five markets were analyzed, and the trends in adding properties were translated into an equation that very closely describes the average fit.⁸ The following non-linear equation describes the penetration level with a .99 fit:

Market penetration as percentage of actual stock estimate based on time in market:

$$Y = .0015x^2 - .0066x + .7465,$$

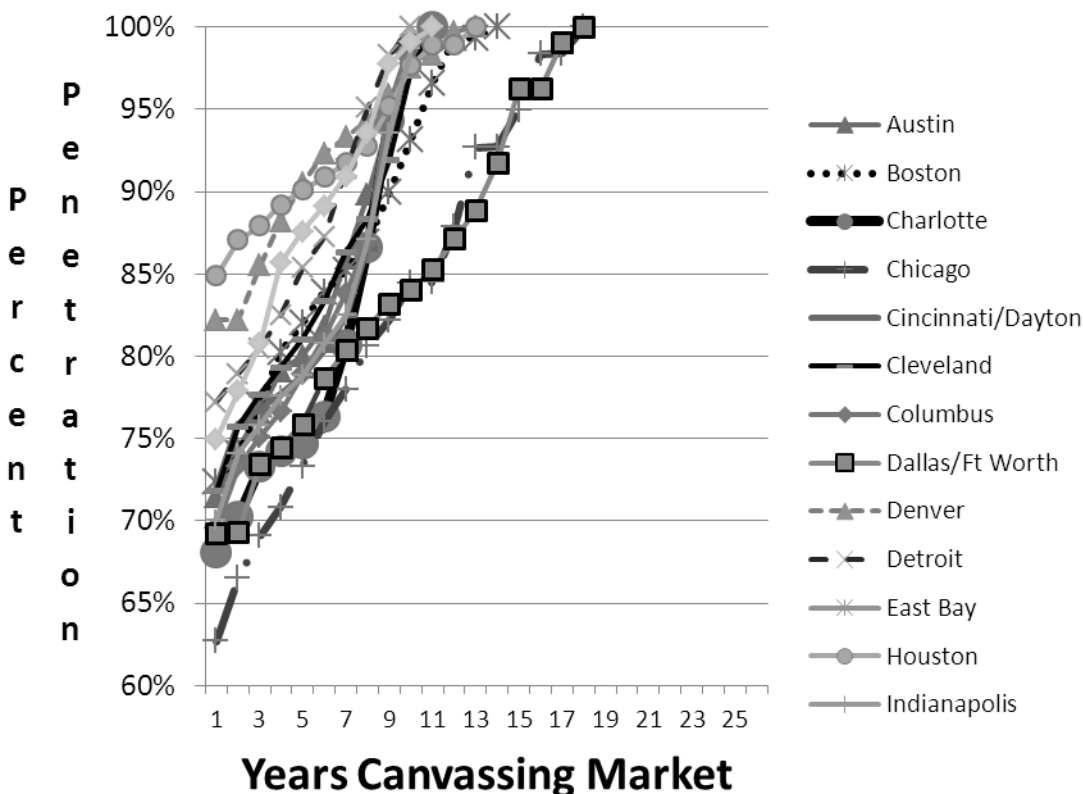
where Y is the percentage of market coverage, x is the number of years in the market, and $.7465$ is the approximate starting percentage of market coverage when first entering a market. The field research starts up to two years before the data are released for that market, which is why we observe 74.65% coverage at initial release. Exhibit 1 shows the actual pattern of market coverage for several markets. Based on this relationship, we could estimate the portion of the market still missing and gross up the data accordingly to estimate the size of each metropolitan market for each property type. This relationship, which is shown in Exhibit 2, is used to estimate the portion of the market missing from our stock based on the time canvassing each market. This was repeated for 150 major markets, covering over 86% of the population of all metro markets. The remainder of the markets, covering less than 20% of the total stock, were estimated using a procedure similar to past researchers, that is the ratio of property space per employment and population data.⁹

Exhibit 2
Market Penetration Trend Function vs. the
Average of 25 Markets
Average Penetration



For the specialty property types of which there is an amazing variety, we used our comp data for estimating prices and several other sources for verifying the number of properties. Typically, we went

Exhibit 1
Market Penetration for Several Markets Over Time



to the association for whatever property type was involved, whether it was prisons or trailer parks. Most of these property types do not matter much for the total property value calculation. For example, pet cemeteries are unlikely to ever show up in anyone's target asset allocations nor are drive-in theaters, for that matter. However, three specialty property types are significant. These are prisons, schools, and religious buildings. We are certain to have missed some churches but feel confident about the school and the prison estimates.¹⁰ Still we expect that we missed some of the lower-quality hotels and some specialty and government properties, and, again, totally excluded single-family units that happen to be within the rental market pool. We estimate this transition housing pool to be 17.7 million units at present, which is almost as large as the entire apartment rental pool. These are units that could remain part of the rental stock or return to owner-occupied housing some day.

Our estimates are largely by direct measurement; more precisely, our estimates are based on direct measurement supplemented with a few statistical extrapolations similar to the process used by Malpezzi, Shilling, and Yang (2001) and others.

Unit Price Calculations

For each property type we pulled all of the sales comps for 2009 then used the mean from the middle of the year. We also checked the trend using a Hodrick-Prescott filter and took out the extremes. The mean prices per square foot were then applied to the square footage for each of the property type categories. One might argue that mid-2009 prices are an anomaly with a soft economy and some distressed sales, but we are not embarking on discussions about equilibrium prices here, rather taking a snapshot of the current size of the market and its implied value. As it so happens, the mid-point of 2009 corresponded well to the very bottom of the commercial real estate market, as viewed from the time perch of April 2010.¹¹ This will make the middle of 2009 an ideal reference point for future comparisons.

