THE Frontier Line

Thought leadership and insights from Frontier Advisors

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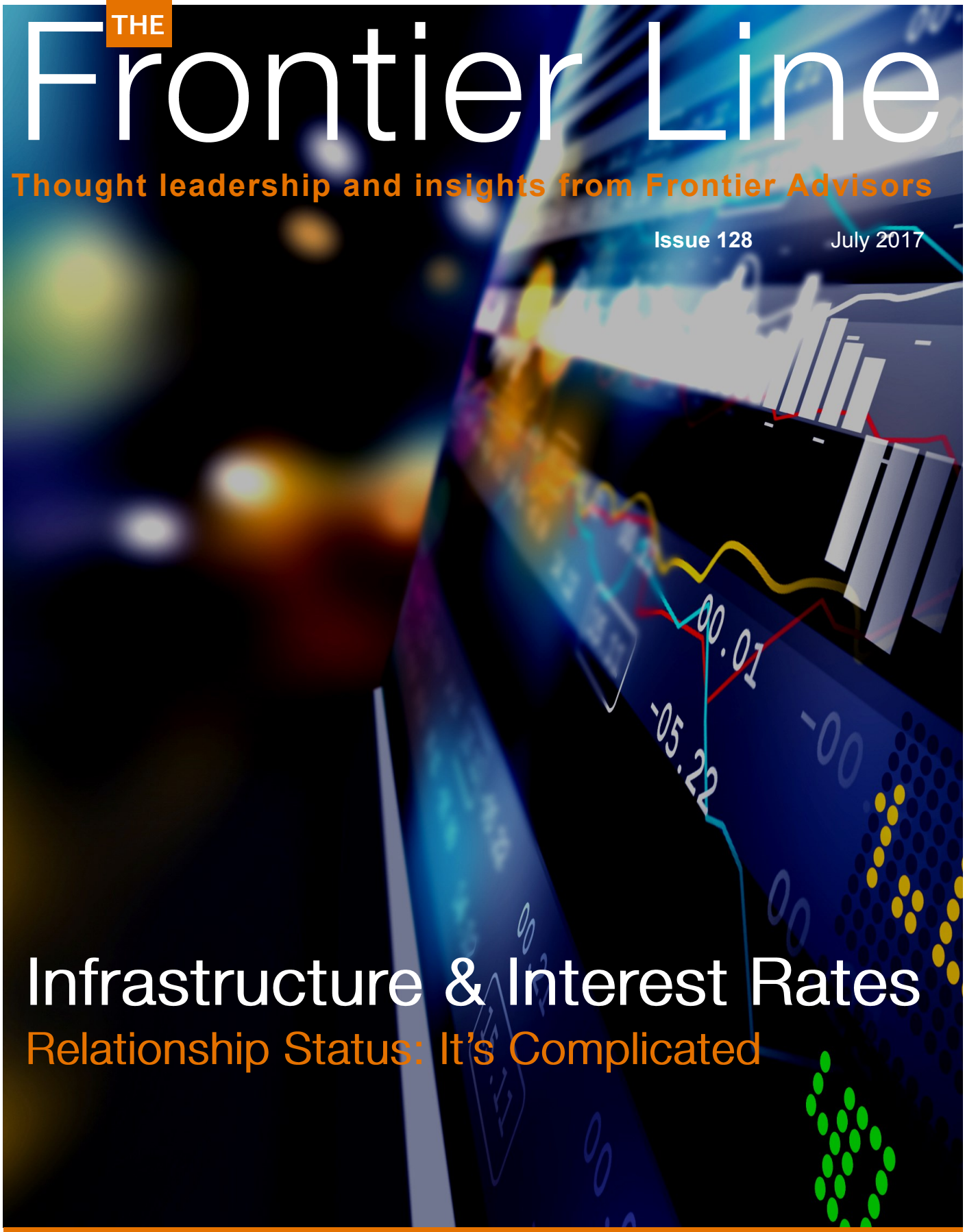

Infrastructure & Interest Rates

Relationship Status: It's Complicated

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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.

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Michael Sofer is a Senior Consultant and leads the firm's Quantitative Solutions Group. His team develops risk management strategies, quantitative tools and data management processes for clients. QSG is responsible for the analytical modules on Frontier's Partners Platform.

