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Listed vs. private infrastructure: Why not both?

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Investing in listed infrastructure may provide benefits that make a strong case for a larger allocation to listed markets relative to private investments than is currently observed by institutional investors. At Nuveen, we strongly believe in the infrastructure asset class.

EXECUTIVE SUMMARY

Historically, institutional investors have preferred direct or unlisted infrastructure investments within this asset class. However, investing in listed infrastructure may provide benefits such as:

- Broader diversification by country, sector, and holding
- Asset liquidity that facilitates portfolio rebalancing
- Temporary market mispricing that the active portfolio manager can seek to exploit
- Access to many high quality infrastructure assets that are not offered on the private market (airports, seaports, and public transportation systems)

We believe that these advantages and more make a strong case for a larger allocation to listed markets relative to private investments than is currently employed by institutional investors.

THE APPEAL OF INFRASTRUCTURE ASSETS

Infrastructure assets in general are becoming more familiar to investors, and are being used increasingly as part of a global asset allocation. This is due in large part to the compelling characteristics of the infrastructure assets themselves.

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Infrastructure assets are often monopolistic, which can make them an attractive investment. For example, the sheer size and capital intensive nature of an electric grid creates high barriers to entry. The cost of construction of a competing asset in a similar geography is prohibitive and redundant.

In addition, many infrastructure assets are essential use assets with demand characteristics that remain fairly stable over the gross domestic product (GDP) cycle. They are generally regulated to ensure fair pricing, which is often contractually linked to inflation. This regulated return stream — coupled with consistent demand and the long-term nature of contracts and concessions for the ownership and operation of the assets – leads to visible and predictable cash flows. We believe that these cash flow and income-producing dynamics provide inherent value and make infrastructure assets an attractive investment.

LISTED INFRASTRUCTURE CAN SERVE AS A COMPLEMENT

Investors usually cite three primary reasons for preferring unlisted infrastructure: superior returns, lower volatility and lower correlations. However, we feel that these perceived advantages are not as compelling as some believe, and that there is a strong case for global listed infrastructure investment as a complement to unlisted infrastructure investing.

Access to high quality projects

Due to global privatization initiatives, many mission-critical infrastructure assets throughout the world are operated by companies rather than governments and are available for investment only through the listed companies on the publicly traded markets.

Figure 1: Many mission-critical infrastructure assets are operated by listed companies

Airports	Seaports	Public transportation
Sydney	Shenzhen	London bus system
Zurich	Hong Kong	Singapore light rail system
Vienna	Sydney	Hong Kong light rail system
Frankfurt	Hamburg	
Beijing	Shanghai	
Paris	Dalian	
Cancun	Port of Santos (São Paulo)	
London (Heathrow)		

Data source: Nuveen research.

Ownership structure does not provide a return advantage

Investors typically require compensation for illiquidity, which is why there is an assumed return advantage in the unlisted marketplace. However, over a long time horizon, there should be no return advantage or disadvantage based solely on the ownership structure of the asset.

For example, the owner or operator of a toll road has rights to the cash flows from the asset, whether it is held via an unlisted direct equity stake or a stake in a publicly listed corporate entity. However, it is difficult to measure this thesis due to the absence of unlisted return data. According to the CFA Institute, “Despite growing interest in the infrastructure asset class, no standard exists for benchmarking the performance of unlisted infrastructure investments.”[1]

However, we believe a parallel can be drawn between private and public infrastructure and private and public real estate, where measured return series do exist for substantial time periods. While infrastructure and real estate have their differences, the rationale for this linkage lies in the similarities between the two investments:

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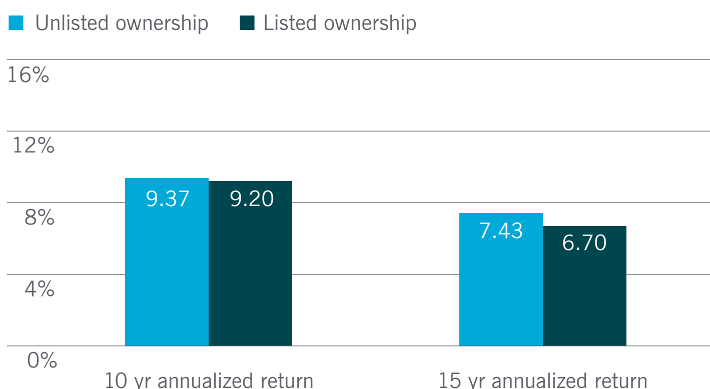
- Both are physical structures tied to a specific location
- Both provide income to the investor through cash flow streams based on utilization of the asset
- Both derive value from cash flow and the value of the structure
- Both typically have relatively high barriers to entry

Figure 2 shows that the listed/public real estate marketplace has provided similar returns as the private market over both the 10- and 15-year periods ended 30 Sep 2020.

Figure 2: Listed and unlisted real estate provided similar returns



Data source: Morningstar Direct, periods ending 30 Sep 2020. **Past performance does not guarantee future results. Representative indexes: Unlisted Ownership:** NCREIF Property Index; **Listed Ownership:** FTSE NAREIT All Equity REIT TR Index. The chart is for illustrative purposes only and is not reflective of any Nuveen investment. Index returns include reinvestment of income and do not reflect investment advisory and other fees that would reduce performance in an actual client account.

Stale pricing dampens volatility and correlation measures

Lower measured volatility and correlations for unlisted investments makes private asset ownership appear attractive to investors. Theoretically, these characteristics lead to increased diversification within a portfolio for an improving risk/return profile. However, we believe these benefits are overstated due to the smoothing effects of infrequent, appraisal-based valuation methodologies on returns.

This "stale pricing" dampens volatility measures. *Global Investments,* published by the CFA Institute, states: "The infrequent nature of price updates in the alternative asset world induces a significant downward bias to the measured risk of the assets. In addition, correlations of alternative investment returns with conventional equity and fixed income returns, and among the alternatives, are often close to zero or even negative, because of the smoothing effect and absence of market-observable returns."[2]

Consider the following excerpt from *Asset Allocation Effects of Adjusting Alternative Assets for Stale Pricing:* "For asset classes subject to stale pricing, some proportion of the current period's actual economic return is realized, some proportion of last period's actual economic return is realized, and some proportion of all previous relevant periods' actual economic returns is realized in the current period. As an example, consider security with a continually priced economic return stream (ERi) with a mean, μERi, of 10% and a standard deviation of 20%. If the security in question were subject to stale pricing such that only half of this period's economic price change were realized this period and the other half were realized in the next period, there would exist a corresponding smoothed return process (SRi), such that:

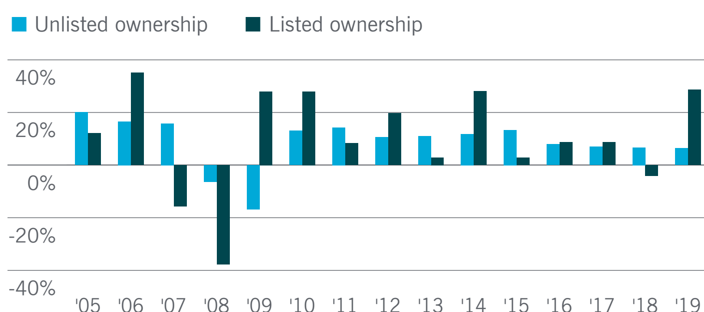
$$SRi,t = .50 \times ERi,t + .50 \times ERi,t\text{-}1$$

Over a full investment cycle, the mean of the smoothed return stream, μSRi, would still equal 10%, but the standard deviation would be muted to 14.1%."[3]

Returns on private real estate vs. publicly listed real estate investment trusts (REITs) suggest that there is simply a lag effect when measuring performance. This is logical, considering it is the job of the public markets to discount estimated future cash flows to the present in order to assign an intrinsic value to the asset being analyzed. This bringing forward of cash flows should foreshadow the future value of the underlying asset.