What is striking in the current values is how much they have declined since 2006. The repeat sales index approach for estimating values yielded slightly

higher results for a few property types; however, these results were based on the end of 2009 when values had already started increasing in some property categories. The repeat sales index was based upon a starting point in 2007 when much more transaction data were available. By 2009, volumes had trailed off to less than 20% of the peak volumes observed three or four years earlier (Peng, Case, Florance, Huang, and Miller, 2010).

To derive current estimates of value based on a commercial repeat sales index, we used a procedure not unlike Case and Shiller in the residential market. For price, we used average prices per square foot by property type by metro market from the CoStar dataset. We started with 2007 data as that year had the most transactions. For those markets with five or more transactions, we used the price. For a market with fewer than five transactions, we estimated the price. The estimation process used is purely a function of rent and cap rates. Once we had a base price for all markets, we adjusted the prices according to a value-weighted arithmetic repeat sale index brought forward to the end of 2009. This adjustment is property type specific but the same for all geographic markets.

The process for hotels is slightly different. We get both 2007 and 2009 average prices from the CoStar transaction dataset but without rent to estimate prices for those markets with fewer transactions we needed to enlarge the market and relied more on the larger geographic market. Here we relied on Smith travel data, Costar counts and ratio checks to estimate the size of the market before applying CoStar comparable prices to estimate value.

Market Size and Cap Estimates

We have estimated the size of every metropolitan market and summed up to the U.S. for each major property type. For multi-family, we use state-level data and for all other special property, we use aggregate national data. Exhibits 3 and 4 show our aggregate totals for market size and two different estimates of 2009 values: one based on mid-year averages; the other based on an index adjusted

Exhibit 3**Market Size by Property Type in Rentable Building Area and Market Cap Based on Mean Prices for the Mid-Point of 2009**

Property Type	Square Footage	Price/SF	Market Cap
Office	12,058,379,264	\$102	\$1,229,954,684,928
Industrial	23,851,606,671	\$45	\$1,073,322,300,195
Flex	2,907,635,121	\$75	\$218,072,634,075
Retail	17,336,105,191	\$101	\$1,750,946,624,291
Health Care	2,634,773,693	\$490	\$1,291,039,109,668
Hospitality	2,556,726,260	\$95	\$242,888,994,700
Mixed-Use	107,651,632	\$95	\$10,226,905,040
Multi-Family	22,643,500,000	\$62	\$1,403,897,000,000
Specialty, Sports & Entertainment			\$1,953,008,671,667
Totals	84,096,377,832		\$9,173,356,924,466

Exhibit 4**Market Size by Property Type in Rentable Building Area and Market Cap Based on Repeat Sales Indices from 2007 to the end of 2009**

Property Type	Square Footage	Price/SF	Market Cap
Office	12,058,379,264	\$136	\$1,639,939,579,842
Industrial	23,851,606,671	\$45	\$1,073,322,300,185
Flex	2,907,635,121	\$91	\$264,594,796,011
Retail	17,336,105,191	\$172	\$2,981,810,092,879
Health Care	2,634,773,693	\$490	\$1,291,039,109,668
Hospitality	2,556,726,260	\$97	\$248,002,447,220
Mixed-Use	107,651,632	\$95	\$10,226,905,040
Multi-Family	22,643,500,000	\$62	\$1,403,897,000,000
Specialty, Sports & Entertainment		varies	\$1,953,008,671,667
Totals	84,096,377,832		\$10,865,840,902,512

from 2007 to the end of 2009. Next we show the totals for specialty property types in Exhibits 5, 6, and 7. Even without parking lots, we see a total of about \$1.9 trillion for these miscellaneous categories, which include post offices, libraries, schools,

prisons, and many others as shown. The shocking result here was our total value for prisons, worth more than all the schools combined. In the U.S., we have 5% of the world's population, but 23% of

Exhibit 5**Specialty Property Types and Estimates of Count or Size and Values**

Specialty Type Property	Building Count or Acres	Ave Size/SF or Acre	Ave. Price/SF or Acre	Total Value
Prisons	3,400	150,000	140	\$632,100,000,000
Schools	147,197	22,205	160	\$522,961,501,600
Religious Buildings	465,000	12,432	74	\$427,785,120,000
Theaters (movie only)	5,561	37,000	324	\$66,665,268,000
Cemeteries in Operation	33,886	23	60,000	\$46,356,048,000
Sports	14,592	27	112,000	\$44,126,208,000
Vineyards (acres)	934,000		38,390	\$35,856,260,000
Marinas	9,245	18,205	195	\$32,819,518,875
Police Stations	54,000	4,400	120	\$28,512,000,000
Post Office Branches	32,741	5,578	156	\$28,490,170,488
Golf Courses (acres)	15,979	115	14,305	\$6,355,227,304
Convention Centers	620	313,000	90	\$17,465,400,000
Fire Stations	30,100	3,900	120	\$14,086,800,000
Trailer and RV Parks (acres)	11,900	8	98,000	\$9,516,192,000
Libraries (public)	9,214	6,250	160	\$9,214,000,000
Recycling Centers (acres)	8,900	2	400,000	\$7,120,000,000
Casinos	1,350	25,100	98	\$3,320,730,000
Drive-in Theaters	381	6	73,000	\$161,315,400
Pet Cemeteries	673	2	72,000	\$96,912,000

Exhibit 6
Visual Depiction of All Special Property Type Values
Total Value of Specialty Property Types in \$Millions
as of 2009

