

## Infrastructure investment - crossing the divide from asset to investment characteristics

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Australia has had a long history of infrastructure investment. Yet, it is still a relatively new asset to many investors in today's markets. As an asset class, infrastructure encompasses a number of underlying inherent attributes that makes it an intuitively attractive investment, particularly for investors with long term investment horizons.

This paper supports the argument that a global infrastructure exposure, split into listed and unlisted assets, delivers attractive benefits to an investor. AMP Capital will consider the different return and risk attributes generated by packaging infrastructure assets in listed and unlisted structures and strategies with the aim of capturing the best outcomes for investors. After describing the underlying inherent attributes of infrastructure assets this paper seeks to:

1. Explore the manner in which these attributes are preserved, diluted or altered by the way infrastructure assets are packaged into unlisted or listed product structures;
2. Outline the potential benefits and shortfalls of exposure to both unlisted and listed infrastructure; and
3. Suggest strategies to access infrastructure exposure for investors in a manner that captures the 'best of both worlds'. This will be achieved through the analysis and construction of combined portfolios comprised of both unlisted and listed infrastructure investments.

### Increased Popularity of Infrastructure as an Asset Class

Private investment and ownership of infrastructure emerged as an organised asset class in the mid-1990's. Original investment opportunities were largely focussed in Australia, the United Kingdom and Canada. These were a result of budget pressures and policy initiatives that prompted privatisation of previously publicly-owned infrastructure assets, such as airports. Public Private Partnership (PPP) and Private Finance Initiative (PFI) frameworks also emerged for the procurement, development and ownership of economic and social infrastructure assets such as roads, hospitals and schools. Growth in these 'traditional' infrastructure investment markets continues to be driven by a combination of public sector fiscal restraints and a general acknowledgement that in many circumstances, the private sector is better equipped to deliver superior value for money in the provision of large scale and complex infrastructure projects.

#### *Increased allocations from institutional and pension funds*

Latest data from Mercer to 31 May 2007 shows that the average current allocation of Australian superannuation funds to 'Direct Investments' including private equity and infrastructure, stands at 3%, compared with 0.7% in June 2003.<sup>1</sup> According to JANA, Australia's largest institutional asset consultant, 'for a growing superannuation fund, an allocation of between 5 per cent and 10 per cent to infrastructure is typical'.<sup>2</sup> Early adopting 'pioneers' have sought to increase allocations in response to a positive

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<sup>1</sup> Source: Mercer Investing Consulting

<sup>2</sup> Source: Infrastructure – Policy, Finance & Investment, InAssociation, June 2007

experience, overall, during their first decade of investing in infrastructure. At the same time, many funds that have not historically allocated to infrastructure have felt the need to play catch-up.

#### *Rapid development of the infrastructure funds management industry*

Most major global investment banks have evolved their participation in the infrastructure sector, changing from the provision of financial advice and debt services to an end-to-end model involving asset origination, financial advice, principal investment, debt provision, asset repackaging and funds management. The inherent conflicts of interest present in such a model have been largely overlooked to date by an investment group whose primary current objective is to “get set”. Most established Australian infrastructure managers have created an offshore presence to pursue international investment opportunities while many of the international investment banks entering the sector have recruited Australian expertise and knowledge. This is one of the few examples of the export of Australian funds management “best practice” to the rest of the world. Standard & Poors estimates that 27 new infrastructure funds were launched in 2006 alone and at that time, US\$100-150 billion of private capital was available to be deployed globally into infrastructure investment opportunities.<sup>3</sup>

#### *Increased securitisation of infrastructure assets*

Development and growth of infrastructure has been accompanied by increased securitisation of infrastructure assets on global stock exchanges. Infrastructure and utility stocks accounted for 1.12% of the S&P/ASX 200 index as at 30 June 2002. This grew to 5.2% as at 30 June 2007.

