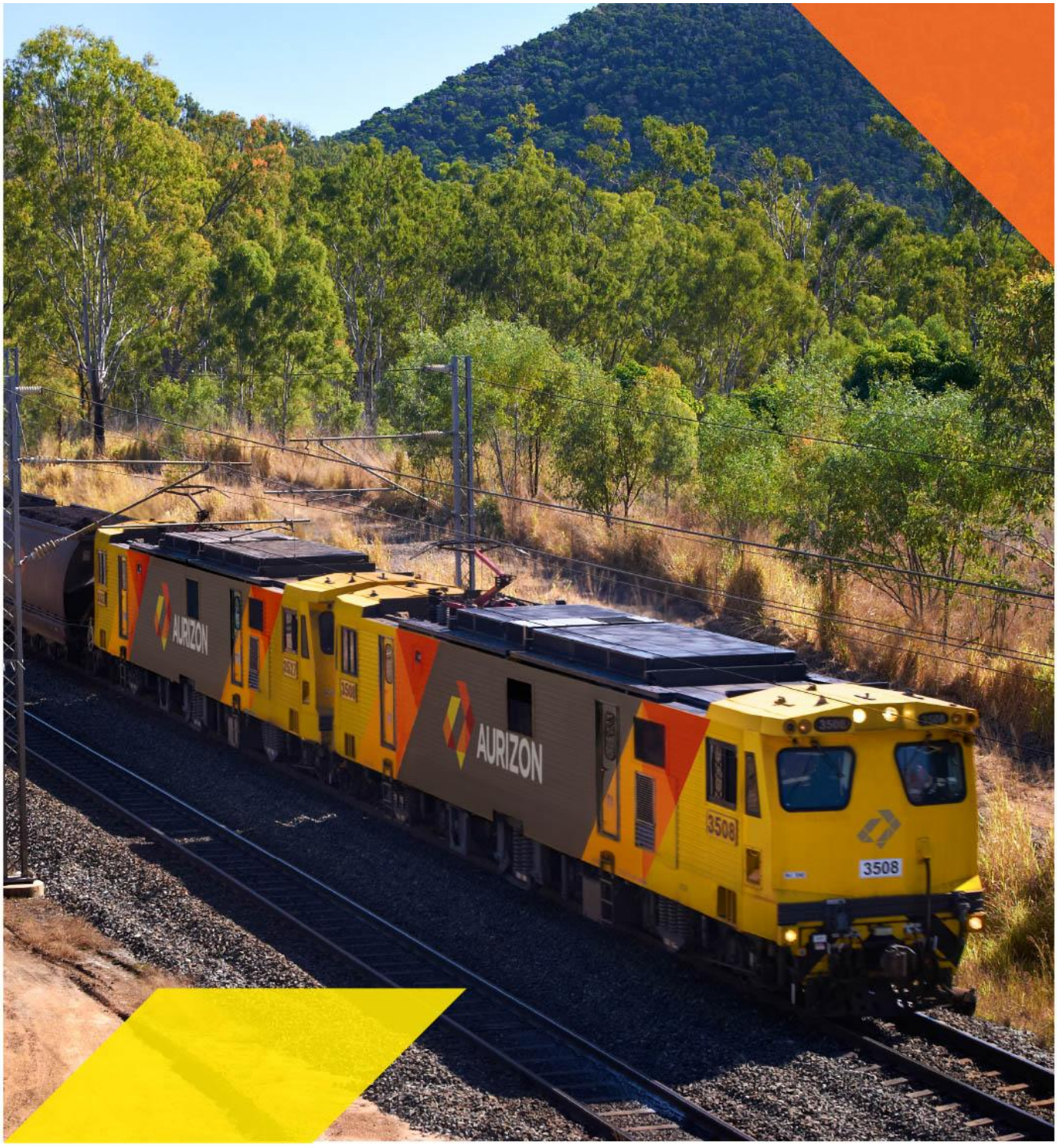
AURIZON

20 January 2014

A Comparator Analysis of Aurizon Network's Commercial and Regulatory Risks

A submission to the Queensland Competition Authority regarding the relative risk of Aurizon Network



1 Executive Summary

A key challenge in determining the applicable equity / asset betas for Aurizon Network is the lack of directly comparable companies. This is a fair conclusion that most parties agree upon. The contentious element in the determination of betas is what companies are suitable comparators. As evidenced in our UT4 submission, industry submissions and the Queensland Competition Authority's expert reports, there are a wide range of views on the pros and cons of comparable companies. From a first principle analysis purpose the decision needs to be driven by an understanding of the key commercial and regulatory risks faced by Aurizon Network and the extent to which comparable companies face similar risks.

1.1 Objective

This report - *A Comparator Analysis of Aurizon Network's Commercial and Regulatory Risks* - will outline, in detail, the commercial and regulatory risks that are faced by Aurizon Network in the provisioning of coal services in the Central Queensland Coal Network. The report seeks to make pertinent and confident comparisons to select companies, allowing for a correct qualitative determination of Aurizon Network's commercial and regulatory risks.

This report also serves the purpose of supplementing the original UT4 submission in relation to (1) Aurizon Network's commercial and regulatory risks; (2) to address a range of issues within the stakeholder submissions; and (3) the report commissioned by the QCA in relation to equity beta.

1.2 Goals

This report is to provide definitive answers on the following questions:

<u>Direct Industry Comparators</u>
Direct industry comparators provide a comparator base of companies that are involved in a coal supply chain. All of these comparators are based on the east coast of Australia with the exception of Westshore Terminals which is based in Vancouver, British Columbia, Canada.

When compared to the following direct comparators, do similarities in Aurizon Network's operations and structure sufficiently compare to allow a pertinent and confident comparison of commercial and regulatory risks?

- Aurizon Holdings;
- Hunter Valley Coal Network;
- Dalrymple Bay Coal Terminal;
- Westshore Terminals;
- Wiggins Island Coal Export Terminal;
- Gladstone Ports Corporation; and,
- Port Waratah Coal Services.

From the above direct industry comparator companies that do allow a reasonable comparison, to what degree should these comparators provide fact-based guidance in determining the commercial and regulatory risks of Aurizon Network?

Indirect Industry Comparators

Indirect industry comparators are comparators that are predominately associated with the provision of rail services.

When compared to the following indirect industry comparators, do similarities in Aurizon Network's operations and structure allow sufficient compare to allow a pertinent and confident comparison of commercial and regulatory risks?

- US Class 1 Railways;
- US Surface Transportation Board;
- Canadian Regulated Grain Services and,
- Other Rail Comparators.
- Tollroads

From the above indirect industry comparator companies that do allow a reasonable comparison; to what degree should these comparators provide fact-based guidance in determining the commercial and regulatory risks of Aurizon Network?

