

The background of the cover is a dark blue and black gradient with various financial data visualizations. On the right side, there is a 3D bar chart with several bars of varying heights. Below it, there are several line graphs with different colored lines (yellow, red, blue) showing trends. Some numbers are visible on the graphs, such as '00.01', '-05.22', and '-00'. There are also some green dots at the bottom right. The overall theme is financial analysis and data.

THE Frontier Line

Thought leadership and insights from Frontier Advisors

Issue 123

December 2016

Real Assets Team:

The Investment Case for Real Assets

▶ Frontier Advisors

Frontier Advisors has been at the forefront of institutional investment advice in Australia for over two decades and provides advice over more than \$260B in assets across the superannuation, charity, public sector and higher education sectors.

Frontier's purpose is to enable our clients to generate superior investment and business outcomes through knowledge sharing, customisation, client empowering technology and an alignment and focus unconstrained by product or manager conflict.



AUTHOR

Martin Thompson

Martin is a Senior Consultant at Frontier, having joined the firm as an Associate in 2009. Martin provides consulting support to a number of clients and undertakes investment and manager research.

Prior to joining Frontier, Martin worked at Starfish Ventures, an Australian venture capital fund manager focused on high growth life sciences, information technology and clean technology companies. Prior to this Martin has worked in technology commercialisation at the University of Melbourne, virology research at Murdoch University, and taught undergraduate students whilst engaged as a PhD candidate at the University of Western Australia.

Martin has a Master of Applied Finance through Macquarie University, a PhD in Molecular Cell Biology and a Bachelor of Science with first class honours.

The investment case for real assets

The exposure to illiquid assets is, and has been, a point of differentiation between a number of investors in the market, particularly industry superannuation funds and retail superannuation funds. Industry funds have traditionally been heavy investors in the unlisted asset classes, while retail funds are generally characterised by much lower allocations to these asset classes. The variance can be explained by a number of factors; however membership profile and structure (default option versus member choice) are contributing factors.

At the simplest level, the reason to add an asset class to a portfolio is that it improves the overall return for each unit of risk taken on, which can be measured by the Sharpe ratio. However, in practice other considerations are important as well, such as portfolio size and scale, liquidity constraints, expected return path and targeted return of the investment option. These other considerations are important, but will vary considerably according to the requirements of the investor; hence the attractiveness of particular asset classes will also vary according to the requirements of an investor.

The purpose of this Frontier Line is to consider the investment case for including illiquid asset classes in a portfolio, in particular the “real” asset classes of unlisted infrastructure and property (by real assets we mean those where a large percentage of the value is in physical assets). We consider a number of characteristics of property and infrastructure in this paper; some of which are attractive and others less so.



Characteristics of unlisted infrastructure and property

While there are numerous illiquid asset classes available, for the purposes of this paper we will focus on unlisted infrastructure and property as these make up the majority of illiquid exposures for most funds. We also focus on the types of property and infrastructure exposures that are found in Frontier client portfolios (and also many other industry funds), which is primarily Australian core property and Australian and international core infrastructure.

Where we refer to property or infrastructure, we will typically mean the unlisted version of these asset classes and will specifically refer to listed infrastructure or listed property for the listed versions. We are also referring primarily to equity investment within these asset classes, as opposed to property debt and infrastructure debt.

Definitions of property and infrastructure

Property

Core property comprises established office, retail or industrial properties which are largely occupied and require minimal capital expenditure in the immediate future. The asset management focus for these assets is therefore leasing and re-leasing space, and minor capital expenditure. Generally, the objective of a core property exposure is to obtain exposure to property market “beta”, rather than “alpha” from active management, though all assets require some level of active management.

Infrastructure

Infrastructure assets are considerably more heterogeneous than property assets and are typically described by the characteristics they share. These are often large monopolistic assets such as roads, seaports, airports, electricity networks and water assets. However, there are also smaller assets that fall into the social infrastructure class, such as schools and prisons. All of these are expected to have relatively consistent and long-term cash flow generation, whether due to regulation, long-term contracts, inelastic demand or monopolistic positioning.

Riskier exposures

Within both asset classes there are riskier approaches, which have higher risk and return expectations, such as greenfield investments (i.e. assets not yet built or operational) and property development projects. While such exposures make

sense at various points in the market cycle, many investors do not treat these as “evergreen” exposures with most investors focusing on the less risky “core” assets.

Investment structures

Open ended funds

The route to investing in illiquid assets varies, although open ended funds are quite common for Australian institutional investors. These typically have no formal termination date, hence are expected to have very long time horizons, which makes sense if an investor is interested in these assets due to their typically long duration. Investors can also usually make further commitments to such a fund over time and often have the option to reinvest distributions back into the fund rather than taking them as cash. The downside is that these funds are typically quite illiquid – redemption requests can take many years to be effected in some cases, with no guarantees. However, units can be sold on the secondary market as discussed later in *Relative liquidity of different vehicles* on page 3.

Closed end funds

Private equity style closed end limited partnerships are generally more common overseas. Redemptions cannot be made over the life of the fund, but they will have liquidity towards the end of the fund life (which is around 10 to 12 years, often with several extensions subject to unitholder approval). While this forced liquidity may have some benefits, it means the term of the fund is not well matched to the duration of the assets it holds. This can potentially be a negative for a long-term investor, as it means unnecessary turnover of asset exposures and additional costs. Theoretically, situations could arise where an asset is sold from one fund to another but the beneficial owner remains the same. As with open ended funds, it may also be possible to sell units in these funds on the secondary market.

Direct investment/separately managed accounts

Direct investing allows the investor to hold the asset directly, meaning it has considerably more control over when the asset is sold. Often an investment manager is still employed to acquire, manage and sell the assets, but the investor has much more control over the process, especially regarding asset acquisitions and disposals. Important considerations for the investor include level of capital required for investment (in order to achieve diversification and solid governance), internal resourcing and level of expertise of the internal investment team, regardless of whether an investment manager is used.

