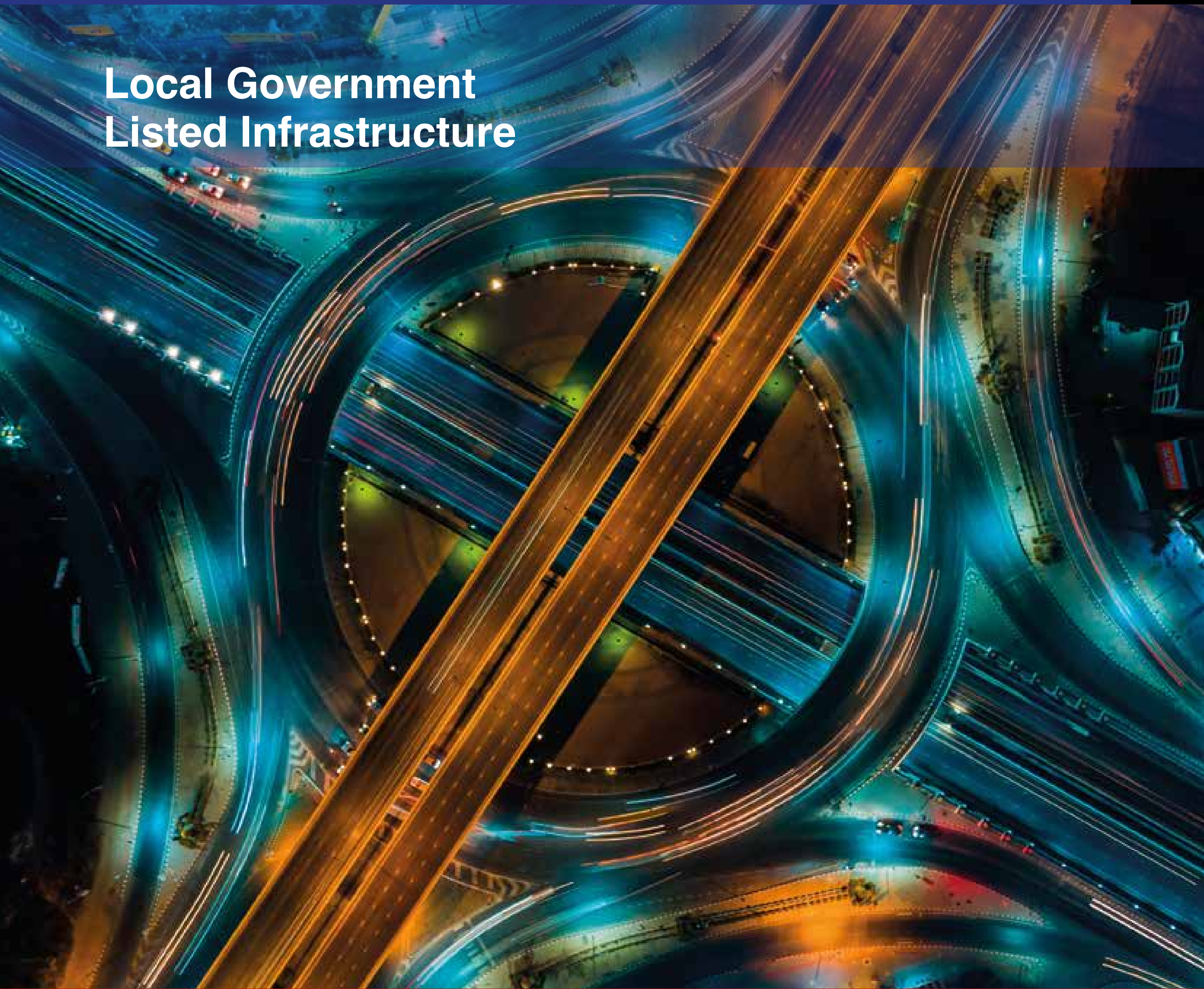
May 2019

Pension Fund Service



Local Government Listed Infrastructure

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An improved capacity and capability to invest in infrastructure

Headline criterion: Only a very small proportion of Local Government Pension Scheme assets are currently invested in infrastructure; pooling of assets may facilitate greater investment in this area.

Investment in infrastructure is increasingly being seen as a suitable option for pension funds, particularly amongst larger organisations. This may in part be the result of the typically long term nature of these investments, which may offer a useful match to the long term liabilities held by pension funds.

Creating the opportunity

In considering such investment, administering authorities might want to reflect on the wide range of assets that might be explored, such as railway, road or other transport facilities; utilities services like water and gas infrastructure; health, educational, court or prison facilities, and housing supply. Authorities should also examine the benefits of both:

- Greenfield infrastructure – projects involving the construction of brand new infrastructure, such as a new road or motorway junction to unlock a housing development, or the recent investment of £25m by the Greater Manchester Pension Fund to unlock new sites and build 240 houses; and

- Brownfield infrastructure – investing in pre-existing infrastructure projects, such as taking over the running of (or the construction of a new terminal building at) an airport.

As set out above, investment in infrastructure represents a viable investment for pension funds, offering long term returns to match their liabilities. Authorities will need to make their investments based on an assessment of risk, return and fit with investment strategy.

Source: Department for Communities and Local Government

Building exposure to infrastructure

By Fraser Hughes, GLIO

Target allocations on the increase

Over the past ten years, infrastructure investment has gained momentum among institutional investors like pension funds, insurance companies and sovereign wealth funds but to a certain extent, infrastructure investment has hit a crossroads. From one side, the global economy is crying out for more infrastructure investment but governments still own much of their economic infrastructure directly, and are struggling to grow the pipeline of investable infrastructure assets. On the other side, a large and growing number of institutional investors are competing for exposure to a relatively small pool of non-government owned core infrastructure assets. This has seen transaction multiples increase strongly over the past ten years. There is a clear supply and demand imbalance.

Infrastructure investment trends

Institutional investors typically allocate funds to infrastructure on the basis of its defensive characteristics and inflation-linked cash flows. This trend shows no sign of abating, with 71% of public pension funds believed to be allocating more money to infrastructure within the next 12 months.

The combination of increasing allocations and fund raising combined with a limited availability of assets means that asset managers have found it increasingly difficult to deploy capital. The latest figures estimate that $173bn of dry powder, or unspent capital commitments, is waiting on the sidelines to invest in unlisted or private infrastructure. Exacerbating this capital backlog is scarcity of core infrastructure assets in the direct market and high multiples. Not unsurprisingly, given the strong flow of investment, a recent investor survey found that 59% of unlisted infrastructure fund managers see high valuations as the major challenge to capital deployment, while 52% of managers believe that infrastructure assets are currently overvalued. Furthermore 81% of managers are seeing more competition for assets relative to 12 months ago.

All this points to a market in which it will become increasingly difficult to deploy capital and equally difficult to acquire fairly-valued assets. Surely something has got to give?

Given the current challenges of building an unlisted infrastructure exposure efficiently, we would expect that any current allocations to infrastructure are likely to take some time to be deployed (assuming the asset manager displays a level of discipline, in terms of both pricing and infrastructure asset type). In the period during which allocated capital is not invested (directly, or through managers) in the desired infrastructure assets, it may even be invested elsewhere in an institution's liquid assets portfolio, most likely in a combination of equities, cash and bonds.

We make the case in this article that the $2.4 trillion listed infrastructure market as defined by the GLIO coverage provides investors with a complimentary, or alternative investment opportunity, which could provide a significantly better fit to their desired infrastructure exposure. This could be in the form of a long-term investment as an alternative to investing directly, or a shorter-term location to park capital until funds are drawn-down to invest directly.

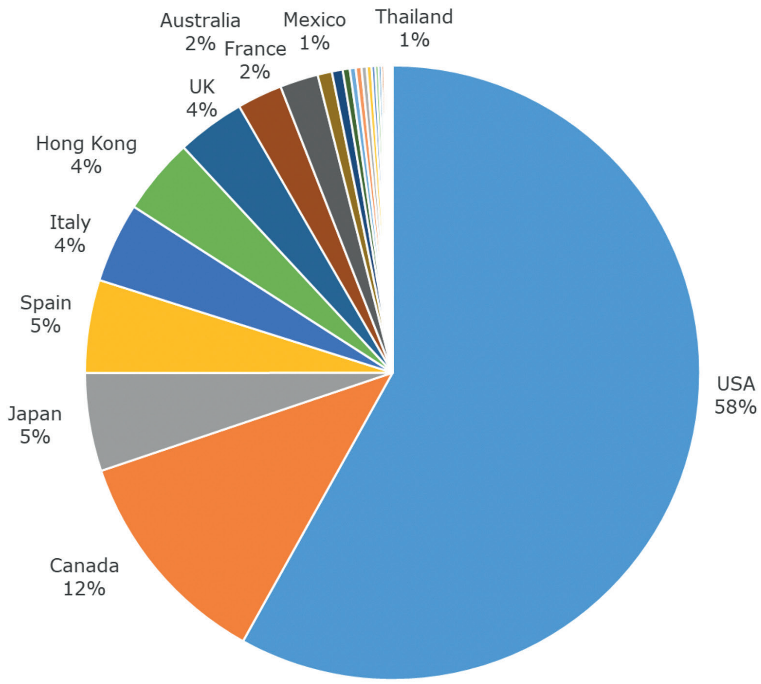
So why invest in Listed Infrastructure?

Listed infrastructure companies tend to own long-lived assets that provide essential services to society, such utilities, energy transportation networks, communications and transportation infrastructure. These assets can offer stable and predictable cash flows supported by long term contracts or regulation, with monopolistic characteristics and high barriers to entry. The GLIO Coverage has shown that the asset class exhibits compelling investment characteristics over the short, medium and long-term.

