



Alpha Watch
December 2014

Data Centres

Fast growing, superior quality and
high yielding asset class



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Authors

Chua Chor Hoon
Director, Research

Tan Yali
Associate, Research

Executive summary

Data centres are highly specialised facilities that house mission-critical computer and networking equipment and are usually fitted with backup power supplies, environmental controls and security systems.

Third-party data centres have and will continue to experience fast growth due to increasing data storage and security needs, cloud adoption and outsourcing of data centre requirements.

Investing in third-party data centres thus provides investors the opportunity to participate in its fast growth. Data centres are specialised and high value real estate that enables value creation through development and operational expertise. They can potentially provide stable, quality and high yielding cash flow.

However there are also risks that are unique to this asset class: downtimes, vacancy, end-users developing their own data centres, cloud adoption which could trim demand growth by eliminating the need for traditional backup system, market opaqueness, rapid changes in technology and infrastructure needs, increasing legislation on data centre security and environmental impact, and the highly specialised nature of data centres which could limit exit options.

Hence, partnering an experienced operator is key. A partner with established presence, local relationships and customer base will be able to mitigate the risks by providing market intelligence and, sourcing site and end-user. As market fundamentals can influence pricing charges, vacancy and cap rates, market selection is important. Safety, security and reliability, energy cost and policies, and ease of doing business are also major considerations.

Investing in the data centre market at an early stage of the asset lifecycle and market growth provides greater returns. Its high barriers to entry from both technicality and investment perspectives provide operators market power and limit competition from other investors. While its technicalities may deter many direct investors from participating in the fast growth, there are opportunities for equity participation for investors with access to strong partnership. With increasing interest from both institutional and retail investors, divesting to a data centre REIT provides an additional exit option.

Third-party data centre services

Wholesale Co-location

Provides cells or pods, i.e. individual white space* rooms ranging from 10,000 to 20,000 sq ft in size.

Retail Co-location

Provides individual racks and cages of fitted data centre space ranging from 500-5,000 sq ft in sizes. A managed co-location facility also includes full facility maintenance and systems.

Managed Hosting

Provides operating servers and storage, and any other IT services.

Cloud Solutions

Provides on-demand computing, storage and application resources over a network. These services can be broadly categorised into: 1) software services (SaaS), e.g. applications; 2) platform services (PaaS), e.g. networks, servers and storage; and 3) infrastructure services (IaaS). In an IaaS model, the operator owns and manages the full equipment including hardware, networks, servers and storage to support the customer's operations.

*White space refers to the raised floor area where computing equipment are placed.

Introduction

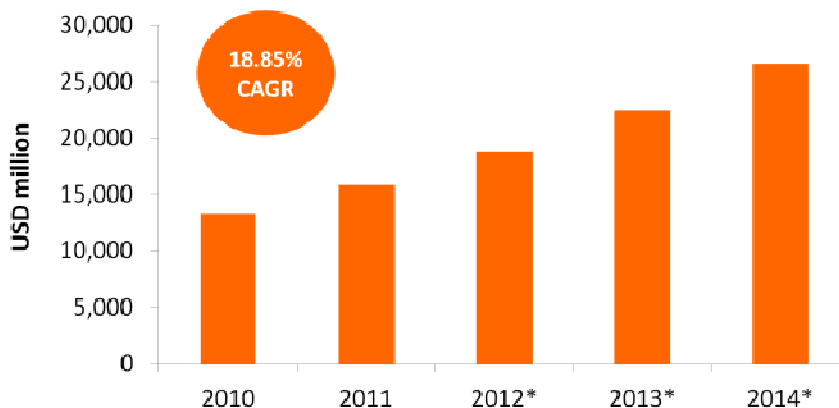
Data centres are highly specialised facilities that house mission-critical computer and networking equipment such as data storage systems, telecommunications equipment, routers and servers. They are usually fitted with: 1) backup power supplies to reliably operate during emergencies; 2) environmental controls such as cooling system and fire protection; and 3) security systems to prevent fire disasters and security breaches.

In third-party data centres, operators provide a range of services from wholesale co-location, retail co-location, managed hosting to cloud solutions, and manage these functions (see side box). Operators can charge based on space or rack take-up or power consumption but are increasingly using the latter because it is a better measurement of usage. Major customers include government agencies, financial institutions, telecommunications, gaming, media and content companies.