Michael is also an infrastructure specialist. He works with clients to design and build infrastructure portfolios. He advises on direct transactions and manages the group's global infrastructure research database, RADIAS.

Michael completed a Bachelor of Commerce and Bachelor of Aerospace Engineering (Hons) at Monash University. He graduated Class Dux for Engineering and received the University Medal for Commerce. He is a CFA Charterholder.

Introduction

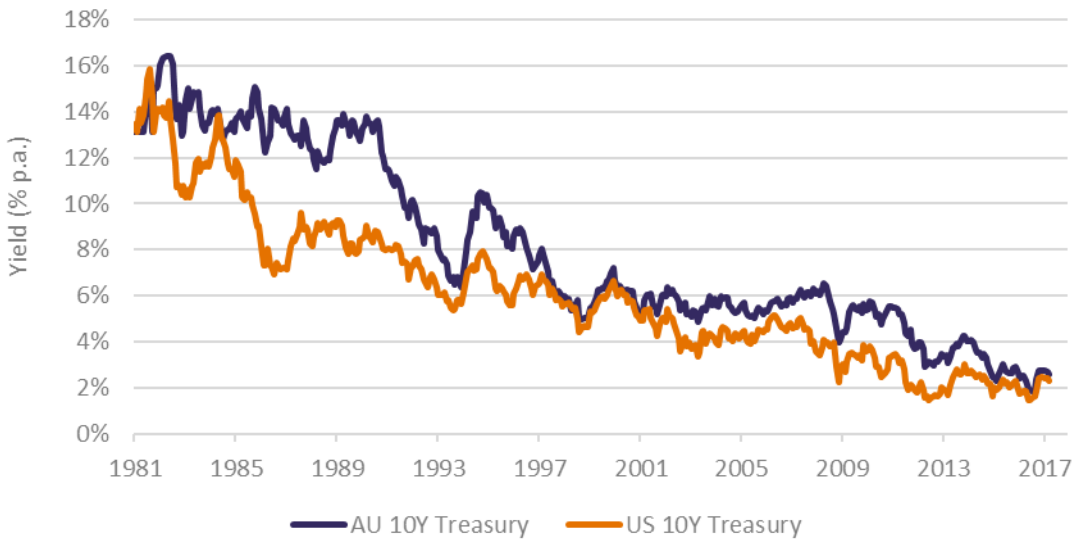
Infrastructure assets often have very long time horizons (up to 99 years). Holding all else constant, this makes their value sensitive to changes in the discount rate (the rate used for discounting the future cash flows). From a technical perspective, this is referred to as their duration. As a general rule, higher duration assets are more sensitive to changes in the discount rate than lower duration assets.

Interest rates around the world are at 30-year lows driven by a combination of falling inflation and real growth expectations. These are linked (through the risk free rate) to infrastructure discount rates, which are in turn linked to valuations (and in this paper unlisted infrastructure equity valuations specifically).

Hence, an important question: what will happen to infrastructure valuations when interest rates rise?

With over $20 billion of client money invested in infrastructure assets around the world, Frontier has researched this topic in detail. Interestingly, our findings show that infrastructure is, in fact, not as sensitive to interest rate moves as one might first assume. This Frontier Line outlines our reasoning.

Chart 1: The Bond bull market



Source: Bloomberg

Mathematical duration

Mathematically, infrastructure is one of the longest duration asset classes around. Holding all else constant, changing the discount rate has a significant impact on value.

Using our RADIAS database, which includes comprehensive metrics on over 500 global infrastructure assets, we estimate the average duration to be around 17 years. Mathematically, this means that a 1% increase in the discount rate results in a 17% reduction in equity value.

With global interest rates likely to rise, this represents a scary proposition for current infrastructure investors as well as those considering the asset class.

Realised duration

However, in practice, infrastructure valuations are not as sensitive to changes in interest rates as the mathematical duration would suggest. That is, we argue that their duration is much less than 17 years.