Aurizon Network's Commercial and Regulatory Risks

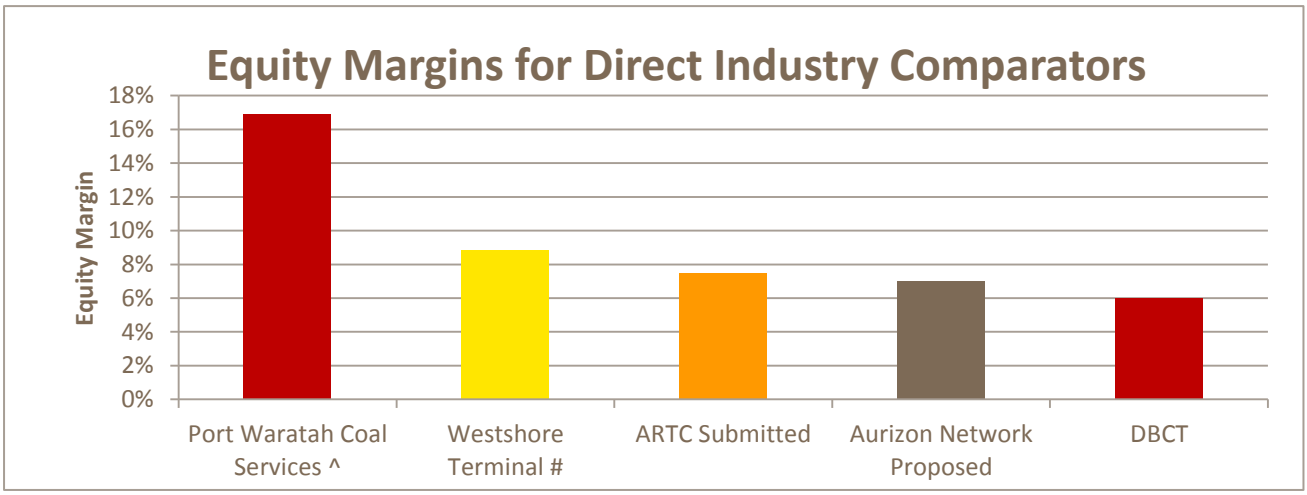
In regards to the following risks outlined in the Castalia report[1], is, and to what extent, Aurizon Network subject to this risk?

- Revenue risk;
- Inflation risk;
- Asset Stranding risk;
- Expenditure risk;
- Regulatory risk;
- Political risk; and,
- Force Majeure risks.

Using the approach of risk comparison, and list of comparators, outlined in the Castalia report, and re-evaluating the comparisons made, what are the risks borne by Aurizon Network when compared to the following comparator group?

- Sydney Desalination Plant;
- Electranet;
- GasNet;
- Aurora;
- Additional Comparator - Telstra; and,
- Relevant East coast coal comparators.

[1] Castalia Strategic Advisors (2013), Report to the Queensland Resources Council – Aurizon Access Undertaking: Risk Allocation Analysis, pg. 11, available at www.qca.org.au



 # Based on a relevered equity beta of 1.36 at 55% gearing and an equity margin of 6.5%

^ Average accounting equity margin for previous four years

1.3 Overview of Findings

Following is a high-level overview of the findings contained in the paper.

1.3.1 Direct Industry Comparators

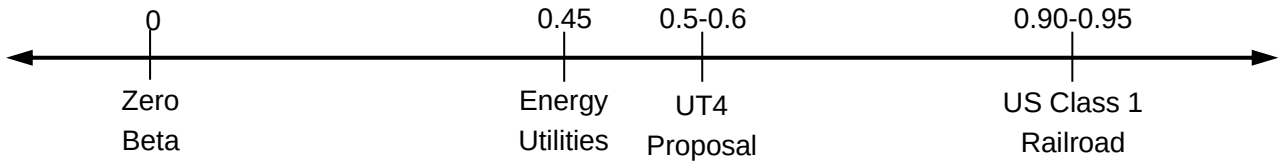
Through the use of beta analysis, pricing and return on equity requirements, Aurizon Network has provided an extensive comparison with the comparator group. The main source of comparison was made through the equity margin; which is the multiple of the company's beta and market risk premium.

In relation to these direct industry comparators, Aurizon Network's proposed equity margin compares favourably to the direct industry comparators, given the key differences in relation to operating costs and fixed monthly take or pay associated with the DBCT and HVCN assets as shown in the following figure.

1.3.2 Indirect Industry Comparators

The major comparator that has been of some contention in the UT4 process is that of Aurizon Network's self-comparison to US Class 1 railroads.

The approach employed by Aurizon Network in the 2013 DAU was to identify that in some respects, the provision of coal carrying train services within the Central Queensland Coal Network (CQCN) possess similar risk characteristics as a US Class 1 Railroad. As a consequence, it is not unreasonable to give some weight to US Class 1 railroads. However, Aurizon Network emphasises that it does not believe it possesses the same risk profile (asset beta) characteristics as a Class 1 Railroad. The difference between Aurizon Network proposing the carbon-copy of a US Class 1 beta and, using it as part of a broad comparator group is best shown through the depiction below.



Aurizon Network found that international railways outside of North America would not provide useful comparisons. A review of the operation of these railways finds that they are predominantly passenger operations, not actually a railway, or have significant non-railway operations.

Aurizon Network also tested the comparability of tollroads which were included within its comparator group by Incenta. Incenta holds the view that the asset beta for these comparators provides a cap on Aurizon Network's asset beta. This conclusion relies on an assumption that revenue and operations are correlated with economic activity which has not been substantiated. Our review of tollroads finds:

- Much of the revenue is based upon passenger vehicle movements and uncorrelated to variance in the market contrary to Incenta's underlying assumption (as it is driven by slow moving macroeconomic variables such as potential long term growth in population);
- There is no volatility in vehicle movement or earnings to support Incenta's conclusion; and
- Asset stranding risk is shown to be typically based on political risk associated with the concession requirements which is not systematic.

1.3.3 Aurizon Network's Commercial and Regulatory Risks

Aurizon Network considers that the key systematic risks to a regulated business are likely to be those which substantially alter the cash flow beta through (1) EBIT variability (not revenue); (2) the discount beta through inflation (due to impacts on real returns); and (3) medium to long term demand risks (due to impact economic returns). A summary of Aurizon Network's analysis can be found below.

Risk	SDP	Electranet	GasNet	Aurora
Revenue	less risk	less risk	less risk	less risk
Expenditure	less risk	less risk	less risk	less risk
Inflation	less risk	less risk	less risk	less risk
Stranding and Bypass	Significantly less risk	less risk	less risk	less risk
Regulatory	Significantly less risk	Significantly less risk	less risk	Significantly less risk –
Political	less risk	Similar risk	Similar risk	Similar risk
Force Majeure	Significantly less risk	Similar risk	less risk	Similar risk
Summary	**Significantly less risk**	**less risk**	**less risk**	**less risk**

In all of these areas, Aurizon Network finds that it bears greater risks than the comparator regulated energy and water utilities. In particular, the lack of adjustment to revenues to account for movements in actual inflation against the capital base increases the volatility of real earnings over the regulatory period. Neither