Cash flow implications of different structures

Each of these structures has different cash flow implications. With an open ended fund it is reasonably common for committed capital to be drawn relatively quickly as funds raise what they project is needed in the near term. For a closed-end fund capital will be drawn over the duration of the fund's investment period (which could be five years or more). Hence, the open ended structure often has a bit more certainty for cash flow planning purposes. With direct investing this is under the control of the investor, who can decide whether or not to make a particular investment (subject to the terms of the investment management agreement, if any).

Relative liquidity of different vehicles

All of these investments and structures should be considered very illiquid. However, direct investments would often be the most liquid in the sense that the investor has greater control over the sales process of assets. Open ended and closed-end funds will vary, but the latter will have guaranteed liquidity over the long-term.

As previously mentioned, it may also be possible to gain liquidity from fund investments by selling the units in these vehicles on the secondary market. This typically requires manager approval, but some managers will help facilitate the process. The downside is that demand for the units can be highly variable and may dry up in stressed market conditions. In addition, the seller may need to offer the units at a discount in order to attract any interest from potential purchasers. This is especially the case for closed-end vehicles which often have a more concentrated investor base relative to an open-ended vehicle. Hence, liquidity via this route may come at a cost, especially in market conditions where a high premium is placed on liquidity.

Fees

Fees within unlisted property and infrastructure are quite variable, but are generally on the higher side relative to liquid asset classes. The cheapest products tend to be open ended funds with base fees comparable to listed equities and no performance fees. The more expensive products tend to be in closed-end structures that charge private equity-like base and performance fees. True direct investing will avoid manager fees, but will incur additional costs such as increased staffing and transaction and due diligence costs when attempting to purchase assets. However, in the Australian market at least, most direct investing still uses a manager in the form of a separately managed account. The fees for separately managed accounts will vary, especially with size, but would be expected to be cheaper than the manager's equivalent pooled vehicle.

Historical characteristics

The tables and charts in this section outline a number of characteristics of Australian and international equities, bonds, Australian listed property and listed infrastructure as well as Australian unlisted property and unlisted infrastructure. Each asset class is represented by an index or benchmark as outlined in Table 1. The infrastructure time series is maintained by Frontier and consists of the average return of a number of unlisted open-ended infrastructure products. The underlying assets in this series are biased towards Australian core infrastructure assets. We also note that we would not recommend clients invest in a listed property exposure similar to the S&P/ASX 200 Property Accumulation Index (with our preference being a more global listed property exposure), however this index has been used as the closest listed alternative to an Australian unlisted property exposure.

Table 1: Representative benchmarks

Asset Class	Benchmark
Australian equities	S&P ASX 300
Australian fixed interest	Bloomberg AusBond Composite 0+ Yr Index
Global equities	MSCI World ex-Australia
Global fixed interest	Barclays Capital Global Aggregate Index (Hedged)
Listed property	S&P/ASX 200 Property Accumulation Index
Listed infrastructure	FTSE Developed Core Infrastructure 50-50 Capped Net Total Return (Hedged)
Unlisted property	MSCI/IPD Direct Property Index
Unlisted infrastructure	Frontier Infrastructure Benchmark

Source: Bloomberg

Performance, volatility and correlations

Table 2 outlines the performance of the asset classes over various time periods to June 2016, with unlisted property and infrastructure highlighted. Over the long term, both unlisted property and infrastructure have performed very strongly, with infrastructure the strongest performer within the group over 10, 15 and 20 year periods. What is also noticeable is the relative consistency of period returns for the illiquid asset classes.

Chart 1 shows the rolling three year performance of various listed and unlisted asset classes. This helps highlight some of the characteristics that can be seen in the tables above. Fixed interest has produced the most consistent performance, with rolling three year returns staying between around 4% and 11% p.a. At the other end of the spectrum, listed equities, listed property and listed infrastructure were very volatile over the charted period with three year annualised performance for listed property varying from around 25% to 28% p.a. Both unlisted property and infrastructure fall between these two extremes; but arguably closer to bonds than equities.

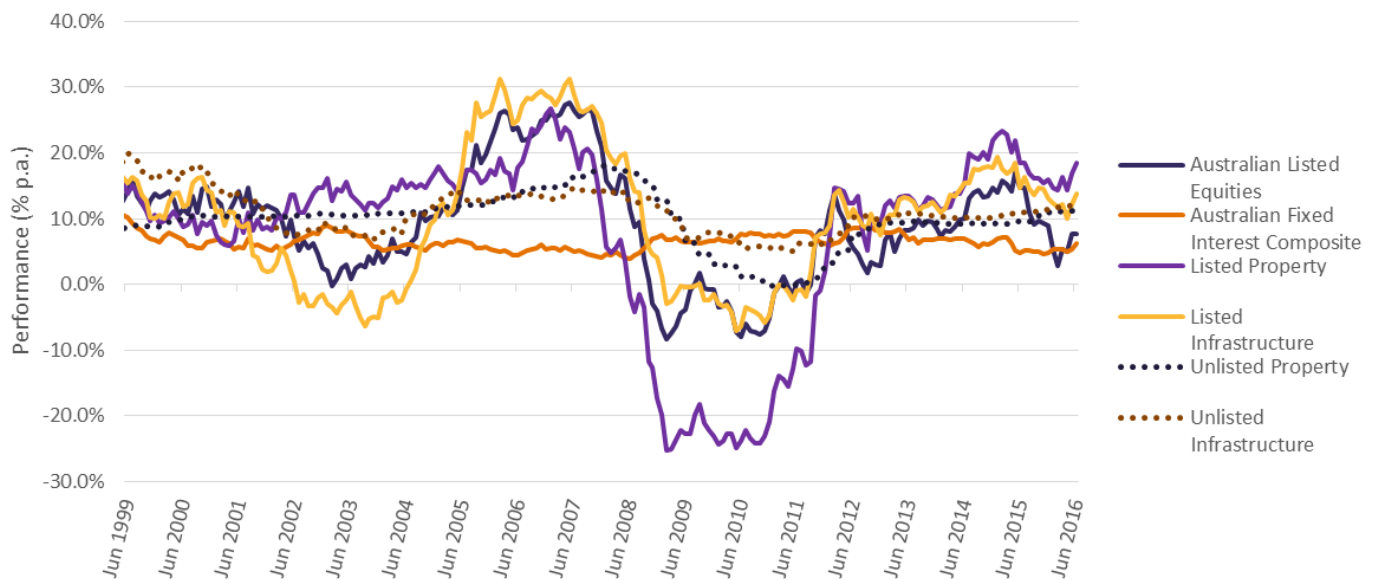
In Table 3 we look at the annualised volatility of each asset class over various periods. Notably, the listed equity asset classes (Australian equities, global equities, listed property and listed infrastructure) are significantly more volatile than the other asset classes. The fixed interest sectors exhibit the lowest volatility, followed closely by unlisted property and then unlisted infrastructure. These figures are not unexpected given the daily public trading reflecting market sentiment and intrinsic riskiness of listed equities will result in a more volatile return series. While bonds are publicly traded they are also much less risky than equities due to their position in the capital structure as well as a large component of government debt in these indices. The low volatility of unlisted property and infrastructure is due to the infrequent but stable valuation process that occurs in these asset classes, but is also because of the intrinsically stable nature of core assets and the characteristics of low risk and high income component of asset returns.