In addition, UBS estimates that the market capitalisation of the infrastructure and utilities sector rose from around 3.3% as at 30 June 2000, of the total market capitalisation of global equities markets (as measured by the S&P/Citigroup BMI World Index)<sup>4</sup> to 5.1% as at 30 June 2006. The UBS Global Infrastructure & Utilities Index currently accounts for US\$1,787 billion of total market capitalisation.

#### *Creation of specialist sharemarket indices*

The increased growth and demand for securitised infrastructure assets has resulted in the creation of a variety of published equity market indices designed to track the performance of listed infrastructure securities, globally. S&P, FTSE and a number of financial institutions have developed individually constructed indices, tracking different combinations of infrastructure and utilities securities. While it is believed that none of these indices adequately represent a universe of securities that fulfil an appropriate definition of infrastructure, prompting AMP Capital to create its own Global Listed Infrastructure index, their development represents an important signpost for the growing focus on infrastructure as a discrete asset class.

#### *Development of retail products*

In contrast to its more traditional institutional background, recent times have seen the development, for the first time, of packaged products designed to facilitate diversified infrastructure exposure for retail investors. The majority of these products have been built primarily around listed infrastructure securities, with resultant positives and negatives in terms of investment characteristics and their impact on broader portfolio attributes. However, a number of retail-focussed products that either have been launched or are due to be launched, also aim to deliver investors a combined exposure to both unlisted and listed infrastructure assets and their corresponding investment characteristics.

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<sup>3</sup> Source: S&P – The Amazing Growth of Global Infrastructure Funds: Too Good to be True ? 2006

<sup>4</sup> Source: UBS Investment Research, “S&P calculated benchmark for Global Infrastructure & Utilities”, 13 February 2006

## Generic Attributes of Infrastructure Assets

### *Investment advantages*

The attractiveness of investing in infrastructure is underpinned by a number of inherent characteristics within this asset class. These include:

- The provision of essential services. Consequently, these investments have a demand and revenue profile that is relatively inelastic to both price and cyclical variation in economic activity or the business cycle. For example, consumers require relatively consistent amounts of gas or electricity irrespective of whether economic activity is booming or depressed.
- Operation in highly regulated environments leading to either monopolistic characteristics or high barriers to entry that create sustainable competitive advantage and generate high predictability of revenue and earnings. The land required to construct a major city airport means that airports like Sydney, Melbourne and Brisbane operate as virtual natural monopolies.
- Typically long duration assets, built or acquired with a life expectancy of 30-50 years (or more) and generating a cashflow profile suitable to match long duration liabilities such as those of a superannuation fund or other long term investor. Toll-road concessions for new projects such as Sydney's Lane Cove Tunnel or Brisbane's North South Bypass Tunnel allow the road operator to collect toll revenue for between 30 and 45 years;
- Pricing or revenue regimes that are explicitly or implicitly linked to movements in the Consumer Price Index (CPI), making them an effective hedge against inflation and reliable generator of real returns. Toll-road concession agreements have toll increase mechanisms that are linked to CPI movements while pricing for regulated monopoly assets like gas or electricity distribution networks have inbuilt CPI adjustments.
- High up-front capital build or purchase costs but relatively low levels of ongoing operating costs and volatility, allowing infrastructure assets to generate high earnings before interest, tax, depreciation and amortisation (EBITDA) margins and predictable levels of operating cashflow. Mature operating toll-roads such as those owned by Transurban (for example, Sydney's M1, M4 and M5 or Melbourne's CityLink) operate at EBITDA margins of between 70-85%. These characteristics lend themselves to innovative financial engineering and use of gearing within asset structures, allowing income to be delivered to investors in a tax-effective manner.

### *Investment risks*

The primary risk factor that can potentially impact the performance of infrastructure assets is movements in the level of real interest rates. Given the typically geared nature of infrastructure assets, an increase in interest can affect interest payment obligations and future debt refinancing prospects. But given that revenue from most infrastructure assets is explicitly or implicitly indexed to inflation, a natural hedge is created. Consequently, it is when real interest rates rise (an interest rate increase exceeds an increase in inflation) and interest expenses are in excess of revenue rises, that performance and asset valuation may be impacted.

