

Infrastructure investing needs a tight definition

Andrew Maple-Brown | Maple-Brown Abbott | 13 August 2015

ABSTRACT

In an environment of considerable market volatility and inflation risk, investors globally are searching for defensive portfolio solutions. As such, infrastructure investments have gained greater focus in recent years as investors are drawn to the defensive characteristics of the sector. Inflation protection, reduced volatility (relative to broader equity markets), and portfolio diversification benefits are amongst the core tenants of what an infrastructure approach has to offer. But investors face a dilemma: will an expected defensive asset actually deliver these defensive characteristics when required?

History has shown that infrastructure assets have demonstrated considerable variances in defensiveness, both in recent years, and most notably during the Global Financial Crisis (GFC). Investors' perception of the performance of listed infrastructure during the GFC was hugely impacted by the investment strategy that they had chosen, or the infrastructure index they may consider as a proxy of the sector's performance. In the author's opinion, the reasons for this variance are poorly understood. Moreover, the typical definition of infrastructure continues to broaden within the market today.

This paper contends that infrastructure investing requires a tight definition to deliver the defensive attributes that investors are targeting. The most significant factor that impacts the defensiveness of the sector can be found in the very definition itself. It is proposed that core infrastructure investing requires an approach that looks beyond the physical attributes of a security, and instead delves into the commercial frameworks in which the assets operate. Of second most importance is the influence of corporate governance.

The variance in returns experienced across the sector is considered, in both recent years and during the GFC. The impact that these two factors – (a) the definition used; and, (b) corporate governance – had on the variance of returns is then analysed. Examples of assets that are commonly referred to as infrastructure (including ports and integrated utilities) are discussed, and examples of corporate governance practices in the sector that are concerning are highlighted.

The paper concludes that the definition of infrastructure used by an index (or an investment manager) has a substantial impact on its defensiveness. Further, it is argued that investment managers should select indices consistent with their investment strategy – and so, the choice of infrastructure index for each investment strategy provides a valuable insight into the likely defensiveness of the strategy.

1. THE DEFENSIVE ASPECTS OF AN INFRASTRUCTURE ASSET

The defensive components of infrastructure investing can be found in the essential service nature and strong strategic positions of the underlying assets. In a number of cases, the revenues of infrastructure assets have a natural link to inflation, which can in turn lead to a level of inflation protection. From a portfolio perspective, the long-dated cashflows from infrastructure assets are seen as an effective match for long-dated liabilities, while the lower correlation to traditional asset classes can provide diversification benefits. The defensive characteristics outlined here have long been central to the infrastructure investment narrative.

In the author's opinion, these key characteristics distinguish infrastructure investments and, in turn are keenly sought by investors. It is therefore logical that these characteristics should drive an investment process and formulate a definition of the investment universe.

2. ARE ALL THE INFRASTRUCTURE ASSETS DEFENSIVE?

As noted above, the defensive nature of infrastructure assets is derived from their essential service nature and strong strategic positions. Naturally, different assets possess these qualities to different extents and so it follows that infrastructure assets will possess varying degrees of defensiveness.

These differences have commonly been observed within academic research of the sector. For example, a particularly in-depth analysis of the infrastructure sector by the Technische Universität München (TUM) in 2012 concluded: "there is no such thing as a "standard infrastructure asset" with universally low investment risk".¹

The extent of this variance is often misunderstood. A review of the historical performance, volatility and correlation data of the main global listed infrastructure (GLI) indices demonstrates this. Even starker is the variance in performance of the GLI indices during the GFC. This will be expanded on later in this paper.

2.1 Background to infrastructure indices

There are several commonly used GLI indices. Until recently, the most frequently used were:

- Dow Jones Brookfield Global Infrastructure Index (DJB);
- UBS Global Infrastructure and Utilities 50-50 Index (UBS 50/50); and,
- Standard & Poor's Global Infrastructure Index (S&P).

It is worth noting that the UBS 50/50 index was terminated in May 2015. This provided an opportunity for industry participants to develop an index that more accurately reflected the industry's views of the infrastructure opportunity set. The resulting index was developed

from the existing FTSE Global Core Infrastructure Index, but with appropriate sector and stock caps introduced to better capture what the industry group believed to be the median manager's view of the sector.