Table 2: Period returns to 30 June 2016 (% p.a.)

	1 year	3 years	5 years	10 years	15 years	20 years
Australian equities	0.9	7.7	7.2	4.8	7.2	8.9
Australian fixed interest	7.0	6.2	6.7	6.6	6.4	7.0
Global equities	-1.4	10.9	11.3	6.5	6.1	7.4
Global fixed interest	9.3	7.6	7.7	8.1	7.9	8.0
Listed Property	24.6	18.5	18.1	3.1	7.2	8.7
Listed Infrastructure	12.8	13.8	12.6	8.8	9.1	10.2
<i>Unlisted Property</i>	<i>13.5</i>	<i>11.2</i>	<i>10.4</i>	<i>8.4</i>	<i>9.8</i>	<i>9.7</i>
<i>Unlisted Infrastructure</i>	<i>13.7</i>	<i>11.6</i>	<i>11.0</i>	<i>9.8</i>	<i>10.5</i>	<i>11.6</i>

Source: Bloomberg, Frontier

Chart 1: Rolling three year performance



Source: Bloomberg, Frontier

Table 3: Annualised volatility to 30 June 2016

	1 year	3 years	5 years	10 years	15 years	20 years
Australian equities	14.6	12.4	12.7	14.3	13.2	13.0
Australian fixed interest	2.4	2.5	2.8	2.8	2.8	3.2
Global equities	14.6	10.9	11.8	15.0	14.6	14.9
Global fixed interest	2.3	2.5	2.6	2.7	2.8	2.8
Listed property	10.3	11.3	12.0	18.8	16.0	15.0
Listed infrastructure	10.1	9.0	9.0	11.5	11.7	11.5
<i>Unlisted property</i>	<i>2.8</i>	<i>2.0</i>	<i>1.7</i>	<i>4.1</i>	<i>3.7</i>	<i>3.4</i>
<i>Unlisted infrastructure</i>	<i>2.8</i>	<i>3.7</i>	<i>3.7</i>	<i>4.3</i>	<i>4.8</i>	<i>5.4</i>

Source: Bloomberg, Frontier

Table 4 examines the correlations between the various asset classes over the medium term (five years in this case). Examining correlations provides a guide as to the diversification benefit that could have been gained from investing in a range of different asset classes. Table 4 shows that both the unlisted asset classes have negative correlations with listed equities and bonds, which suggests there are significant diversification benefits to including these in a portfolio that consists largely of listed equities and bonds. Interestingly, both listed infrastructure and property have reasonably high correlations with listed equities and low or negative correlations with their unlisted equivalents. We examine the portfolio effect in more detail in *Portfolio Considerations* on page 8.

Fundamentally, we would expect at least a small positive correlation between equities and the unlisted asset classes given all these asset classes have linkages to GDP growth. However, these correlations are lower, in part due to a lag in unlisted valuations relative to listed valuations (which can be seen in Chart 1) as well as unlisted valuations being driven primarily by fundamentals, whereas listed equities can also be driven by market sentiment.

Chart 2 highlights the low correlation between the unlisted asset classes and equities by charting one year returns of unlisted infrastructure and property versus the MSCI World over the same periods. This shows that performance of the unlisted assets classes is relatively consistent irrespective of the performance of listed equities.

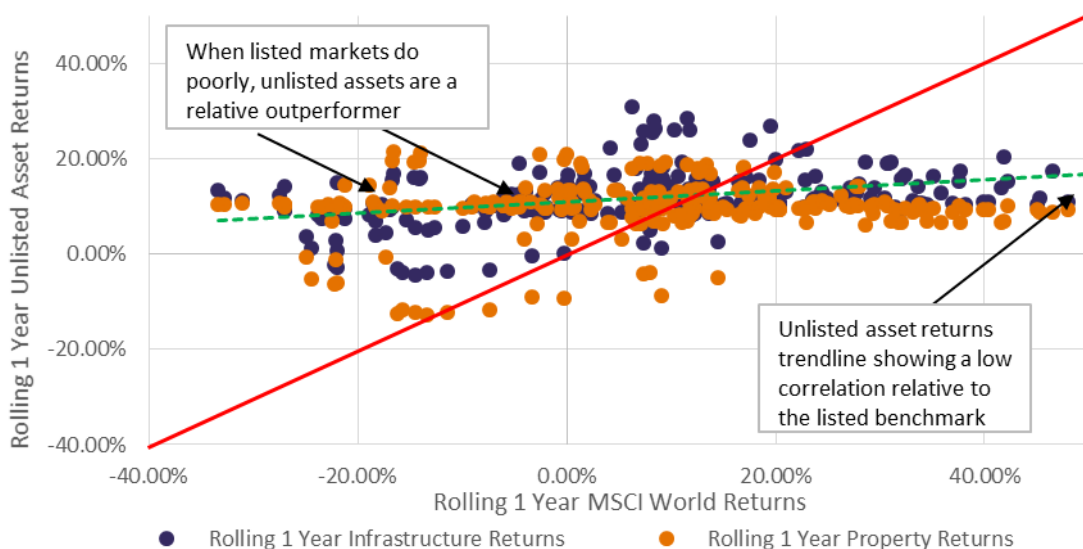
The sum of all these observations is that property and infrastructure are asset classes with strong historical performance, reasonably low volatility and low or negative correlations with bonds and equities (including its listed counterparts).