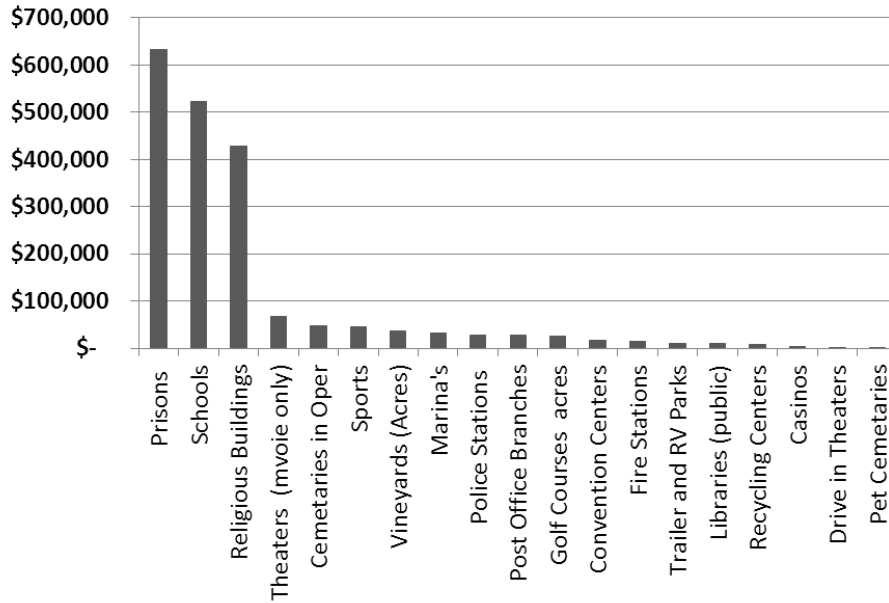
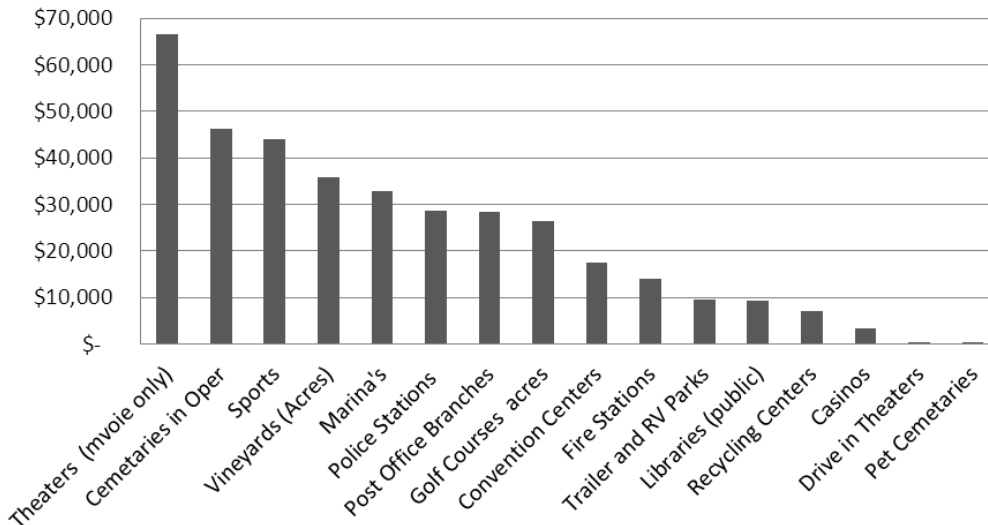


Exhibit 7
Visual Depiction of the Smaller Specialty Property Type Values
U.S. 2009 Specialty Type Property Values in
Millions



the world's prisons. Over 2.4 million prisoners are kept mostly out of eyesight, and the trend has been toward privatization, which explains why we have a significant number of comps for this obscure property type.

Office Space

In Exhibit 8, we show the office space distribution for the nation by state with the exception of Hawaii and Alaska. We note that there exist over 40 square feet per capita in the U.S., and the concentrations are correlated with population distributions as expected. By metro the largest markets are shown in Exhibit 9, with New York dominating this chart, followed by the Los Angeles metro, then Washington, D.C. metro. On a per capita basis, D.C. is the highest as shown in Exhibit 10. We note here that Washington, D.C. is also the highest in terms of green office space per capita, with far more than any other region or state.

Industrial Space

The U.S. has over 76 square feet of warehouse space per capita. It is concentrated in population

centers and along transportation nodes and highways. We see the continental state distribution in Exhibit 11 and the largest concentration by metro market in Exhibits 12 and 13. On a per capita basis, we see concentrations along major north-south and east-west highways, and our per capita numbers reflect lower populations near highways as much as warehouse concentrations. Cities like Cleveland, Indianapolis, Columbus, Ohio, Atlanta, and Chicago are surely transport hubs with far more than the 76 square feet average. Los Angeles benefits both from being near the port of Long Beach, and also from being a major urban market in and of itself.

Retail Space

The U.S. has over 56 square feet of retail space per person and probably much more, as shown in Exhibit 14, if we classified all the retail in the first floors of office buildings and hotels as retail rather than as office or hotel space respectively. Thus, our estimates of office and hotel space may be a touch high, while our retail estimates may be a touch low. Concentrations follow population density but