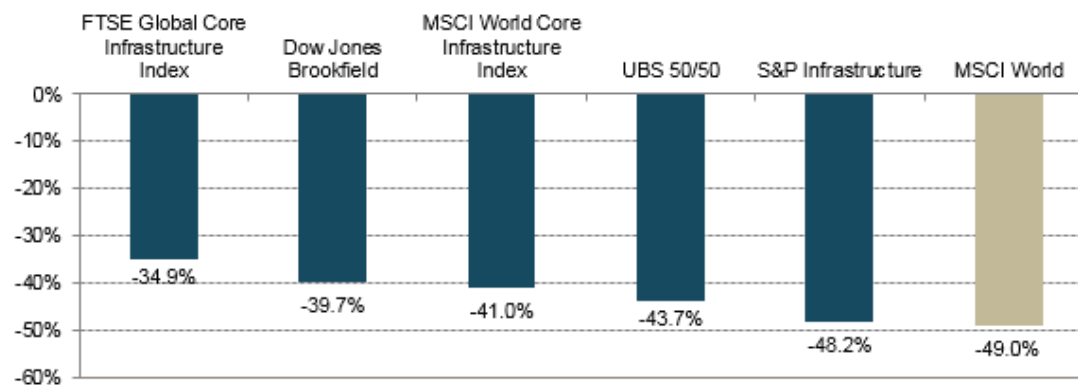
The resulting index is the FTSE Global Core Infrastructure 50/50 Index ("FTSE 50/50 Index"). It has quickly become the most widely used GLI index globally. The index has historical constituent and performance data that dates back to 2009 and, so, for evaluation of performance during the GFC, the analysis herein has used the original, uncapped version of the index (from which the FTSE 50/50 Index was developed). Both indices have identical constituents, the only difference being in stock weightings (due to the sector and stock caps that were introduced) and, as such, the performance data remains closely linked.

Concurrently with the FTSE 50/50 being developed, a new infrastructure index was launched by MSCI, the MSCI World Core Infrastructure Index.

2.2 Performance during the GFC

On the whole, equity indices peaked very late in 2007 before bottoming on (or very close to) 11 March 2009. Figure 1 compares the performance of the infrastructure sector from 31 December 2007 to 11 March 2009.

Figure 1: Comparison of index returns
31 December 2007 to 11 March 2009 (AUD Hedged)



Sources: Bloomberg, Factset

As can be seen, the MSCI World Index was down 49% during the period. What is striking is the extent of variance in the performance between the main infrastructure indices. Several of the indices demonstrated their defensive nature by materially outperforming global equities, however, the S&P and UBS 50/50 infrastructure indices largely disappointed.

In particular, the difference between the strongest performing infrastructure index (FTSE Global Core) and the weakest (S&P Infrastructure) were extreme. The S&P index only

marginally out-performed global equities during this period, falling short of its supposedly defensive characteristics, while the FTSE index delivered out-performance of approximately 14%.

For Australian investors that invested on an unhedged basis, the negative returns were not as large, but the divergence between indices was similar. On a AUD unhedged basis, the S&P Infrastructure index (-38%) actually slightly under-performed global equities (-37%).

Investors' perception of the performance of listed infrastructure during the GFC was therefore hugely impacted by the investment strategy that they had chosen, or the infrastructure index they viewed as a proxy for the sector's performance.

2.3 Statistical comparison of infrastructure indices

The same pattern is apparent when more recent data is considered. Figure 2 reveals large statistical differences between GLI indices beyond the GFC, when comparing the volatility, correlation and beta of five main infrastructure indices.

Figure 2: Statistical comparison of five main infrastructure indices²
(Five years to 31 March 2015)

	Volatility (% pa)	Correlation vs. MSCI World	Beta vs. MSCI World
FTSE Global Core Infrastructure 50/50 Index	8.1%	0.68	0.46
Dow Jones Brookfield Global Infrastructure Index	8.1%	0.63	0.43
UBS Global Infrastructure and Utilities 50-50 Index	8.7%	0.68	0.50
MSCI World Core Infrastructure Index	8.4%	0.75	0.53
S&P Global Infrastructure Index	9.0%	0.78	0.59
MSCI AC World Index	13.0%		

Sources: Bloomberg; FTSE; MSCI; MBA GLI calculations based on original data sourced from index providers.