A fast growth sector

Third-party data centres have experienced fast growth of about 19% CAGR from 2010 to 2014¹ (Figure 1).

Figure 1: Global third-party data centre revenue growth



Note: Excludes single-tenant data centres. *Projected
Source: 451 Research Estimates, 2012

¹ 451 Research, "Multi-Tenant Data Center Global Providers - 2012", 2012. 451 Research excludes single-tenant or single-user data centre which is a narrower definition of third-party data centres. Nevertheless, this is used as a proxy.

They are expected to continue to enjoy strong growth due to the following reasons:

- a. **Data storage needs are expected to increase to meet global data and Internet Protocol (IP) traffic growth** projected at 48% and 21% CAGR respectively from 2013 to 2018² (Figure 2). This will be driven by: 1) increasing number of people connecting to the internet and using internet-enabled devices; 2) increasing online shopping, social networking, video streaming and data sharing; and 3) more “Big Data”³ and analytics to help businesses predict trends and make informed decisions.
- b. **Increasing compliance and regulatory requirements will drive demand from businesses to store more data and store them more securely** in data centres that can provide long term access, secure storage and easy on-demand retrieval. Examples are more corporations requiring backup storage for disaster recovery and business continuity and increasing regulations over data collection and protection (Table 1).
- c. **Cloud adoption will continue to grow as businesses seek lower cost and more efficient computing resources.** Cloud computing resources can be purchased from third-party providers on a per use basis, configured and rapidly provisioned⁴, and are highly scalable⁵. The concept is gaining popularity among corporate and individual end-users. Cloud infrastructure services (IaaS) for instance, are projected to grow by 35-55% CAGR from 2014 to 2018⁶ which will drive data centre demand as cloud services require data centres with high power density to operate.
- d. **Outsourcing of data centre requirements will increase to meet end-users’ needs to keep capital efficient and cost effective** by focusing on their core businesses and letting third party handle their changing requirements and manage the increasingly complex operations. Some customers may also find it cost ineffective to have large servers taking up expensive office space as their businesses expand. Global outsourced data centre space is estimated to increase by 18.7% in 2014, much higher than in-house data centre space which grew by 2.3% (Figure 3). There is still room for outsourced space to grow as its proportion out of the total data centre space is still low at an estimated 24% for 2014.

² Broad Group, 2014.

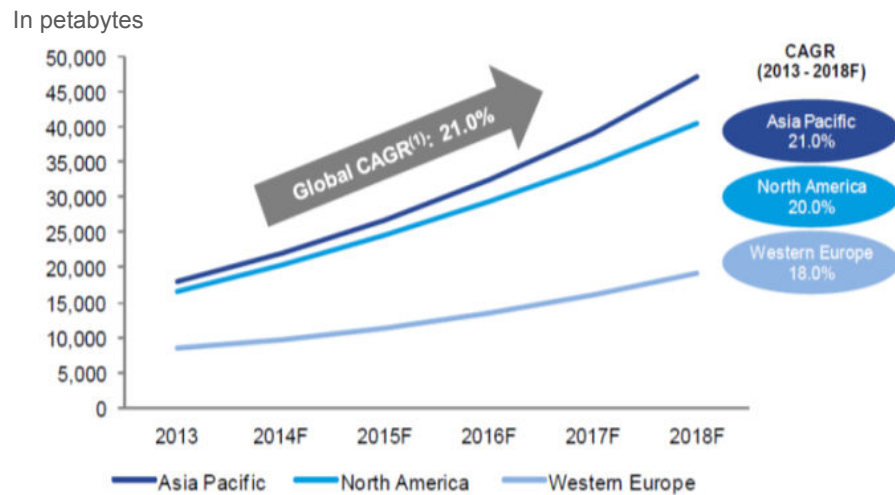
³ Big Data is the collection of large and complex data sets, both historical and real-time data, which are difficult to analyse using traditional data processing applications.

⁴ This means that more or fewer resources can be used and configured to meet its requirements, as and when required, easily.

⁵ This means that performance can be increased in proportional to the resources added.

⁶ Broad Group, 2014.