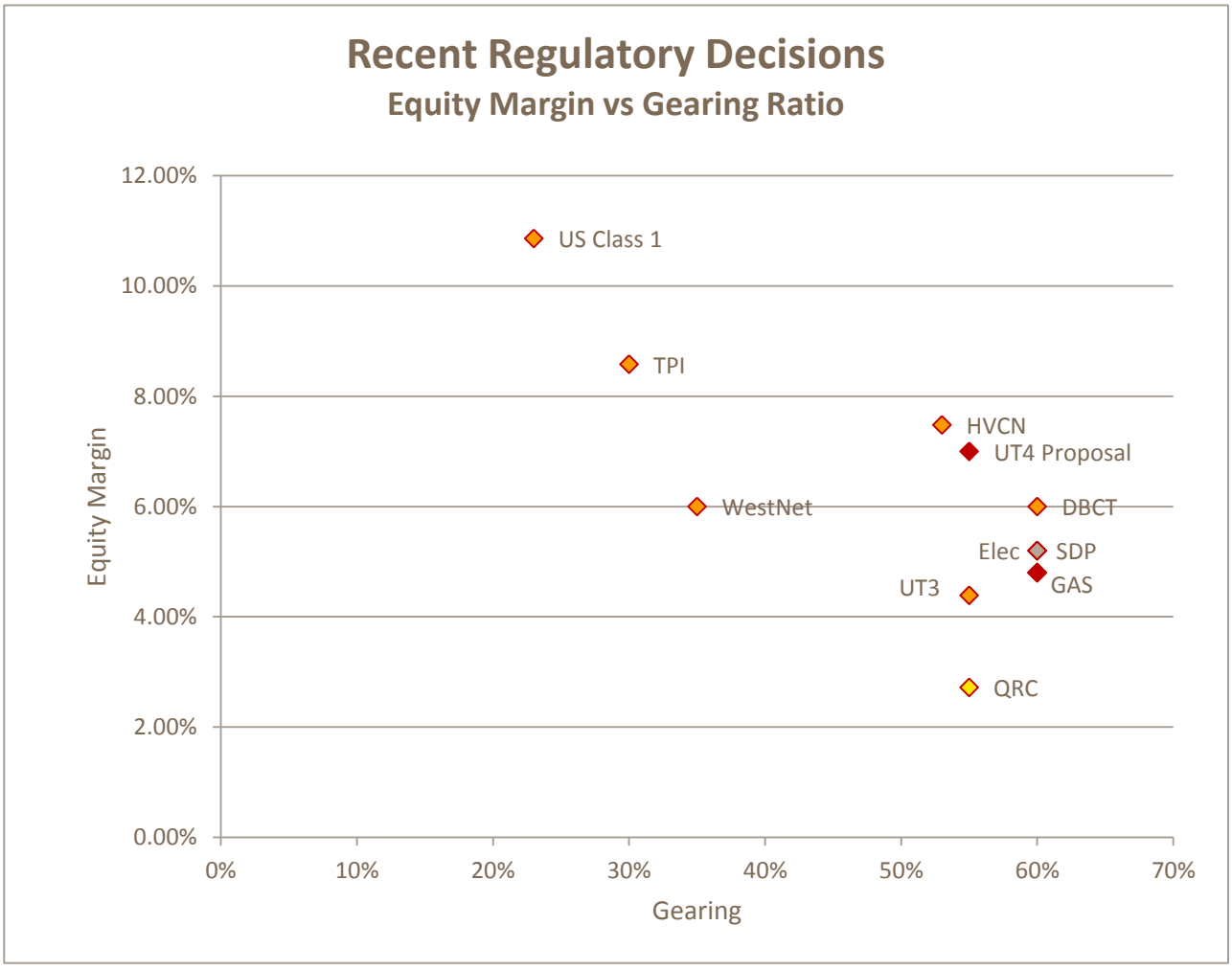
stakeholders nor the QCA's consultant have correctly identified this risk and therefore, have not appropriately weighted its contribution to systematic risk and a higher equity beta.

On the basis of Aurizon Network's more detailed assessment and review of the underlying assumptions made by Castalia, it is evident from the risk summary in the following table that water and energy utilities carry less commercial and regulatory risk than the CQCN. The outcome of this analysis can be found in the previous graph.

1.4 General Findings

Analysis in this submission supports Aurizon Network's proposed equity margin as being reasonable and commensurate with the difference in commercial and regulatory risks associated with relevant comparators. As shown in the following graph, the UT4 proposed equity margin (reflecting the proposed equity beta of 1.0 at a gearing of 55% and a market risk premium of 7%) is:

- Substantially below that of the US Class 1 railroads;
- Less than the HVCN which Aurizon Network assesses as being lower risk; and
- Greater than energy utilities, which are expected given:
    - the significant difference in market structure and demand,
    - coupled with the observation that lower gearing normally corresponds to increased business risk.



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2. Introduction

2.1 Purpose

A key requirement of the *Queensland Competition Authority Act 1997* (the QCA Act) is that prices are at least enough to generate expected revenue for a service to meet the efficient costs of providing access to that service, whilst including a return on investment commensurate with the regulatory and commercial risks involved[2].

Application of the building blocks model typically employed by Australian economic regulators seeks to achieve this objective by applying a weighted average cost of capital associated with a benchmark firm, to assess return on capital requirements. While the cost of debt for the benchmark firm may be derived from observable market data, estimating the cost of equity often involves a degree of subjectivity, usually by assessing a range of information so as to obtain a point estimate that appears reasonable in the context of any relevant comparators.

This is particularly the case for the beta estimate, which reflects the systematic risk profile of a firm within the context of the industry in which it operates. As no 'pure play' comparators exist for a benchmark heavy haul below rail service provider that are listed on Australian or international stock exchanges, it becomes necessary to exercise discretion in obtaining a point estimate for comparative purposes. Particular respect should be given to the following points:

- Has regard to all relevant information;
- Is logical with respect to that information; and
- Retains a high degree of confidence that it will not underestimate the true cost of equity, even if it was observable.

The last of these criteria is considered essential in ensuring that the statutory requirement of 'at least enough to generate expected revenue' is satisfied. Further, the last criterion also ensures that the public interest is served by continuing promote investment whilst avoiding the social consequences of underinvestment.

2.2 Background

Aurizon Network's 2013 Draft Access Undertaking (2013 DAU) proposal was supported by analysis prepared by SFG Consulting (SFG), which applied a robust statistical approach including data from:

- Australian listed industrial transportation firms (including Aurizon Holdings Limited);
- US Class 1 Railroads; and
- Australian listed energy network businesses.

Aurizon Network's proposed return on equity equates to an equity margin of 7%. The proposed WACC submitted by the Queensland Resources Council (QRC) of 5.65% equates to an equity margin of 2.65%. In responding to the UT4 proposal the QRC has submitted expert reports by:

[2] Queensland Competition Authority Act 1997, s.168A(a)

- Castalia Strategic Advisors, who perform a qualitative risk analysis of Aurizon Network against predominantly energy utilities (Castalia paper); and
- MacKenzie and Partington, who include reference to a broader data set of railways without any detailed consideration of the reliability of those firms to their applied purpose.

The general conclusion from the industry submissions is that Aurizon Network's only truly relevant comparators are Australian energy utilities. These conclusions were solely reliant on the main findings contained in the Castalia paper, which was that the provision of coal carrying train services in the Central Queensland coal network (CQCN) has lower commercial and regulatory risks than those firms. In contrast, the SFG report noted that reliance on energy network businesses *"…has the obvious limitation of having a different product and customer base to a rail network."*[3]

Based upon the 2013 DAU and the analysis contained later in this submission, Aurizon Network does not agree with the the analysis presented by the QRC and its consultants. In addition there is a broader range of information which supports the reasonableness of Aurizon Network's proposed UT4 equity margin of 7.0%.

Of particular relevance to assessing the reasonableness of the proposed equity margin are the return expectations for investments in similar, complementary and substitute services and facilities.Comapred to coal supply chain infrastructure investments with 'lower commercial and regulatory risks' than those embodied in the 2013 DAU, Aurizon Network has found that its proposed equity margin is both lower and comparable.

Aurizon Network notes that the QRC's proposed equity margin of 2.65% is unreasonable in that:

- It is only marginally higher than their proposed cost of debt;
- It is based on a very limited set of comparators unrelated to export supply chains or transportation services;
- It does not address the material and readily apparent disparity between the equity margin of 2.65% and 'industry agreed' equity margins in supply chain infrastructure access arrangements; and
- The submission provides no evidence of equity return expectations inherent in the pricing of privately owned and unlisted supply chain infrastructure providers, many of which of have substantially lower risk profiles than the 2013 DAU.