Table 4: Five year correlations to 30 June 2016

	Aust. equities	Aust. bonds	Global equities	Global bonds	Listed prop	Listed infra	Unlisted prop	Unlisted infra
Australian equities	1.00							
Australian bonds	-0.16	1.00						
Global equities	0.71	-0.36	1.00					
Global bonds	0.06	0.64	-0.13	1.00				
Listed property	0.69	0.21	0.32	0.29	1.00			
Listed infrastructure	0.49	0.09	0.59	0.37	0.52	1.00		
<i>Unlisted property</i>	<i>-0.18</i>	<i>-0.26</i>	<i>-0.15</i>	<i>-0.17</i>	<i>-0.21</i>	<i>-0.04</i>	<i>1.00</i>	
<i>Unlisted infrastructure</i>	<i>-0.25</i>	<i>-0.13</i>	<i>-0.14</i>	<i>-0.25</i>	<i>-0.15</i>	<i>0.04</i>	<i>0.70</i>	<i>1.00</i>

Source: Bloomberg, Frontier

Chart 2: Rolling one year unlisted assets vs MSCI World Benchmark returns



Source: Bloomberg, Frontier

Growth versus defensive characteristics

It is typical to classify asset classes as being “growth” or “defensive”. These classifications are quite qualitative, but one definition is that a return from a growth asset class is largely from capital appreciation, while for a defensive asset class it is largely in the form of yield or income. A defensive asset class could also be viewed as lower risk and growth as higher risk. The archetypal growth and defensive asset classes are listed equities and fixed interest respectively.

While a number of market participants classify both unlisted property and infrastructure as being growth assets, Frontier’s default position is to consider core property and infrastructure as 50% growth/50% defensive. The defensive component for infrastructure comes from long dated

contracts, monopolistic market positioning and predictable robust cash flows; while core property’s defensive characteristics come from long weighted average lease expiries (WALEs), assets that sit within supply constrained markets (e.g. Melbourne or Sydney CBD) and conservative leverage. While property and infrastructure are considered lower risk exposures relative to listed equities, they are considered to be riskier than fixed interest due to the inherent risk in these assets and given investors sit below the debt holders in the capital structure. The volatility and return characteristics of property and infrastructure as described over the past few pages are broadly consistent with the positioning of these asset classes between equities and fixed interest on the risk/return spectrum.

Portfolio considerations

As outlined above, a number of the benefits of unlisted assets are likely to arise when they are part of a diversified portfolio, due to low correlations with other asset classes. Here we undertake some modelling to look at the effect removing unlisted property and infrastructure from portfolios would have had over the past 15 years.

Portfolio performance

Our historical analysis has used a number of portfolios, as follows:

The Frontier 'Model Portfolio';

Portfolio A – removes unlisted property and infrastructure and distributes the proceeds pro-rata across the remaining listed asset classes;

Portfolio B – removes unlisted property and infrastructure and distributes the proceeds to bonds and equities only; and

Portfolio C – removes unlisted property and infrastructure and distributes the proceeds to the listed market equivalents (listed property and listed infrastructure).

The asset allocations of these portfolios have been detailed in Table 5. These maintain the same growth/defensive split with the exception of distributing the unlisted allocation pro-rata, which has more growth assets than the default portfolio. We have then calculated the performance that these portfolios would have achieved over the past 15 years. This does assume continuous rebalancing, a static asset allocation, and benchmark returns for each asset class, but it should still provide a reasonable guide.

Table 6 shows the return and volatility characteristics of these portfolios. Over all periods, illiquid assets in the portfolio is beneficial to the risk/volatility trade off (measured by the Sharpe ratio, which is excess return over the risk free rate divided by volatility) and over longer periods has improved performance as well. Including unlisted assets effectively smooths the performance of a portfolio, making it less volatile over the long term.

Table 5: Portfolio asset allocations (%)