Overall, it can be said that infrastructure indices have demonstrated substantially lower volatility and beta relative to global equities, along with diversification benefits. More specifically, however, the divergence in the performance of the five main indices across these

three key defensive indicators (volatility, beta and correlation to equity markets) stands true today.

On the one hand, the S&P Infrastructure Index behaves more similarly to global equities than the other indices listed; on the other, the FTSE and DJB Indices are considerably more defensive and provide greater diversification benefits.

3. WHAT CAUSES THIS VARIANCE IN DEFENSIVENESS?

"The largest factor that impacts the defensiveness of the sector is the definition of the investable universe itself, and of second most important is the influence of corporate governance."

The divergence in performance in the infrastructure sector should not be viewed as an aberration. Infrastructure indices are constructed with different index methodologies and, in the experience of the author, the investment characteristics of assets that are typically classified as "infrastructure" can vary materially. The factors within each of the index construction methodologies include, for example, the regional and sector allocations of the various indices.

But above all others, the largest factor that impacts the defensiveness of the sector is the definition of the investable universe itself and of second most importance is the influence of corporate governance.

3.1 The importance of how infrastructure is defined

If the key objectives of lower volatility and inflation linkage are not focused on throughout the investment process, investment outcomes may tend towards that of broader equity markets.

To test this hypothesis, consider the infrastructure "purity" of each of the main infrastructure indices. "Purity" refers to the extent that the constituent assets within each index exhibit the key infrastructure characteristics. A detailed review of each stock in the main GLI indices has been conducted, calculating the exposure of each company to different infrastructure asset types.³

Some assets strongly exhibited defensive characteristics (assigned a 100% "strength factor"), while other assets partly exhibited the characteristics (a factor between 100% and 0%) and some did not exhibit them at all (resulting in a 0% strength factor).⁴

To conduct this analysis, the proportion of each company across 20 different sector types was first calculated.⁵ The index purity is therefore the weighted sum of each sector's proportion, multiplied by its sector strength factor. Determining the appropriate sectors and their sector strength factors is clearly subjective. These views are primarily based on the

author's experience in the sector, and supported by the recent academic analysis with regards to volatility and inflation protection.⁶

Importantly, the analysis considered more than the physical characteristics, instead dividing the sectors based on the commercial arrangements supporting the assets themselves. The market typically defines infrastructure on the basis of its physical attributes, however, infrastructure sectors should be defined as much by the predictability of the cashflows as they are by their physical characteristics.

The results of the analysis of the infrastructure purity of the GLI indices is shown in Figure 3.

Figure 3: Calculations of infrastructure "purity" of the main indices
(As at 31 March 2015)

	Index "Purity"
FTSE Global Core Infrastructure 50/50 Index	83%
Dow Jones Brookfield Global Infrastructure Index	82%
UBS Global Infrastructure and Utilities 50–50 Index	77%
MSCI World Core Infrastructure Index	75%
S&P Global Infrastructure Index	73%

Sources: Bloomberg; FTSE; MSCI; MBA GLI calculations based on original data sourced from index providers.

As can be seen, the purity of the indices correlates very closely to the volatility of the indices – both during the GFC and over the past five years. The index with the least purity is the S&P Infrastructure Index and, indeed, it was this index that experienced the largest declines during the GFC and exhibited the highest volatility over the last five years.

The index with the greatest purity was the FTSE 50/50 Index – the sister index of which was the strongest performer through the GFC (refer Figure 1), and exhibited the equal lowest volatility of all the indices over the last five years. The DJB Index was the next best on all measures, while the UBS and MSCI Infrastructure Indices scored very closely.

Clearly, the definition of infrastructure used by an index (or investment manager) has a very large impact on the defensiveness of the asset class.

3.2 If the definition of infrastructure is so important to the defensiveness achieved, then what are the key variables to look for?

The primary issue is that infrastructure assets are typically defined by the market by their physical characteristics. Although this is one factor to consider, the more important consideration is the commercial frameworks that underpin the asset. Typically, the existence of commercial frameworks provides a monopolistic position that leads to the asset's defensiveness.

What then are examples of assets that are frequently referred to as infrastructure, but which should not be included in an infrastructure definition?