Other major risks inherent in infrastructure assets are their exposure to factors such as regulatory or political risk and vulnerability to exogenous shocks such as terrorist events. Passenger numbers at Melbourne Airport declined by almost 5% from the prior year in 2001/02, following the 2001 terrorist

attacks on the World Trade Centre but had fully recovered by the end of the 2002/03 financial year.<sup>5</sup> In addition, there are the standard risks that apply to most investments such as currency and liquidity risk.

### **Making the leap from asset to investment characteristics – the importance of packaging**

The generic attributes of infrastructure assets detailed above combine to generate investment characteristics that are inherently attractive for a traditional balanced portfolio. AMP Capital believes these attributes and the corresponding investment characteristics below form the cornerstone of product building. They include:

1. Predictable and stable cashflows that are relatively uncorrelated to cyclical volatility in economic activity, business sentiment and other traditional equity market drivers;
2. The potential to generate a relatively high and predictable level of running yield due to the combination of demand and revenue stability, predictable operating costs and typically low ongoing capital expenditure requirements; and
3. Inflation and interest rate hedged cashflows and returns, allowing the generation and preservation of real investment returns and asset values.

In addition, the manner in which infrastructure assets are packaged in a product for investors, through the use of unlisted or listed investment structures, is an important factor in preserving, diluting or altering these characteristics.

#### *Unlisted infrastructure – investment features*

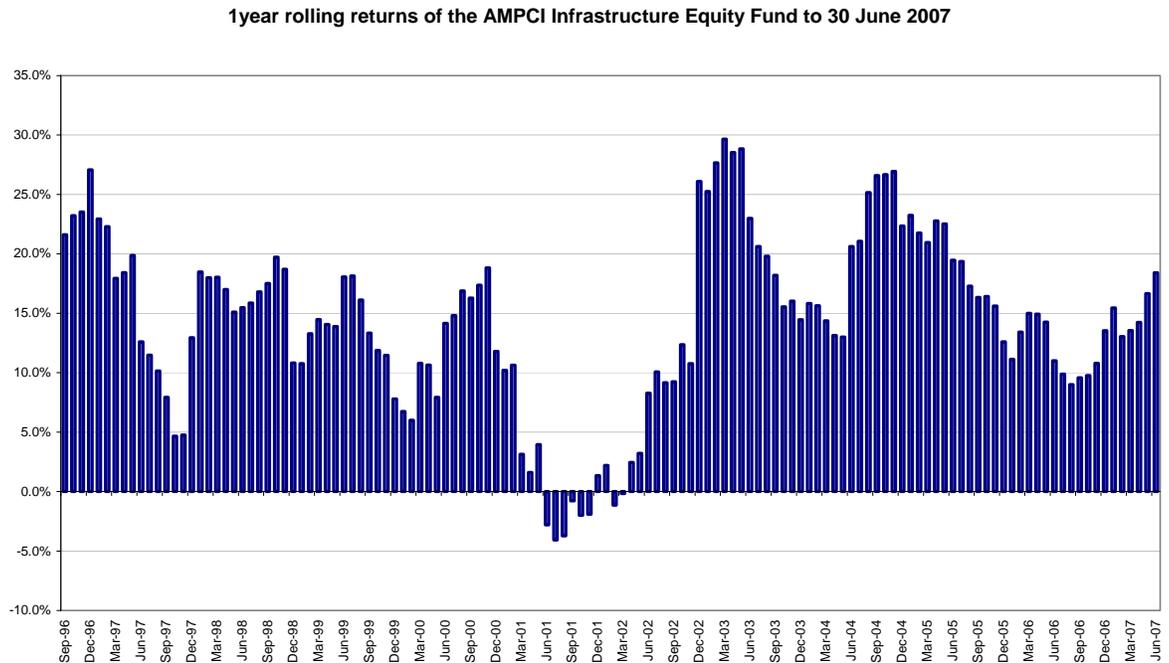
The use of unlisted asset and portfolio structures tends to provide a more “pure” exposure to the inherent underlying characteristics of infrastructure assets. Periodic asset revaluations, normally based on discounting future expected cash flows back to a net present value, accurately match incremental accretion or dilution of investment value over time. Unlisted packaging effectively translates the underlying stability, low volatility and uncorrelated nature of infrastructure asset performance into investment performance and return characteristics. It also facilitates exposure to a broader range of infrastructure sub-sectors, such as greenfield tollroads and social infrastructure, than is currently accessible through securitised, listed infrastructure markets.