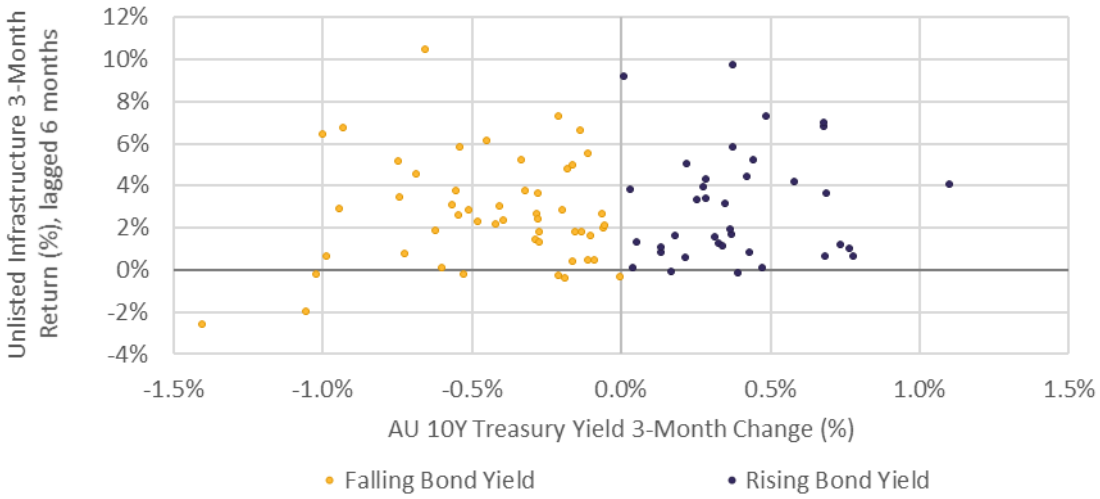
First, let's review the historical perspective. Chart 2 shows interest rate changes (using Australian 10-year government bonds as a proxy) against equity valuation changes. As you'll see, and despite what one would expect, there doesn't appear to be much of a negative relationship (i.e. rates down/ performance up and rates up/performance down). In fact, history has shown generally positive performance regardless of interest rate movements.

Let's also delve a bit deeper and isolate periods when interest rates were specifically rising. Chart 3 shows infrastructure performance over different decades – 1990s, 2000s and 2010s.

- **1990s -** The Australian 10-year government bond yield rose noticeably twice – increasing 4.1% over nine months in 1994 and 2.2% over 16 months starting in 1998. Referencing the 1998 period (our infrastructure data series only commences in 1995), on average no negative infrastructure performance was observed.
- **2000s –** The Australian 10-year government bond yield rose noticeably only once – increasing 1.7% over 16 months starting in 2008. Again, despite some negative performance during the global financial crisis, infrastructure overall continued to perform strongly.
- **2010s –** More recently, the Australian 10-year government bond yield increased 0.9% over five months in 2016. Once more, no negative performance in infrastructure was observed.

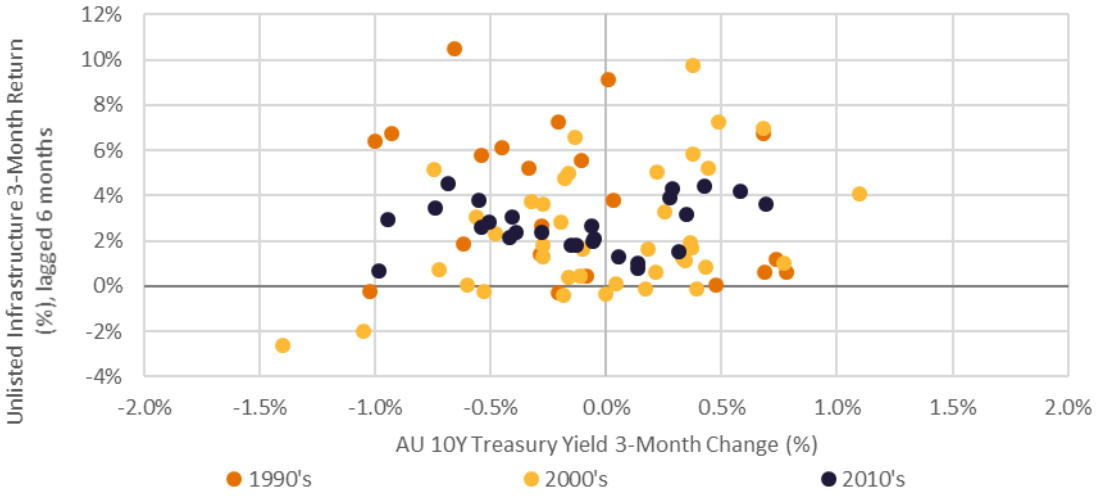
While we do know that the global financial crisis was a tough period for certain infrastructure assets, in general the past has not provided evidence of a strong negative relationship between interest rate changes and infrastructure performance.