3.2.1 Integrated utilities

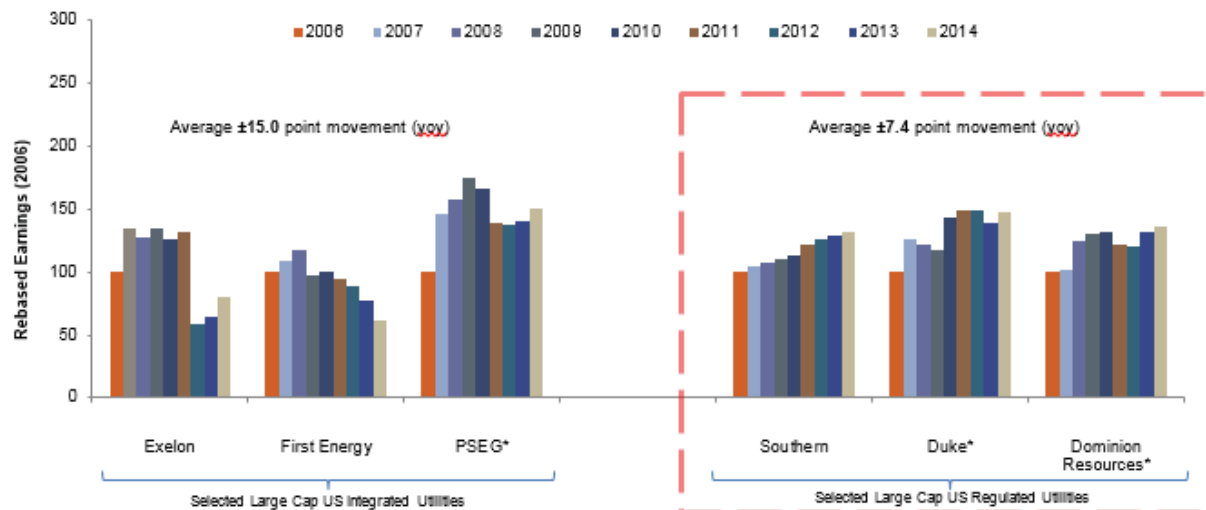
A key difference between the performances of the different infrastructure indices would be caused by a differing treatment of utilities. The FTSE 50/50 and DJB indices only include utilities that are regulated (or largely regulated), whilst the other indices also include integrated utilities.

Regulated utilities – whether they are in the water, gas or electric sectors – are true monopolies, and so should earn a stable and predictable return through their regulatory mechanism. The largest variable to their future returns are typically driven by changes in cost of capital, which is primarily linked to interest rates.

In contrast, integrated utilities also operate in competitive markets. Most commonly, these utilities generate electricity in deregulated energy markets, although they may also own other competitive businesses such as electricity or gas retailing, and energy trading or marketing. These businesses tend to be far more cyclical, with lower barriers to entry, relative to regulated businesses.

Not surprisingly, the earnings and share price volatility between regulated and integrated utilities have been starkly different. Figure 4 shows the earnings per share profile of three of the largest US integrated utilities versus three of the largest US regulated utilities between 2006 and 2014.

Figure 4: Rebased earning between 2006 – 2014



Source: Bloomberg

Looking at the integrated utilities on the left, it can be seen that earnings per share (EPS) has been very volatile. Indeed, on average, the EPS has increased or decreased by 15% each year.

In contrast, the EPS of the regulated utilities has been far more predictable. On average, the EPS change has been half of that experienced by the integrated utilities and has seen a largely steady increase throughout the period.

To conclude, the defensiveness of utilities is far less impacted by the commodities that the utility is delivering (water, gas or electricity), and far more by the commercial frameworks under which it operates. The analysis highlights that only regulated utilities well demonstrate the defensive traits of infrastructure assets.

3.2.2 Stevedoring companies and “ports”

An example of a sub-sector that is universally included amongst infrastructure indices, but which remains contentious amongst some investment managers, are “ports”.

Generally, these assets are referred to as ports – both in relation to (a) the freehold owner of the port; and, (b) the concessionaire who has the right to operate the port. The freehold owner of the port has a very long-dated asset that is in a strong strategic position and is subject to long-term contracts (to the concessionaires), so well fits the definition of an infrastructure asset. However, the freehold owner is most typically a government entity and there are virtually no such assets listed on global stock exchanges (Westshore Terminals in Canada and the Port of Tauranga in New Zealand are exceptions).