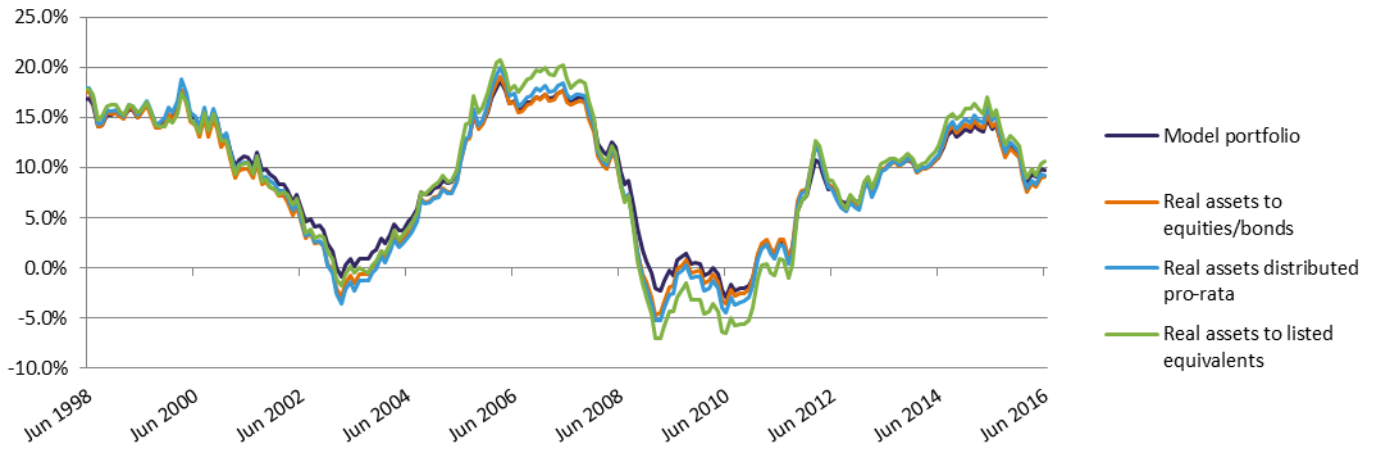
	Default Frontier Model Portfolio	Portfolio A Unlisted Distributed Pro-rata	Portfolio B Unlisted to Bonds and Equities	Portfolio C Unlisted to Listed Equivalents
Australian Equities	27.0	33.8	32.0	27.0
International equities	23.0	28.8	28.0	23.0
Private equity	6.0	7.5	6.0	6.0
Infrastructure	10.0	0.0	0.0	0.0
Floating rate debt	5.0	6.3	5.0	5.0
Property	10.0	0.0	0.0	0.0
ARS	3.0	3.8	3.0	3.0
Fixed interest	14.0	17.5	24.0	14.0
Listed Property	0.0	0.0	0.0	10.0
Listed Infrastructure	0.0	0.0	0.0	10.0
Cash	2.0	2.5	2.0	2.0

Table 6: Portfolio characteristics to 30 June 2016

	Frontier Model Portfolio	Unlisted distributed pro-rata	Unlisted to bonds /equities	Unlisted to listed equivalents
Return (% p.a.)				
5 year	9.5	9.2	9.1	10.5
10 year	6.7	6.1	6.3	6.1
15 year	7.5	6.8	6.9	7.2
Volatility (% p.a.)				
5 year	5.3	6.8	6.5	6.8
10 year	6.8	8.5	8.1	9.2
15 year	6.6	8.2	7.8	8.7
Sharpe Ratio				
5 year	1.21	0.90	0.92	1.09
10 year	0.35	0.21	0.24	0.19
15 year	0.43	0.26	0.28	0.29



Chart 3: Rolling three year performance

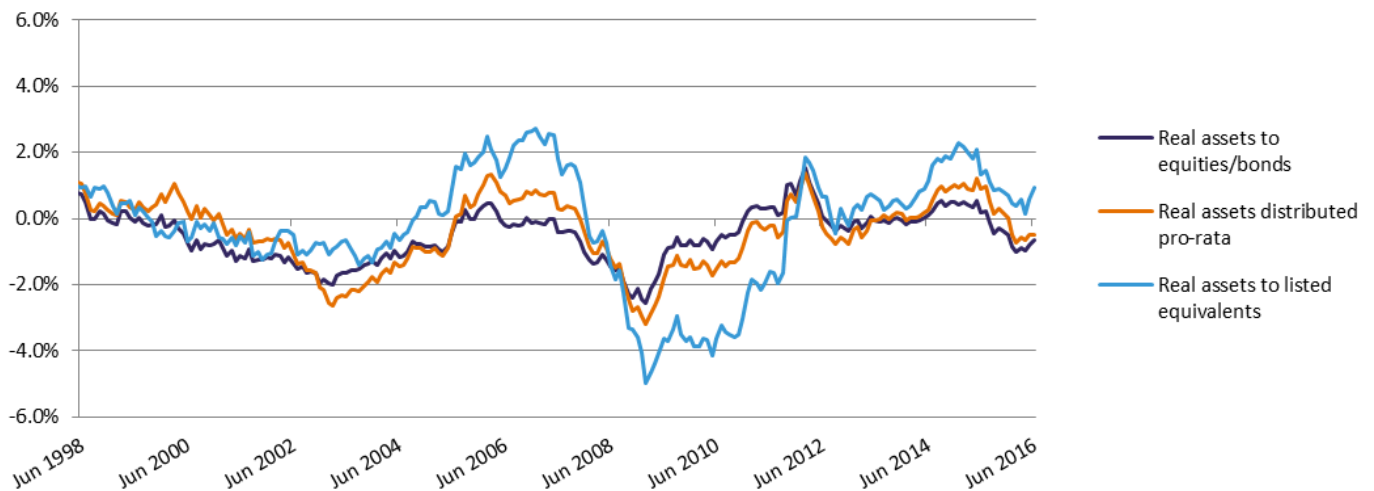


Source: Bloomberg, Frontier

Chart 3 shows rolling three year performance of the portfolios, while Chart 4 outlines rolling three year performance of the portfolios relative to the default portfolio in order to highlight the differences in performance.

Clearly, the portfolio containing unlisted assets performs more strongly when listed equity markets do poorly. Also, the overall variability of the default portfolio is lower than those that do not contain unlisted property and infrastructure. This is exactly as expected given the characteristics already discussed.

Chart 4: Rolling three year performance relative to model portfolio



Source: Bloomberg, Frontier

We have also run these portfolios through Frontier’s capital markets assumptions (CMA) model, with some key outputs shown in Table 7. The outcome of this is similar to those seen in Table 6 with the illiquid assets improving performance, reducing risk and improving the return per unit of risk.

It is worth noting that Frontier’s CMA assumptions for illiquids are reasonably conservative, with assumed risk and correlations higher than has been observed historically.