The stability of unlisted infrastructure returns is illustrated by the chart below, showing the rolling one year return of AMP Capital's Infrastructure Equity Fund (IEF), one of the world's oldest unlisted infrastructure funds, established in September 1995. Of the 130 total monthly observations between 30 September 1996 and 30 June 2007, IEF has generated positive one year returns for 122 of these observations, or 93.9% of the time. Since 31 December 1999, IEF has generated positive rolling one year returns for 89.9% of monthly observations. This compares with the frequency of positive return observations from the S&P/ ASX 200 and the UBS Global Infrastructure & Utilities Index of 83.5% and 81.0% respectively over the same period. All data shown is before fees and taxes.

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<sup>5</sup> Source: Australia Pacific Airports Corporation and AMP Capital Investors

**Chart 1: Frequency of positive rolling 1 year returns to June 2007 (before fees and tax)**



Source: AMP Capital Investors. All data shown is before fees and tax. Past performance is not a reliable indicator of future performance.

Unlisted infrastructure does however deliver these benefits at a cost that has historically precluded most retail investors from participation. This cost is illiquidity. Individual investors seeking to acquire or divest exposure to a single or a diversified portfolio of unlisted assets may not be able to do so in a timely or efficient manner. In addition, the scale of capital commitment required to build a globally diversified portfolio of unlisted infrastructure exposures has largely placed this access beyond the reach of a mainstream retail investment audience.

#### *Listed infrastructure – investment features*

Illiquidity in the unlisted market was one of the primary factors that drove the development of the listed, securitised market for infrastructure assets and vehicles that emerged in the 1990's. Listed packaging creates liquidity in inherently illiquid underlying assets and allows investors to trade views on asset or sector value in a timely and efficient manner. Investors can also construct globally diversified portfolios of infrastructure exposures with a smaller portfolio size requirement in a more cost effective and time-efficient manner.

These benefits, however, are also generated at a cost. This cost is volatility of investment return that is mismatched with the often underlying operational stability of infrastructure assets and the "tainting" of infrastructure investment characteristics with equity market beta. This return volatility and equity market beta dilutes the portfolio diversification benefits of participation in the infrastructure asset class.

The table below illustrates the relatively higher historical correlation of listed infrastructure returns with broad equity market returns during the five year period to 30 June 2007, compared with unlisted infrastructure returns. The UBS Global Infrastructure & Utilities Index is used as proxy for the listed

exposure. And given the absence of a broad based, unlisted infrastructure index, IEF has been used as a proxy for unlisted infrastructure in all of the analysis that follows.

**Chart 2: Correlation of asset returns to 30 June 2007**

| Correlation of returns |                      | S&P/ASX 200 | Unlisted             | Listed               |
|------------------------|----------------------|-------------|----------------------|----------------------|
| 5 years to 30/06/07    |                      |             | Infrastructure (IEF) | Infrastructure (UBS) |
| S&P/ASX 200            |                      | 1.00        | 0.11                 | 0.61                 |
| Unlisted               | Infrastructure (IEF) | 0.11        | 1.00                 | 0.12                 |
| Listed                 | Infrastructure (UBS) | 0.61        | 0.12                 | 1.00                 |

Source: AMP Capital Investors

As shown in Chart 2, the low historical correlation of investment returns from unlisted infrastructure with returns from equities during the past five years has made the asset class a powerful diversifier of risk in equity-focussed portfolios. Similar results and conclusions are evident over both shorter and longer term historical horizons.