Since lodgement of stakeholder submissions to the UT4 proposal, on 31 October 2013 the QCA published an additional report which it commissioned in relation to Aurizon Network's proposal.[4] Aurizon Network considers that the Incenta report contains a number of errors in summarising Aurizon Network's risk profile, albeit against a broader range of comparators. Issues relating to the estimation of beta and empirical methods in response to the Incenta and relevant stakeholder submissions have been addressed in a companion report prepared by SFG Consulting.[5] This submission therefore focuses primarily on the qualitative judgements exercised by Incenta in relation to its first principles analysis and comparator selection.

[3] SFG Consulting (2012), Systematic Risk of QR Network, 31 August 2012, pg. 5
[4] Incenta (2013) Regulatory Capital Structure and Asset/Equity Beta for Aurizon Network, Report prepared for the Queensland Competition Authority, 9 December 2013, available at www.qca.org.au
[5] SFG Consulting (2014) Systematic risk of Aurizon Network, Report prepared for Aurizon Network in response to stakeholder submissions, January 2014

In addition, this submission has been prepared to evaluate the reasonableness of Aurizon Network's proposed equity beta and consequential equity margin via consideration of a broader range of relevant financial parameters than presented by the QRC.

2.3 Outline

This paper is structured as follows:

- Section 3 reviews the relevant financial information pertinent to assessing the overall reasonableness of the equity margin;
- Section 4 summarises the commercial and regulatory risks associated with the provision of coal carrying reference train services under the 2013 DAU;
- Section 5 reviews and augments the comparative risk analysis prepared by Castalia and expands the scope to include the following firms:
    - Dalrymple Bay Coal Terminal
    - Hunter Valley Coal Network
    - Sydney Desalination Plant
    - Electranet
    - Gasnet
    - Aurora Energy; and
- Section 6 summarises the analysis and assesses the reasonableness of the Aurizon Network's proposed equity margin.

3. Relevant Financial Information

In the absence of 'pure–play' comparators, it may be necessary to consider a broader range of financial information when undertaking empirical analysis on comparator betas. Given the statistical imprecision in derived beta estimates, additional financial information can provide guidance on where a point estimate within the reasonable range of those estimates should be chosen. The most logical starting point for this exercise would be to compare beta, pricing and return-on-equity requirements for direct and indirect industry comparators.

3.1 Direct Industry Comparators

Aurizon Network considers the following firms represent the most suitable direct industry comparators:

- Aurizon Holdings
- Hunter Valley Coal Network
- Dalrymple Bay Coal Terminal
- Westshore Terminal
- Wiggins Island Coal Terminal
- Gladstone Ports Corporation
- Port Waratah Coal Services

3.1.1 Aurizon Holdings

Aurizon Holdings (AZJ) was publicly listed on the Australian Stock Exchange on the 22 November 2010, where during the 2013 financial year, 94% of the EBITDA performance was derived from the transportation of bulk commodities, thus indicating that relevant comparative information would be identified within the price movements of the Aurizon Holdings equity capital. As the first 12 months of trading data following the IPO was typically associated with financial markets improving their understanding of the firm's cash flows and specific risks, a weekly beta analysis was performed between the November 2011 and August 2013 period, comprising 92 weekly beta observations, with sufficient trading volumes having occurred to avoid any thin trading concerns regarding the beta estimate (refer Figure 1 overleaf).

The OLS weekly beta estimate for AZJ over this period equated to approximately 0.99. Using an average gearing level of 20% for this period, this in turn this equated to an unlevered asset beta of 0.84, materially exceeding the upper bound estimate of 0.6 proposed by Aurizon Network.

As a cross-check, the asset beta was unweighted between relevant business segments based upon the AZJ proportion of group EBITDA performance for the 2013 financial year. Therefore, assuming an Aurizon Network asset beta of 0.6 would require; an unlevered asset beta of 1.05, and an equity beta of 1.34 for the above rail business in order to align to the weighted enterprise asset beta of 0.84. Given the low level of earnings within the intermodal freight segment, this asset beta would appear to be a very high estimate when compared to Asciano's unlevered weekly asset beta of 0.64 over the same period. This is contrary to prior expectations given Asciano's higher exposure to containerised freight through its port operations. [6]

[6] Source: Bloomberg. Based on weekly equity beta of 0.94 with a gearing level of 40.20%.

Figure 1 - AZJ Monthly Price Movement against ASX200

Source: ASX, 4 November 2013

Aurizon Network acknowledges that caution should be exercised in interpreting a single estimate for a recently listed firm and that segment earnings forecasts may influence share price movements in a different proportion than current segment EBITDA. Nevertheless, the empirical market data indicates that Aurizon Network's proposed relevered equity beta is reasonable.

3.1.2 Hunter Valley Coal Network

The Hunter Valley coal network (HVCN) is a standard gauge rail network currently supporting approximately 125 million tonnes of constrained export coal and 8 million tonnes of constrained domestic coal per annum.[7] Managed by the Federal Government owned corporation Australian Rail Track Corporation (ARTC), the HVCN is subject to an open access regime pursuant to the Hunter Valley Coal Network Access Undertaking (HVCNAU), accepted by the ACCC on 29 June 2011.

The ACCC accepted a proposed rate of return for the provision of coal carrying train services in the Hunter Valley based on a nominal pre-tax cost of capital of 9.1%.[8] As this estimate was an agreed estimate, ARTC did not lodge individual parameters in support of the estimate and therefore, the ACCC was not required to consider the reasonableness of individual parameters. However, as the real pre-tax WACC closely approximates ARTC's revised WACC proposal of August 2010, it is reasonable to infer an estimate of 9.16% for the equity margin from the revised proposal. Hence, ARTC's revised WACC proposal represents a

[7] Australian Rail Track Corporation (2013) Submission to ACCC on RAB Roll-forward and ceiling test for 2012 calendar year, May, p. 25 http://www.accc.gov.au/system/files/ARTC%20-%202011%20HVAU%20-%20Annual%20Compliance%20assessment%202012.pdf

[8] Australian Competition and Consumer Commission (2011) Decision in relation to the Hunter Valley Coal Network Access Undertaking, June, p. 7. http://www.accc.gov.au/system/files/ACCC%20Final%20Decision%20on%2023%20June%202011%20application.pdf

proposed **equity margin of 7.48%**, based on a return on equity of 12.45% less a risk-free rate of 4.97% (post tax nominal).[9]

Aurizon Network acknowledges that this is an agreed rate of return between ARTC and its customer base for taking on additional obligations. However, it is a relevant rate of return benchmark within the market place and forms a reference point for investor expectations on revenue outcomes for similar assets such as the CQCN. Notwithstanding the additional non-financial obligations on ARTC associated with the industry agreement, the outcome reflects a requirement from the service provider regarding the return expectations of its equity investors to continue to invest in the network which was not considered onerous or unreasonable by the customer base.

The implied HVCN equity margin is comparable to Aurizon Network's proposal and it will be demonstrated in *Section 5* that Aurizon Network's commercial and regulatory risks are greater than the HVCN regulatory framework.

In relation to the HVCNAU, Incenta's report also cites the ACCC 2010 position paper where the regulator proposed an equity beta of 0.94 at a debt to total asset ratio of 52.5%. Incenta shows in Table 5.6 of their report that these parameters equate to an unlevered asset beta of 0.545, which relevers to an equity beta of 0.99 at 55%, broadly coinciding with the Aurizon Network's proposed upper bound equity beta of 1.0.