This methodology is the same whether the asset is real estate or infrastructure. And we believe, in the absence of private market return series on infrastructure assets, the real estate relationship will hold true. As shown in **Figure 3,** both the muted nature of the volatility of returns, as well as the lag effect demonstrated by the private real estate return series, can be observed by looking at calendar year returns of private versus publicly listed REIT returns.

Figure 3: The lag effect and performance in real estate



Data source: Morningstar Direct, 01 Jan 2005 – 31 Dec 2019. **Past performance does not guarantee future results. Representative indexes: Unlisted Ownership:** NCREIF Property Index; **Listed Ownership:** FTSE NAREIT All Equity REIT TR Index. The chart is for illustrative purposes only and is not reflective of any Nuveen investment. Index returns include reinvestment of income and do not reflect investment advisory and other fees that would reduce performance in an actual client account.

As shown in **Figure 4,** the period of 2007-2009 is the most obvious case of the public markets discounting the future returns on private assets. Negative returns in 2007 foreshadowed private market returns in 2008 and 2009, while a violent rebound in the public markets foreshadowed better days in the private markets beginning in 2010.

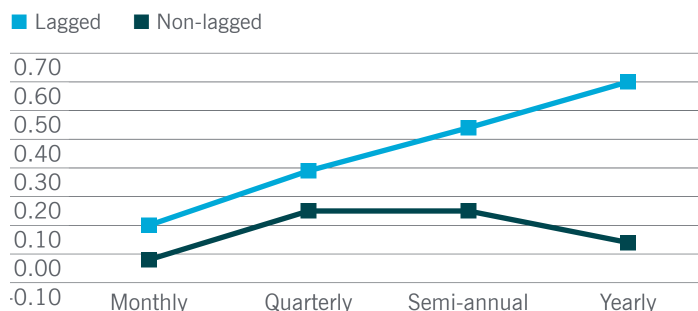
Figure 4: Public markets discounted future returns

	2007	2008	2009	2010	2011	2012
Unlisted ownership	15.84	-6.46	-16.86	13.11	14.26	10.54
Listed ownership	-15.69	-37.73	27.99	27.95	8.28	19.70

Data source: Morningstar Direct. **Past performance does not guarantee future results. Representative indexes: Unlisted Ownership:** NCREIF Property Index; **Listed Ownership:** FTSE NAREIT All Equity REIT TR Index. The chart is for illustrative purposes only and is not reflective of any Nuveen investment. Index returns include reinvestment of income and do not reflect investment advisory and other fees that would reduce performance in an actual client account.

When the smoothing effect of appraisal-based valuations is combined with the observation that private market returns lag those of the public markets, the perceived benefit of low correlations in private markets also seems less compelling. When measuring the returns of the listed and unlisted real estate markets dating back to 1985, **Figure 5** shows the effect on correlations of lagging the returns of the public markets one year (to allow private markets to "catch up") and changing the interval at which the assets are valued. When the time interval used is a monthly return series, even on the lagged data set, the private and public markets demonstrate very low correlation. However, if the interval is annual to approximate an appraisal based method on the listed securities, the correlation rises to 0.61.

Figure 5: Correlation of listed and unlisted real estate assets



Data source: Morningstar Direct, www.ncreif.org, 01 Jan 1985 – 31 Dec 2019. **Past performance does not guarantee future results. Representative indexes: Unlisted Ownership:** NCREIF Property Index; **Listed Ownership:** FTSE NAREIT All Equity REIT TR Index. The chart is for illustrative purposes only and is not reflective of any Nuveen investment. Index returns include reinvestment of income and do not reflect investment advisory and other fees that would reduce performance in an actual client account.

Assuming the same sort of relationship holds within the listed and unlisted infrastructure markets, we would advocate a greater allocation to listed infrastructure investments for investors with appropriate risk tolerance. This is by no means an abandonment of unlisted investments, but a complement to unlisted assets in a portfolio, given the potential added benefits to investors or plan sponsors.