Figure 2: Global monthly IP traffic growth



¹ From 2013 to 2018F
Source: Broad Group, 2014

Table 1: Compliance and regulatory requirements

Regulatory act/ agency	Requirements	Effective Year
People's Bank of China	Prohibits Chinese banks to process or analyse data obtained in China or outside of the country.	2011
Monetary Authority of Singapore	Guides banking and insurance industries in technology risk management: 1) to put in place adequate and robust risk management systems, and operating processes to manage those risks; 2) and deploy strong authentication to protect customer data, transactions and systems.	2013
EU Data Protection Regulation	Impending changes to data protection laws to significantly control how companies handle data. Businesses will face censure and substantial fines if they do not comply with the new rules.	Planned for 2015
Health Insurance Portability and Accountability Act, US	Will be implemented in the US health care industry to protect patient data in hospital computer networks and data centre storage to ensure that patient privacy is not compromised.	Planned for 2015

Source: Broad Group, 2014

Investment activity

Europe

Europe's largest cloud services platform provider Interoute Communications Ltd expands in the UK by acquiring Vtesse group, which has one of the largest national networks in the UK, connecting 55 data centres and 48 major town and cities in England, Scotland and Wales.

London-based Colt Group looks for investment opportunities in higher-growth markets such as China and Hong Kong following the acquisition of Japanese data centre operator KVH.

APAC

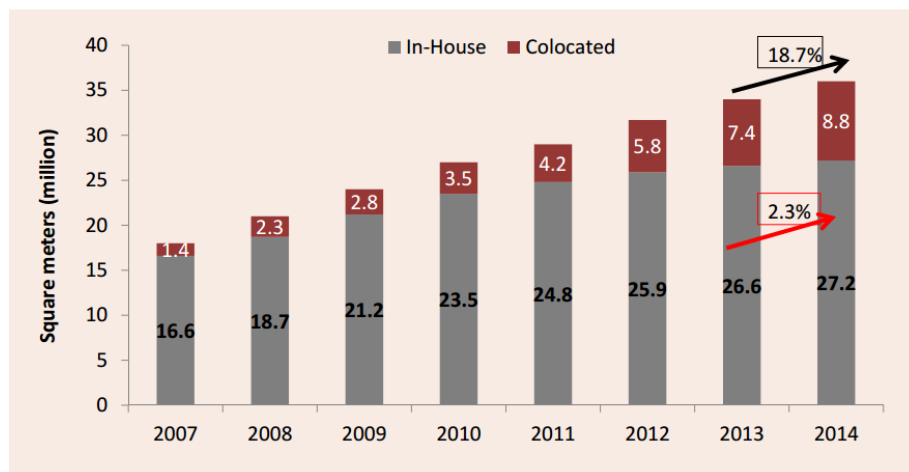
Temasek Holdings' Singapore Technologies Telemedia (STT) makes its foray into China's booming data centre market by acquiring a 40% stake in GDS services, which operates 17 data centres in China and Hong Kong.

REITs

San Francisco-based Digital Realty plans to divest its non-core assets as it looks to restructure its portfolio.

Singapore Keppel Telecommunications & Transportation is looking to list the first data centre REIT in Asia. Its initial portfolio is expected to comprise 8 data centres in APAC and Europe.

Figure 3: Data centre space – in-house vs. co-location



Source: Datacenter Dynamics, 2014

Investment case

Investing in third-party data centres thus provides investors the opportunity to participate in its fast growth. Side box highlights some of the recent investment activity.

Data centres are specialised and high value real estate that enables value creation through development and operational expertise. A data centre operator can employ technical expertise, knowledge and intricate understanding of industry to earn development profits. Gross margins are anecdotally 15-20%. Tenants' data centre requirements may require significant customisation, including different lease, security and redundancy needs, which an experienced operator can efficiently provide and optimise.