Aurizon Network also considers that the ACCC did not err in setting the debt beta to zero when relevering, nor was it unintentional. Setting the debt beta to zero when relevering is common financial practice and broadly consistent with the approach utilised by most regulators, including the ACCC and AER. Aurizon Network also has fundamental concerns with the application of a debt beta which does not equate to zero. Where the covariance of the returns on debt is measured against a market portfolio which does not comprise those assets, it is feasible that the measured equity beta would be greater against the broader market portfolio and therefore, using a positive value for the debt beta could introduce a downward bias in asset betas.

3.1.3 Dalrymple Bay Coal Terminal

The Dalrymple Bay Coal Terminal (DBCT) provides coal handling and export services to coal producers in the Goonyella system. Access to the terminal is provided pursuant to the Dalrymple Bay Coal Terminal Access Undertaking (DBCTAU), initially approved by the QCA on 15 June 2006. Given the need to expand the facility to alleviate supply chain bottlenecks the QCA approved an equity margin of 6.0% to promote investment in the terminals expansion from 54.5 to 85 million tonnes per annum. The expansion path is shown in Table 1.

[9] Australian Rail Track Corporation (2010) Explanatory Guide 2010 HVAU, Appendix 3 – ARTC Revised Rate of Return Proposal, August, p.27. http://www.accc.gov.au/system/files/ARTC%202010%20Hunter%20Valley%20Access%20Undertaking%20Explanatory%20Guide%20-%20Appendix%203.pdf

Table 1 DBCT Expansion Pathway[10]

Expansion	Capacity	Date Commissioned	Investment ($Millions)
Opening RAB Value	54.5	Jul-04	850.00
Short Gain (g	59	Sep-06	33.30
Phase 1	68	Apr-08	619.00
Phase 2	--	Jan-09	341.70
Phase 3	85	Jul-10	419.00

As is evident from Table 1, the terminal value increased by a multiple of 2.66 over a 6 year period (in RAB terms), where the QCA accepted the roll-forward of the 6% equity margin in approving the 2010 DBCTAU, which was agreed between DBCT and industry (and necessary to avoid hold-up after making the investment). Aurizon Network considers that the recent and proposed expansions to the CQCN also involve a material increase in the value of the RAB over a commensurate period of time; and that the DBCT equity margin is a relevant benchmark for assessing the reasonableness of Aurizon Network's proposed equity margin. In addition to the financial risks associated with significant investment in the RAB, Section 5 also demonstrates that Aurizon Network's commercial and regulatory risks are greater than those of the DBCT.

Of note, Incenta has also included DBCT within its report by referring to the opinions of Grant Samuel. In the course of independently valuing Babcock and Brown's infrastructure, Grant Samuel have determined a lower bound asset beta of 0.35 and concluded that there is indirect evidence of:

> *a case where a regulated asset operating in the same value chain as Aurizon Network was considered to have less systematic risk than a regulated electricity network.*[11]

It is unclear how Grant Samuel arrived at their beta estimate range of between 0.7 and 0.8 for DBCT, as the referenced report includes no direct comparator. In addition the author does not rationalise the apparent differential between DBCT and Powerco as noted by Incenta. Further, Grant Samuel makes no estimation of an asset beta for DBCT and explicitly raise concerns regarding delivering and relevering due to estimation error. Accordingly, the asset beta of 0.35 is a derived estimate by Incenta.

Aurizon Network does not have sufficiently detailed information on Powerco to form its own opinions as the drivers of this differential. Incenta also offer no explanation, other than to cite a single qualitative anomaly as providing evidence for their hypothesis that Aurizon Network is comparable to that of an energy utility. Incenta do not extend their first principles analysis of DBCT or other comparators to adequately and objectively validate the conclusions. Therefore, Aurizon Network considers its exposure to a range of financial and operating risks, not present in the DBCT regulatory regime, materially increase its systematic risk relative to DBCT.

[10] DBCT Management (2010) 2010 Access Undertaking Submission, March, p. 44. http://www.qca.org.au/files/P-2010dbctdau-DBCT-DAUSupportSub-0310.PDF
[11] Incenta, 2013, pg. 60.

3.1.4 Westshore Terminals

Westshore Investment and Westshore Terminals derive their cash inflows from their investment in Westshore Partnership by way of distributions on its limited partnership units. Westshore Partnership operates a coal storage and loading terminal at Roberts Bank, British Columbia; some 32 kilometres south of downtown Vancouver and only 500 metres from the United States border. Westport Terminals is the largest coal loading facility on the west coast of the Americas. Since opening in 1970, Westshore Terminals has over four decades of operating experience and forms part of Port Metro Vancouver. As Canada's No. 1 export coal facility, it shipped a record 27.3 million tonnes in 2011, easily surpassing the combined total coal exports of all other Canadian facilities.[12]

Westshore Terminals was considered a comparator firm by the QCA's consultant – the Allen Consulting Group (ACG) – as part of the equity beta considerations in UT3. However, due to the risk profile of the terminal, ACG did not consider the terminal's relevered equity beta of 2.91 as a direct comparator noting:

> *"We group Westshore with coal miners because we believe it is more like a coal producer, given the uniqueness of its coal loading contracts, which are tied to the Canadian dollar price of coal"* [13]

However, the risk profile of Westshore Terminals has materially transformed since the preparation of the ACG report. In 2012, the terminal throughput was comprised of 61% metallurgical coal and 38% thermal coal from a more diversified customer base. Importantly, Westshore Terminal's 2012 annual report notes that:

> *"Prior to 2010, a substantial portion of the throughput of the Teck Coal Partnership ("Teck") was handled at loading rates that varied with the price of coal. Since April 1, 2011 none of the contracts with Teck provide for variable pricing. Contracts entered into over the last two years provide customer volume commitments, much of which are at fixed rates, for over 80% of the Terminals' estimated current capacity through to 2021."* [14]

Accordingly, Westshore Terminals now represents a more conventional infrastructure risk profile whose earnings are predominantly driven by coal exports with associated capacity commitments. As the contractual arrangements changed in the 2011 there is currently insufficient data to establish a monthly beta estimate. Nevertheless there are sufficient observations to review a weekly equity beta from 1 April 2011.

Incenta initially selected three ports including Westshore, and then discarded them all on the basis that it was a small group with disparity associated in the nature of their operations. On the basis that an industry portfolio cannot be established as viable direct comparator, it is usually excluded from the comparator analysis. Yet whilst there is likely to be wider confidence intervals in reliance upon a single firm, rather than that of a broader industry classification, this individual firm should still be considered on the basis of its merits and the inherent degree of precision in its estimate. In this regard the equity beta for Westshore coal terminals of 0.76 with a gearing level of 5% closely approximates the asset beta[15]. It can therefore be

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[12] Westshore Terminals Ltd (2013) http://www.westshore.com/investors.htm

[13] Allen Consulting Group (2009) Final Report to the Queensland Competition Authority – Queensland Below Rail Network Cost of Capital Update, p. 30 http://www.qca.org.au/files/R-2009DAU-ACG-QLDbrailnet-updatecostcaptpara-1209.PDF

[14] Westshore Terminals Ltd (2012) Annual Report, pg. 4. http://www.westshore.com/8D1D8DD7-6682-41F5-9B24-C3173E93D1B5/FinalDownload/DownloadId-212915D8A8C02F2FBF5266D561994C2B/8D1D8DD7-6682-41F5-9B24-C3173E93D1B5/pdf/finance/2012/ar.pdf

[15] Source: Bloomberg

concluded with a reasonable degree of confidence that Aurizon Network's proposed asset beta range of 0.5-0.6 is below the asset beta for Westshore coal terminals.