From a portfolio management perspective, the liquidity that listed infrastructure affords an asset allocator is critical. Listed infrastructure is

very liquid, and can be traded daily. Conversely, private infrastructure is very illiquid, generally requiring years of commitment.

Liquidity enables the investor to rebalance a portfolio in ways that are not possible with illiquid, unlisted investments. Market movements can seriously impact portfolio weights. Exposure to a specific asset class in illiquid form only handcuffs the plan sponsor from either tactically or strategically rebalancing, should their asset class or capital market assumptions change. Owning a liquid form of the asset class allows the investor to rebalance the portfolio back to a target weight, or change the overall weight to better reflect a changed perspective on the asset class, whether positive or negative.

CASE STUDY: ESTIMATING VALUATIONS AND RETURNS FOR UNLISTED ASSETS

There is no benchmark for unlisted infrastructure investments to compare the performance of private and publicly traded assets. But transaction multiples can be used as a proxy. While this proxy is limited, we chose to look at the airport sector from 2005 to 2019 because of the availability of information from the sector over the period. A lack of private market transactions in recent years limited the sample size. To estimate the total return of airports in the European private market, we assumed:

- Growth rate = the average long-term EBITDA growth rate for a global basket of listed airport companies
- Entry price = average merger and acquisition (M&A) multiple in year 1
- Exit multiple = average M&A multiple in year 5
- 5-year time horizons

Figure 6 shows that public equity investments had a higher average compounded annual growth rate (CAGR) with lower standard deviation than the unlisted marketplace for both the European and global baskets of airport companies. This further supports our belief that the return premium for private infrastructure assets is likely overstated and the volatility is likely understated. This is very similar to the dynamic within the public and private real estate markets.

Figure 6: Public equity investments outperformed private companies with lower risk

Data source: Bloomberg L.P., 31 Dec 2004 – 31 Dec 2019. **Past performance does not guarantee future results.** Data is based on five- year rolling period returns. The chart is for illustrative purposes only and is not reflective of any Nuveen investment. Index returns include reinvestment of income and do not reflect investment advisory and other fees that would reduce performance in an actual client account. See Endnotes for additional disclosures regarding the calculations used for the European Public Airports and the Global Public Airports.

IN SUMMARY

Long-term returns or benefits inherent to these assets should pass through to the investor, regardless of the format or ownership structure. We've used the listed and unlisted real estate return series to represent the relationship we expect to hold true within infrastructure investments along with a case-study in the airport sector which also appears to support the thesis.

Since the long-term returns on the observed series of listed and private real estate are very close, we believe that there exists no return premium for locking up capital in an unlisted vehicle. Likewise, we believe the perceived benefits of lower correlation and standard deviation measures are overstated, due to the effect of smoothed returns that are a function of appraisal-based valuation methodologies. When public market returns are lagged a year to allow

appraisal valuations to catch up, and correlation interval measurement is extended to an annual period to approximate the same phenomenon, it is clear that correlations between public and private real estate assets are much higher than generally believed.

Again, the benefits of listed investing are reduced concentration risk through broader diversification by country, sector, and holding, asset liquidity that facilitates portfolio rebalancing, and temporary market mispricing that can be taken advantage of by active portfolio managers.

ENDNOTES

Following is additional information regarding the case study analysis.

The European Public Airports included FRA, ADP, FLU, FHZN, GEM, SAVE and KBHL.