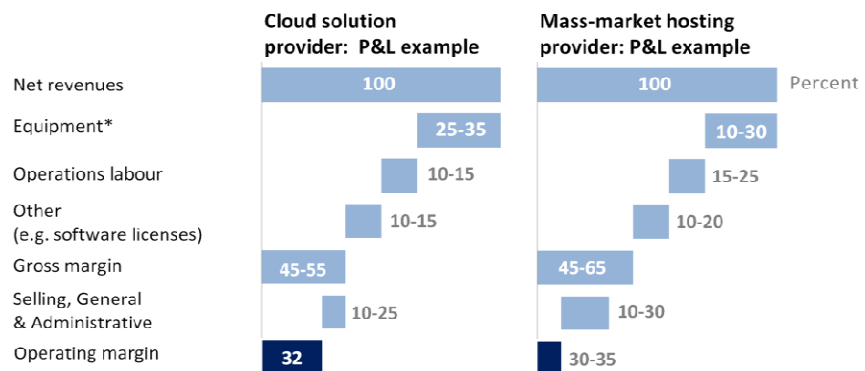
Data centres can potentially provide stable, quality and high yielding cash flow for the following reasons:

- a. **Long lease term and high customer retention rates** – Globally, lease contracts typically range from 5 to 25 years for wholesale co-location and up to 5 years for retail co-location. Retention rates can reach more than 95% in the wholesale co-location market and 90-95% in the retail co-location market⁷. Retention rates are typically high due to the substantial relocation cost and significant investment that customers have to bear. Operators thus have the bargaining power to charge higher-than-market prices at lease renewal stage.

⁷ Broad Group, 2014.

- b. **High quality tenants** – Customers are usually large and reputable companies or government agencies which mean tenant defaults are less likely. Expansion is also common among existing customers and typically shown to increase revenue by 60-80%⁸.
- c. **High value lease contracts** – Data centre infrastructure and services are highly specialised which explains the generally high EBITDA margins, excluding cost of power, of 60-70% for wholesale co-location providers and 40-50% for retail co-location providers⁹. EBITDA margins are relatively stable as the cost of power and system cooling can be passed on to customers. Operating margins for mass market hosting and cloud solution providers were estimated at 30-35% after excluding the cost of power in another study (Figure 4). Lease contracts also have built-in escalators for their charges, to provide for an increment of 2-5% each year or at the rate of inflation.

Figure 4: Profit margins of mass market hosting and cloud solution providers



*Includes capital expenditure as depreciation; hardware and software assume 4 years of useful life at 8% maintenance ratio.

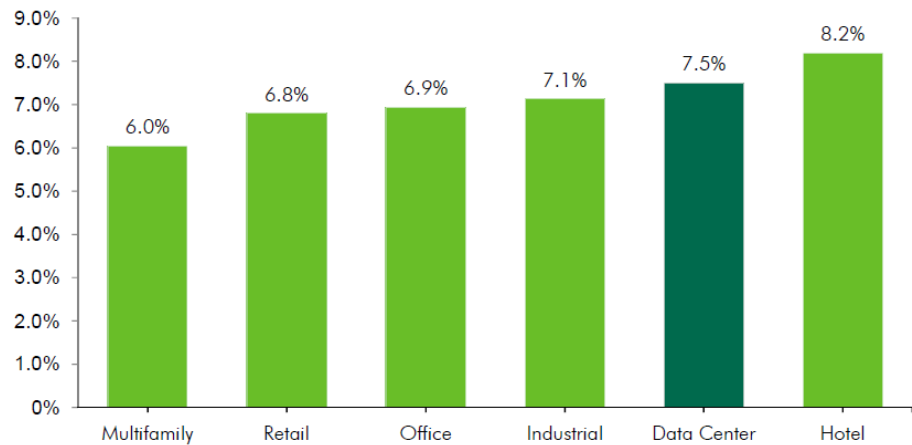
Source: Interview with solution providers by McKinsey (2011), AIP Research

⁸ Broad Group, 2014.

⁹ EBITDA margins are lower due to higher marketing, property, operational and administration expenses. Source: Broad Group, 2014.

- d. **Data centres have higher cap rates than most other traditional real estate asset classes.** In the US for instance, data centres have the second highest average cap rate at 7.5% in 2Q2014, after hotels (Figure 5).

Figure 5: US cap rates across asset class



Note: Data centre cap rates reflect those of fully leased facilities with at least seven years of remaining lease.

Source: Real Capital Analytics & CBRE Data Center Solutions Group, 2Q2014

Market selection

As market fundamentals can influence pricing charges, vacancy and cap rates, market selection is important.