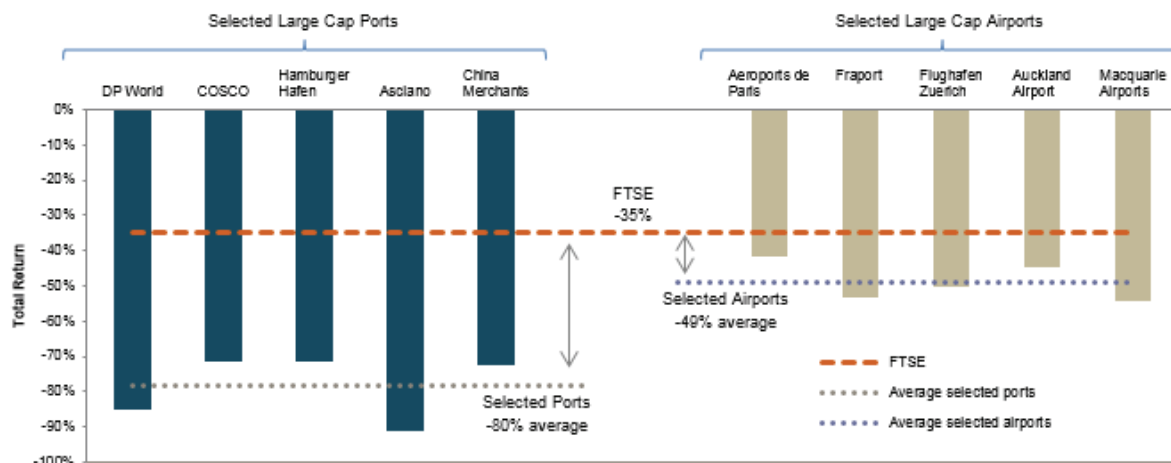
The other listed companies that are referred to as ports are actually stevedoring companies. They do not own the port or its hard infrastructure. Instead, they have been granted a concession to operate the port for typically around 25 years. In most cases, the port has granted concessions to more than one stevedoring company and so these stevedoring companies compete for the business of only a small number of shipping alliances. The contracts that they have with these customers are short-dated (normally one to three years) and, considering the extremely cyclical nature of shipping volumes, their pricing power is low.

For all these reasons, stevedoring companies do not appear to possess the defensive characteristics typically exhibited by infrastructure assets. This view was supported by the performance of these assets during the GFC. In 2009, for example, global GDP was down 2%, yet port volumes in Germany were down by a massive 23%, and those in Hong Kong down 14%.⁷ Such volume sensitivity is not supportive of stable cashflows or defensive investments.

Further, with the shipping lines facing extreme pressure at that time (and enabled by the competition between stevedoring companies), the revenues earned per container by the stevedoring companies also dropped. This drop in revenues per container exacerbated the volume fall, and so resulted in dramatic decreases in earnings.

The outcome on stevedoring company share prices during the GFC is shown in Figure 5 compared to airports, the other most economically sensitive infrastructure sector. As can be seen, while the major airport stocks on average (down 49% in local currencies) did materially worse than the FTSE 50/50 index, each of these airports was stronger than all the major "port" companies (which were down on average 80%).

Figure 5: Returns of "ports" vs airports
31 December 2007 – 11 March 2009 (Local terms)



Source: Bloomberg

This relative out-performance by airports was partly due to the lesser drop in air passenger numbers than container volumes during the GFC.⁸ Of greater importance, though, was that the airports retained their pricing power – due to their monopoly positions – while the stevedoring companies did not.

For these reasons, the author contends that stevedoring companies do not have sufficient market power to be appropriately referred to as infrastructure assets, and that the inclusion of these assets in an infrastructure definition is likely to materially impact the level of defensiveness achieved. Further, this is one reason why an infrastructure strategy with an appropriate infrastructure definition should be more defensive than the various infrastructure indices.