Exhibit 8
Office Space Per Capita

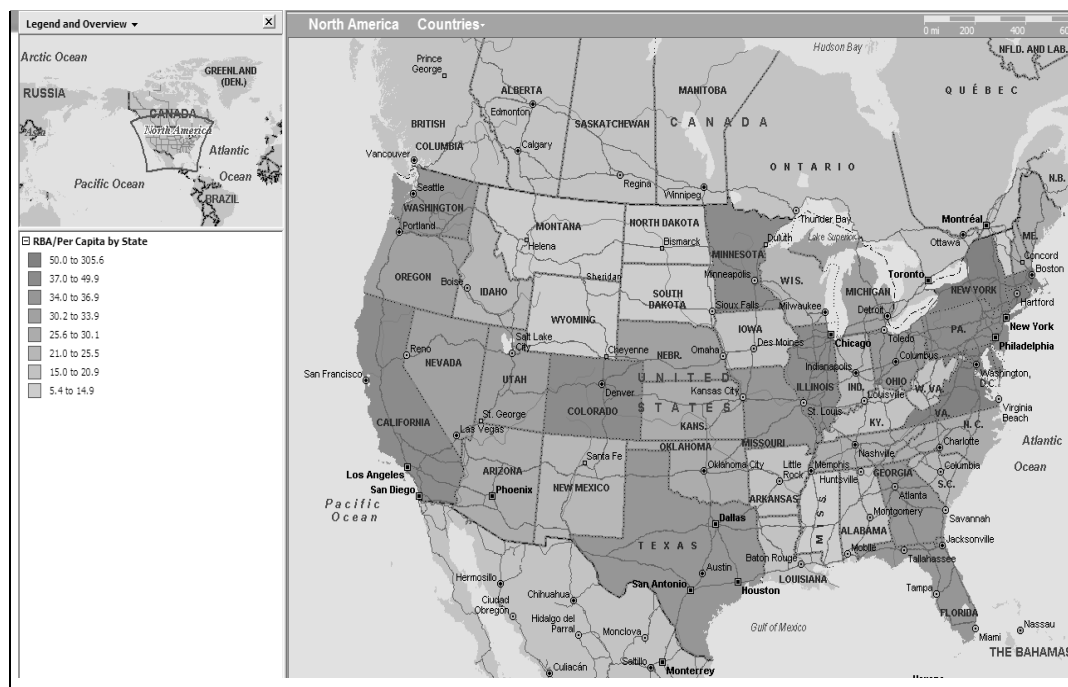


Exhibit 9 Largest Office Metros—Square Footage

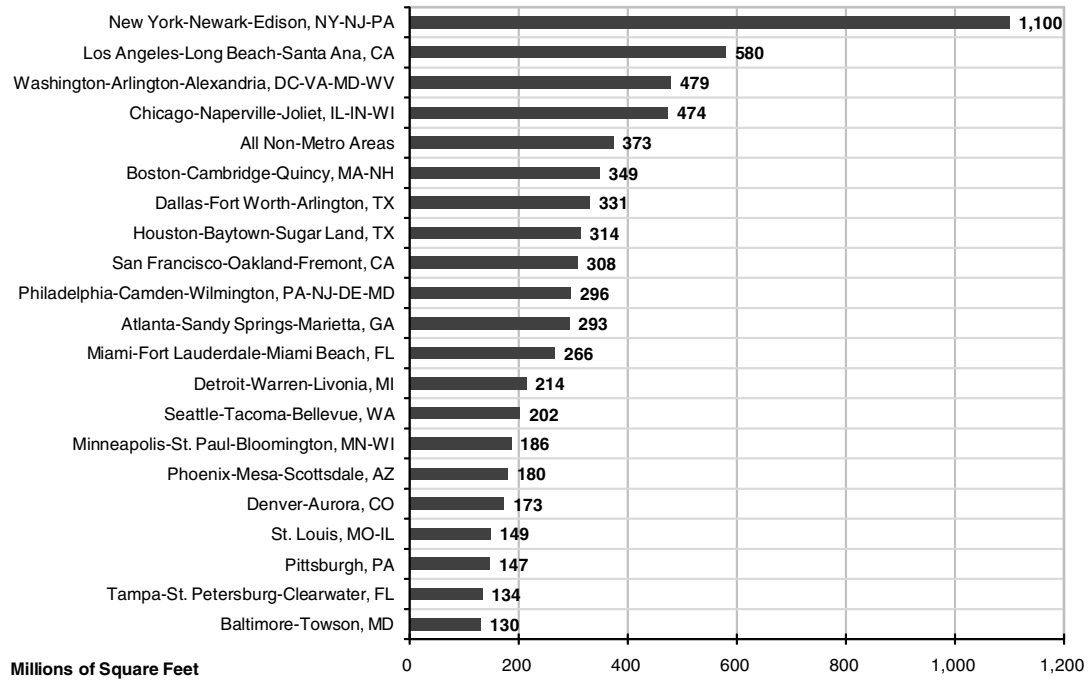


Exhibit 10 Largest Office Metros—SF per Capita

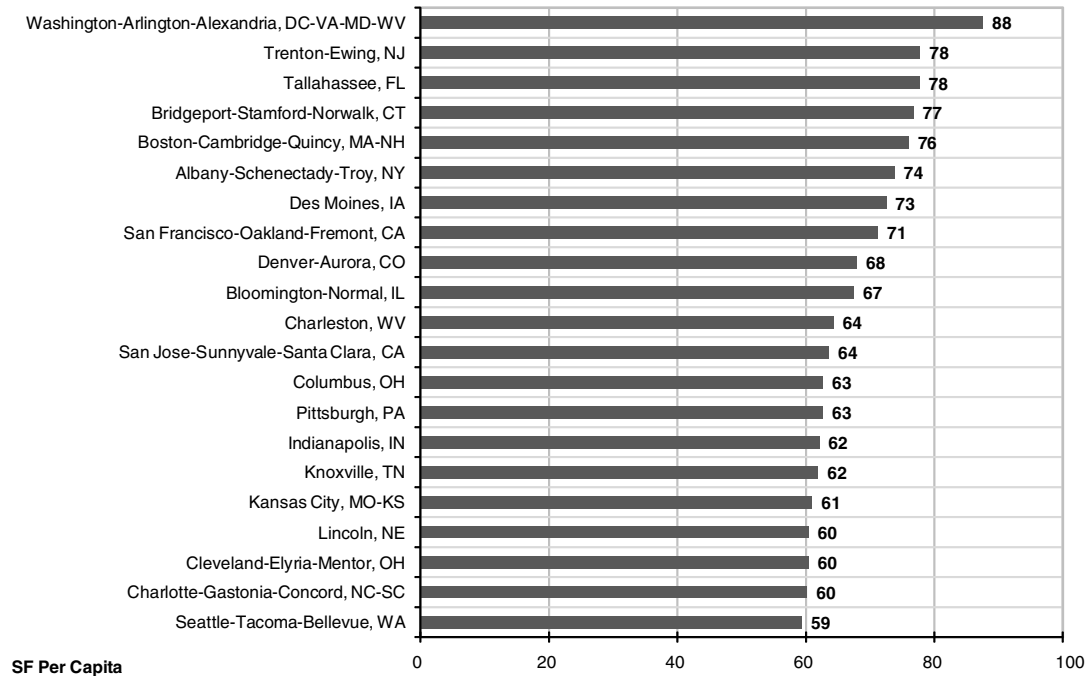


Exhibit 13 Largest Industrial Metros—Square Footage

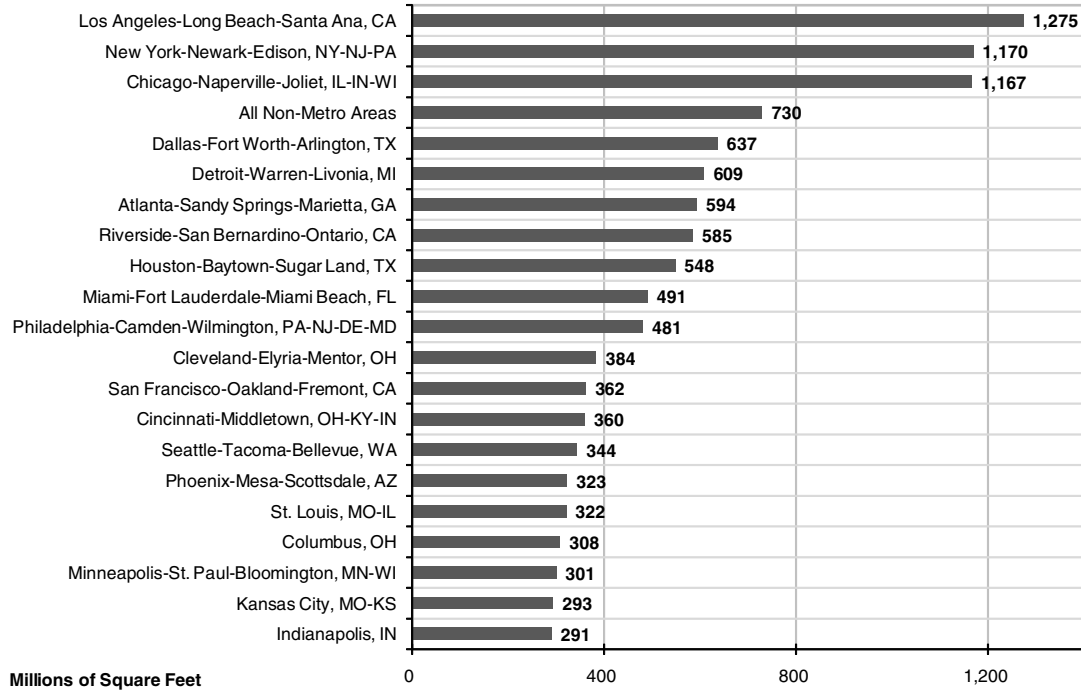


Exhibit 14 Retail Space per Capita



also those tourist cities on the coast and in Nevada. New York City, and Los Angeles have the largest concentrations of space as shown in Exhibit 15, but on a per capita basis we see cities like Myrtle Beach, North Carolina, Sandusky, Ohio, and several small coastal markets with the highest figures, as shown in Exhibit 16. There is no question that Las Vegas would show up here were it not for the classification of retail within hotels and casinos as retail space.

Multi-family Property

Multi-family concentrations are higher in less affordable markets and states, as seen in Exhibit 17. Where land is cheap, the homeownership rate is high and the rental proportion low.

Flex Space

Exhibit 18 shows the concentration of flex space as highly correlated with warehouse space and higher tech production facilities. In Exhibit 19, we see the concentration per capita.

Hotels

CoStar has been collecting hospitality data over a shorter time span than for office, industrial, and retail property. As such we do not provide great details here except to note that in terms of market size, the largest concentrations by size or per capita are in Las Vegas and Orlando. New York and Miami also have large concentrations, as do all tourist/convention markets including San Diego, San Francisco, and New Orleans. Las Vegas alone has over 102 million square feet of hotel space, which accommodates 35 million tourists each year.¹²

Replacement Costs and Value Trends

Using the office market for illustration, the national costs to construct new office space per square foot is approximately \$200, with land set at 25% of total costs. This does not include local impact fees, permit fees or legal costs to secure entitled land, but only the direct costs of designing and building. The result is that we are far away