Location criteria for data centres include:

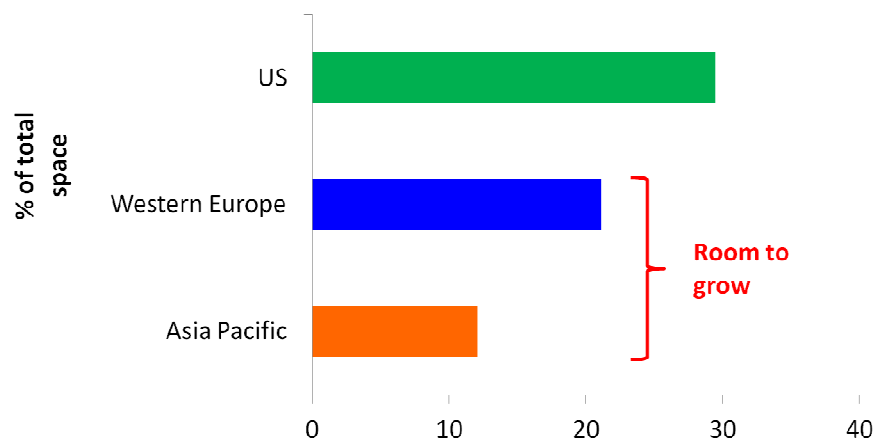
- a. **Safety, security and reliability** – Data centres need to be in locations that are highly secure and safe from cyber attacks, political or social unrest and natural disasters to ensure power and service reliability. Infrastructure has to be highly developed with high internet bandwidth and connectivity to provide fast and stable support.
- b. **Energy cost and policies** – Cheap or subsidised energy costs and cool weather will help to reduce costs. Renewable energy may become a more important consideration as traditional sources deplete. Legislation against carbon emission may add to costs.
- c. **Ease of doing business** – Apart from a business-friendly environment, tax incentives will also help reduce costs. Certain markets however require licenses to operate.

Data centres need not be in the same location as the customer base. However, some sensitive sectors may be required by regulations to have their data centres located only in certain areas. Businesses in the gaming and financial industries or those using data centres for disaster recovery will need their data centres to be located in close proximity to their operations or cable landing point for fast speed of data transfer. Where close proximity is not ideal due to risk of natural disaster or less developed IT infrastructure, data centres may be located elsewhere but in the same time zone.

There are investment opportunities at different geographies given the size and different stages of maturity of the global data centre market:

By region: North America is the most mature but also the most competitive market. Led by the US, it has the largest and most developed IT infrastructure supporting rapid adoption of technology in the region. About 300 data centre providers – both traditional and real estate players – currently cater to the wide demand for a full spectrum of services: co-location, managed services and cloud services. Latin America (LatAm) is still developing. Europe, Middle East and Africa (EMEA) and Asia Pacific (APAC) are more diverse, with higher growth potential in some areas due to more advanced infrastructure development and technology adoption. APAC and Western Europe have greater room to increase their third-party data centre space compared to the US given that the proportion of third-party data centre out of total data centre space is still low at 12.1% and 21.1% respectively (Figure 6). APAC's higher economic growth versus other regions will provide a strong demand driver. Performance will however ultimately be market-specific.

Figure 6: Proportion of third-party data centre space by region, 2013



Source: Broad Group, AIP Research

By city: First-tier markets, which are the largest and most established markets in the region, see stronger data centre demand because they are the major economic hubs. A significant take-up in international hubs is by multinational corporations (MNCs) whose demand for high operating standards is met by global operators. Emerging markets are still seeing a demand gap. Local markets can benefit from regional demand if neighbouring locations are less ideal. Table 2 provides a list of data centre markets in the world, followed by an analysis of some key markets' fundamentals.

