Overview of U.S. Data Center REITs

Morningstar Credit Ratings, LLC
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Contents

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Executive Summary

Data center REITs make up a small though growing and increasingly important sector of the overall REIT universe. These companies are building their portfolios to enable their customers to not only connect with each other but also with populations across the globe. Ever expanding trends in technology, including the Internet of Things, edge computing, artificial intelligence, automated vehicles, and the buildout of 5G, ensure that demand growth for data center space will be high for the foreseeable future. Moreover, while the development and maintenance of these facilities tends to be more capital intensive than most traditional types of commercial real estate, the data center REITs have accessed capital without burdening their balance sheets with secured debt, ensuring the flexibility to access alternative liquidity in the form of their unencumbered assets should the need arise.

Data Center REITs Overview

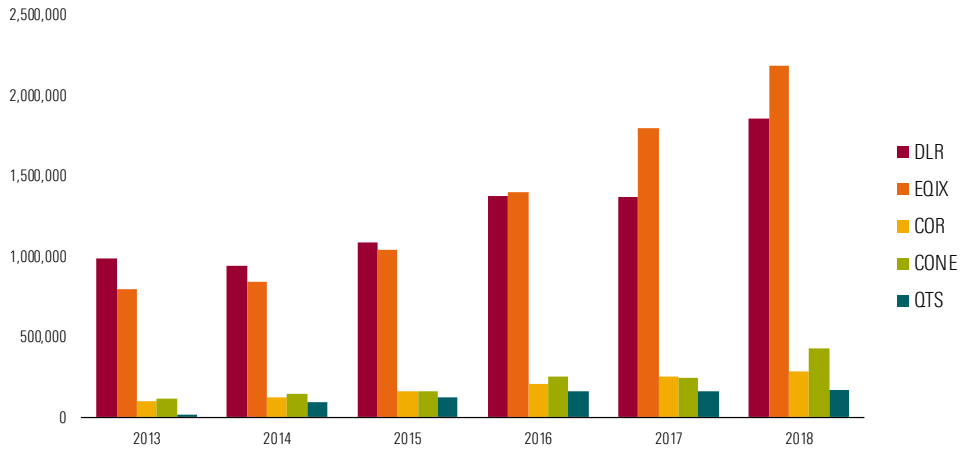
Exhibit 1 Data Center REITs

Data Center REIT	Ticker	Headquarters	IPO Date	No. Properties	U.S./Global	Millions Square Feet	Annual EBITDA ($000s)	Gross Assets ($ billions)
Digital Realty Trust, Inc.	DLR	San Francisco, CA	10/28/2004	214	Global	28.6	1,851.6	20.1
Equinix, Inc.	EQIX	Redwood City, CA	8/10/2000	84	Global	12.4	2,181.3	18.0
CoreSite Realty Corporation	COR	Denver, CO	9/22/2010	22	U.S.	3.0	283.9	2.4
CyrusOne Inc.	CONE	Dallas, TX	1/17/2013	50	Global	6.7	430.6	6.0
QTS Realty Trust, Inc.	QTS	Overland Park, KS	10/8/2013	26	Global	6.2	168.1	3.1
TOTAL				**396**		**56.9**	**4,915.5**	**49.5**
AVERAGE				**79**		**11.4**	**983.1**	**9.9**

Source: the REITs; SNL; Morningstar Credit Ratings, LLC. Data as of Feb. 28, 2019.