Exhibit 15
Largest Retail Metros—Square Footage

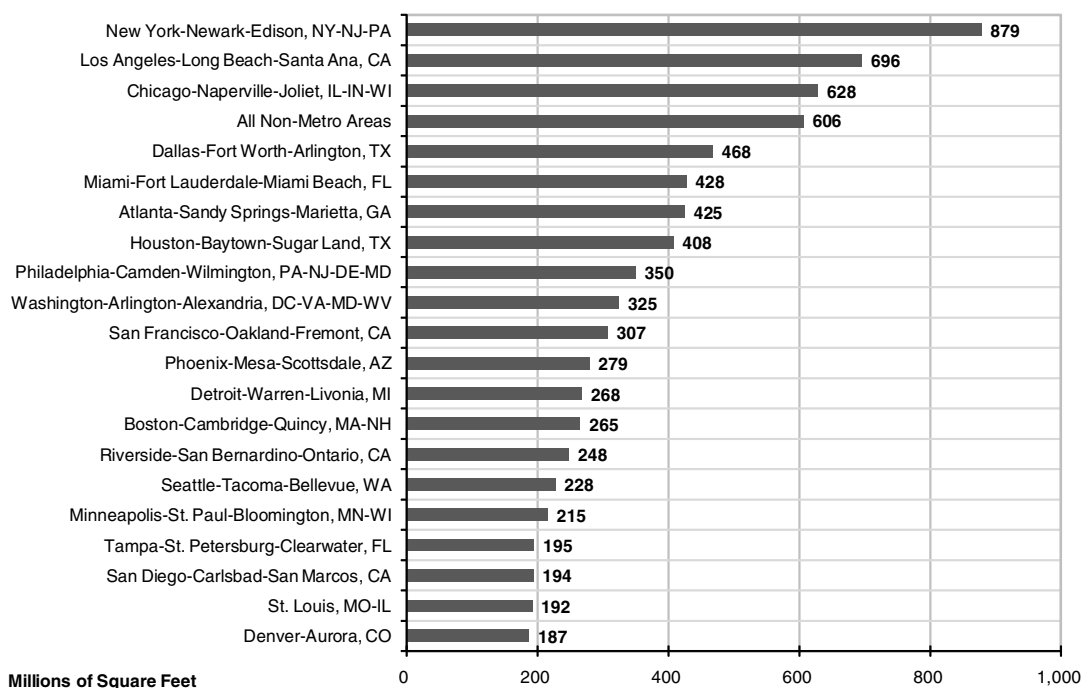


Exhibit 16 Largest Retail Metros—Square Footage per Capital

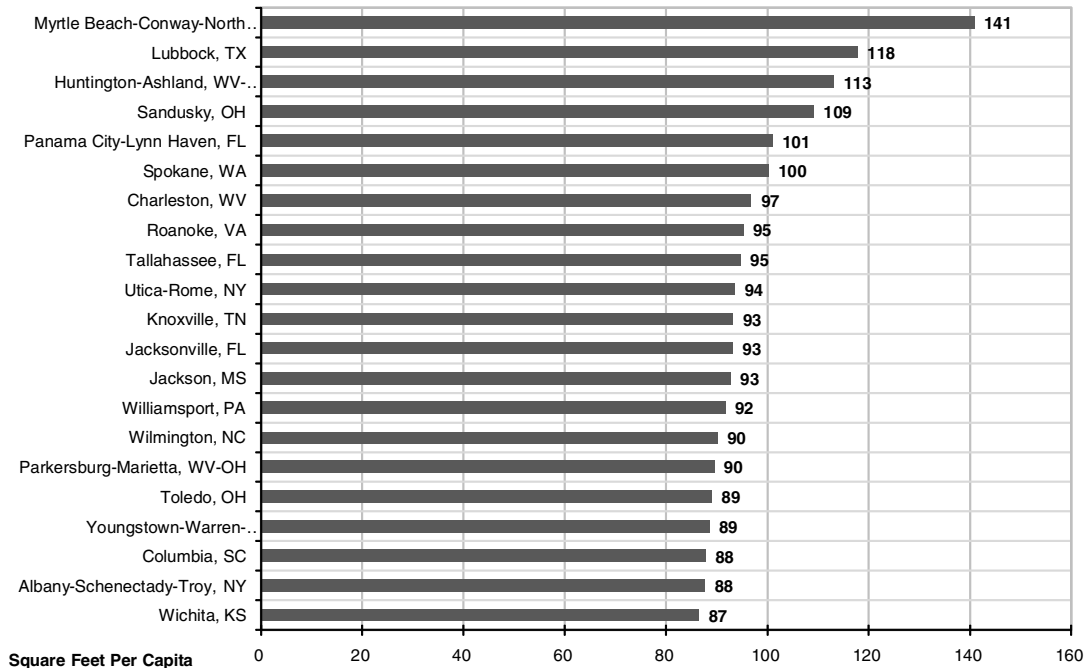


Exhibit 17 Multi-family Properties by State



Exhibit 18 Largest Flex Metros—Square Footage

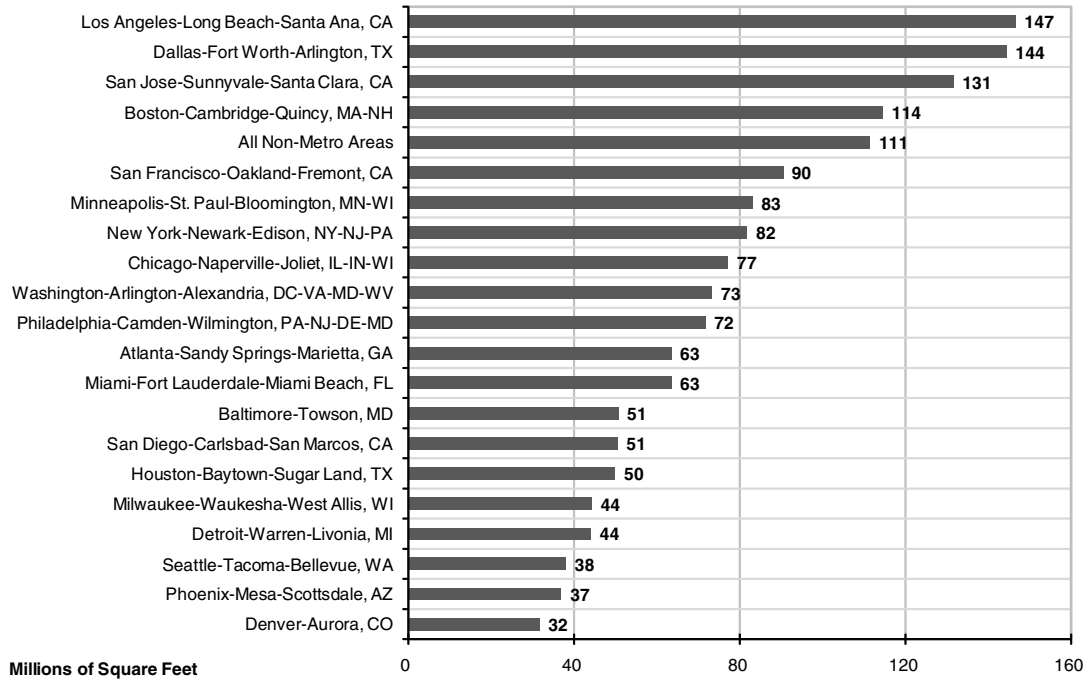
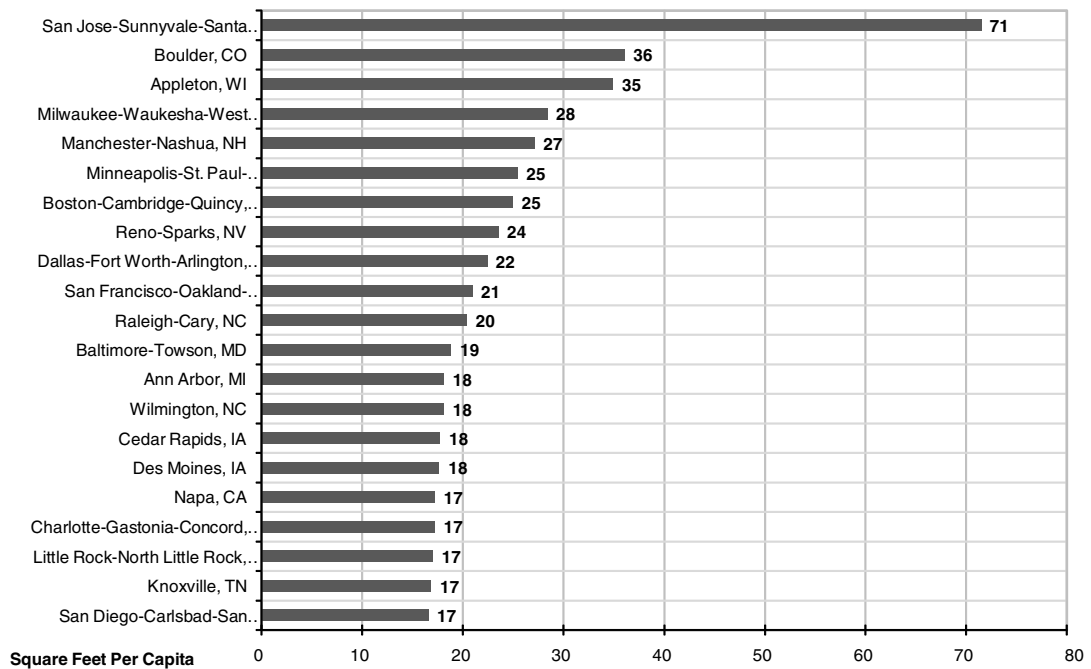


Exhibit 19 Largest Flex Metros—Square Footage per Capita

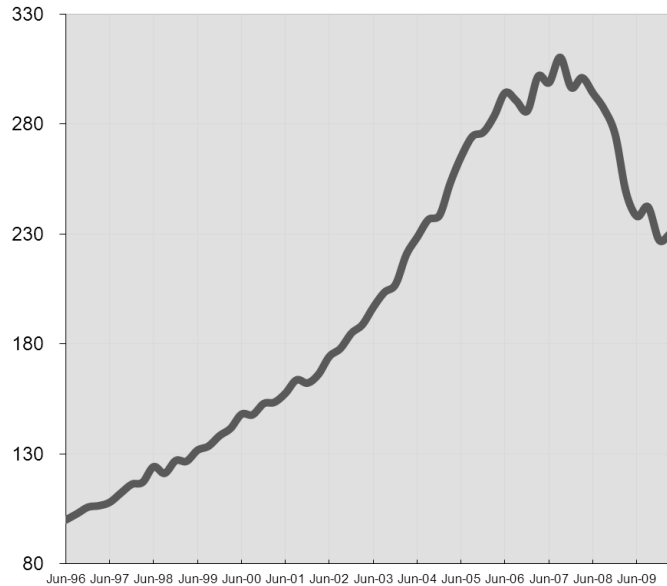


from cost-feasible price levels. Stated another way as of the end of 2009, we are far away from the rents needed to support cost-feasible construction. Even though land prices have fallen, these other costs and the temporal risks of political hurdles make any significant construction unlikely for quite awhile. We will still see some new construction but it will be build-to-suit for government tenants, schools, museums, and military facilities and those tenants that simply need specialized space that does not exist in a contiguous block near the desired locations sought out by the tenant.