Table 7: CMA portfolio characteristics

	Model Portfolio	Unlisted distributed pro-rata	Unlisted to bonds /equities	Unlisted to listed equivalents
Return (% p.a.) (after tax)	7.4	7.4	7.2	7.3
Risk (% p.a.)	7.1	8.6	8.2	8.5
Sharpe ratio	0.48	0.39	0.38	0.38
10 year risk of loss (%)	0.03	0.27	0.23	0.26
Probability of -10% return (% p.a.)	0.39	1.52	1.27	1.45

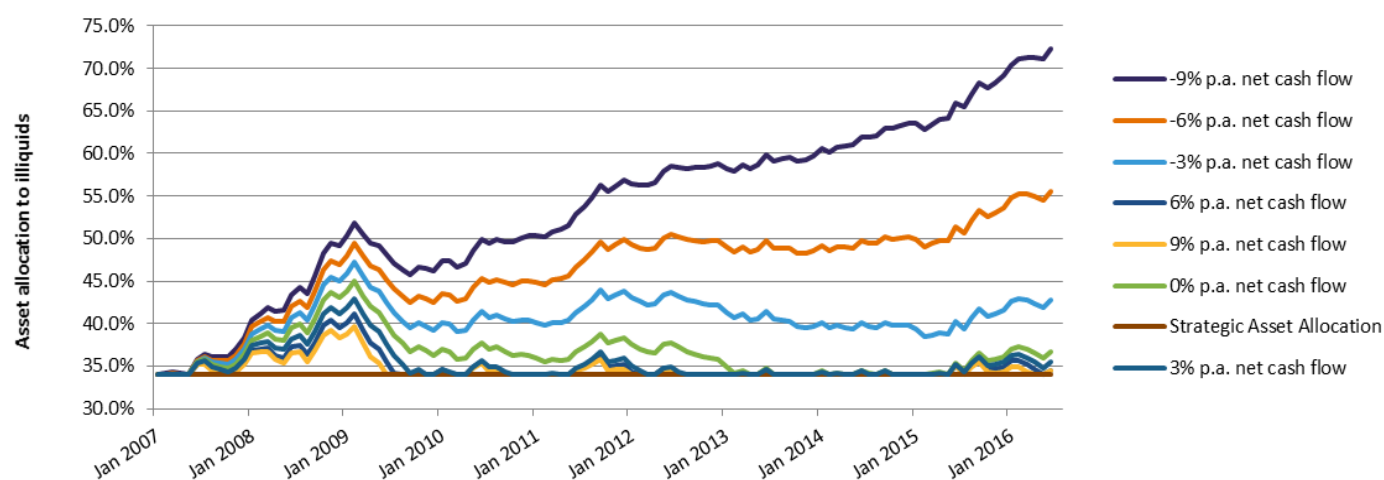
Illiquid asset exposure

Since liquidity is a key portfolio constraint for many investors, we have undertaken modelling in Chart 5 to look at levels of illiquid assets over time with different cash flow assumptions. There are numerous simplifying assumptions so this is only a broad guide. The period covered includes the global financial crisis, which was a reasonable stress test with regards to liquidity.

As can be seen in the Chart, the illiquid exposure as a proportion of the total portfolio increases significantly in the

depths of the financial crisis as liquid assets dropped rapidly in value and illiquid asset values remained reasonably stable, helped by their infrequent valuation cycle. Ironically, the low observed correlations between the two types of assets exacerbate the overall illiquid exposure. For those projections with positive cash flows, the portfolios rebalance reasonably quickly, helped by an eventual decline in illiquid asset values and a rebound in liquid asset performance. Only in scenarios where there are reasonably severe ongoing negative cash flows do the illiquid exposures not eventually head back towards the strategic allocation.

Chart 5: Asset allocations to illiquid assets by net cash flow



Note: assumptions include an annual yield of 3% from illiquid assets, liquid assets can be redeemed without cost and illiquid assets cannot be redeemed.

Source: Frontier

While none of the scenarios illustrated in Chart 5 ends in disaster (i.e. there is always some level of liquid assets), it may mean the fund loses asset allocation flexibility for extended periods of time and performance will be increasingly driven by the illiquid assets.

Another factor to consider with regards to liquidity is the how a challenging market environment is likely to influence the need for liquidity by the investor. This can vary quite considerably. For example, a superannuation fund may need a greater level of liquidity during a crisis period as member switching occurs. The level of challenge here will depend on the nature of the switching (i.e. from less liquid to more liquid options, or out of the fund entirely), the magnitude of the switching (the level of activity of the membership base) and the level of cash inflows into the fund. These characteristics

will vary from fund to fund, hence the tolerance of different funds to illiquid assets will vary considerably. A fund with strong cash flows and a relatively stable membership base can (all other things being equal) tolerate a higher level of illiquid assets (such as a fund with a younger membership base), while a fund with low or negative cash flows and highly active membership base can only tolerate relatively low levels of illiquid assets (such as a fund with an older membership base). As another example, crisis conditions can potentially increase demand for services and decrease donations for a charity investor, which will decrease the tolerance for illiquidity in their portfolio. These examples simply illustrate that the level of illiquid exposure should be tailored to the characteristics of the investor. It also means that if these characteristics change, the appropriate level of illiquid exposure may also change.



Benefits and disadvantages of unlisted assets

Benefits

There are a number of benefits to investing in unlisted or illiquid assets; specifically property and infrastructure. Some of these are reasonably significant, others are less important, and a number of these will also be interrelated. These benefits include the following.

Strong performance

As outlined in *Performance, volatility and correlations* (on pages 4 to 6), long term historical performance has been very strong for these asset classes. This is due to a number of factors including a favourable supply/demand dynamic as well as an intrinsic illiquidity premium. While it is difficult to quantify the illiquidity premium, over longer periods both unlisted infrastructure and property have outperformed their listed counterparts. While we do not necessarily expect performance to continue to be as strong as historically experienced, performance should still be reasonable over the long-term for assets purchased at reasonable prices.

Low volatility

Volatility of returns is low, in part due to infrequent valuations, but also because of the characteristics of the underlying assets. In a portfolio consisting mainly of more volatile assets such as listed equities, the inclusion of unlisted asset classes should dampen overall portfolio volatility.

Low correlations

These asset classes have low correlations with both fixed interest and equities, which should improve the risk/reward trade-off of a portfolio. As noted on page 5 the observed correlation with equities is actually lower than we would expect given the underlying fundamentals. This may be in part due to the lag in unlisted valuations, due to the valuation process, as well as factors other than fundamentals driving listed equities.