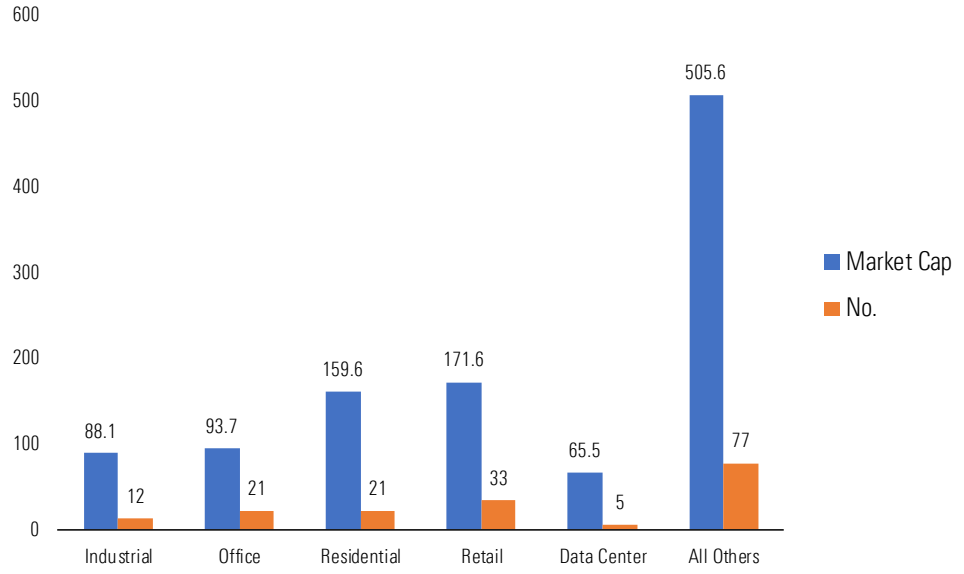
Data center REITs are becoming an increasingly important sector of the REIT market. At the end of January 2019, the National Association of Real Estate Investment Trusts, the preeminent organization representing and advocating REITs globally, tallied 169 equity REITs with a market capitalization of $1.1 trillion constituting the FTSE Nareit All Equity REIT Index. Equity REITs are the most common type and are owner-operators of real estate for which they collect rent, as opposed to mortgage REITs, or mREITs, that typically invest in mortgages or mortgage-backed securities. Nareit tracks 35 mREITs with a market capitalization of only $72.3 billion. Data center REITs are a subset within equity REITs, numbering five with a market capitalization of $65.5 billion (or $68.1 billion including operating partnership units). The largest ones have been public for 15-20 years.

Exhibit 2 Data Center REIT EBITDA ($000s)



Source: the REITs; SNL; Morningstar Credit Ratings, LLC. Data as of Feb. 28, 2019.

Exhibit 3 REIT Market Cap ($ Billions) and Count by Subsector



Source: NAREIT. Data as of Jan. 31, 2019.
Note: In the above exhibit, Residential REITs include apartment REITs, manufactured home REITs, and single-family home REITs; retail REITs include regional mall REITs, shopping center REITs, and free standing retail REITs.

Data centers provide secure, continuously available environments for the exchange, processing, and storage of critical electronic information. Data centers are used for digital communication, disaster recovery purposes, transaction processing, and housing mission-critical corporate IT applications. Certain data centers, which are sometimes referred to as Internet gateways, are highly interconnected, network-dense facilities that serve as hubs for Internet and data communications within and between major metropolitan areas. Data centers that offer higher levels of connectivity among the various types of tenants are relatively more valuable and are more challenging to replicate. While the business is driven by growth in technology, it is at its core fundamentally a real estate business. Similar to a traditional commercial real estate landlord, the data center owner leases space in its properties to tenants.

Demand for data centers is a function of the need for highly specialized properties designed for housing the high-power loads, cooling facilities, hardware and telecommunications equipment for computers, data storage, Internet and other related functions. Such properties are constructed for a variety of clients, from small users to major international telecommunications companies. Some centers are more focused on computer power, servers, and information storage, while others are more geared for telecommunications and Internet support. As this property type is experiencing an ongoing evolution from older mainframe computer facilities to newer and much more efficient equipment, and from single users to shared facilities, following advances in information technology, data centers can be very capital-intensive and require increasingly specialized infrastructure. The need for electric power, including generator and battery backup systems, is well above that of traditional commercial property, as the

concentration of computer and telecommunications technology, as well as cooling equipment, is greater.

Tenants

Terminology surrounding tenants can be confusing and is not always consistent across the data center industry. Organizations can represent multiple types of tenants, depending on the specific service or product. For example, Google and Amazon both offer cloud platforms, and they also have uses that require their own data storage and use, such as search engines and consumer retail. Lines can blur in the relationship between landlord and tenant, as larger cloud providers and network providers will own and operate their own data centers. These are some general buckets commonly in use when referring to data center tenants.

- Cloud "Hyperscale": These are the largest and most pervasive users of data centers, both leasing from the REITs and building their own facilities; these types of tenants include Alibaba Cloud, Amazon's Amazon Web Services, Microsoft's Azure, Google Cloud, and IBM's SoftLayer. These companies' offerings are often termed IaaS, or infrastructure as a service. Their role is increasingly critical in the digital age as more and more companies outsource some or all of their data needs. According to JLL and International Data Corporation, an estimated $65.2 billion was spent by the cloud providers in 2018 alone.
- Network: If the hyperscale cloud providers are the digital warehouses of the Internet, then the network providers are the highways and rails that deliver connectivity of data to, from, and between users. Some examples of larger network providers include AT&T, CenturyLink, Comcast, and Verizon.
- Enterprise: This category of data center customers can essentially include any type of tenant that is not hyperscale or network. These are essentially any business which requires capacity for data storage, though it is not a core competency. While sometimes identified more specifically, this group includes financial institutions, manufacturers, media and entertainment, retailers, energy companies, and more.