Regional and Infrastructure sector Diversification

Listed infrastructure companies offer investors access to a broad and diversified portfolio of assets across three main regions: Americas, EMEA and APAC. These will include both developed markets ($2.3trn) and emerging markets ($100bn). In the GLIO Coverage (based on country of primary listing) the USA, Canada, Japan, Spain, Italy, Hong Kong and the UK are heavily represented. This breakdown can be slightly misleading, as most listed infrastructure companies own and operate, numerous infrastructure assets which can be located in a number of countries despite their location of listing. It is worth noting that the GLIO Coverage only accounts for 5% of the broader MSCI World Index.

COUNTRY BREAKDOWN BY FREE FLOAT MARKET CAP AS AT APRIL 30, 2019



Infrastructure assets tend to fall under four-main headline sectors which comprise more defined sub-sectors. These are:

- **Utilities:** Electric distribution, electric transmission lines, gas distribution pipelines, renewable energy facilities, water cleaning & distribution systems
- **Energy Transportation & Storage:** Long-haul energy pipelines, gathering and processing facilities, liquid terminals and LNG facilities,
- **Transportation:** Airports, seaports, railroads, highways & toll-roads
- **Communications Infrastructure:** telecommunications infrastructure (wireless macro towers & small-cells) and satellites

The following breakdown highlights the range of infrastructure sub-sectors in the GLIO Coverage. As at April 30, 2019.

Company	MC $Mn	MC Wght	FF MC $Mn	FF Wght	Yield	Beta
Electric Utilities	808,663	33.00%	731,750	34.8%	3.7%	0.48
Ground Freight	361,240	14.74%	347,355	16.5%	1.7%	1.10
Energy Transportation	312,572	12.76%	288,363	13.7%	5.2%	1.04
Telecom Infrastructure	181,464	7.41%	174,131	8.3%	2.1%	0.73
Multi-Utilities	167,025	6.82%	141,458	6.7%	5.0%	0.64
Passenger Rail	130,908	5.34%	103,856	4.9%	1.3%	0.79
Gas Utilities	116,034	4.74%	74,634	3.5%	2.3%	0.69
Water Utilities	85,226	3.48%	71,607	3.4%	3.1%	0.72
Airports	124,504	5.08%	61,424	2.9%	3.4%	0.84
Highways & Toll-roads	91,050	3.72%	60,363	2.9%	3.8%	0.82
Diversified	21,657	0.88%	15,659	0.7%	4.7%	0.96
Marine Ports	29,824	1.22%	14,953	0.7%	4.2%	0.88
Satellites	14,813	0.60%	12,958	0.6%	4.6%	0.98
Construction & Engineeri	5,495	0.22%	4,001	0.2%	3.1%	0.68
Grand Total	**2,450,473**	**100.00%**	**2,102,512**	**100.0%**	**3.4%**	**0.76**

It is worth noting that global listed infrastructure can access a broad set of investment opportunities across geographies and sectors which by comparison may not be available through direct investment. It is also worth noting that although the listed infrastructure market is large, some assets cannot be accessed – US airports are a good example. Regulatory frameworks and contract structures vary greatly from country to country and from sector to sector, as they are based on and exposed to macro variables in different ways. Diversification can help mitigate risk in concentrated exposure to regional economic conditions and regulations.

Attractive Yields

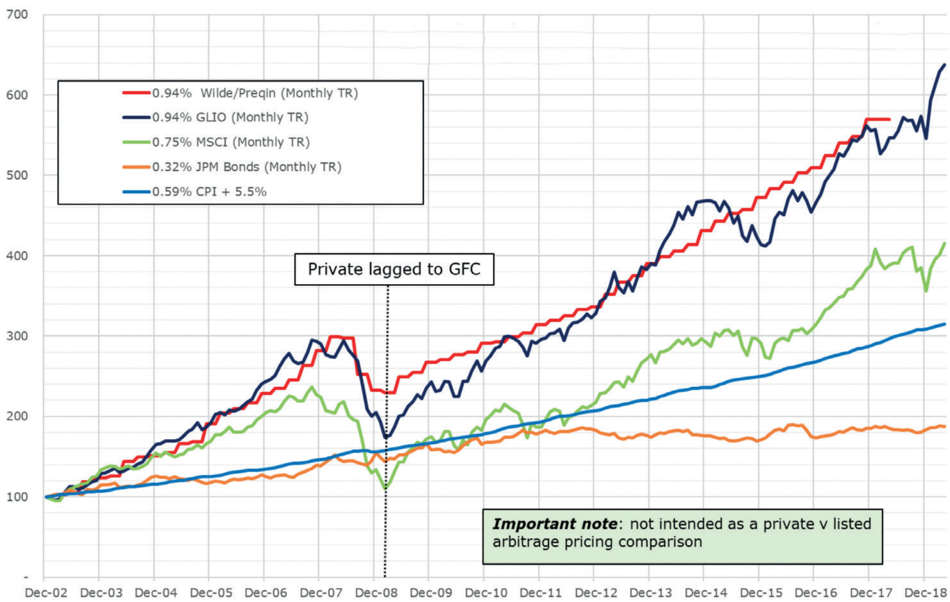
Historically, global listed infrastructure has offered an attractive income component as a portion of the overall total returns. The asset class has offered higher yields compared against global equities over a long-period of time. On average, since 2003 global listed infrastructure yielded approximately 3.6% versus 2.6% for global equities. Global utilities averaged 4.1% over the same period. These regular shareholder payouts are underpinned by higher sustainable cash yields which provide companies with the opportunity to raise payout ratios if required. This is particularly evident amongst the transportation focused companies like freight rail and highways & toll-roads.

GLIO COVERAGE V GLOBAL EQUITIES - DIVIDEND YIELD DECEMBER 2002 TO APRIL 2019

Short-term valuation dislocation, long-term performance

Infrastructure assets with the same economic exposures will respond similarly to changes in the economic environment. However, the types of vehicle in which these assets are held can be valued using different methods. Unlisted infrastructure values are based on periodic valuations which lag current market conditions and are inherently smoothed, or even suffer from autocorrelation. Listed company valuations are subject to daily pricing and are more volatile by nature over the short-term. Of course, this can create opportunities for active global listed infrastructure managers. Putting aside short-term differences in valuation, GLIO research highlights the fact that over the medium to long-term listed infrastructure offers the very similar performance as unlisted infrastructure, and vice-versa. Many would argue listed infrastructure can act as an excellent proxy for direct/unlisted infrastructure.

GLOBAL INFRASTRUCTURE LISTED & PRIVATE (LAGGED TO GFC) V GLOBAL EQUITIES & BONDS DECEMBER 2002 TO APRIL 2019



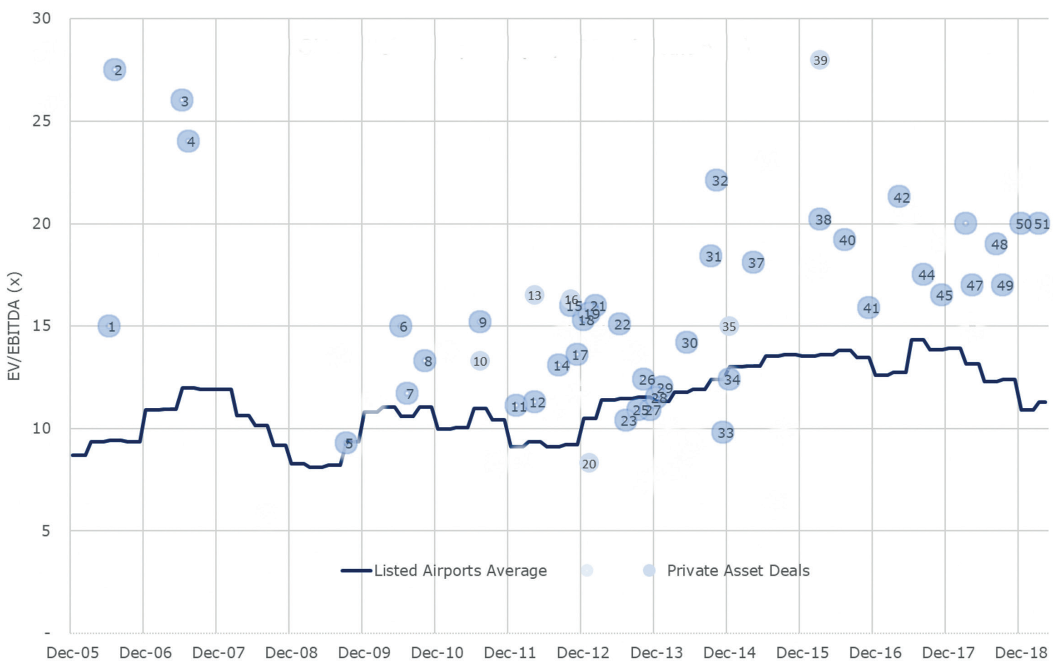
Valuation Multiples

Another method to compare the unlisted and listed infrastructure valuations is to use EV/EBITDA multiples. In this example, we look at the global airports sector over a 12 years period. The blue circles represent individual airport asset deals. The blue line represents the average EV/EBITDA ratio of the listed airport sector. Many of the listed airports own some of the world's most best performing assets in terms of passenger volumes and customer experience/quality. It is clear from the example, listed airports offer 'better value for money' compared against transacting individual airport assets. The question of diversification (one asset versus a diverse exposure across a number of assets) and management quality and experience can also be raised here.