#### **Issues with listed infrastructure indices**

The inherent equity market beta that is embraced via investment in listed infrastructure is magnified by the inappropriately constructed nature of the published listed infrastructure indices against which most active listed infrastructure managers construct and manage portfolios. The universe of securities comprising the major weightings within these indices are heavily biased towards companies and vehicles operating in areas that we believe do not fulfil a valid definition of infrastructure, based on the characteristics described earlier in this paper.

These indices are mostly heavily weighted towards merchant electricity generating and vertically integrated utility businesses (including energy retailing). As an example, electricity generation and vertically integrated utility companies currently account for 57.5% of the total market capitalisation of the UBS Global Infrastructure & Utility Index. Companies operating in these areas often compete in markets that are either unregulated or possess low barriers to entry and are characterised by high and/or volatile operating costs. As such, they are similar in nature to traditional industrial companies and not surprisingly, more highly correlated with them than assets and entities possessing true infrastructure characteristics.

#### *Creation of a customised index reflecting the true characteristics of infrastructure assets*

AMP Capital has sought to deal with this issue by constructing a customised listed infrastructure index<sup>6</sup> that excludes securities and companies that do not fulfil a definition of infrastructure consistent with the required characteristics outlined in this paper. Certain regulated components of the utility sector and utility assets operating within the energy transmission and distribution sectors have been retained, due to their true infrastructure characteristics. The AMP Capital Global Infrastructure & Utilities Index has a market

<sup>6</sup> The AMP Capital Global Infrastructure Index

capitalisation of USD\$439 billion and comprises 24.6% of the broader UBS Global Infrastructure and Utilities Index at 30 June 2007.

The table below illustrates the performance characteristics of the AMP Capital Global Infrastructure Index versus the UBS Global Infrastructure & Utilities Index for five years to 30 June 2007. As illustrated, removing the more volatile and equity market-correlated components of a mainstream index has resulted in an index with lower historical volatility and a higher historical risk /reward ratio and dividend yield.

**Chart 3: Performance relativities between listed infrastructure indices**

| Five years to 30 June 2007                  | Return (% pa) | Risk (Volatility - % pa) | Reward to risk ratio | Dividend Yield % |
|---|---------------|--------------------------|----------------------|------------------|
| AMP Capital Global Infrastructure Index     | 19.6          | 8.6                      | 2.3                  | 4.0              |
| UBS Global Infrastructure & Utilities Index | 20.5          | 10.7                     | 1.9                  | 3.8              |

Source: AMP Capital Investors. All data shown is before fees and tax. Past performance is not a reliable indicator of future performance.

#### **Strategies to Capture the Best Attributes of Unlisted and Listed Infrastructure Investment**

Until recently retail investors were faced with a challenging dilemma when deciding to invest in infrastructure. This dilemma required them to choose either:

- The illiquidity of unlisted infrastructure as a trade-off for accessing its inherent stability and diversification benefits; or
- The equity market beta inherent in listed infrastructure, with negative volatility and diversification consequences, as a trade-off for its liquidity.

Neither of these alternatives has proven completely satisfactory and the economies of scale requirements have made it challenging for most individual investors to blend unlisted and listed assets and vehicles into an integrated portfolio, particularly on a global basis.

#### *Portfolio Benefits of Unlisted and Listed Infrastructure*

At the same time, historical empirical evidence suggests that both unlisted and listed infrastructure exposure has added diversification benefits to mainstream portfolios. This is illustrated below, where the inclusion of allocations to listed, unlisted and a combination of listed and unlisted infrastructure has improved the performance characteristics of a theoretical portfolio comprised initially of 50% Australian shares (using the S&P/ASX 200) and 50% Australian bonds (using the UBS Warburg Composite Bond Index).