Leases vary depending on the type and needs of the tenant, with smaller enterprise customers signing for durations of two to three years, and large users, typically hyperscale, contracting for upward of 10 years or more. Because of the fundamental need for electric power, data center leasing is typically determined and quoted in dollars per wattage. For the largest tenants, which tend to be of the hyperscale cloud variety occupying large portions of or entire centers, rates will be lower, at around $100 per kilowatt (kW) per month. Smaller tenants, which may only occupy a few racks, will pay upward of $250-$500 kW. Data center capacity, as a result, is often measured in wattage in addition to square feet, with facilities ranging from a few megawatts (MW) or less, to the largest offering more than 100 MW. The U.S. data center REIT portfolios are deployed primarily in the U.S. and Canada, though most have overseas facilities that enable them to grow their offerings to serve large population centers across the globe and avail one-stop leasing for increasingly global tenants.

Exhibit 4 Data Center REIT Portfolio Locations

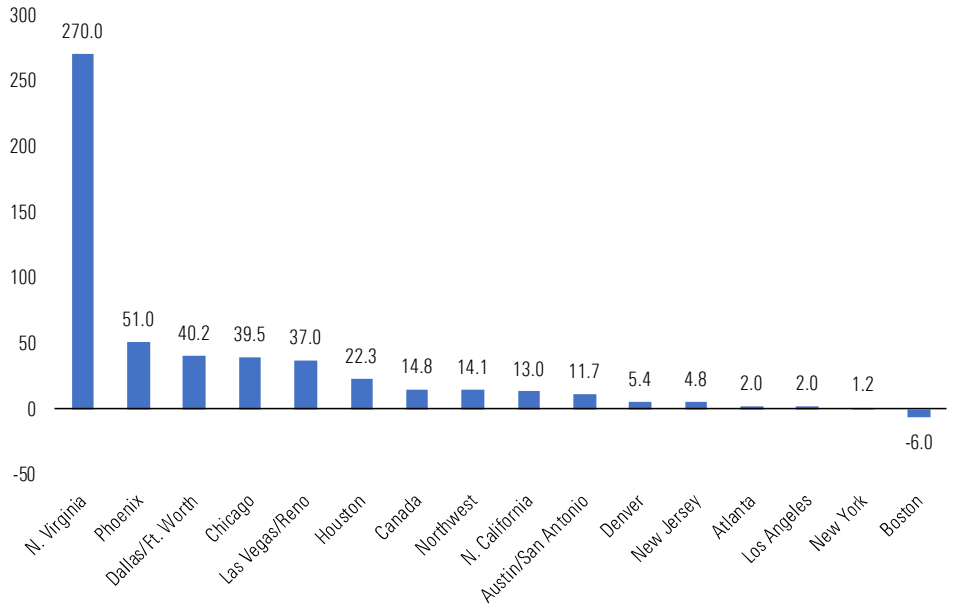
Source: SNL; the REITs; Morningstar Credit Ratings, LLC. As of Feb. 28, 2019.
Note: Portfolio locations outside the U.S. and Canada not represented.
Yellow shaded areas represent population density; darker yellow represents increasing density.

Investment Markets

In its "North American Data Center Outlook 2019," CBRE describes robust demand especially from both hyperscale cloud providers and enterprise companies outstripping already elevated supply levels that were coming to market. Inventory added since 2015 in key data center markets, including Silicon Valley and Northern Virginia, totaled more than 80% through the end of third-quarter 2018. Key market absorption was at its highest ever in 2017, and through Sept. 30, 2018, it had already reached 80% of the prior-year total. The desirability of the asset class is also evident by movement of data center cap rates, which have dropped 200 basis points on average over the past decade. As well, in certain cases data centers have traded at lower cap rates than a more traditional asset class, industrial warehouse,

which is itself enjoying the benefits of a healthy economy and the growth of ecommerce. JLL, in its recently published "Data Center Outlook," noted continued strong absorption in 2018 that is expected into 2019, with the U.S. and Canada leading the world with more than 500 MW last year (Exhibit 5). Most notable was the important Northern Virginia market, which accounted for more than half of 2018 absorption in the U.S. and Canada, and more than doubling its 2017 absorption of 115 MW. Almost half of last year's total was taken up by cloud providers. Each of the data center REITs has a presence in this market, which not only permits relatively low latency contacts with population centers on the U.S. eastern seaboard, but also allows significant access to U.S. government and defense clients. It is important to note here that it is relatively more challenging to track every leasing transaction, and as such broker data may not capture retail or smaller colocation activity in its entirety.