Inflation-hedge

Generally speaking, core infrastructure assets will offer investors predictable cash-flows. Cash-flows are driven by price and volume. Firstly, companies which operate assets in regulatory or concession frameworks often have periodic inflation-linked adjustments, or annual escalators built into contracts. Secondly, economic conditions in a country or region, will drive demand for an infrastructure asset. Of course, these revenue drivers will vary across infrastructure sectors. The case study presented by Ferrovial in the GLIO Journal - Issue 4 is a good example in the highways and toll-roads sector.

GLIO GLOBAL AIRPORTS (EV/EBITDA MULTIPLES)



Source: GLIO/Inframation

Liquidity

Effectively, listed infrastructure companies offer liquid access to illiquid assets. The dry powder from unlisted infrastructure funds is now at a record high, and the issue is compounded by a scarcity of core infrastructure assets. In contrast, the liquidity of listed infrastructure enables new allocations to be deployed with a high degree of efficiency. Importantly, liquidity enables active managers to adjust portfolios according to their convictions.

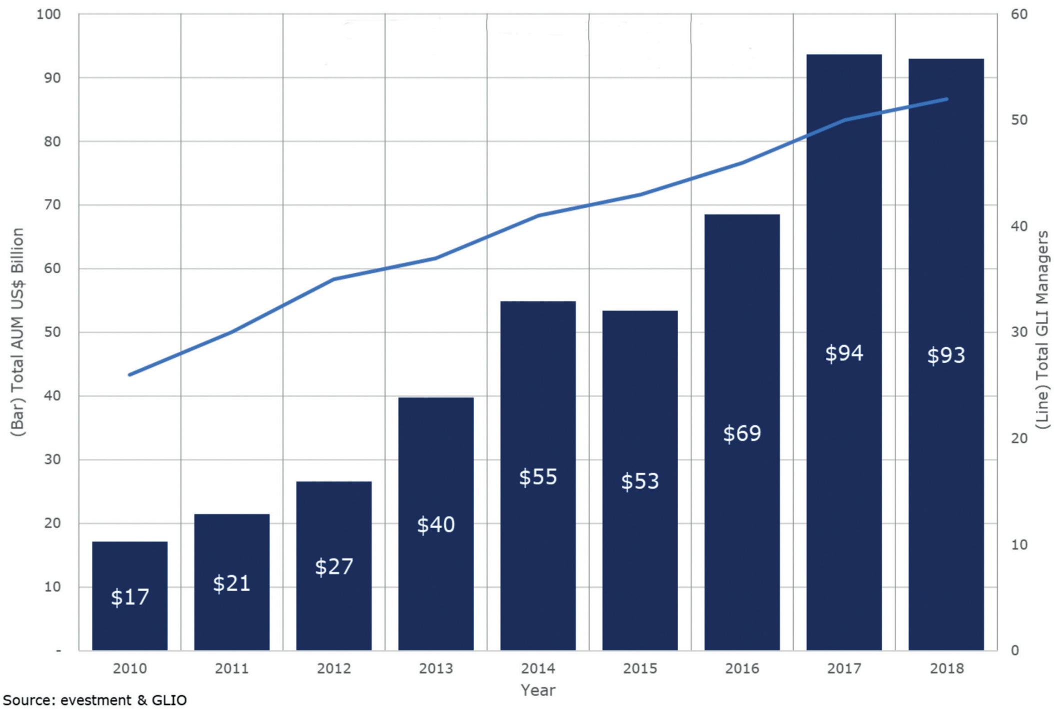
Leverage

On average, listed infrastructure companies are more conservatively leveraged compared against other types of infrastructure investment which can leverage up to chase excess returns. Of course, extreme levels of debt can alter the characteristics of equity. On average, the listed infrastructure companies leverage in the GLIO coverage lies at under 50%.

Active GLI Manager Growth

Global listed infrastructure is a relatively young asset class, but there is a growing recognition that the asset class can deliver significant benefits to boarder multi-asset portfolios, and targeted infrastructure allocations. The chart below shows the growth of the active global listed infrastructure active management community over the past eight years. We have seen an impressive growth in assets under management over that period. Looking forward, as the challenges of building a direct infrastructure allocation intensify, more investors will look to listed infrastructure as an alternative route to deploy capital into the quality core infrastructure assets they crave. Ten years from now this total AUM could easily pass $300bn.

GROWTH OF GLOBAL LISTED INFRASTRUCTURE ASSETS UNDER MANAGEMENT (US$BN AUM)



Source: evestment & GLIO

Future drivers

The need for infrastructure investment is a never-ending cycle. Looking to the future, Governments will need to offer incentives for infrastructure investment to provide the backbone to boost economic growth. For example, the poor state of US infrastructure is well documented. The latest American Society of Civil Engineers (ASCE) scorecard makes depressing reading across the range of infrastructure sectors. The overall grade for US infrastructure was D+. The story is similar across the globe as the percentage of infrastructure investment relative to GDP has declined over recent decades. Subsequently, the infrastructure investment gap has widened with an estimated shortfall of $15trn to 2040 according to GI Hub.

Current and new forms of infrastructure investment vehicles will need to develop and evolve to help address this critical issue. In recent years the US has seen Yieldcos, MLPs and REITs offer investors exposure to infrastructure with a focus on income. Belgium recently expanded its REIT structure to include infrastructure, India introduced an Infrastructure Trust and Mexico introduced the FIBRA-E. The opportunity to create a clearly defined Infrastructure Investment Trust (IIT) for economic critical infrastructure could look attractive for governments wishing to attract both domestic and international capital to fill the investment gap.

Concluding remarks

Listed infrastructure is a compelling way to gain exposure growing part of the global economy, combining the attributes of direct infrastructure investments coupled with the benefits of listed markets: broad global $2.4 trillion market, liquidity, daily pricing and transparency. Ultimately, a carefully defined core listed infrastructure market is made up of a large number of high-quality infrastructure assets, covering regulated utilities, energy transportation, transportation and communication infrastructure. These assets are mission critical to the needs of the global economy. We should not forget that most institutions would gladly include these assets within their direct infrastructure portfolios if they were available in unlisted form, so why view them differently them because they are listed? The companies which comprise the GLIO $2.4 trillion listed infrastructure coverage have demonstrated desirable investment characteristics over many years and can and should play a valuable long-term strategic and tactical role within an institution's broader infrastructure allocation. Investors who ignore the global listed infrastructure asset class narrow their core infrastructure options considerably, which could in turn damage stakeholder returns.

ATLAS INFRASTRUCTURE

LISTED INFRASTRUCTURE

AN INTRODUCTION

MAY 2019

INTRODUCTION

Investors are attracted to infrastructure as an asset class because infrastructure offers long term, predictable and often regulated cash flows at the asset level, and reasonably predictable returns on new investments, which can contribute to a more stable, less volatile investment strategy. The regulations underpinning these cash flows can also incorporate varying degrees of inflation protection, allowing for regular, stable dividend growth which renders them well suited to the long-term outlook of many pension funds.

Over the past five years, the weight of funds flowing into the infrastructure asset class has grown dramatically, with the great majority of these funds directed towards unlisted infrastructure. This demand for private infrastructure assets has not, however, been met by an equivalent increase in supply of suitable infrastructure opportunities. Thus, a dynamic of growing demand and constrained supply, combined with stimulatory monetary settings, has exerted significant downward pressure on available returns and, particularly for more disciplined Infrastructure investors, has seen capital deployment become increasingly challenging. As at December 2018, unlisted infrastructure funds had US$172bn[1] of “dry powder”, a 65% increase relative to the equivalent number in 2015. Even this increase does not include the unallocated part of infrastructure programs at pension and sovereign wealth funds; including these, the total value of allocated but undeployed capital may be over US$250bn. This amount is over three times the sum raised for the asset class in 2018, and so represents a very significant backlog of unspent capital.

The listed infrastructure market is comprised of a wide variety of high-quality infrastructure companies that own and control exactly the types of high-quality infrastructure assets that are likely to be of interest to investors in unlisted infrastructure. The investment universe spans a range of sectors that would typically be considered “core” infrastructure within a direct portfolio. Listed Infrastructure therefore offers investors a versatile and highly liquid complementarity with their direct or unlisted fund portfolios that can be used to establish, balance or diversify exposure, to smooth the timing of investment deployment, or to fill out an existing investment portfolio.

