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Data Centers:
A Fit for a Real Asset Portfolio?

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Introduction

Data centers sit in the background of almost all online communication and transactions, providing a crucial part of the infrastructure of modern life. Over the past 20 years, data centers have grown rapidly as the internet has moved from the fringes of society to its current omnipresent state. In the process, the infrastructure behind the internet has matured as an asset class. Today, the data center sector continues to grow rapidly to keep up with seemingly insatiable demand from all segments of society and business to store, analyze and stream data. Satisfying this demand are credit tenants committed to long-term leases. This combination creates an attractive investment that exposes investors to both tech sector growth and real estate fundamentals. We believe the core-plus risk-return attributes of this sector make data centers a strategic fit for a real asset portfolio.

Part I: What is a data center, and how does the market work?

At its heart, a data center is simply a centralized location containing servers that are used for any number of computing processes and data storage. The uses of data centers have expanded to include almost every part of our daily lives. Data centers are where streaming video and social media accounts reside, navigation devices find their routes, online purchases are accomplished, stock market transactions are executed and recorded, businesses store their interoffice memos, spy agencies archive metadata, human genomes are decoded and many other uses.

The Property

From the exterior, a data center looks like a typical warehouse or industrial building, while on the inside it is a meticulously engineered environment with row after row of server racks, as well as powerful HVAC systems to disperse the generated heat. A successful data center must have access to ample and reliable electricity, fiber optic telecommunication networks and a low-risk location (e.g., almost no risk of hurricanes, earthquakes, tornadoes, political unrest, etc.). A state-of-the-art data center must have redundant access to electricity and communications networks in order to provide its tenants and their customers uninterrupted access to their servers. Data centers are located in many places, but in general, major markets develop in locations with fast and "thick" telecommunications connections. Of late, another attribute is spurring the development of data centers — inexpensive or affordable carbon-free electricity (e.g., hydropower in the Pacific Northwest, wind power in Iowa and west Texas).

Largest Leases in 2017

Tenant	Location	Megawatts
Microsoft Corp.	Austin, TX	18.0
Apple	Chicago, IL	14.5
IBM/Softlayer	Dallas, TX	4.0
Digital Realty Trust	Atlanta, GA	3.0
Zayo Group	Los Angeles, CA	2.5

Source: JLL Research[1]
Note: Unidentified tenants were omitted.

The Operator

A key component to a data center's success is its operator. Data centers are the lifeblood of their tenants' operations. Whether they are streaming-video operators or simply storing the files of an insurance company, if a data center loses connectivity, its tenants cannot operate their businesses. When a typical, sophisticated tenant is looking for space in a data center, it will only lease with an operator that has a long track record of operating with virtually no disruption. In addition to an unblemished track record, an operator can distinguish itself by having the ability to expand quickly, providing a network of data centers that allow a tenant to deploy in multiple locations, and by offering a low total cost of operation (primarily a function of electricity cost, design and climate), manageable cost of electricity and proximity to technology hubs. Ashburn, Virginia,[2] by far the largest data center market in the United States, is a good example of where these attributes intersect. Ashburn received a head start on other locations when the government and the private sector originally built the beginnings of the internet's physical infrastructure in Northern Virginia. It is estimated that up to 70 percent of the world's internet traffic passes through data centers in Loudoun County daily, which includes the Ashburn market.

Part II: How should one invest in data centers?

Due to the importance of the skills of the data center operator, a single, stand-alone data center is not likely to be successful because robust operations require an organizational infrastructure that can only be supported by multiple properties. Also, a robust operator has the ability to offer tenants quick expansion guarantees, as well as access to large networks, providing one-stop shopping for tenants looking for multiple locations. The need for these characteristics suggests that the use of entity-level investments may be a viable approach to investing in data centers. Entity-level investments can be made by investing in public REITs or in private entities, although the latter option is limited.

Part III: How do data centers fit in a real asset portfolio?

Investors review many attributes of an asset class before including a particular asset in their real asset portfolio. Some of the attributes investors gravitate toward in a real asset

Top U.S. Data Center Markets

Market	S.F.	Megawatts	Past Six Months Net Absorption (MW)
Northern Virginia	12,800,000	883	41.0
Chicago	3,800,000	840	22.6
New York & New Jersey	4,300,000	490	3.1
Northern California	4,600,000	424	3.0
Pacific Northwest	3,900,000	350	16.6

Source: JLL Research[3]

Intergate Manhattan, New York, NY

portfolio may include stable cash flows, low correlation with traditional assets, growth potential, high barriers to entry and appealing risk-adjusted returns. The data center category can offer not only real estate income attributes from high-credit tenants leasing space in stabilized assets, but also the prospect of capturing the outsized growth associated with both the tech sector expansion and the increasing reliance on technology for business, healthcare and the exchange of social information. In addition to the prospect of tech sector growth, investors can take advantage of significant barriers to entry. Beyond the relatively limited pool of seasoned, capable operators with whom investors can align, data centers have barriers to entry more typical of real estate investments. Data centers tend to cluster around network hubs where global telecom carriers coincide with reliable and inexpensive power. Data center tenants like to be at the center of major hubs, leading to scarce space and outsized rents in these gateway locations.