Exhibit 5 2018 Data Center Absorption (MW)



Source: JLL. Data as of Feb. 27, 2019.

Environmental, Social, and Governance

Data center REITs are, similar to best practices among the highest-profile investment grade REITs, seeking to ensure lower risk profiles in environmental, social, and governance, or ESG, areas. Sustainalytics, a provider of ESG research and ratings to investors, had not identified any moderate to severe controversies for any of the data center REITs in its overview of qualitative performance during the past five years, with only two low-level incidents during that period and one moderate-level dating from April 2013. Controversies would include incidents with employees or customers, product or operational miscues, and lapses in governance or ethics.

In Exhibit 6, we have summarized Sustainalytics' findings for the data center REITs. As a whole, the sector is an average ESG performer relative to the universe of companies assessed. Areas for

improvement include reporting of ESG initiatives and commitment to prescribed green building standards. We anticipate that the data center REITs will increasingly look for means to deliver increasingly sustainable energy, engage with ESG-conscious investors such as through green bonds, and raise the profile of their efforts though focused and well-articulated strategies.

Exhibit 6 Sustainalytics ESG Scores for Data Center REITs

Data Center REIT	Ticker	Environment	Social	Governance	ESG Rating	Performance
CoreSite Realty Corporation	COR	53	41	53	50	Average
CyrusOne Inc.	CONE	40	41	50	43	Underperfomer
Digital Realty Trust, Inc.	DLR	56	50	54	54	Average
Equinix, Inc.	EQIX	70	51	61	59	Average
QTS Realty Trust, Inc.	QTS	NA	NA	NA	46	Average
AVERAGE		**54.8**	**45.8**	**54.5**	**50.4**	

Source: Sustainalytics. Data as of Feb. 28, 2019.
Note: Scores range from 0 to 100, with higher scores corresponding to lower risk.