The following table outlines a sample of assets that are available in the listed market (it is not designed to be representative of a particular portfolio):

Electric Utilities	Gas Utilities	Water Utilities	Energy
NextEra Energy (US)	Sempra Energy (US)	Severn Trent (UK)	Transcanada (Canada)
Edison Int. (US)	ONEOK Inc (US)	United Utilities (UK)	Enbridge (Canada)
PPL Corp (US)	Cheniere Energy (US)	Pennon (UK)	Kinder Morgan (US)
Emera (Canada)	Vectren Corp (US)	American Water Works (US)	Williams (US)
Spark Infra (Aust)	Southwest Gas (US)	American States Water (US)	Pembina (US)
Terna (EU)	Canadian Utilities		Vopak (EU)
Red Electrica (EU)	SNAM (EU)		APA Group (Aust)
National Grid (UK)			
Toll Roads	**Airports**	**Communications**	**Rail**
Transurban (Aust)	Aeroports de Paris (EU)	American Tower (US)	Union Pacific (US)
Vinci (EU)	Frankfurt Airport (EU)	SBA Comms (US)	Norfolk Southern (US)
Atlantia (EU)	AENA (EU)	Crown Castle (US)	CSX Corp (US)
Ferrovial (EU)	Sydney Airport (Aust)	SES (EU)	Eurotunnel (EU)
SIAS (EU)	Flughafen Wien (EU)	Inmarsat (EU)	Aurizon (Aust)
Atlas Arteria (EU)	Flughafen Zurich (EU)	Chorus (NZ)	East Japan Rail (Japan)
			West Japan Rail (Japan)

[1] Source: Preqin

In the context of an overall infrastructure strategy, listed infrastructure can be used in a number of ways:

- It can be a means to establish a central, diversified "core" infrastructure exposure. As the opportunity set in the listed infrastructure market is fairly consistent over time, and is immediately available, the sector can be used as a means to establish a cost effective, core exposure to general infrastructure, as a "first step" into the market around which a more specialised exposure can be developed over time.
- It can allow for the rapid deployment of funds to meet a desired infrastructure allocation. The deployment of funds within an unlisted portfolio allocation is a necessarily lumpy and somewhat unpredictable process. Maintaining a desired portfolio allocation through the listed market allows an investor to achieve the exposure required immediately and still to have the funds available to meet capital calls as opportunities in the private market present themselves.
- It can provide a mechanism for maintaining investment in infrastructure as funds are returned from asset sales and prior to redeployment in the private market. Just as capital calls are not always predictable, realisations can also be lumpy; the listed market presents a ready mechanism for maintaining a desired level of exposure to infrastructure after capital from existing investments is returned.
- It can provide exposure to sectors of the market that are not commonly addressed within the private market. Direct investment in the unlisted market can produce portfolios which are skewed to particular sectors due to the inconsistent availability of investment opportunities. Listed infrastructure can be useful in helping to balance an overall portfolio by targeting sectors not available in a firm's direct infrastructure portfolio.
- It can allow for a rapid reaction to market events. In the event of a sudden market downturn the listed sector allows for very agile investment into attractive long-term assets in a way that is difficult to achieve in less liquid direct markets.

Historically, many infrastructure investors have viewed the listed infrastructure market with caution given its mark-to-market volatility, which many investors directly equate to "risk". However, for a long-term investor, such an equivalence may be misdirected and result in an over-estimation of risk in the listed infrastructure market.

In this paper we evaluate the risk/return characteristics of the listed infrastructure market to assess whether its long-term investment returns match those of unlisted infrastructure and we examine the market characteristics of the unlisted market in the context of the wider equity market.

A note on methodology

There are several global listed infrastructure indices, and each tends to contain a degree of geographic or industrial bias. In this paper we focus on the FTSE Developed Core Infrastructure Index (FTSEDC Index). This index comprises over 200 companies and has been developed using the Industry Classification Benchmark criteria, including companies with 65% of revenues in specific ICB subsectors which FTSE considers to be core infrastructure. There is an uncapped version of the index and a capped version of the same index: the FTSE Developed Core Infrastructure 50:50. The capped index has the same constituents as the uncapped version, but with the weight of utilities restricted to 50%, transport to 30%, leaving other at 20%. We believe that the 50:50 index provides a better balanced index for the purpose of general analysis so it is the index we prefer; however it has a shorter history and so is sometimes less usable for the analysis in this paper.

ATLAS itself does not use one single benchmark in the construction of its universe; we would be happy to share our methodology on request.

ATLAS INFRASTRUCTURE

ATLAS Infrastructure is a specialist investment manager concentrating exclusively on long-only investment in the listed equity of quoted infrastructure companies in OECD companies. The firm was founded in early 2017 with the backing of Global Infrastructure Partners (GIP) with the intention of providing a world leading investment process and operational platform for investors in the listed infrastructure sector, to match the success GIP has achieved in the private sector. GIP remains a majority owner of ATLAS.

We aim to provide investors with stable and consistent returns of 5% over inflation through long-only investment in listed infrastructure; to achieve that we have assembled an investment team of twelve specialists, which we believe to be the largest and most experienced team in the sector. The team is based in London and in Sydney. We run a UCITS fund and also offer large institutions individually tailored investment strategies within the infrastructure sector.

Our focus is on the underlying long-term cash flows of listed infrastructure companies through analysis of their component assets, essentially adopting a private markets approach to modelling investment returns over an extended period. The process is designed to allow for the consistent comparison of investment opportunities within a universe of 150 infrastructure companies, with a total market capitalisation of some $2trn. Our investment beliefs are summarised in the following table:

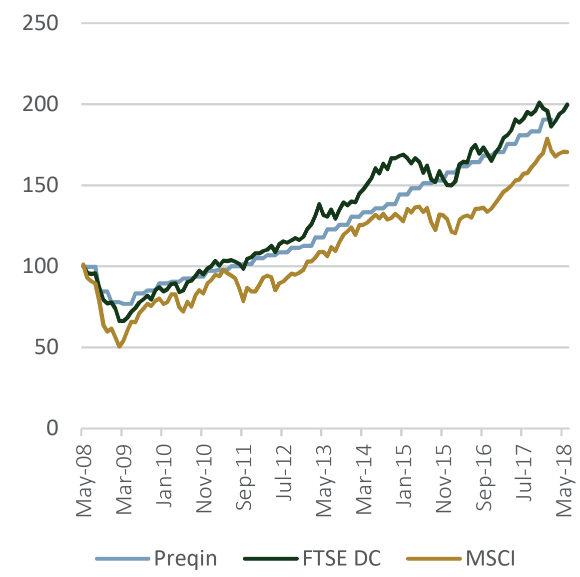
Performance characteristics	The listed market provides liquid access to a large pool of high-quality infrastructure assets. Over time the performance characteristics of these assets are more similar to the unlisted infrastructure market than they are to the equity market.
Listed infrastructure market inefficiency	For most equity market participants, infrastructure assets represent a small (c5%) part of the overall equity market and the cost / benefit of developing a specialist analytic capability in the sector rarely makes sense. This leads to regular pricing inefficiencies as the global pool of capital managed by specialist listed infrastructure managers is not large enough to be the dominant price setter in the market. An investor with a long-term investment horizon and a detailed specialist knowledge of the infrastructure sector can capitalise on these opportunities.
Active vs. passive management	Active, high conviction infrastructure portfolios can materially improve long term returns through a combination of avoiding benchmark influenced positions in overpriced assets, careful analysis of risk, and high conviction positions in assets which offer stable, above average cash flow returns over the long term. This sort of active management is best achieved through detailed, bottom-up research and due diligence, deep sector understanding and careful cash flow analysis.
Listed and unlisted infrastructure	Listed and unlisted infrastructure can complement each other: exposure to some infrastructure sectors is unavailable through unlisted funds but readily available through listed equities and vice versa. The breadth of the listed infrastructure market, combined with its liquidity, means that it can balance or complement a client's unlisted infrastructure exposures, improving the efficiency of the total portfolio.
Ability to tailor investment portfolios	ATLAS has been designed to provide tailored investment solutions to clients. Portfolios can be constructed to meet specific exposure, return, benchmark and risk objectives for clients rather than assembled around a central strategy or knowledge pool.
Risk management and diversification	The nature of infrastructure investment is such that protection of capital at both the individual asset level and at the portfolio level is essential: it may be difficult or impossible to compensate for poor investment decisions through earning outsized returns from other investments. ATLAS's approach to risk is always to work to minimise the risk of capital loss.

LONG TERM ASSET CLASS RISK AND RETURNS PROFILE

In the chart below it can be seen that listed infrastructure, as measured by the FTSE Developed Core Infrastructure Index (FTSE DC Index), has matched the returns of the direct market, as measured by the Preqin Index of infrastructure funds, over the period since the global financial crisis.

We also see that over time there has been a material outperformance of listed infrastructure over the broader equity market (MSCI All World) in terms of both return and volatility.

Performance Chart to 30 June 2018



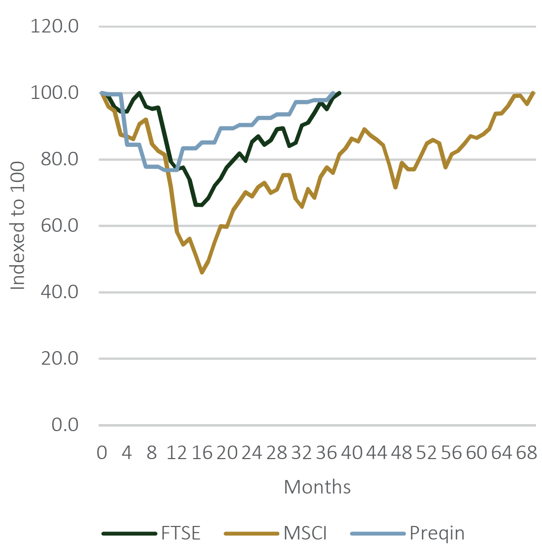
Investment Characteristics to 31 December 2018

	3 years	5 years	10 years
Returns			
FTSE DC Index	9.4%	7.0%	9.7%
MSCI All World	6.3%	4.6%	9.7%
Volatility			
FTSE DC Index	8.9%	9.2%	10.3%
MSCI All World	10.4%	10.7%	14.3%
Sharpe Ratio			
FTSE DC Index	0.80	0.52	0.69
MSCI All World	0.39	0.22	0.50
Beta vs MSCI AW			
FTSE Infra Index	0.49	0.54	0.53

Source: Factset, Preqin, ATLAS Calculations

Listed infrastructure has also shown materially better resilience in a downturn (lower drawdown and lower volatility) than general equities and has recovered value much faster. In this respect its performance matches that of the unlisted infrastructure market more than that of equities more widely:

Peak to Recovery Analysis – Financial Crisis



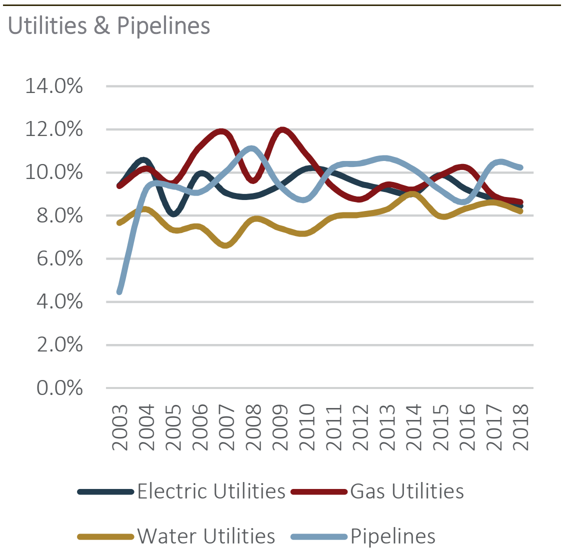
Volatility vs Equities

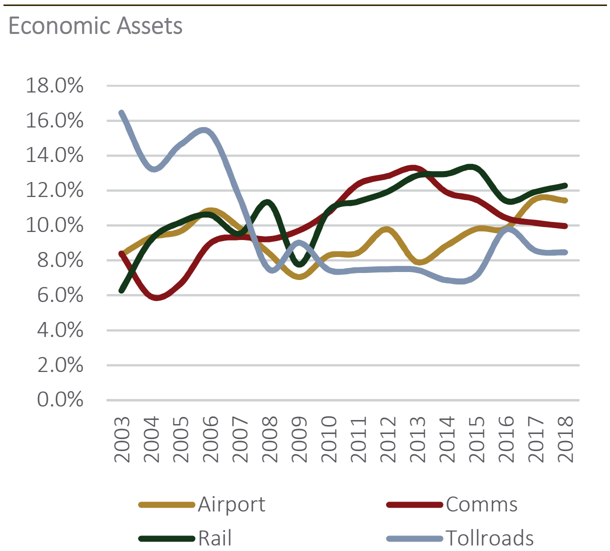
Source: Factset, Preqin, ATLAS Calculations

EARNINGS STABILITY

Given evidence that it is the asset earnings and cash flows which ultimately drive investor returns (and the impairment of equity cash flows which typically leads to loss of shareholder value), ATLAS believes that for long-term infrastructure investors it is more useful to evaluate the volatility of earnings as a measure of risk, rather than the volatility of daily, weekly or even monthly share price movements.

The following charts plot EBITDA to Book EV for infrastructure and utilities companies within the ATLAS universe. The results of this analysis show that the earnings of companies in these sectors have been remarkably stable through time. Of note is that there is minimal change to cash earnings for these firms even through the financial crisis, during which infrastructure companies remained comfortably profitable. This further supports the hypothesis that these assets have a very low correlation to economic activity and a low risk of impairment during periods of economic disruption.





Source: Factset, Preqin, ATLAS Calculations

LIQUIDITY

Given the scale of the markets served by companies in the listed infrastructure sector and the size of the companies themselves, it is unsurprising that the liquidity of the sector is in the market is very good. As a result, we estimate that 80% of an illustrative £100m listed infrastructure portfolio, even a concentrated portfolio such as that managed by ATLAS, could be deployed or liquidated within a single week without significant market impact. The characteristics of the market are such that, if required, it would also be possible to build a portfolio to meet specific liquidity requirements in excess of this.

A PERMANENT ALLOCATION TO LISTED INFRASTRUCTURE

ATLAS believes that when correctly structured and managed, a listed infrastructure portfolio should deliver the performance characteristics sought by infrastructure investors over the medium to long term. For this reason, we believe that listed infrastructure warrants a permanent position within an institution's infrastructure portfolio.

The specific level of that position will depend on a range of factors including:

- The total allocation to infrastructure;
- The opportunities for capital deployment in the unlisted market;
- The desired exposure to particular sub-sectors;
- The institution's preference for liquidity and tolerance of volatility;
- The size of the organisation's infrastructure team; and
- The relative returns available in the listed and unlisted infrastructure markets.

In our experience, many larger institutions with a dedicated allocation to infrastructure have an allocation to listed infrastructure of between 10-20% of their total infrastructure portfolio. Given the time taken to deploy capital in the unlisted market (particularly in the current market environment) compared to the relatively speedy deployment possible in the listed market, institutions may have higher percentages of their total infrastructure portfolio in listed form during the early years of implementation of their chosen infrastructure strategy.

A TACTICAL ALLOCATION WITHIN A GENERAL EQUITY PORTFOLIO

This paper has for the most part focussed on the versatility of listed infrastructure within a given portfolio allocation to infrastructure. Given its defensive market and favourable cash flow characteristics the asset class might also be used to provide any given equity portfolio a more defensive tilt: as the prognosis for equity markets becomes less certain the cash flows underpinning listed infrastructure equities and the dividends those cash flows support can help mitigate the volatility of equity portfolios and assist with liability matching. This will be the subject of another paper – but of course, we'd be happy to discuss the idea in detail at any time.

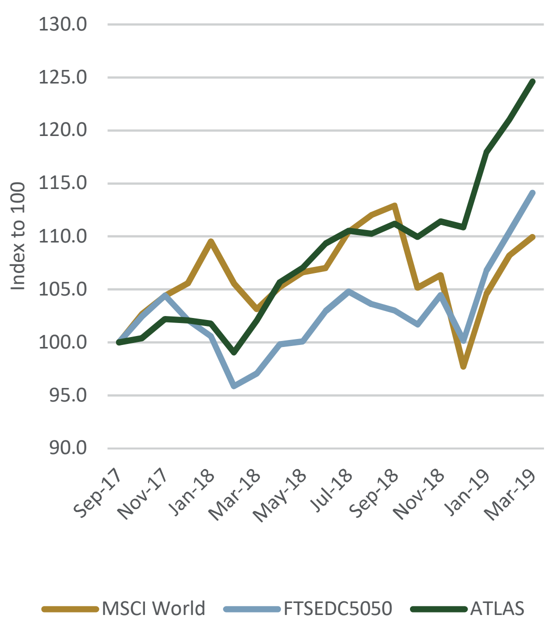
LISTED INFRASTRUCTURE WITHIN YOUR PORTFOLIO

To discuss how listed infrastructure might fit within your portfolio please get in touch with your usual ATLAS contact or email info@atlasinfrastructure.com .

ATLAS INFRASTRUCTURE: INVESTMENT PERFORMANCE

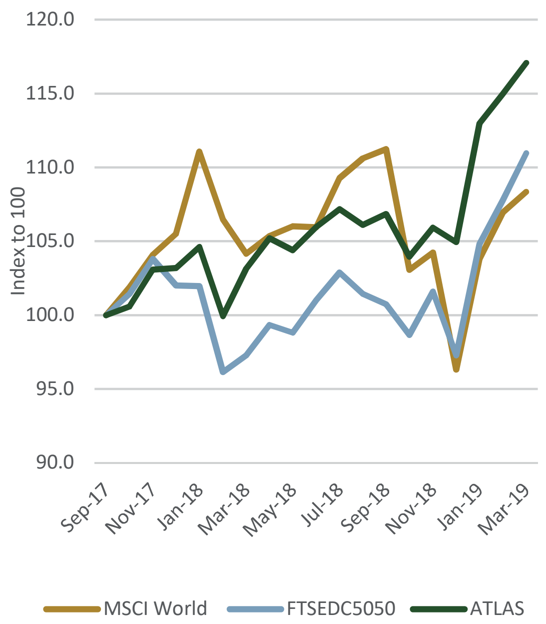
The charts below show the performance of the ATLAS Global Infrastructure Fund over the period since its inception, compared with the listed indices. The Fund outperformed the indices by a considerable margin and showed strong relative resilience and stability during significant pull backs in January 2018 and over Q4 2018.

AUD Hedged Indexed to 100



Source: FactSet, ATLAS Calculations

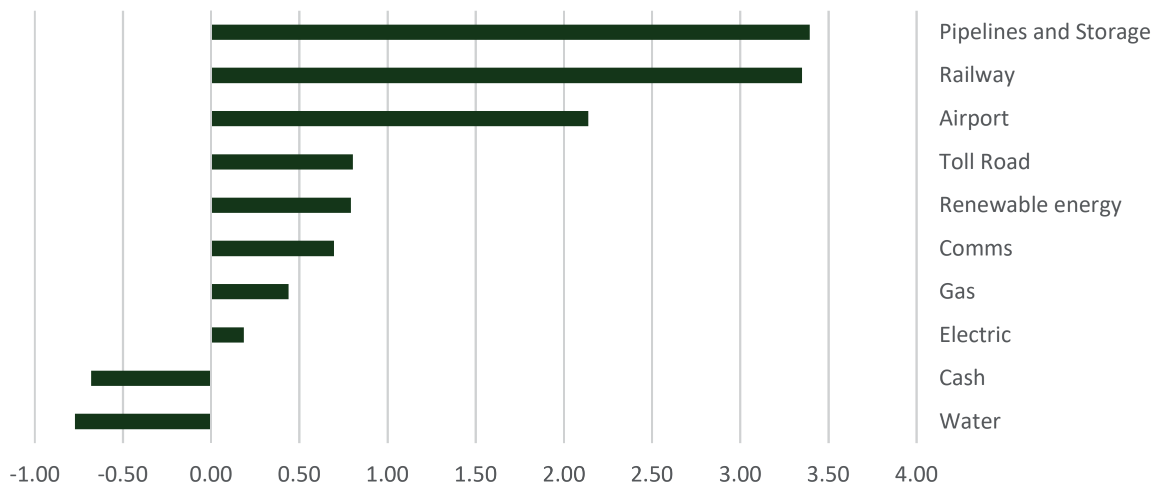
USD Unhedged Indexed to 100



Source: FactSet, ATLAS Calculations

The chart below shows the dispersion of relative returns by sector and further illustrates the stability of the ATLAS portfolio, which outperformed the FTSE 50/50 index in all sectors but one. This highlights that performance has been generated through stock selection across the portfolio, rather than by market timing or through tilting to outperforming sectors.