Table 2: Data centre markets

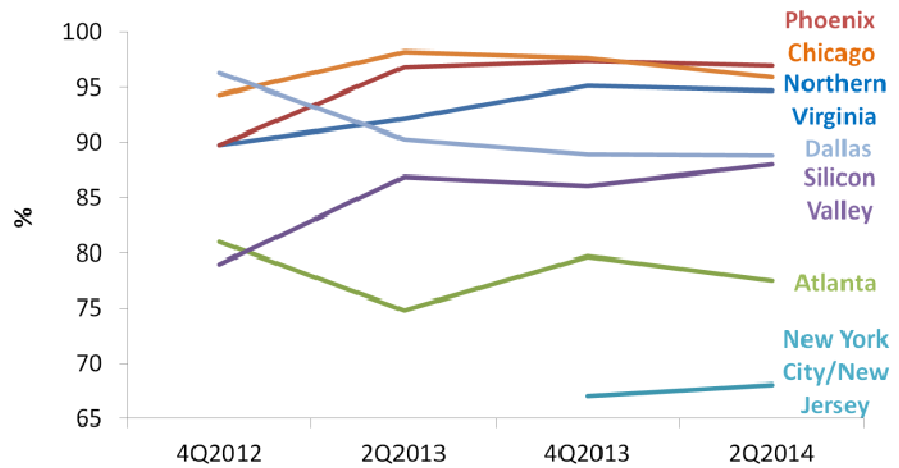
	APAC	EMEA	North America	LatAm
Tier-1	Hong Kong Singapore Tokyo Sydney	Amsterdam Frankfurt London Paris	Atlanta Boston Chicago Dallas Los Angeles New York City/ New Jersey Northern Virginia Phoenix San Francisco/ Silicon Valley Seattle	
Non-Tier 1	Kuala Lumpur Shanghai Taipei Manila Melbourne Seoul Shenzhen Brunei Cambodia Indonesia Rest of China Vietnam	Madrid Dublin Milan Finland Iceland Norway Sweden South Africa	Baltimore Charlotte Cincinnati Denver Houston Las Vegas Miami Minneapolis Philadelphia San Diego Toronto	Brazil Mexico

Source: 451 Research, BICSI, Broad Group, CBRE, JLL, AIP Research

Most key **US** markets are improving in utilisation rates¹⁰, underpinned by robust demand from technology companies, financial institutions, cloud providers and IT infrastructure companies compared to a year ago. Pricing charges are increasing after bottoming in late 2013 (Figures 7-8). In **Chicago**, growing demand for good quality space – which may not be met by the pipeline supply – will likely continue to support growth in pricing charges. In **Silicon Valley**, substantial available sub-lease space from Facebook and Zynga may limit growth in pricing charges despite strong demand.

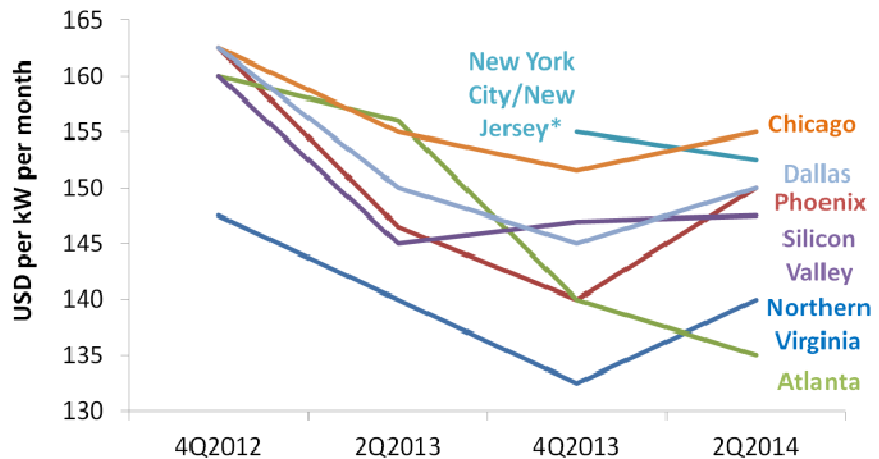
¹⁰ Utilisation rate – an indication of demand – refers to the amount of utilised power as a proportion of total power supplied.