**Chart 4: Performance characteristics of a theoretical balanced portfolio to 30 June 2007 (before fees and tax)**

| 5 years to 30 June 2007   | Return (% pa) | Risk (Volatility - % pa) | Reward to risk ratio |
|---|---------------|--------------------------|----------------------|
| <b>Portfolio 1</b>  |               |                          |                      |
| 50% Australian shares   | 12.26%        | 4.39%                    | 2.79                 |
| 50% Australian bonds  |               |                          |                      |
| <b>Portfolio 2</b>  |               |                          |                      |
| 45% Australian shares, 45% Australian bonds,  | 12.90%        | 4.20%                    | 3.07                 |
| 10% Unlisted infrastructure   |               |                          |                      |
| <b>Portfolio 3</b>  |               |                          |                      |
| 45% Australian shares, 45% Australian bonds,  | 13.00%        | 4.51%                    | 2.88                 |
| 10% Listed infrastructure   |               |                          |                      |
| <b>Portfolio 4</b>  |               |                          |                      |
| 45% Australian shares, 45% Australian bonds, 5% Unlisted infrastructure, 5% Listed infrastructure | 12.95%        | 4.32%                    | 3.00                 |

Source: AMP Capital Investors. All data shown is before fees and tax. Past performance is not a reliable indicator of future performance.

The data contained in the table above shows that including infrastructure, listed or unlisted, in the theoretical balanced portfolio improves its reward to risk ratio. The most superior outcome is the 10% allocation to unlisted infrastructure although the trade-off is the cost of illiquidity. Portfolio 3, a 10% allocation to listed infrastructure also provides a good outcome return-wise. However, portfolio risk is higher given the increased exposure to equity market risk. Portfolio 4, the 10% allocation to the combined listed and unlisted infrastructure portfolio, provides an attractive combination of enhanced return and lower risk relative to each of the other theoretical portfolios.

#### *Combined infrastructure products*

A new breed of mixed infrastructure investment products are emerging that will allow investors access to the best features of unlisted and listed infrastructure. These products can potentially efficiently and effectively deliver, on either a regional or global basis, the combined benefits of liquidity, low volatility and low correlation of investment returns with mainstream asset classes. The historical performance characteristics of a theoretical portfolio comprised of a 50/50 unlisted/listed infrastructure split and including actual exposures to five direct unlisted mature assets (35%), IEF (15%) and the AMP Capital Global Infrastructure & Utilities Index (50%) is presented in Chart 5. The period of analysis is five years to 30 June 2007 and is before fees and tax.

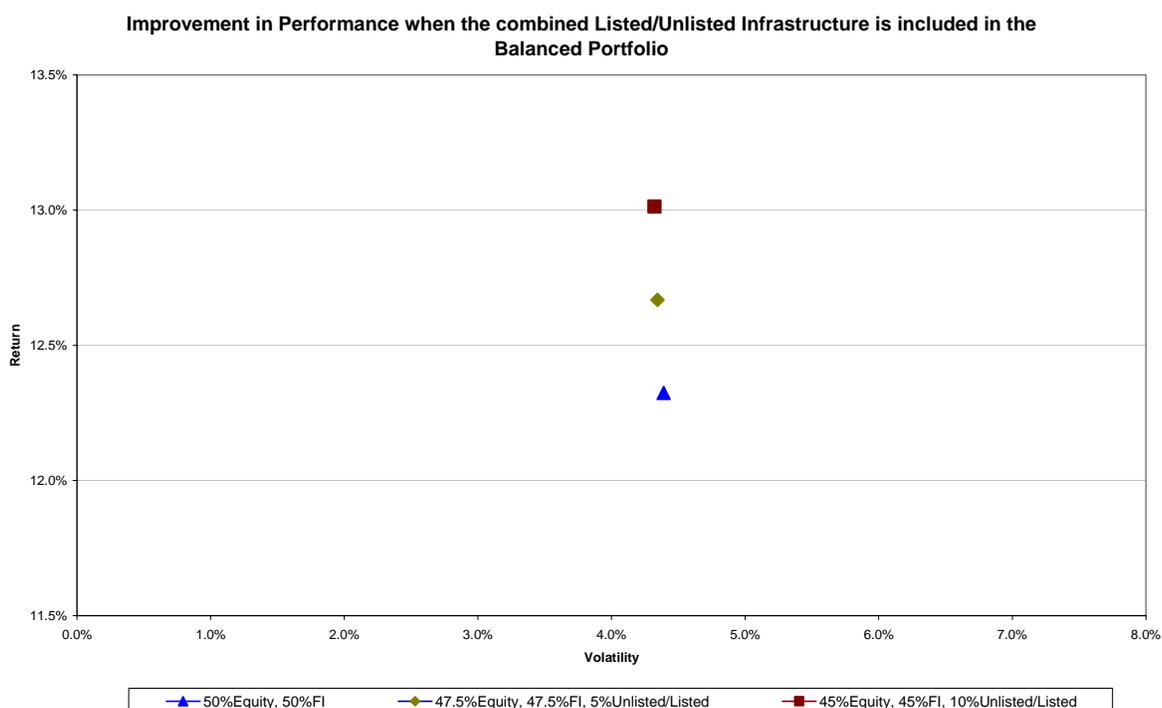
**Chart 5: Risk and returns of a combined infrastructure portfolio before fees and tax**