Based on the metrics included in the chart below, the data center sector has a return profile we believe would fit well into a real asset portfolio. Analyzing REIT returns can provide a current source of quantitative information for assessing data center performance. Of the six existing data center REITs, with a total market capitalization of $75 billion, only two existed 10 years ago.[4] The two oldest companies — Digital Realty Trust and Equinix — are many times larger than the other four companies, and a merger wave appears to be underway, creating larger entities with broader market reach.[5] Industry players feature a wide variety of business models with different approaches to leasing, as well as both regional and global operations. Given these characteristics, REITs provide a limited data set from which to draw conclusions; however, their historic performance is informative: [6]

- All six REITs have outperformed the S&P 500 over each time period (1, 3, 5 and 10 years) with the exception of the one-year returns, which had mixed results.
- All six REITs also outperformed the NCREIF NPI and the FTSE NAREIT All Equity REITs Index over all time periods, although data center REITs tended to be more volatile than the public indexes and the NPI.
- Sharpe ratios for five of the six companies are higher than both the S&P 500 and the FTSE NAREIT All Equity REITs Index, while performance was comparable to the NCREIF NPI. Overall, this performance suggests strong risk-adjusted returns for the sector.
- Data center REITs averaged approximately a 20 percent correlation with the S&P 500 and about a 45 percent correlation with the FTSE NAREIT All Equity REITs Index. In addition, there is approximately a 25 percent correlation between NPI and the S&P, as well as the NPI and the All Equity REIT Index.

Due to this combination of attributes, investors should view an entity-level data center company investment as a core-plus investment containing a stable core of leased space and significant growth potential. Therefore, such an investment can offer higher return potential than a strictly core investment.

Public Data Center REIT Returns

	NAREIT All Equity[1]	NCREIF NPI[2]	S&P 500[3]	QTS[4]	Digital Realty[4]	Dupont Fabros[4]	CoreSite[4]	CyrusOne[4]	Equinix[4]
10-Year Return	6.2%	6.4%	7.2%	N/A	16.1%	N/A	N/A	N/A	18.4%
7-Year Return	10.0%	10.5%	15.4%	N/A	15.2%	18.4%	N/A	N/A	29.3%
5-Year Return	8.9%	10.2%	14.6%	N/A	13.8%	22.0%	36.2%	N/A	22.8%
3-Year Return	0.2%	7.0%	9.6%	26.2%	30.2%	38.6%	50.4%	35.4%	32.7%
1-Year Return	2.3%	1.8%	17.9%	–3.7%	7.4%	34.1%	18.8%	3.4%	13.0%

As of 6/30/17, All returns are gross of fees.
Sources: [1]NAREIT; [2]NCREIF; [3]S&P Indices; [4]Yahoo Finance

Conclusion

Given tech sector income growth, appreciation potential and relatively low correlation to the S&P 500, data centers can offer a compelling complement to other real assets. Investors, however, must be comfortable with the sector's development component, as well as its volatility. The category fits well into a core-plus strategy by which investors can take advantage of income-oriented returns from existing assets while also realizing value gains from developing new space.

[1] Shifting clouds, surging M&A (Data Center Outlook, North America, Rep. No. H1 2017). (n.d.). JLL Research. Retrieved from: http://www.us.jll.com/united-states/en-us/news/4662/shifting-clouds-surging-m-a-shape-2017-data-center-demand.
[2] Loudoun Virginia Economic Development. (n.d.). Data Centers. Retrieved September 23, 2017, from https://biz.loudoun.gov/key-business-sectors/data-centers.
[3] Shifting clouds, surging M&A (Data Center Outlook, North America, Rep. No. H1 2017). (n.d.). JLL Research. Retrieved from: http://www.us.jll.com/united-states/en-us/news/4662/shifting-clouds-surging-m-a-shape-2017-data-center-demand.
[4] Performance by Property Sector/Subsector. (n.d.). Retrieved September 20, 2017, from https://www.reit.com/data-research/reit-indexes/historical-reit-returns/performance-property-sector-subsector.
[5] REIT.com. (2017, June 30). Data Center REITs. Retrieved September 20, 2017, from https://www.reit.com/investing/reit-basics/reit-sectors/data-center-reits.
[6] Data and charts below based on an internal analysis of data from NCREIF.com, NAREIT, REIT.com and Yahoo Finance.
[7] U.S. Energy Information Administration, Form EIA-861M (formerly EIA-826), Monthly Electric Power Industry Report. https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a.