Credit Metrics

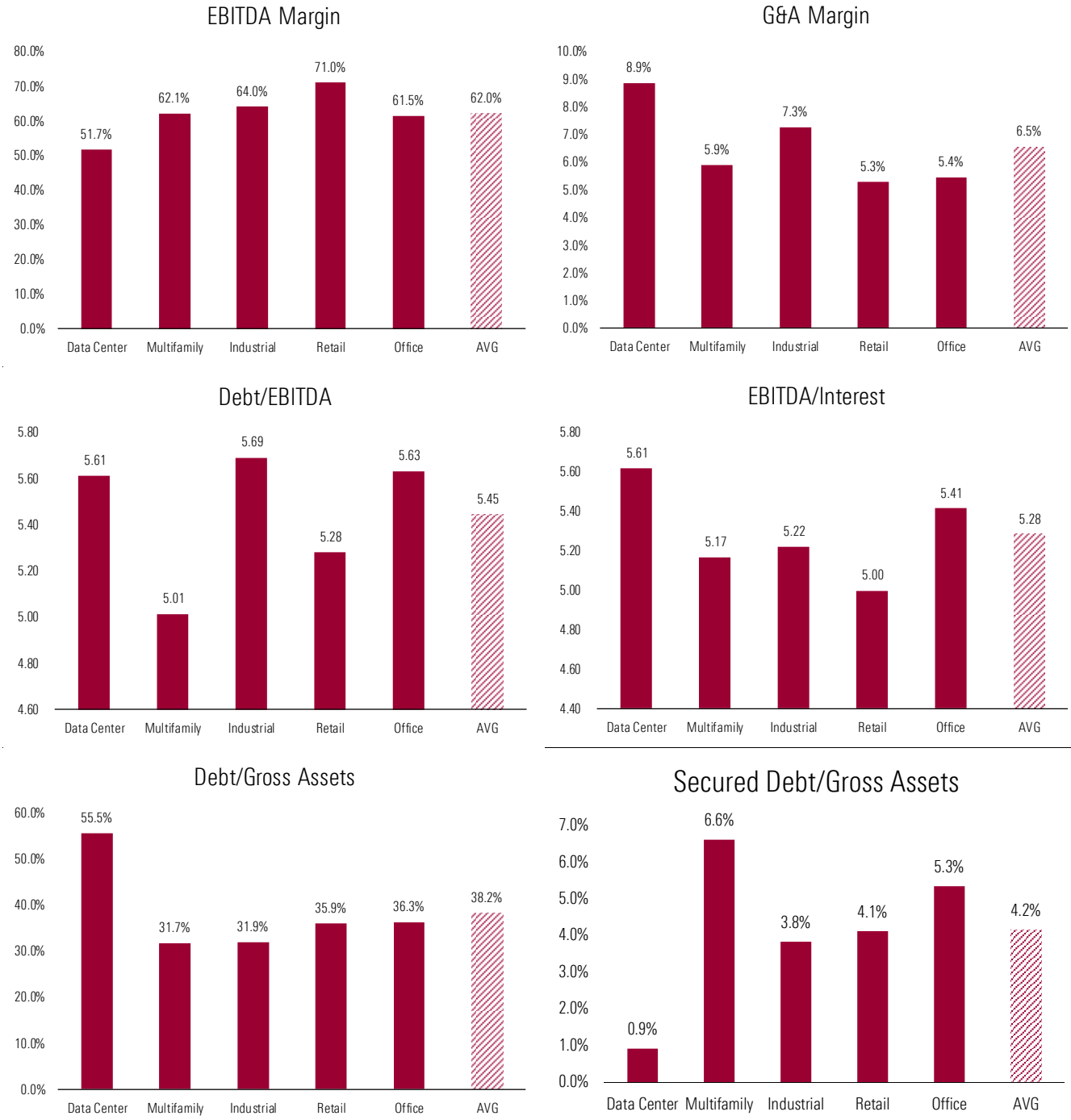
Over the past five years, data center REITs have improved key margins on average with EBITDA margins up to 50.6% in 2018 from 46.7% in 2014. As well, G&A margins have declined to 10.7% from 12.6% over the same period. Notably, these advancements have occurred during a time of strong fundamental growth, when management teams may have been tempted to increase certain costs or lose pricing discipline in order to capture a greater share of demand. As data center REITs access capital in order to increase capacity to meet growing demand, leverage has likewise increased, though not to alarming levels. Since 2014, average debt/EBITDA rose to 5.8 times from 4.7 times, and debt/gross assets to 53.2% from 43.2%. Importantly, secured debt levels are negligible, implying significant alternative liquidity by virtue of significant unencumbered portfolios (Exhibit 7).

Despite recent improvements in margins, data center REIT margins remain weaker than the REIT average. This is not unexpected, given that costs to develop and maintain data centers tend to be higher than that of other more traditional commercial property types. As well, given the relatively expansionary fundamentals of the data center subsector and the need for capital required to meet demand, leverage levels are at the higher end of REIT averages. Conversely, the data center REITs continue to grow balance sheets without encumbering them with secured debt and therefore maintain the lowest secured debt metrics in the REIT space (Exhibit 8).

Exhibit 7 Historical Data Center Credit Metrics

Source: SNL; the REITs; Morningstar Credit Ratings, LLC. As of Feb. 28, 2019.

Exhibit 8 REIT Subsector Credit Metrics



Source: SNL; the REITs; Morningstar Credit Ratings, LLC. As of Feb. 28, 2019.

Economic Moats

Some data center REITs are able to achieve narrow economic moats, which is the result of switching costs or network effects, or both. Moats enable these REITs to earn adjusted returns on invested capital that exceed their weighted average cost of capital. We would anticipate that returns will steadily improve for those that shift toward the higher-margin colocation and interconnection revenue streams.

Exhibit 9 Morningstar Equity Research Data Center Moats

Data Center REIT	Economic Moat	Moat Trend	Customer Switching Costs	Efficient Scale	Intangible Assests	Network Effect
Digital Realty Trust, Inc.	Narrow	Positive	Yes	-	-	-
Equinix, Inc.	Narrow	Stable	Yes	-	-	Yes
CoreSite Realty Corporation	Narrow	Stable	Yes	-	-	Yes
CyrusOne Inc.	None	Stable	-	-	-	-
QTS Realty Trust, Inc.	NA	NA	-	-	-	-

Source: Morningstar Direct. As of Feb. 28, 2019.

Morningstar® Credit Research

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