Figure 7: US wholesale co-location – utilisation rate



Source: CBRE, AIP Research

Figure 8: US wholesale co-location – average pricing charges

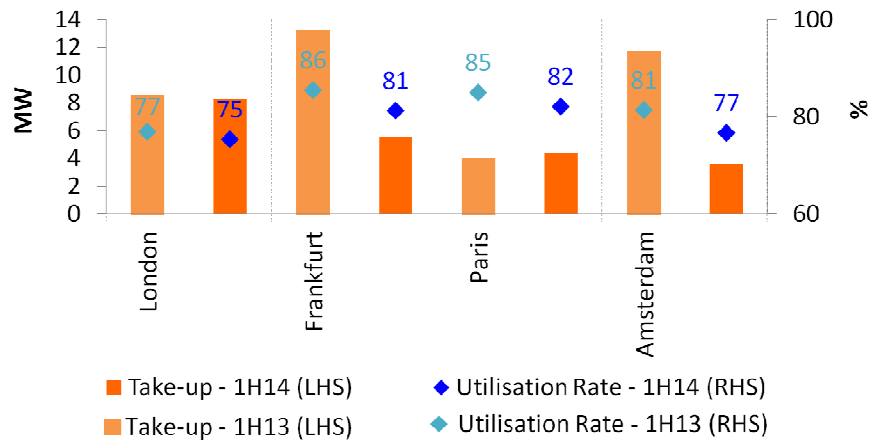


*Excludes Manhattan

Source: CBRE, AIP Research

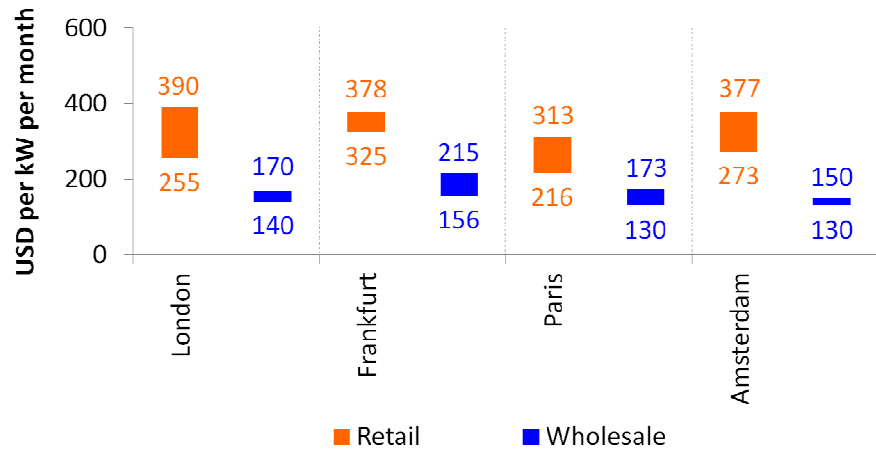
Most key **European** markets are stabilising in demand although increasing new supply are still putting pressure on pricing charges in some areas. In **London**, latent demand and relocation activity is supporting a stable market despite some downsizing as enterprises rationalise their space requirements due to excess capacity. Relocation is high as customers take advantage of the pricing differential between market charges and renewal rates. In **Frankfurt and Amsterdam**, demand is exceptionally strong and operators have responded with increasing development activity. While there are signs of slowdown in Germany’s economy, demand in Frankfurt continue to be sustained by demand from technology companies, cloud providers and IT infrastructure companies. In **Paris**, demand remains constrained by France’s weak economy and pipeline supply is large. Figures 9-10 provide a snapshot of the utilisation rates and pricing charges in these key markets.

Figure 9: Europe co-location demand & utilisation rate



Source: CBRE, AIP Research

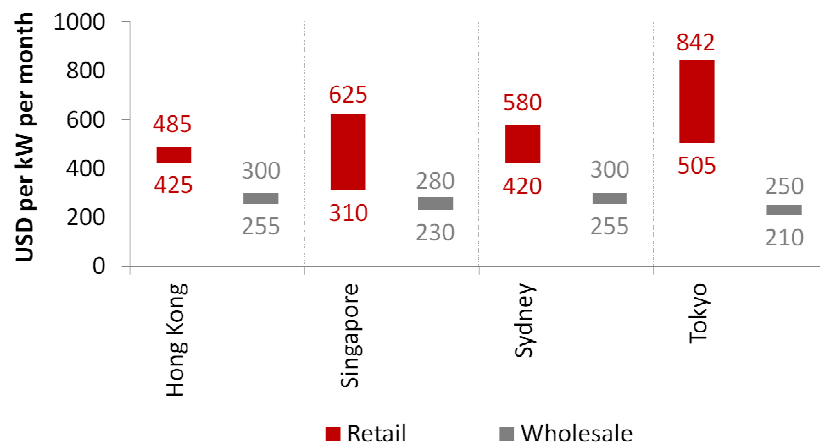
Figure 10: Europe typical co-location pricing charges, 2013