Chart 2: Infrastructure performance and interest rate changes



Source: RADIAS and Bloomberg

Chart 3: Infrastructure performance and interest rate regimes



Source: RADIAS and Bloomberg

Qualities of infrastructure that reduce the duration exposure

As seen in the previous analysis, realised infrastructure performance does not conform to our traditional understanding of long duration assets (i.e. interest rates rising equals poor performance, and interest rates falling equals good performance). There doesn't appear to be a strong negative relationship between infrastructure performance and interest rates.

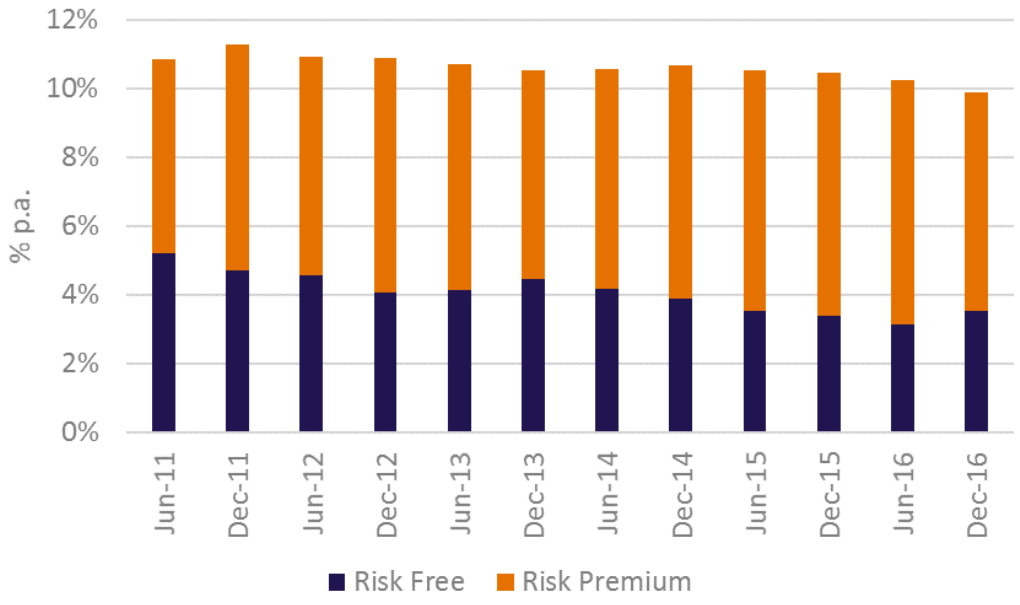
There are several key reasons for this.

- **Independent Valuation Methodology** - The discount rate adopted by independent valuers is built up off a variety of factors and is not solely driven by government bond yields. Importantly, the risk free rate used as the basis for the building block methodology is adjusted to reflect longer-term and normalised expectations. For example, this can be done by using a rolling average method (e.g. average 10-year government bond yields over a period of time) or applying premiums to the existing spot rate to account for today's unusual interest rate period (e.g. quantitative easing premiums, liquidity premiums, etc). As a result, despite long-term government bond spot rates around the world being around 2.5% or less (2.7% and 2.3% for Australian and US 10-year government bonds as at 3 July 2017 to be exact), our RADIAS database shows that actual risk free rates used for valuation purposes are closer to 3.5%. Hence, we would expect that, as interest rates rise from their current low levels, discount rates will also start to increase but not as quickly as spot interest rate movements. For us, this is an important feature of infrastructure valuations that will protect value as we exit this unprecedented period.
- **Risk Premium -** Another important component of infrastructure discount rates is the risk premium - the additional return offered to investors in exchange for accepting illiquidity risk, asset-specific risk, legislative risk, etc. As can be seen in Chart 4, while the risk free rate has been declining over the past several years, the average risk premium for core assets has been increasing. Effectively, the changes to the risk premium have been partially offsetting falling risk free rates. We think of this as a kind of buffer, which has been moderating the changes to overall infrastructure discount rates. Importantly, we observed in the RADIAS data that for the first time in several years, the risk free rate has already increased slightly (from 3.1% in June 2016 to 3.5% in December 2016). At the same time, the risk premium fell (from 7.1% to 6.4%) so that the overall discount rate still fell (from 10.2% to 9.9% on average for core global infrastructure assets). Today, the average risk premium for a core infrastructure asset is around 6.4%. This is in-line with its historical average, and provides a material buffer to offset rising risk free rates (the inverse of what has been happening over the past several years). Again, this reasonable premium leads us to conclude that infrastructure's duration risk will be more muted than its mathematical expectation.