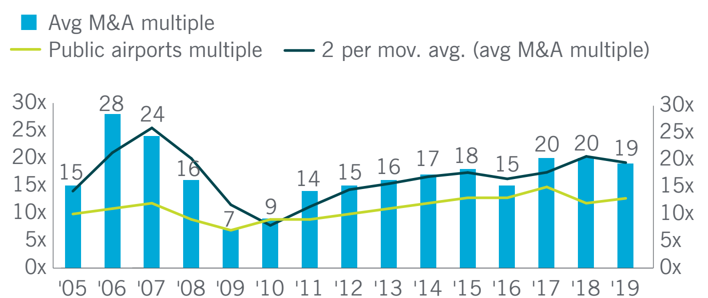
The Global Public Airports included FRA GY, ADP FP, FLU AV, FHZN SW, AIX AU, 694 HK, 9706 JP, TAVHL TI, ASURB MM, GAPB MM, OMAB MM, SYD AU, 357 HK, AIA NZ, MAHB MK and KBHL DC.

To calculate a CAGR, we used the entry and exit assumptions listed below:

- We used the average M&A multiple at the beginning of the period as the investment entry price.
- We assumed EBITDA CAGR of 6.75% over the investment horizon (the average long-term EBITDA growth in the Global Airport basket, higher than European basket).
- We used the average M&A multiple at the end of the period as the investment exit realization on EBITDA that grew at the 6.75% CAGR during the investment period. To make returns USD based, we adjusted this EBITDA for EUR/USD currency movements during the investment period.

Figure 7 shows the valuation multiples of the public and private airports used to calculate the rolling 5-year investment results. The bars represent the average M&A multiple of the private companies and the lines illustrate the public airport multiples in the same time periods.

Figure 7: Trailing 12 months EV / EBITDA European airport multiples



Data source: Bloomberg L.P. Data from 31 Dec 2005 – 31 Dec 2019. **Past results does not guarantee future results.** The chart is for illustrative purposes only and is not reflective of any Nuveen investment.

We rolled this analysis forward to each time period in **Figure 6:**

- European Public Airports Returns = The weighted (market cap) average CAGR of owning a basket of public European airport companies during the investment horizon. These returns are USD based.
- Global Public Airports Returns = The weighted (market cap) average CAGR of owning a basket of public global airport companies during the investment horizon. These returns are USD based.
- Dividends for the unlisted airports were ignored deliberately because public airport companies have been net consumers of cash given their massive CAPEX budgets.

For more information, please visit nuveen.com.

1 Investment Performance Measurement. Benchmarks for Unlisted Infrastructure: Part 1, Bachher, Orr, and Settle. CFA Institute 2012.
2 Global Investments, Sixth Edition, Bruno Solnik and Dennis McLeavey, CFA, CFA Institute. ©Copyright 2009 by Pearson Education.
3 "Asset Allocation Effects of Adjusting Alternative Assets for Stale Pricing," Andrew Conner, The Journal of Alternative Investments, Winter 2003.

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A word on risk

All investments carry a certain degree of risk, including possible loss principal and there is no assurance that an investment will provide positive performance over any period of time. Diversification does not insure against market loss.

Because infrastructure portfolios concentrate their investments in infrastructure-related securities, portfolios have greater exposure to adverse economic, regulatory, political, legal, and other changes affecting the issuers of such securities. Infrastructure-related businesses are subject to a variety of factors that may adversely affect their business or operations, including high interest costs in connection with capital construction programs, costs associated with environmental and other regulations, the effects of economic slowdown and surplus capacity, increased competition from other providers of services, uncertainties concerning the availability of fuel at reasonable prices, the effects of energy conservation policies and other factors. Additionally, infrastructure-related entities may be subject to regulation by various governmental authorities and may also be affected by governmental regulation of rates charged to customers, service interruption and/ or legal challenges due to environmental, operational or other mishaps and the imposition of special tariffs and changes in tax laws, regulatory policies and accounting standards. There is also the risk that corruption may negatively affect publicly-funded infrastructure projects, especially in emerging markets, resulting in delays and cost overruns. In addition, investing internationally presents certain risks not associated with investing solely in the U.S., such as currency fluctuation, political and economic change, social unrest, changes in government relations, differences in accounting and the lesser degree of accurate public information available, foreign company risk, market risk and correlation risk. It is important to review your investment objectives, risk tolerance and liquidity needs before choosing an investment style or manager.

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