Building Property Type	Approximate U.S. National Average Price as Percentage of Replacement Cost ¹³
Office	68%
Industrial	42%
Flex	65%
Retail	88% ¹⁴
Health Care	94%
Hospitality	46%
Mixed-Use	51%
Multi-Family	32%

Most striking is the gap for multi-family, suggesting we have the longest wait for this type of construction. Nonetheless, prices will rebound faster and sooner than rents, and since all markets are local, there are certainly several markets in better condition for multi-family, such as those in Texas. We also note that most markets are bifurcated into distressed and non-distressed sales, so that averages do not mean much in 2010. There are certainly many retail properties that are selling for small fractions of their replacement costs, while others from large fundamentally sound portfolios in primary markets like Washington DC or New York City are selling for much higher figures and with much lower cap rates. The retail price figures from the repeat sales index at the end of 2009 reflect the larger portfolio sales. The percentage of replacement costs using mid-2009 numbers would be 52%, which is much lower than 88% of replacement costs shown here. The lack of repeat sales affected this figure and we believe that 52% as of mid 2009 was a more realistic estimate. Health care facilities include interior improvements, so

Exhibit 20
National Composite CRE Value Trends Since 1996 Based on the CoStar Repeat Sales Value Weighted Index. Since Q2 1996 to Q1 2010 the average annual return is 6.9%.



that explains both the high costs, which were \$490 per square foot in 2009.

We show in Exhibit 20 some indices that have been recently computed for mapping out the CRE price trends. One should note that we have already bounced back somewhat from the lows of early in 2010. At the same time, closer examination of CoStar data suggests a spread of prices per square foot and by cap rates with the smaller flow of capital now oriented toward larger properties in larger cities. Lower-quality properties in smaller markets are fighting for liquidity from an extremely small group of buyers. We have seen this pattern before, and we will see it again as capital comes back to the market and regains an interest in lower-quality properties within Tier Two and Tier Three markets. But how fast the capital will come back is hard to predict. We are closely watching REITs and opportunity funds to see if they replace the CMBS market capital, albeit with equity as opposed to debt.¹⁵

Conclusion

The commercial real estate market includes about 24 billion square feet of industrial space, nearly 23

billion square feet of multi-family space (excluding single-family homes and condos that are in the rental pool), over 17 billion square feet of retail space, and over 12 billion square feet of office space. All in all, without counting the size of the specialty, sports and entertainment facilities, we have over 84 billion square feet of commercial space. With the specialty, sports and entertainment facilities, theaters and more we certainly have over 100 billion square feet of space in the U.S. devoted to commercial purposes. That is over 328 square feet per person that is not devoted to home use.

At the bottom of the current cycle commercial real estate was worth approximately \$9 trillion, more if you include land and parking lots. This compares to \$12.5 trillion for the total value of the New York Stock Exchange and perhaps \$17 trillion for all the U.S. Stocks.¹⁶

We will continue to update, monitor, and refine this market estimate of size and apply better value estimates to the inventory as transaction frequency makes it easier to assess value. In the current environment, it seems that we have a large proportion of distressed sales, which will continue to plague the commercial real estate market over the next several years as the CMBS issues mature and banks are no longer willing to pretend and extend. While some rebound in the prices has already been observed and there is plenty of capital ready to move into the market, it will be several years before prices reach the peaks of 2006 again.

Endnotes

1. See, for example, Mueller and Mueller (2003) where they compared 25-year returns ending in 2002 in which indirect real estate (REITs) achieved 14.45% compared to 9.39% for NCREIF (direct) and 10.70% for the Dow Jones Index or 14.24% for the S&P 500 or 13.99% for NASDAQ and 9.28% for Gov't/Corp Bonds.
2. Mutual funds, exchange traded funds (ETFs), and other ways of combining investments add to a long list of choices.
3. We note here that there have been no significant updates to the Census of Government reports on taxable property values since 1982.
4. $k_t = k_0 + \sum_0^{t-1} \Delta K_t$. Here K is the capital stock at a period of time, t , calculated based on a previous value estimate at time 0 with the ΔK equal to the additions (permits or flows), less depreciation.

5. See <http://www.huduser.org/portal/datasets/cinch.html>. The Components of Inventory Change (CINCH) report measures changes in the characteristics of the U.S. housing stock. Using data collected from the national American Housing Survey (AHS), conducted every two years, the characteristics of individual housing units are compared across time. Information is available on the characteristics of units added and removed from the housing stock.
6. In 1964, the Wealth Inventory Planning Study made a series of recommendations for developing estimates of wealth in the U.S. by sector and industry, and emphasized the need for a detailed, periodic census of tangible assets.
7. Some of the data shown here were matched with other data sources like STR Global for hotel counts.
8. Some markets like Atlanta have longer histories going back over 26 years. The market penetrations in the early years were slower in such markets than we find today. Thus, we focus on the most recently added markets to determine what we might be missing and compare them to well canvassed markets like California and Florida.
9. For office stock residuals, we used professional office employment ratios in those smaller metros.
10. The prison estimates here do not include the federal facilities for holding border filiations and undocumented aliens in INS "prisons" run by the Immigration and Naturalization Services or Border Patrols.
11. A double-dip price trend is certainly possible with all of the distressed real estate yet to be worked through the system, but as of early 2010 it appears that opportunity funds, corporate users, and REITs are all willing to provide some price support.
12. Source: Gensler Associates, MGM Mirage, April 25, 2010.
13. Costs are direct average costs for the most typical type of property from a survey of developers including land at 25% and excluding all entitlement and legal costs. Health care includes tenant improvements, which explain the high costs to create.
14. This number is only 52% using our broader sample from mid 2009.
15. We are also watching the CMBS market, which is slowly returning with more carefully placed and more conservatively underwritten debt.
16. As of May 2010.

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