- **Cash Flow Response -** Finally, there is the numerator side of infrastructure valuations (i.e. the cash flows). This is impacted by why interest rates are changing. At the moment, interest rates around the world are rising because of improving economic conditions and the expectation of growth (albeit muted) into the future. As many infrastructure assets are positively correlated to economic growth, it follows, therefore, that this environment should generate higher cash flows, which in turn improve infrastructure valuations. Of course, higher interest rates can also lead to higher costs (through higher debt service), which can detract from this effect, but the impact varies according to the structure of the debt (hedging, tenor, quantum, terms, etc). To sum up, and in general, the ability of infrastructure assets to generate a higher yield in a more conducive economic environment helps to mitigate any adverse impact from an increasing discount rate.

Based on these three factors, we believe that the realised duration of infrastructure is less than the mathematical duration derived from the ultra-long term cash flows from these assets. In other words, the subtleties of the infrastructure valuation process and the assets themselves means that interest rates rising is not in itself negative for the asset class. There are many other factors at play that impact the performance of the individual assets.

Chart 4: Average infrastructure discount rates



Source: RADIAS. Data represents average discount rates for unlisted core infrastructure assets held in existing portfolios

Second order impacts

As shown previously, we believe that the current economic environment (reasonably favourable) and the current valuations of infrastructure assets (which reflect long-term risk free rates and strong risk premiums) mean that rising interest rates will not have a severely adverse impact on the future performance of the asset class.

However, something that we also monitor as a risk is the second order impact of risk free rate changes. In particular, this concerns investor capital flows. In recent years, a significant wave of capital has flowed into the asset class seeking yield. Now, as interest rates rise and other asset classes begin to look more attractive, will we see reduced demand or even capital outflows from infrastructure?

For the moment, we do not see this as a short or even medium term issue; a recent Preqin survey[1] indicated that unlisted infrastructure dry powder continues to rise. However, over the longer-term it is reasonable to expect that demand for the asset class will revert to more reasonable long-term levels. This is one of the many reasons why we continue to apply our rigorous due diligence process when selecting and monitoring investments for clients.

1. Preqin Quarterly Update: Infrastructure Q1 2017.

The final words...

Interest rates around the world have been structurally declining for 30 years and seemingly now the only way is up. This can be quite troubling for investors holding assets with a valuation period that can extend up to 99 years.

However, our research has shown that, while the mathematical duration of infrastructure is high (around 17 years), there are subtleties to the valuation process which in fact reduces interest rate sensitivity. These include the adoption by independent valuers of long-term risk free rates, the current strong risk premium for core infrastructure assets (around 6.4% on average), and the likely positive impact on cash flows from a generally improving global macroeconomic condition. Further, given the complex linkages between infrastructure performance and interest rate changes, it is likely that infrastructure will outperform those asset classes that have a more explicit link (bonds for example).

Today's infrastructure environment is certainly not risk free and we do see several key issues emerging. However, that is the subject of another discussion. Here, we simply make the point that the link between interest rates and infrastructure asset performance is more complicated than it may at first seem, and a dissection of that linkage reveals that there are more factors at play.

We encourage you to contact our Real Assets Team to discuss this topic (and others) in more detail.

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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.

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