3.3 The importance of corporate governance

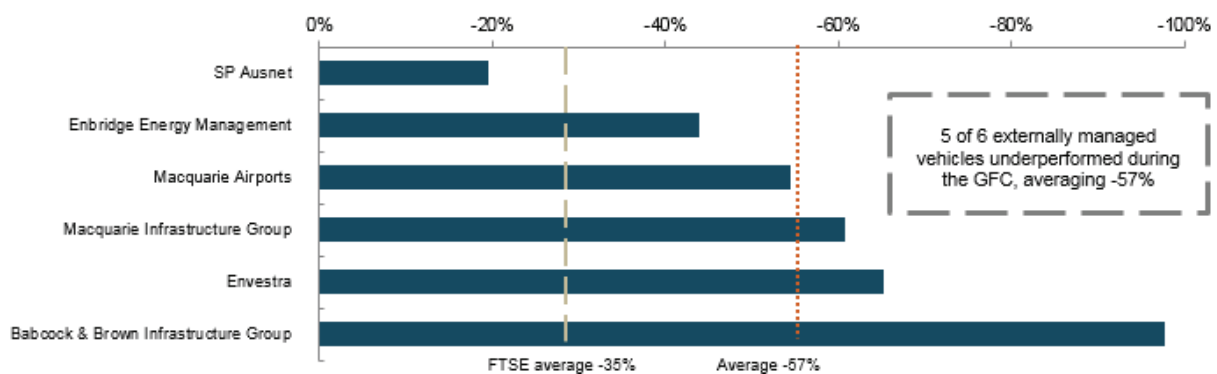
In addition to ensuring an appropriate definition of infrastructure, another key factor when considering the defensiveness of the asset class is corporate governance.

Of critical importance is that investors are well aligned with the other owners and management of investee companies, and that sufficient shareholder protections are in place were that alignment to ever be tested. This is clearly important when investing in any asset class but, in the author's view, is of heightened importance for infrastructure investing, considering:

- The long-dated nature and large capital sums invested in individual infrastructure projects, meaning that the impact to investors from bad capital allocation decisions is greater; and,
- The public nature of the assets, and the historical ownership of many of the assets being in the public sector, causing the potential for diverging interests between government owners and private investors.

An analysis of the performance of the infrastructure sector during the GFC highlights the impact that governance can have on the defensiveness of the sector. For example, externally managed vehicles, due to the potential misalignment of interests that this structure can create (and, specifically, the incentive they provide management to assume greater risk) are of concern. During the GFC, there were six such vehicles within the FTSE Global Core Infrastructure Index and five of these six under-performed the index as a whole (Figure 6). Their average performance was 22% worse than the index.

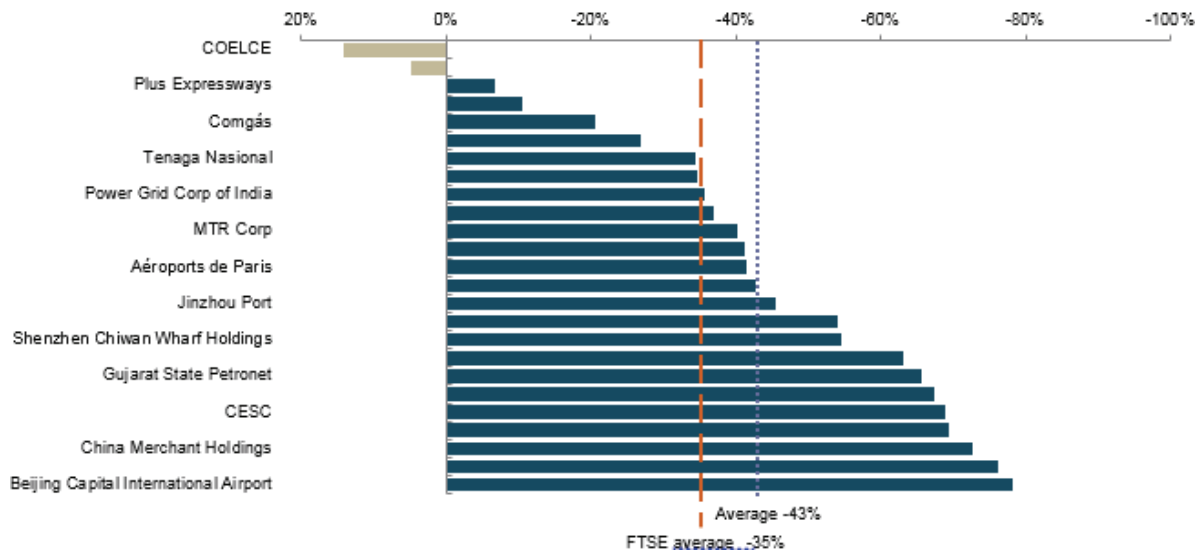
Figure 6: Returns of externally managed vehicals
31 December 2007 – 11 March 2009 (Local terms)



Source: Bloomberg.