| Five years to 30 June 2007                           | Return (% pa) | Risk (Volatility - % pa) | Reward to risk ratio | Dividend Yield (%pa) |
|--|---------------|--------------------------|----------------------|----------------------|
| Unlisted infrastructure                              | 18.4          | 8.9                      | 2.08                 | 5.1                  |
| AMP Capital Global Infrastructure Index              | 19.6          | 8.6                      | 2.3                  | 4.0                  |
| Combination Unlisted/Listed Infrastructure Portfolio | 19.2          | 7.0                      | 2.7                  | 4.5                  |

Source: AMP Capital Investors. All data shown is before fees and tax. Past performance is not a reliable indicator of future performance.

The table shows that although the return is slightly lower than the AMP Capital Global Infrastructure Index, the combination unlisted and listed infrastructure portfolio has lower volatility and a better reward to risk ratio overall. The impact of including 5% and 10% allocations to this portfolio, funded equally from a theoretical portfolio comprised initially of 50% Australian shares and 50% Australian bonds, is also included below.

**Chart 6: Results of 10% inclusion of listed and unlisted infrastructure in a balanced portfolio**



Source: AMP Capital Investors. All data shown is before fees and tax. Past performance is not a reliable indicator of future performance.

Inclusion of a 5% or 10% allocation to a combined unlisted/listed portfolio of global infrastructure assets reduces the risk of a theoretical balanced portfolio and increases its return. The volatility of the portfolio containing the combined infrastructure exposure reduces to 4.3% when a 10% allocation to the combined unlisted/listed infrastructure exposure is included, from an initial level of 4.4%. Returns improve by 70 basis points per annum, from 12.3% per annum to 13.0% per annum. As a result, the reward to risk ratio increases from 2.8 to 3.0 for the portfolio containing the allocation to the combined unlisted/listed infrastructure exposure.

## **Conclusion**

While infrastructure assets have a number of inherent attributes that generate attractive investment characteristics, the way infrastructure assets are packaged for delivery to investors is critical. Unlisted infrastructure assets and vehicles have delivered stable, uncorrelated investment returns at low levels of volatility but investors have had to give up a significant degree of liquidity. Listed infrastructure address the illiquidity issue but has generated investment returns containing a higher degree of volatility and inherent equity market beta.

The search for the 'best of both worlds' has produced a new breed of mixed or combined infrastructure investment products for retail investors, containing both unlisted and listed infrastructure exposures. Through effective diversification into uncorrelated and low volatility investment returns that can be delivered with a high degree of liquidity, an allocation of around 10% of client portfolios into these types of vehicles has the potential to improve the performance characteristics of a theoretical balanced portfolio. In particular, a 50/50 split between listed and unlisted infrastructure has theoretically been found to provide the most effective mix from a risk and return perspective.

All data and analysis is based on research by Paul Foster and Alcides Rojas of AMP Capital Investors, except where otherwise indicated.