Source: CBRE, AIP Research

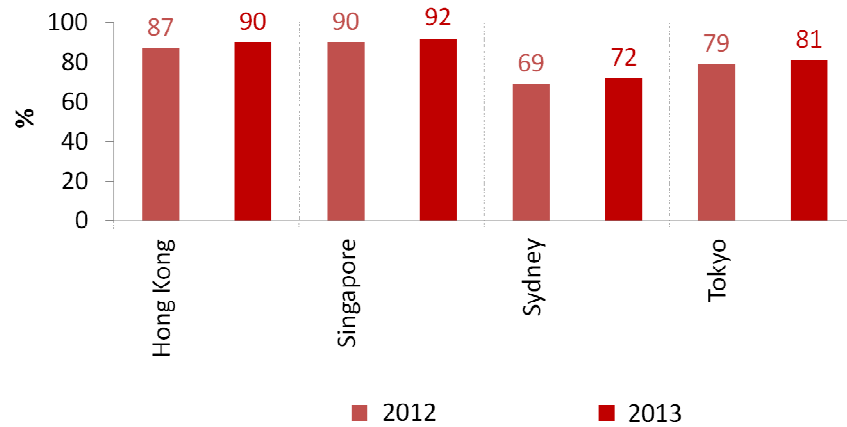
APAC markets are more opaque than those in the US and Europe with little public data available. This provides operators more pricing power, resulting in higher pricing charges compared in the US and Europe (Figures 8, 10, 11). Utilisation rates in Hong Kong, Singapore, Sydney and Tokyo continued to increase over 2013, underpinned by healthy demand (Figure 12). In **Hong Kong and Singapore**, businesses with international footprint continue to express interest in locating their data centres in these global hubs. In **Sydney**, strong local demand is encouraging more development activity. In **Tokyo**, demand is supported by the local gaming industry but earthquake concerns is driving relocation demand out of it and benefitting neighbouring Busan, South Korea. In **China**, strong demand will continue to encourage operators to work through the strict regulations.

Figure 11: APAC typical co-location pricing charges, 2013



Source: CBRE, AIP Research

Figure 12: APAC co-location utilisation



Note: Excludes single-tenant data centres. Utilisation rate here is based on operational sq ft or currently built-out data centres in a facility.

Source: 451 Research, AIP Research

Operational expertise is key

Investment in data centres is not without risks which include: 1) downtimes which may result in compensation payout and reputation damage; 2) vacancy which may require capital expenditure to re-lease the space; 3) end-users with specialised or sensitive needs developing their own data centres which may shrink the potential demand pool; 4) cloud adoption which does away with traditional backup systems (since data can be stored on a single server) may trim down demand growth; 5) market opaqueness¹¹ which may limit the ability to predict future supply and demand, and respond to competition; 6) rapid changes in technology and infrastructure needs which may translate to frequent capital expenditure; 7) increasing legislation on data centre security and environmental impact that may add to costs; and 8) the highly specialised nature of data centres which could limit alternative uses and make monetising challenging.

As data centre is a specialised product that requires operational expertise to manage, partnering an experienced operator is therefore a key consideration. A partner with established presence, local relationships and customer base will be able to mitigate some of the risks and provide the following advantages:

- ✓ **Market intelligence** – Ground information from operators provides insights into market trends particularly in opaque markets like APAC. Familiarity with legislations such as licensing in China and carbon emission controls in Europe will save time and avoid costs.
- ✓ **Site sourcing** – Operators' relationship network provides access to opportunities in markets where land and assets are scarce.
- ✓ **End-user sourcing** – Operators with credible track records will ensure a strong demand pool given that reliability is priority for end-users. Global operators that can meet the global operating standards that MNCs require will appeal to these foreign end-users particularly in emerging markets.

¹¹ Information is usually between the provider and customer and hardly shared due to their sensitivity.

Conclusion

Investing in data centres at an early stage of the asset lifecycle and market growth provides greater returns. Its high barriers to entry from both technicality and investment perspectives provide operators market power and limit competition from other investors. While its technicalities may deter many direct investors from participating in the fast growth, there are opportunities for equity participation for investors with access to strong partnership. Divesting to REITs is increasingly a viable exit option with data centre REITs receiving increasing interest in the US and emerging as a new investment class in Asia Pacific.

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