Relative Attribution by Sector – ATLAS vs. FTSE 5050 Developed Core – Local Currency Analysis

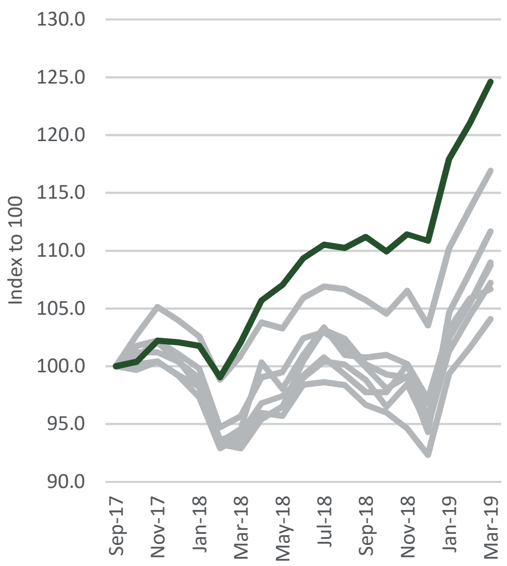


Source: Factset, ATLAS Calculations

ATLAS has also performed very strongly relative to its peer group since inception and in the year to 31 March 2018. The ATLAS Global Infrastructure Fund is currently the top performer in the sector, its higher returns achieved with significantly lower volatility than that of other managers in the sector, as shown in the charts below.:

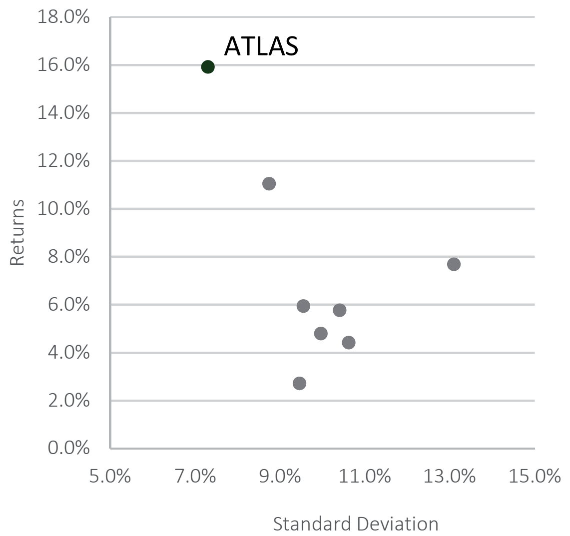
Australian Managers

Performance Indexed to 100 (AUD hedged)



Source: FactSet, ATLAS Calculations

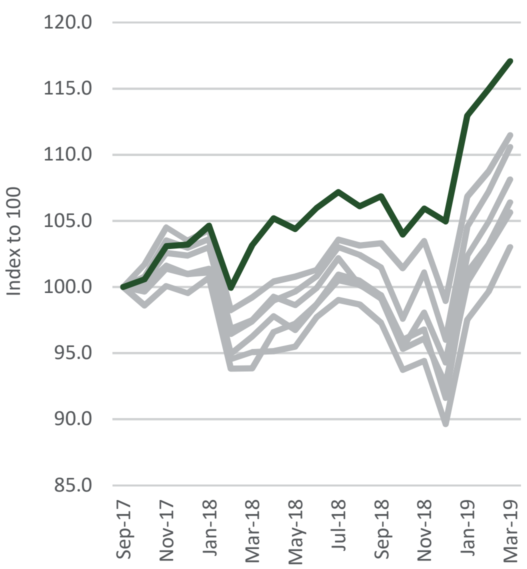
Volatility vs Returns (annualised, to 31 March 2019)



Source: FactSet, ATLAS Calculations

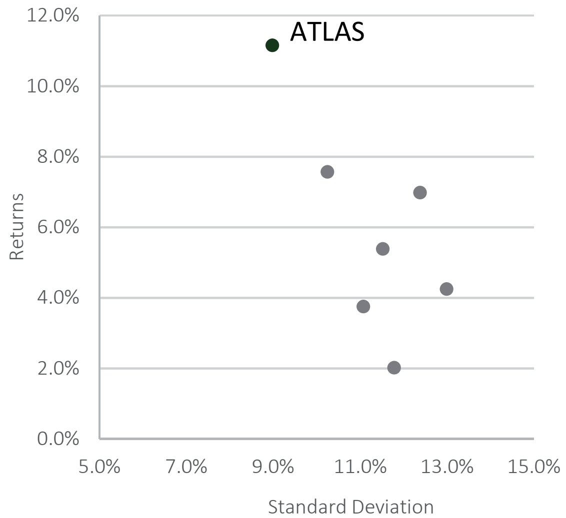
North American Managers

Performance Indexed to 100 (USD unhedged)



Source: FactSet, ATLAS Calculations

Volatility vs Returns (annualised, to 31 March 2019)



Source: FactSet, ATLAS Calculations

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Listed Infrastructure Bridging the Gap between Equities and Alternatives

More and more investors are allocating to global listed infrastructure

MAY 2019

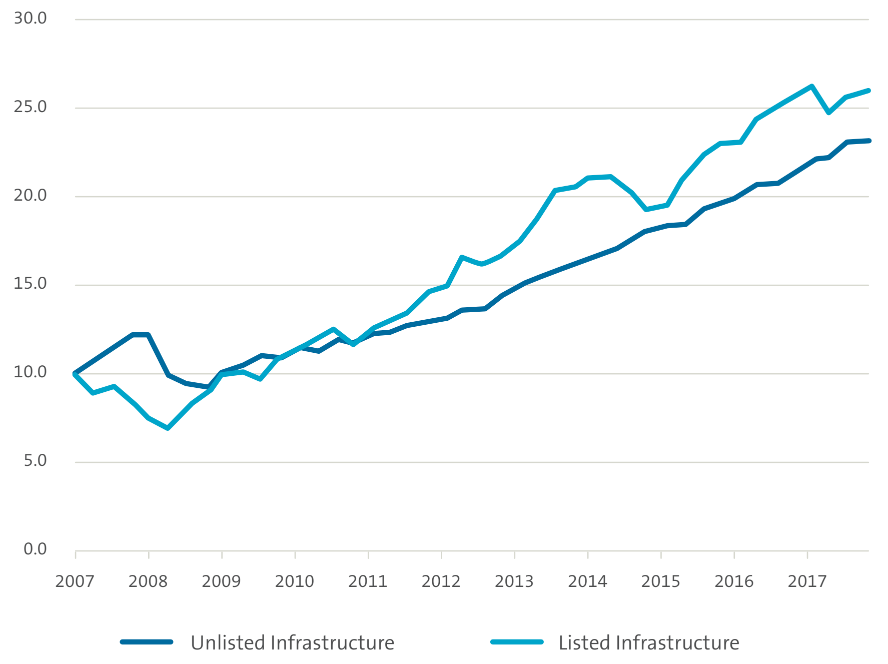
In recent years, demand for infrastructure assets has grown exponentially. Due to the unique nature of the essential services these assets provide to society, investors can access a strongly differentiated set of financial characteristics compared to other asset classes. Infrastructure assets offer stable and predictable cash flow supported by long term contracts or regulation with monopolistic characteristics and high barriers to entry.

However, alongside this growth, competition for core infrastructure assets has surged and valuations have naturally risen; there has also been a corresponding increase in undeployed capital within unlisted infrastructure funds, which has potentially been fuelled by the valuation trend. Since 2015, unlisted infrastructure dry powder has consistently grown from its previous highs to the current record level of $175bn[1], according to Preqin.

It is only natural that listed companies with access to high quality infrastructure assets have become a viable standalone asset class, and because of their current attractive valuation, they are increasingly becoming potential targets for unlisted infrastructure funds under pressure to put capital to work. Just a decade ago listed infrastructure was a niche asset class and poorly understood by many investors. It is now a diverse $3 trillion investment opportunity and over $70 billion is being managed by specialist listed infrastructure managers. The liquidity of listed infrastructure enables new allocations to be deployed with a high degree of efficiency compared to unlisted infrastructure funds can take several years to fully invest.

This also partially explains why listed infrastructure is increasingly being considered alongside unlisted infrastructure funds, also considering that returns between listed and unlisted assets are very similar over a full market cycle; as ultimately the underlying asset, rather than the capital structure, determines returns. Additionally, assets are co-owned by listed infrastructure companies and direct investors in many instances.