3.1.5 Wiggins Island Coal Export Terminal

The Wiggins Island Coal Export Terminal (WICET) is a 27 million tonne per annum multi-user coal terminal currently under construction. The financing arrangements for the terminal are highly geared with little or no direct terminal operating costs (with terminal services to be provided by Gladstone Ports Corporation). Capacity to the terminal is awarded under take or pay agreements with substantive conditions based on reserve ratios.

The WICET financing arrangements are relevant as they provide a direct observation of investor expectations on returns on equity for coal supply chain infrastructure. As noted in the WICET submission to the Productivity Commission's review of Australia's Export Credit Arrangements, the terminal financing is a combination of senior debt, subordinated debt and preference equity. WICET also notes that:

> *"The WIPS (preference equity) has been entirely financed by Stage 1 Shippers/Shareholders as no offers of finance considered acceptable to the Shareholders were received from external financiers."* [16]

This would suggest that producer expectations of required investment returns in greenfield investments are misaligned to market expectations. However, Aurizon Network notes that Bandanna Energy recently sold its equity preference shares at a $6 million premium on the face value[17]. As construction of the terminal is well progressed, this would also appear to provide a directly observable measurement of equity investor valuations through a secondary market transaction. Accordingly, Aurizon Network proposes that the QCA have regard to the pricing arrangements associated with the preference equity dividends when assessing the reasonableness of Aurizon Network's proposed equity margin as this provides a direct market based approach to estimating equity margins for coal export supply chain infrastructure.

3.1.6 Gladstone Ports Corporation

Gladstone Ports Corporation (GPC) operates the RGTanna coal terminal which is the world's fourth largest coal export terminal by throughput.[18] As a key driver of revenue outcomes for GPC is coal throughput subject to ship or pay contracts, then the pricing arrangements for the access charges will be representative of the return expectations associated with the provision of those services.

While GPC is a government owned corporation, it does have responsibilities to pursue commercial objectives. Yet it is reasonable to expect that the return expectations for a privately owned company will exceed those of government shareholders. However, Aurizon Network is unable to establish the implicit return on equity assumptions incorporated into the GPC pricing models for RG Tanna or Barney Point due to the lack of publicly available information.

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[16] Wiggin's Island Coal Export Terminal (2012), *Submission to Productivity Commission's Draft Report on Australia's Export Credit Arrangements*, March, pg.4 http://www.pc.gov.au/__data/assets/pdf_file/0003/115869/subdr037.pdf
[17] Bandanna Energy (2013), *ASX Announcement: Bandanna Energy strengthens balance sheet for project development*, 8 July 2013, http://www.asx.com.au/asxpdf/20130708/pdf/42gxvtgsztcqbh.pdf
[18] Gladstone Ports Corporation (2013), *Annual Report*, pg. 4.

3.1.7 Port Waratah Coal Services

Port Waratah Coal Services (PWCS) operates the Kooragang and Carrington export coal terminals in the Port of Newcastle. The aggregate capacity of these two terminals is approximately 145 million tonnes per annum. The pricing of access charges to these terminals is not subject to a regulatory determination and there is no observable market data in relation to the equity beta. Aurizon Network notes that the terminal also moved to long term ship or pay contracts in January 2010 as part of the Hunter Port Coal Plan as noted in the 2010 Annual Report:

> *"During the year, the company entered into long term commercial framework agreements, which saw long term ship or pay contracts become effective from 1 January 2010."* [19]

This change to ship or pay is evident in the difference between reported revenue and the price/volume data included in the 2012 annual report, which notes that the terminal shipped 105.9 million tonnes at a price of $4.50 per net tonne. This equates to a revenue outcome of $477 million, contrasted with reported revenues of $542 million which suggests that the actual revenues include a large take or pay contribution whilst the terminal assumes little or no ramp-up risk on its expansions[20]. Therefore, it is reasonable to suggest that PWCS is a direct comparator for the reasonableness of Aurizon Network's proposed equity margin.

Given the expected market power and the absence of regulatory constraints to review prices, it is reasonable to expect that prices are reviewed with the objective of achieving a target return on equity; and that the commercial nature of the access agreements would tend to reduce variance around that target. Accordingly, Aurizon Network considers that the financial information in PWCS's annual reports would be relevant to assess Aurizon Network's equity margin.

The following table shows the reported return on equity associated with of provision of coal receipt, blending, stockpiling and ship-loading services in the Port of Newcastle derived from PWCS annual reports.

[19] Port Waratah Coal Services (2009) Annual Report,, p. 6 http://www.pwcs.com.au/pages/about/annual_reports.php
[20] Port Waratah Coal Services (2012) Annual Report, http://www.pwcs.com.au/pages/about/annual_reports.php

Table 2 Financial Information from PWCS Annual Reports

	2009	2010	2011	2012
Revenue	$329.4	$360.8	$438.7	$541.6
Profit After Tax	$64.7	$60.2	$107.6	$144.1
Total Assets	$1,391.5	$1,425.3	$1,649.3	$1,899.0
Equity	$309.2	$340.2	$430.6	$544.5
Debt/Equity	78%	76%	74%	71%
Return on Equity	**20.9%**	**17.7%**	**24.98%**	**26.46%**
Risk-free Rate (20 days prior to 1 July)[#]	6.59%	5.57%	5.33%	5.16%
Implied Equity Margin	**14.34%**	**12.13%**	**19.65%**	**21.30%**
Price $/net tonne	$3.25	$3.75	$4.05/$4.50	$4.50
Volumes (millions)	92.8	95.1	97.8	105.9

[#] *Source: Reserve Bank of Australia*

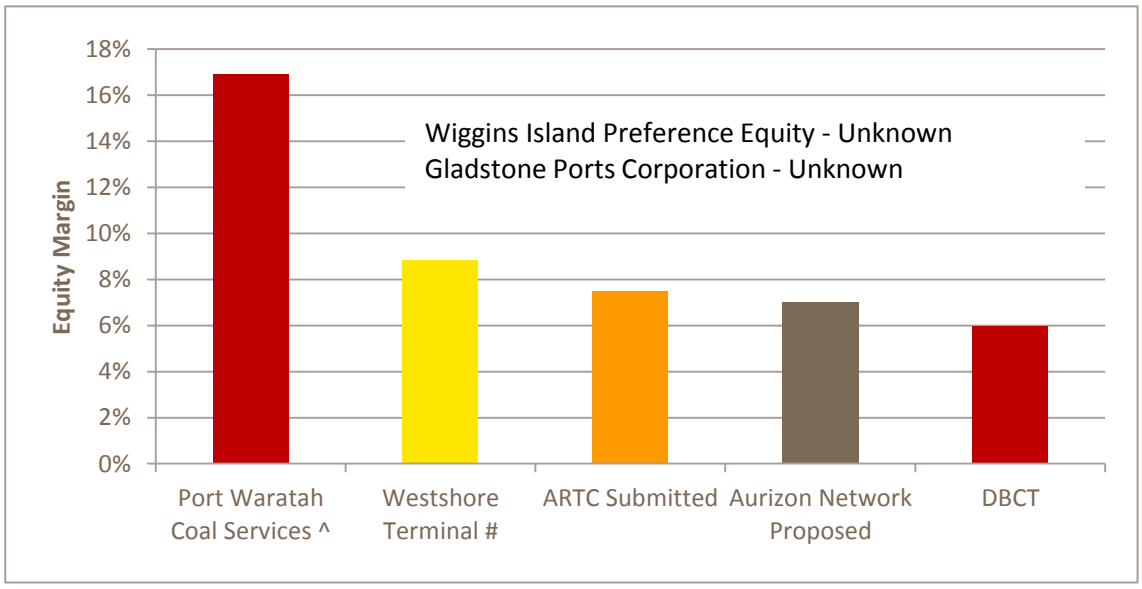
It is also noted that asset lives are constrained to 25 years to reflect commercial obsolescence, which is also commensurate with that proposed by Aurizon Network. As the terminal is also owned by the coal producers it provides a reliable benchmark of genuine industry return expectation on common, user supply chain infrastructure.