Similarly, companies that are controlled by government entities carry the risk that they are partly managed to achieve public policy objectives instead of being solely focused on the interests of shareholders. These companies are consequently less likely to exhibit defensive characteristics, as the risk of a divergence in the interests of the government and private shareholders is greatest during times of market stress (Figure 7).

Figure 7: Returns of companies controlled by government entities
31 December 2007 – 11 March 2009 (Local terms)



Source: Bloomberg.

This concern was well demonstrated during the GFC. There were 25 stocks in the FTSE index during the GFC that had a dominant public shareholder. Only eight out-performed the index during this period, and the average performance of such companies was 8% worse than the index as whole.

CONCLUSION

The defensive characteristics of the infrastructure sector are well proven. The performance of the sector during the GFC and more recently supports this point. For example, as shown above, the FTSE Global Core Infrastructure indices (on an AUD hedged basis) outperformed global equities by approximately 14% during the GFC and, over the last five years, exhibited (a) volatility of nearly 40% less than global equities (8.1% versus 13.0%); and, (b) a beta of 0.46 relative to global equities.

However, the defensiveness of the sector has not been uniform. It has exhibited considerable variances in key characteristics such as volatility, beta and correlation to broader equity markets and, moreover, in investment returns. The S&P infrastructure index performance disappointed during the GFC and its recent performance has similarly been far more closely tied to the performance of the broader global market.

There are two factors in particular that drive this variance in defensiveness:

1. The definition of infrastructure used – in order for an infrastructure portfolio to deliver on the key infrastructure objectives of lower cashflow volatility and inflation linkage, these factors need to be focused on throughout the investment process, and likewise, are fundamental to the definition itself. Further, detailed analysis of each of the stocks in the main GLI indices demonstrates the importance of the "purity" of an index or portfolio in relation to its defensiveness.
2. The importance of corporate governance – due to the history of infrastructure assets being previously owned by the public sector and, also, the large value and long-dated projects in which they invest, strong corporate governance is of increasing importance in the infrastructure sector. An analysis of the performance of stocks with weak governance during the GFC strongly supports this view.

For investors considering the infrastructure sector from the perspective of a defensive equity investment, focusing on the strategy's approach to these two factors is important to achieve the defensive characteristics being targeted.

ENDNOTES

1. Rothballer, C and Kaserer, C (2012) The Risk Profile of Infrastructure Investments: Challenging Conventional Wisdom, The Journal of Structured Finance, Vol. 18, No. 2: pp. 95–109.
2. AUD Hedged Total Returns for 5 years to 31 March 2015. We have intentionally not rolled this forward to June 30th 2015, so to enable the UBS index to be included in the analysis which was terminated in May 2015.
3. "Evaluating global listed infrastructure indices", Maple-Brown Abbott white paper, June 2015.
4. In setting these strength factors, not as much emphasis was placed on the inflation protection characteristic of the assets, as this was separately analysed in "Evaluating global listed infrastructure indices", Maple-Brown Abbott white paper, June 2015
5. In calculating the proportion of these sectors in each company, EBITDA splits were generally used. In some companies this information was not available, and so the available information was used, and/or the author spoke to the company to form a best estimate of the split. The author acknowledges limitations with using an EBITDA number, which may mean that it is not an accurate split of the proportional value of the company, however it enables the greatest consistency and accuracy across the group.
6. "Infrastructure, risk and inflation: A review of recent academic empirical studies", Maple-Brown Abbott white paper, February 2013.

7. World Bank (2015), World Development Indicators, GDP growth (annual %) & Container Port Traffic. Retrieved from <http://databank.worldbank.org>

8. World Bank (2015), World Development Indicators, Container port traffic & Air transport passengers carried. Retrieved from <http://databank.worldbank.org>



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