Performance comparison – listed infrastructure universe vs unlisted infrastructure funds



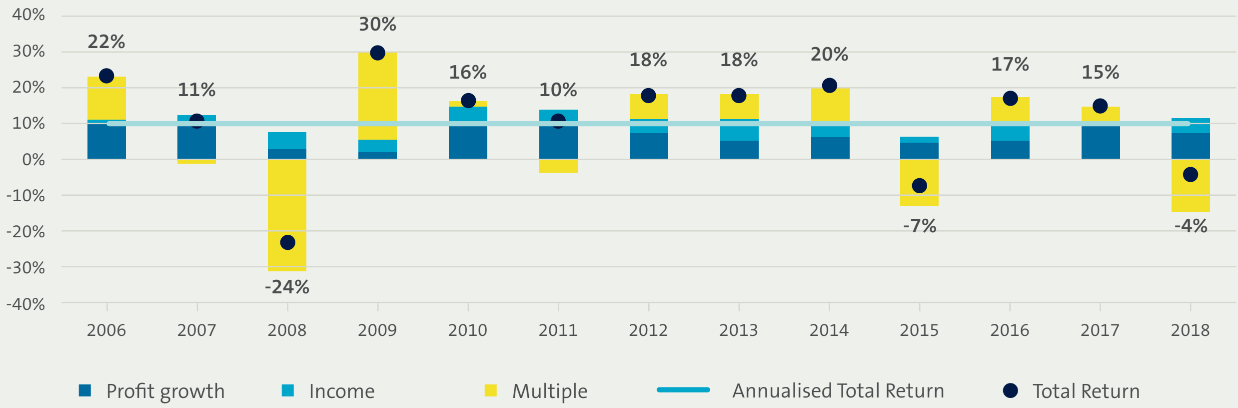
Past performance is not a reliable indicator of future performance. Source: AMP Capital, Bloomberg, Preqin as at 30 September 2018. Data frequency: quarterly. Listed infrastructure data is based on the AMP Capital's Global Listed Infrastructure universe.

1 As at March 2019

Although listed and unlisted infrastructure assets with the same economic exposures will behave similarly to changes in the economic environment, valuation leads and lags do arise between both unlisted and listed infrastructure, due to the mark-to-model vs mark-to-market effect. Unlisted infrastructure assets' valuation cycles are typically bi-annual with fewer unlisted comparative transactions, resulting in lower volatility. Whilst daily valuations can lead to higher volatility, an active listed infrastructure manager is able to take advantage of the opportunities it can create.

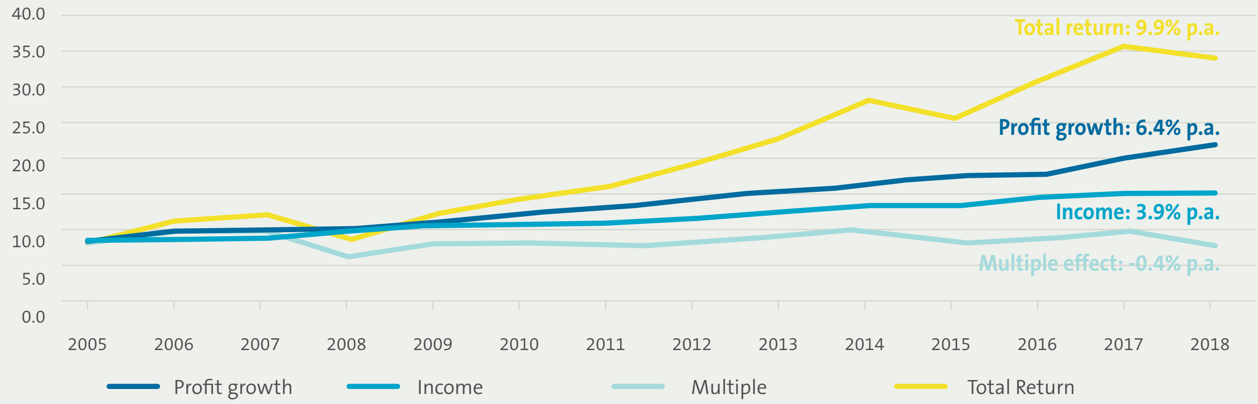
Despite volatility of valuation, long term infrastructure investors should appreciate that majority of the volatility is driven by multiple expansion/contraction, but over the long term this has little impact, as cash flow growth is ultimately what delivers returns, with profit growth for infrastructure companies has been consistently positive year on year. Years with negative total return have primarily been driven by multiple compression, but over the long term, the multiples effect has been neutral. This is why our investment philosophy and process have a stringent focus on cash flows, compared to a more generalist investor. The short-term volatility creates opportunities for us to capture and generate alpha for our clients.

Global Listed Infrastructure total return breakdown by calendar years



Past performance is not a reliable indicator of future performance. Source: AMP Capital, Bloomberg as at 31 December 2018. Data frequency: quarterly. Data based on the AMP Capital's Global Listed Infrastructure universe.

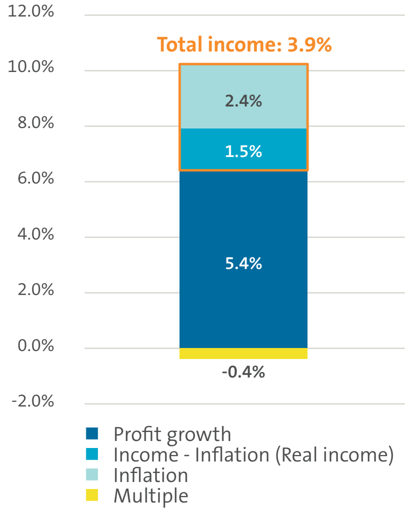
Cumulative performance breakdown



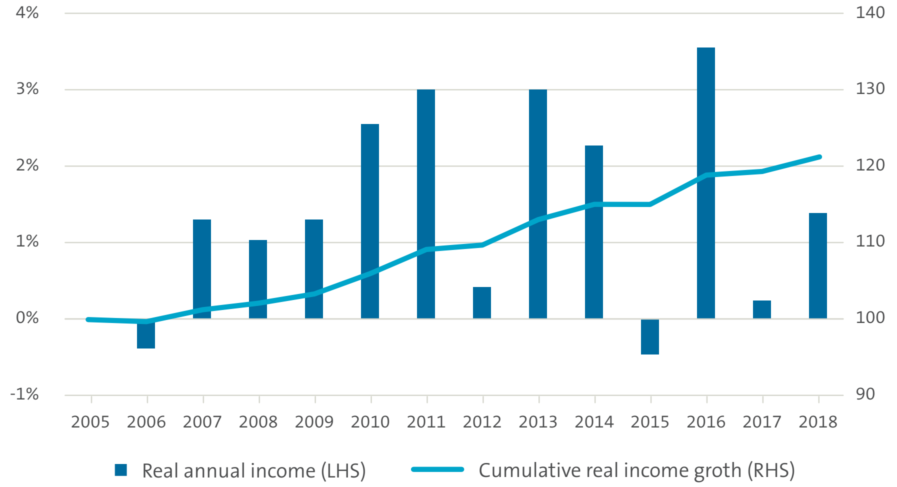
Past performance is not a reliable indicator of future performance. Source: AMP Capital, Bloomberg as at 31 December 2018. Data frequency: quarterly. Data based on the AMP Capital's Global Listed Infrastructure universe.

More and more investors are allocating to the asset class, particularly for the attractive yield and the inflation protection it can provide. As infrastructure assets often have their profits guaranteed by long-term contracts or regulation, returns tend to be relatively predictable over the long term. Additionally, these assets can provide a natural hedge against rising inflation through (1) long-term concessions with inflation-linked increases, (2) regulation that allows a real return to be earned; and (3) pricing power due to the monopolistic characteristics of the industry and its high barriers to entry. For investors, this provides extremely good visibility for cash flows and ultimately, a sustainable income stream.

Total return breakdown – highlighting real income



Real income over the long term



Past performance is not a reliable indicator of future performance. Source: AMP Capital, Bloomberg as at 31 December 2018. Data frequency: quarterly. Data based on the AMP Capital's Global Listed Infrastructure universe.

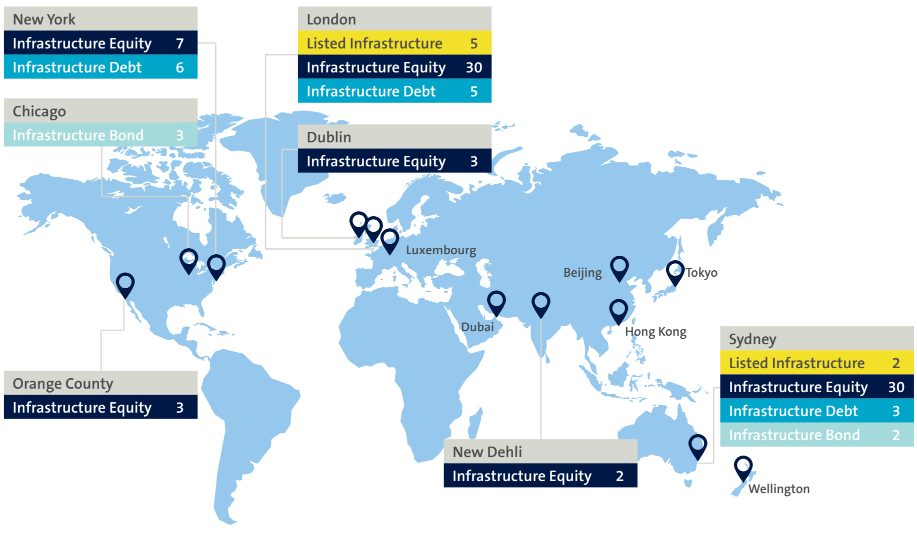
Introduction to AMP Capital

AMP Capital is a global investment manager with a heritage and strength in real estate and infrastructure, and specialist expertise in fixed income, equities and multi-asset solutions. AMP Capital's asset class specialists, investment strategists and economists work together with the aim of delivering strong investment outcomes for clients. Clients trust AMP Capital to invest over £106bn as at March 2019 on their behalf.