On the basis of the average implied **equity margin of 16.9%** over the four year period, Aurizon Network considers that its proposed equity margin of 7% is reasonable relative to the customer endorsed pricing at PWCS.

3.1.8 Equity Margin Summary for Direct Comparators

The following figure summarises the equity margins for Aurizon Network's direct industry comparators where there is sufficient information available for those margins to be derived. A comparison of the equity margins supports the reasonableness of Aurizon Network's proposed equity margin.

Figure 2 - Equity Margins for Direct Industry Comparators



 # Based on a relevered equity beta of 1.36 at 55% gearing and an equity margin of 6.5%

^ Average accounting equity margin for previous four years

3.2 Indirect Industry Comparators

The previous section has reviewed comparators which are infrastructure service providers predominantly associated with exporting metallurgical and thermal coals. This section reviews other comparators which are primarily associated with rail transportation services.

3.2.1 US Class 1 Railways

A cited comparator for investor expectations on investment in rail infrastructure is the US Class 1 Railroads. Aurizon Network acknowledges that there are differences between the US Class 1s and the provision of below rail services in the CQCN. However, these differences are often mischaracterised or overstated and while the resultant equity beta estimates are likely to represent an upper bound for Aurizon Network's beta, they also provide a relevant benchmark and point of reference for equity investors in rail infrastructure.
The Castalia paper[21] considers that the use of this data should be treated with caution as:

- The comparators chosen are almost not directly comparable and that observed betas for US rail companies relate to vertically integrated businesses; and
- Betas can only be derived by reference to the specific market, so betas are only comparable between different markets if the markets have similar characteristics.

[21] Castalia Strategic Advisors (2013), *Report to the Queensland Resources Council – Aurizon Access Undertaking: Risk Allocation Analysis*, pg. 11, available at www.qca.org.au

Viability of Class 1 Railroads as a Comparator

In relation to the first point, Aurizon Network observes that Castalia does not appropriately articulate the nature of these differences, or the materiality of those differences, which render the consideration of those comparators as containing no relevant information. In addition, Aurizon Network does not consider that vertical integration is likely to have a material impact on the suitability of these firms as comparators.

A large portion of the US Class 1 revenue is attributable to captive shippers who have limited alternative transport options or limited competition. As a consequence, the integrated commercial arrangements in markets where there is an ability to exercise a degree of market power are likely to approximate the risk profile of a regulated below rail service provider. However, intermodal business is subject to a high degree of competition and substitutability with road. Therefore as noted in Aurizon Network's UT4 submission, the equity beta for Class 1s would be expected to be higher than Aurizon Network. Yet the extent of this difference is also highly dependent on the market power in services which generate a significant proportion of Class 1 revenues.

The extent of this market power can be evaluated by assessing the contribution of various commodity types to overall rail revenues. Bulk commodities are typically expected to provide material competitive advantages to rail relative to road transport. As rail volumes and revenues grow, it is therefore reasonable to expect that these investments would be subject to some degree of underwriting. In this respect, it is also typical for captive shippers to be responsible for investment in wagons which further reduces the asset mix to more closely align to that of below rail assets. To put this into context, the rail assets for BNSF are comprised of $38.2bn in below rail assets and $9.6bn in above rail (of which $6.3 million relates to locomotives) at the commencement of 2012.[22] Similar asset values of $43.6bn and $9.5bn respectively are observed for Union Pacific. Fuel surcharges within freight rates ensure a large component of the above rail cost structure is passed through to customers, yet clearly the majority of US Class 1 return on assets are attributable to the below rail service.

Located below, Table 3 includes data from the most recent US railroad Commodity Revenue Stratification Reports. Traffic is classified as being either price sensitive (12%), subject to effective competition (53%) or being captive (36%). These classifications align to the STB's revenue to variable cost ratio groupings. Of particular relevance within this data is that the general freight revenue, which is price sensitive or subject to effective competition (Intermodal and Other), accounts for approximately 18% of total revenue.

[22] Surface Transportation Board (2012), *BNSF Annual Railroad Report R-1: Year 2012*, pg.32

Table 3 – US Railroad Revenue ($000s) Stratification 2011[23]

Description	Price Sensitive	Effective Competition	Captive Shipping	Total Revenue
Coal Products	$1,510,524	$6,756,287	$7,987,344	**$16,254,155**
Intermodal	$2,079,126	$4,379,137	$1,562,987	**$8,021,250**
Food (mainly ethanol corn)	$569,742	$3,702,016	$927,545	**$5,199,303**
Chemical Products	$461,972	$3,622,126	$4,757,718	**$8,841,816**
Farm Products	$440,838	$3,278,087	$1,621,994	**$5,340,919**
Transportation Equipment	$706,720	$2,925,103	$907,241	**$4,539,064**
Pulp & Paper Products	$335,168	$1,576,018	$260,111	**$2,171,297**
Metal Products	$210,969	$1,494,760	$656,073	**$2,361,802**
Non-metallic Minerals	$84,753	$1,425,564	$941,157	**$2,451,474**
Petroleum or Coal Products	$49,843	$1,063,846	$963,275	**$2,076,965**
Other	$1,154,898	$4,351,439	$2,696,533	**$8,202,870**
Total	**$7,604,550**	**$34,574,383**	**$23,281,979**	**$65,460,912**
Percentage	12%	53%	36%	

The presence of market power with significant price flexibility across a diverse traffic mix would suggest that US Class 1 railroads have the ability to partially insulate their free cash flow from changes in demand. Additionally, the ability to Ramsey price across a diverse range of services and markets could allow replication of cash flows normally associated with price regulation of a single commodity.

Incenta has included details for a range of US Class 1 traffics in Table 3.3 within their report. The authors rely on this data to substantiate their view that the US Class 1 traffics are highly exposed to the domestic economy and therefore retain high systematic risk, while contemporaneously not addressing the countercyclical reduction in coal movements in 2012. Incenta asserts:

> *"The fact that demand traffic of Queensland export coal was not negatively impacted by the Global Financial Crisis, while US and Canadian Class 1 railroads were significantly impacted, indicates that the latter are not appropriate comparators for Aurizon Network's asset beta."* [24]

[23] Surface Transportation Board (2011) Commodity Revenue Stratification Reports.
[24] Incenta (2013) p.35

The main reason that Aurizon Network's volumes did not decrease, and why they would not have expected to decrease is that in contrast to the US and Canadian economies the Australian economy, and importantly China, did not go into recession as shown in the following table:

Table 4 - Changes in Gross Domestic Product

	Australia*	United States^	Canada^	China†
2009 change in GDP from 2008	1.1%	-2.8%	-2.7%	9.2%

Source: * RBA Table G10, ^ Incenta Table 3.3, †World Bank

Similarly, any inference that CQCN demand risk is not correlated to the economic cycle, due to end demand being primarily export orientated is contradicted by the high average asset betas of 1.50 for the coal sector. This is exhibited within Table 5.4 of the Incenta report.