Solid governance rights

Ownership is typically more concentrated in unlisted assets which means the asset owners have significantly greater governance powers and hence ability to control the direction of the asset. This is in contrast to listed/liquid strategies

where ownership is usually more fragmented and individual investors typically have minimal governance rights. With more concentrated ownership, management can take a longer term view whereas listed companies can become quite focused on shorter term performance. Greater governance rights also mean that different investment management styles are accessible via unlisted assets (such as those that more actively manage the assets).

Active management

Managers can generally undertake greater active management of assets to generate value with unlisted assets than with listed assets. This is in part due to the ability to take larger ownership stakes and have greater governance rights as outlined above, but it is also due to these being more inefficient markets. As a result, there is more capability for a manager to have superior market knowledge which can lead to greater active performance. Frontier's real assets team has the expertise to help clients choose such managers.

Access to a broader set of assets

Investing in unlisted assets broadens the investible universe to otherwise inaccessible investments. For example, most greenfield infrastructure assets will not be accessible via the listed markets. These markets are also likely to be less "efficient" than listed markets due to low levels of liquidity, which may create investment opportunities.

Inflation protection

While this will depend on the specific investment, many property and infrastructure assets have implicit or explicit inflation linkages with revenue (e.g. fixed or CPI-linked rent ratchets in many office and retail property assets). This should provide some inflation protection, though this may depend on the type of inflation (supply or demand driven).

Long duration

Within infrastructure in particular, there are some assets that have long durations, depending on the nature of cash flows. This has benefits for investors undertaking asset-liability matching with long duration liabilities (such as defined benefit funds).

Income generation

Many infrastructure and property assets generate considerable levels of cash flow, particularly those classified as core. For example, Frontier's RADIAS database indicates that the median cash yield for infrastructure assets over the year to 30 June 2016 was 6.3% p.a., while for property this was 6.5% p.a., according to IPD Australia. This yield assists with portfolio rebalancing and general cash flow management.

Broader benefits

Investment in property and infrastructure may have broader benefits than simply the direct investment characteristics. For example, investment in greenfield projects may support employment in several construction and service-based sectors. Also, one of the rationales behind privatising government assets is that private ownership can lead to more efficient operation of these assets, which is likely to have longer term economic benefits.

Disadvantages

There are also a range of potential disadvantages to investing in illiquid assets, which we outline below. A number of these are related to, or are the flipside of, the various advantages outlined above.

Illiquidity

The key and defining characteristic of illiquid assets is their lack of liquidity. This means the timescale for exiting an investment in these types of assets can vary from months to years. Clearly, it would be unacceptable for a portfolio to consist entirely of illiquid assets as basic requirements for cash flow management are unlikely to be met. On the other hand, a fully liquid portfolio is likely to be unnecessary for most investors and would miss the advantages of investing in illiquid assets, such as diversification and risk mitigation. The manageable level of liquidity will vary from investor to investor and will be largely driven by the fund's growth profile, size and membership profile. The other consideration of illiquidity is the difficulty of exiting an investment should the investment strategy change, or issues arise with the investment manager or asset.

Valuation Process

As unlisted infrastructure and property assets are not frequently bought and sold, valuations are quite infrequent

(often every six months or longer) and undertaken by an independent valuer or the investment manager. Valuations are typically based on fundamental valuation models as well as transaction data, although the amount of comparable transaction data can be limited, particularly for the infrastructure sector. This process and low frequency of valuation can lead to a lag in valuations relative to listed markets. Valuations also tend to be quite conservative, especially in the absence of transaction data. This is in contrast with listed asset classes where valuations are based on up to date trading data.

This difference in valuation processes is a common criticism of real assets. While the valuation process is a disadvantage of the asset class, this is not to say all aspects of the process are problematic. For example, unlisted assets will largely avoid technical factors driving valuations (such as sentiment and momentum) which are experienced by listed equities, due to the valuation process being more based in fundamental factors. Another consideration is that the valuation of an unlisted asset will value the whole entity, whereas the valuation of a listed company is based on the current share price. Since the financial crisis there have been changes to valuation processes by many managers of unlisted investments in an attempt to address concerns, with valuations becoming more frequent and with greater use of independent valuers. However, a point can be reached where more frequent valuations simply increase costs with no material benefit.

Concentration risk

Most managers in property and infrastructure take substantial ownership stakes in individual assets, which can be beneficial from a governance standpoint. However, in some cases this can lead to more concentrated portfolios where the performance of a single asset has a larger impact on overall performance.

Conflicts

There are numerous conflicts to be managed, from the investment manager level, through to conflicts between consortia partners. An example is the conflict between contractors and equity holders in greenfield projects. All of these conflicts need to be managed. While this is not exclusively a characteristic of unlisted investments, should such conflicts become apparent, it is more difficult to exit an illiquid investment.

Negative cash flows and timing

While managers operating in the listed asset classes can generally invest committed capital very quickly, this is often not the case with illiquid assets. Hence the time from making a commitment to a manager drawing down capital can be quite substantial (depending on the structure of the vehicle - refer to *cash flow implications of different structures*), and could create cash flow problems should an investor's circumstances change. This tends to be more of an issue with closed-end, private equity style vehicles which raise all of their capital early and invest over an extended period.

Inability to commit further capital

This is primarily a problem with closed-end funds where commitments can only be made prior to final close. Open-ended funds are able to receive additional capital commitments intermittently via capital raisings.

Fees and costs

Management fees on illiquid investments are quite variable, but tend to be on the higher side compared to liquid assets. Costs can also be high. For example, transaction costs involved in purchasing an asset can be substantial, especially in infrastructure. Many of these costs are still incurred even if a bid is unsuccessful.

No passive management

Given the unlisted nature of these asset classes, it is not possible to invest in an index to gain exposure to the asset class "beta". Hence, it is not possible to gain a cheap beta exposure to these asset classes in a manner similar to passive managers in listed equities.