We are pioneers in infrastructure investments with over 30 years of experience. AMP Capital's global infrastructure platform has a network of over 80 investment professionals managing $18bn across the capital structure of infrastructure in both public and private markets.

	Listed	Unlisted
Equity	Global Listed Infrastructure $1.7bn	Global Direct Infrastructure $12.4bn
Debt	Global Listed Infrastructure Debt $0.3bn	Global Direct Infrastructure Debt $4.3bn

One of the largest infrastructure managers globally



- Key AMP Capital Office
- AMP Capital Global Listed Infrastructure Team
- AMP Capital Infrastructure Equity Team
- AMP Capital Infrastructure Debt Team
- AMP Capital Credit Team involved with Global Infrastructure Bonds
- # Team size per location

30yrs Infrastructure investing experience **80+** Investment professionals looking at all aspects of infrastructure **$18bn+** Funds under management*

Source: AMP Capital as at 31 March 2019. *FUM figures represented in USD and includes undrawn commitments, as at 31 December 2018
Note: Giuseppe Corona, Head of Global Listed Infrastructure, also holds a position on the investment and valuation committees for both Infrastructure Equitiy and Infrastructure Debt.

AMP Capital Global Listed Infrastructure team

The significant depth and breadth of AMP Capital's infrastructure investment platform brings together leading investment professionals from different parts of the asset class and enables the cross-fertilisation of investment ideas. Our dedicated listed infrastructure investment team of 7 specialists manages over $1.7bn in infrastructure securities with 83 years of combined investment experience. The sharing of ideas with AMP Capital's unlisted infrastructure equity and debt teams adds insights into our listed infrastructure investments and highlights themes across the entire spectrum of this asset class. We believe that the ability to access the wealth of resources that AMP Capital has in the infrastructure space will lead to more informed investment decisions, and thereby improve portfolio returns.

Philosophy

At AMP Capital, we have a strict focus on long-term cashflow stability and filter the broader infrastructure universe for the following characteristics.

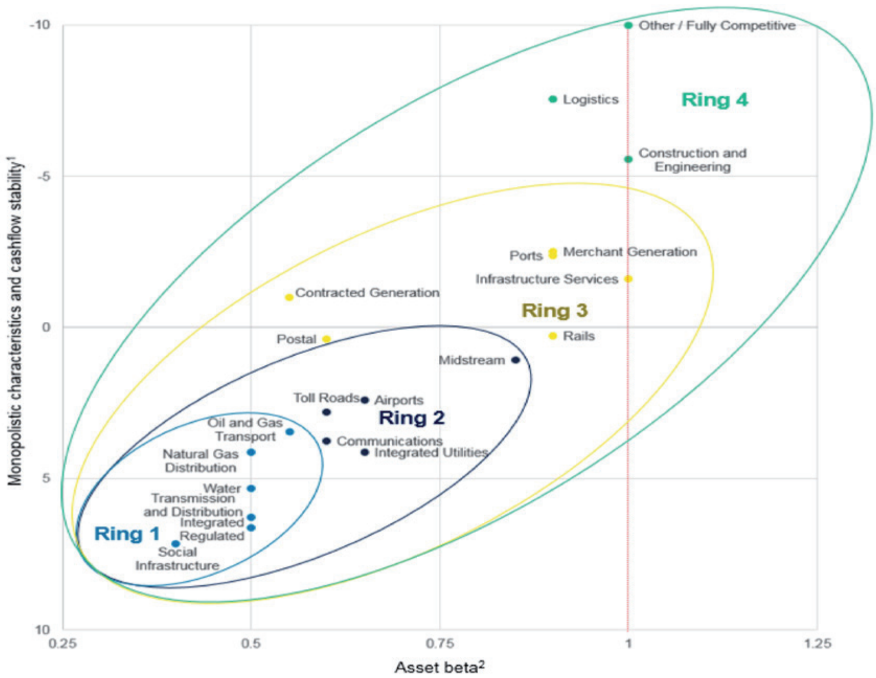
Characteristics we look for	Unfavourable characteristics
> Monopolistic characteristics	> Competitive industries
> High barriers to entry	> Low barriers to entry
> Highly regulated	> Short-term/ no contracts
> Long-term guaranteed contracts	> Low visibility
> Mature assets	> Greenfield developments
> Inflation protection	> Cyclical industries

We then segment the investment universe into four 'rings' depending on their monopolistic characteristics, cashflow stability and their sensitivity to the economic cycle:

The AMP Capital Global Listed Infrastructure strategy focuses on what we describe as 'core and pure' infrastructure assets; that is, assets with lower volatility of cash flows and therefore, in our view, higher expected risk-adjusted long-term returns.

- Ring 1 comprises of assets that generate cash irrespective of the volume of usage and therefore are 'cycle agnostic'.
- Ring 2 includes essential 'user-pays' infrastructure.
- The assets in Ring 3 and Ring 4 are sensitive to the economic cycle as their cash flow profile is sensitive to input costs and to volume of usage.

AMP Capital Global Listed Infrastructure's core investable universe is primarily in 'Ring 1' and 'Ring 2' which narrows potential investable assets to those described as 'core and pure' infrastructure assets; e.g. assets with lower volatility of cash flows and therefore, in the team's view, assets that have higher expected risk-adjusted long-term returns. As can be seen in the corresponding table, AMP Capital's Global Listed Infrastructure Universe has historically delivered superior returns with lower volatility compared to global equities.

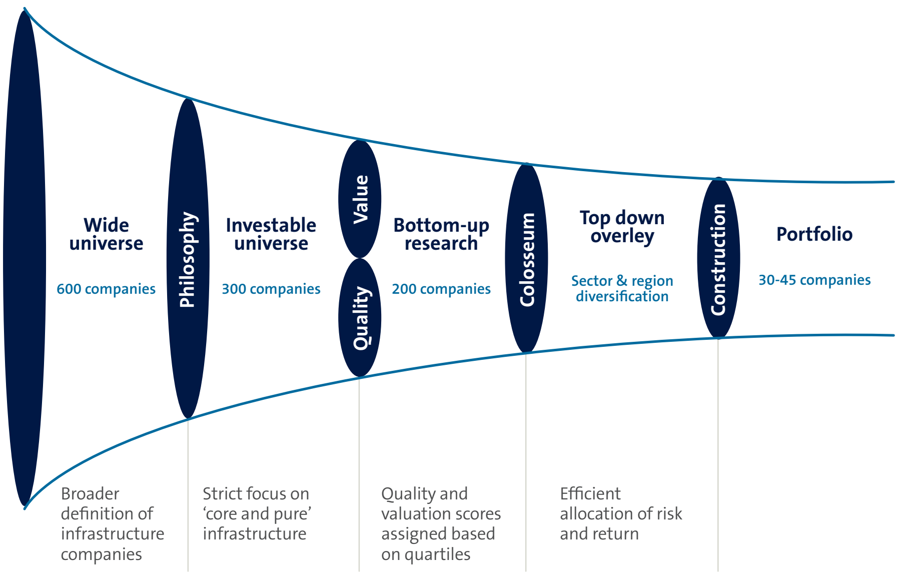


Source: AMP Capital
[1]Monopolistic characteristic and cashflow stability score is a component of AMP Capital Global Listed Infrastructure team's quality scoring framework. [2]The asset beta measures the AMP Capital Global Listed Infrastructure team's estimated sensitivity of the asset cashflow to the economic cycle.

	GLI Universe	Global Equities
Total Return	**9.1%**	**5.8%**
o.w. dividends	3.6%	2.2%
o.w. growth	6.3%	3.7%
o.w. multiple	-0.8%	0.0%
Volatility of Total Return	**11.2%**	**16.0%**
Volatility of growth	2.2%	15.2%
Volatility of multiple	10.3%	17.0%

Source: AMP Capital, Bloomberg as at 31 December 2018. Data frequency: quarterly. Data period: Q2 2005 to Q4 2018. Global Equities is represented by MSCI World. GLI Universe is based on the AMP Capital's Global Listed Infrastructure universe.

Investment process



A comprehensive and detailed bottom up research approach is the key pillar to our investment process. The key outputs of the investment process are the Quality and Valuation Scores.

- The 'Quality Score' of a company summarises the team's qualitative assessment of a company's fundamentals and takes into consideration the factors influencing the company from the asset level through to broader industry themes.
- The 'Valuation Score' of a company takes into account the total return expectation of a stock, derived from the primary risk-adjusted valuation metric – Equity IRR less the cost of equity.

At a high level, the team manages a portfolio of companies that are both high quality and cheap. The portfolio is well diversified and contains 30 to 45 companies that score well on both quality and valuation measures. The bottom up portfolio construction process is complemented with a top down overlay, ensuring appropriate diversification at both regional and sector level.

AMP Capital Global Listed Infrastructure strategy

The current portfolio has c. 40 companies and provides investors access to global infrastructure themes, representing significant investment opportunities such as:

The global trend towards decarbonisation to reduce CO_2 emissions, and the role of energy infrastructure in fulfilling future global energy needs.

Communication infrastructure investment requirements to support the transition to 5G & "Next Generation Video"

Increasing demand for mobility services and the benefit of wealth effects creating opportunities within the transportation sector in Emerging Markets.

Strategy characteristics

Objective	To provide total returns (income and capital growth) above the Dow Jones Brookfield Global Infrastructure Index over the long-term from a global portfolio of listed infrastructure securities
Strategy Inception Date	15 July 2010
Strategy Size	$1,727m
Number of holdings	30 – 45 stocks
Max Single Security	10%
Max Off Benchmark Exposure	30%
Max Cash	10%
Minimum suggested time frame	5 years

FUM Figure represented in USD as at 31 March 2019

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