Outlook

Overall, the characteristics and historical performance of property and infrastructure suggest that they are attractive asset classes for inclusion in a diversified portfolio, provided the overall level of illiquidity in the portfolio is kept to an appropriate level, taking into account the fund's circumstances. So a pertinent question is whether these characteristics are expected to continue into the future.

Infrastructure

As has been the case for a number of years, strong demand for infrastructure has been driving strong performance and, at least over the medium term, we expect demand to continue to outstrip supply. Much of the attraction appears to be the fact that infrastructure assets generate a solid yield in an environment where yield is hard to find. In addition, it is a sector new to many investors globally and increasing familiarity is likely to only increase its demand.

While demand is strong across the board, large core brownfield infrastructure assets attract the most capital due to the low volatility and high income these provide as well as the ability to invest large amounts of capital in single transactions. Hence, pricing should be more attractive in less contested parts of the infrastructure spectrum, such as greenfield infrastructure and mid-market infrastructure, though demand is still very high in these subsectors. There has been some supply side response, such as government privatisations, but not to a sufficient level to absorb the high level of demand.

Given these conditions, performance will likely remain attractive, though it is unlikely to be as high as has been experienced historically. A key risk will be a fall in demand, which could occur when yields in other asset classes normalise. However, as this paper outlines, the benefits of infrastructure are broader than just return/yield, hence new converts to the asset class are still likely to maintain an allocation. It is possible that valuations could be impacted negatively when bond yields increase from their current low levels, but Frontier's data shows that discount rates did not decrease in step with the decline in bond yields and gearing levels are not overly aggressive at present, so there may be a buffer to increasing bond yields.

The other attractive characteristics of the asset class are its low volatility and correlations. It is difficult to know how these are likely to change over time, but it seems unlikely these would change dramatically as they reflect fundamental characteristics of the asset class. However, we do note that over shorter periods or in specific scenarios these could change (for example, correlations between asset classes could increase in a scenario of rising interest rates).

Property

As with infrastructure over the short and medium term, property asset performance will be driven by changes in supply and demand dynamics. In the current market, strong investment activity has continued in key markets in spite of what appear to be mixed fundamentals. Capitalisation (cap) rates in key sectors of the Australian property market are at historical lows, which suggests the strong performance seen in recent times is unlikely to continue, though we still expect performance will be reasonable, underpinned by the strong income component of returns. These low cap rates also need to be considered in the context of the broader low yield environment. Relative to government bonds (which are also at historically low levels), property yields are still attractive when compared to many other asset classes.

While the current conditions indicate purchasing assets on-market is less attractive given low cap rates, quality managers are still able to deploy capital into the market through other less competitive routes, such as through off-market transactions or via additional development of assets in their existing portfolios. At the current point in the cycle, this is Frontier's preferred approach.

As is the case for infrastructure, the low volatility and correlations with other asset classes appear to be fundamental characteristics of unlisted property, hence are likely to remain.

The last word...

In this paper we have looked at a number of historical characteristics of unlisted infrastructure and property and have undertaken modelling to measure the likely impact these have had on portfolio characteristics.

Overall, the inclusion of illiquid assets in portfolios has been positive due to strong performance, low volatility and low correlations with other asset classes. We have also considered the negatives associated with illiquid assets. The main negative is the defining characteristic – illiquidity. There is clearly a constraint on the overall level of illiquid assets any given investor can be exposed to, with the appropriate or maximum level of exposure dependant on the specific investor. However, we see no reason for illiquid assets to be excluded from a portfolio entirely, except where the highest levels of liquidity are required. As with all asset classes there are a series of trade-offs and in the case of illiquid assets, liquidity has been traded off for better performance, lower volatility and low correlations with other asset classes. To date, this appears to have been a reasonable trade off in the case of both infrastructure and property.

While the positive characteristics of illiquid assets have been reasonable in the past, the real question is whether these characteristics continue into the future. Naturally it is impossible to predict with any certainty just what future performance will be; but we do think it is reasonable to expect these asset classes will continue to perform well over the long-term, due to the stable characteristics of the underlying cash flows. It is possible that there could be periods of weaker performance, as demand for these assets ebbs and flows. The other characteristics of low volatility, low correlation and low liquidity seem unlikely to change greatly, though changes such as investment structures or valuation policies may impact these at the margin.

When considering whether an exposure to illiquid assets remains appropriate, it is more relevant to consider the future circumstances of the investor and whether its liquidity requirements are likely to change. This could involve such tasks as profiling the member base of the superannuation fund and estimating how this is likely to affect future liquidity requirements. Frontier's Quantitative Solutions Group can assist with analysing such data.

In summary, we see a strong investment case for including illiquid asset classes in a portfolio, in particular the "real" asset classes of unlisted infrastructure and property. Investors, however, need to be aware of the implications of having such investments and understand their current and future liquidity requirements. As with all asset classes, there will likely be periods of stronger and weaker performance, but over the long-term we believe these assets should continue to perform well in absolute terms and relative to other asset classes, though perhaps not as strongly performing as has been experienced historically. We would also expect other positive attributes of these investments to continue, such as low volatility and low correlations with equities and bonds.

FRONTIER
ADVISORS



About Frontier Advisors: Frontier Advisors is one of Australia's leading asset consultants. We offer a range of services and solutions to some of the nation's largest institutional investors including superannuation funds, charities, government / sovereign wealth funds and universities. Our services range from asset allocation and portfolio configuration advice, through to fund manager research and rating, investment auditing and assurance, quantitative modelling and analysis and general investment consulting advice. We have been providing investment advice to clients since 1994. Our advice is fully independent of product, manager, or broker conflicts which means our focus is firmly on tailoring optimal solutions and opportunities for our clients.

Frontier does not warrant the accuracy of any information or projections in this paper and does not undertake to publish any new information that may become available. Investors should seek individual advice prior to taking any action on any issues raised in this paper. While this information is believed to be reliable, no responsibility for errors or omissions is accepted by Frontier or any director or employee of the company.

Frontier Advisors Pty Ltd ABN 21 074 287 406 AFS Licence No. 241266