In addition, Incenta limits its consideration to a few commodities and places particular emphasis on the reduction in rail movements between 2008 and 2009. For reference these are reproduced in Table 5.

Table 5 Incenta Data on US Class 1 Railroad Rail Movements by Commodity Group

	Intermodal	Automotive	Coal	Agricultural
Volume Percentage Change 2008 to 2009	-20.3%	-36.4%	-20.3%	-13.8%

Incenta provide no explanation as to why it limited its consideration to these commodities and does not specify the relative proportion of these traffics to the US Class 1 Railroad overall revenues. This is particularly relevant to automotive which does not warrant its own classification in the STB revenue stratification reports. In light of such significant falls, one would expect to also see considerable revenue and free cash flow impacts. However, a closer examination of the railroad revenues and variable costs demonstrates that US Class 1 Railroads were not financially impacted by this order of magnitude. The following table shows US Class 1 Railroad revenue and contribution to common cost performance (Revenue less Variable Costs) for the period of 2007 to 2011.

Table 6 US Class 1 Revenue Stratification Report Summaries (000's)

Country Region	2007	2008	2009	2010	2011
Revenue	$56,790,347	$61,348,957	$49,715,798	$58,596,704	$65,460,912
Contribution to Common Cost	$15,423,262	$17,205,953	$15,512,802	$19,182,801	$20,221,641
Coal, Chemical and Farm Revenue	$23,452,147	$27,001,091	$24,137,776	$27,712,795	$30,436,889

To the extent that Aurizon Network's asset beta is less than 50% of a US Class 1 railroad at 0.90, a number of observations can be drawn from this table which support the proposition that Aurizon Network cash flow risks are not materially different:[25]

- First, while overall revenue decreased by approximately 19% between 2008 and 2009, the reduction in variable costs substantially mitigated the impact on contribution to common costs to less than 10%;
- Second, the revenue impact was primarily driven by mixed shipment freight forwarded business with the major commodities of coal, agriculture and chemicals falling by only 10.6%. The observation that revenues only decreased by less than half that of actual volumes provides some support to the proposition that US Class 1 Railroads are able to price differentiate with sufficient flexibility to manage EBIT impacts arising from a significant economic event; and
- Finally, in the year immediately following the GFC, revenues returned to pre-GFC levels with contribution to common costs in 2010 exceeding that in 2008.

In relation to the final point, Aurizon Network notes that the determinants of systematic risks with respect to operating risks are not well understood; where price changes for both the firm and the market reflect medium to long run expectations of earnings and not short run cash flow fluctuations. Accordingly, Aurizon Network considers the consolidation of the US rail industry – combined with the diversified commodity mix – provides reasonably stable, medium to long term earnings forecasts, with greater flexibility to recover lost margins in subsequent years to protect long run economic returns.

The diversified view is also supported by the Canadian Canola Growers Association (CCGA) who stated, in relation to whether an additional risk premium was warranted for grain traffics, that:

> *"CCGA considers the argument for a grain risk to be based on the railway companies' grain revenues being more volatile than their overall revenues measured on an enterprise basis, and submits that a diversified traffic base will produce an overall revenue stream that is less volatile than any individual traffic segment, because the segments are likely to be uncorrelated to one another."* [26]

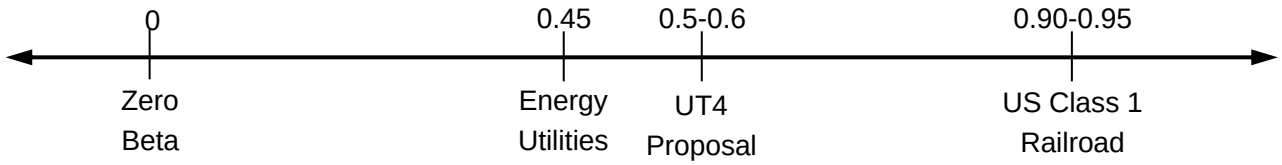
Such flexibility can be contrasted against the fixed and inflexible pricing associated with exposure to a single commodity, particularly within a regulated framework where revenues are periodically reset to reflect prevailing (under current systematic) market conditions.

Aurizon Network reiterates its earlier position that it neither, has, nor is seeking, the same asset beta as a US Class 1 railroad. Aurizon Network further believes that a compelling case has not been made, either through previous regulatory determinations or expert reports submitted to or procured by the QCA that Aurizon Network's asset beta is less than 50% of a US Class 1 railroad; or that investors would be satisfied with a return based on this assumption. The scale and relativity of the UT4 proposal as shown in Figure 3 illustrates this position.

[25] Incenta (2013) Table 5.4, p. 59

[26] CTA, 2011, *Appendix B to Decision No. 425-R-2011*, available at www.cta.gc.ca

Figure 3 - Relativity of UT4 Asset Beta Proposal with US Class 1 Railroads



Estimation of Operating Leverage

Incenta has also considered that Aurizon Network's operating leverage is substantially lower than that of a Class 1 Railroad. Aurizon Network agrees with the findings that its operating leverage would be lower than these firms. Clearly, this would be due to the vertical integration of Class 1 Railroads, which would also expect to have higher operating costs for train operations. While we agree with the derivation of the opex/assets ratio for Aurizon Network in Table 3.4 of the Incenta report, we are somewhat more circumspect on the other reported metrics, as they are most likely to have been derived from regulatory cash flows (where revenues are assumed to be independent of sales) and not real cash flows or earnings. The effect of using theoretical earnings and actual earnings on derived operating leverage (DOL) can be shown using data from audited below rail financial statements.

Table 7 Aurizon Network DOL from Below Rail Financial Statements

Measure	2007-08	2008-09	2009-10	2010-11	2011-12
EBIT ($000s)	149,921	191,628	279,669	241,717	283,037
Change in EBIT		**28%**	**46%**	**-14%**	**17%**
Sales (net tonnes)	158,485,564	163,848,393	186,402,072	163,978,271	166,737,641
Change in Sales		3.4%	13.8%	-12.0%	1.7%
DOL		**8.22**	**3.34**	**1.13**	**10.16**

Source: Aurizon Network

As the above table indicates, the average DOL of 5.71 is significantly greater than the econometrically derived estimate by Incenta of 1.01. It is also worth restating that as noted in Appendix D of the Incenta report:

> *"If a business has high fixed costs and low variable costs, the impact of variable revenue will be accentuated, as revenue rises and falls."* [27]

As a consequence, using opex-to-assets as a measure of operating leverage for US Class 1 railways is unreliable unless the operating costs are predominantly comprised of fixed costs. However, it is directly comparable to regulated transmission utilities with an average opex-to-asset ratio of 3.1.[28] This is less than 50% of Aurizon Network's opex-to-asset ratio of 8.0 as calculated by Incenta.

[27] Incenta, 2013, pg. 81
[28] Australian Energy Regulator, 2013, *Transmission Network Service Provider Performance Report 2010-11*, Table 2.3, pg. 16. July 2013, available at www.aer.gov.au

In addition, the other DOL proxy estimates for the US class 1 Railroads are also likely to be substantially overstated, as they do not take into consideration the large proportion of costs which are variable with sales (i.e. fuel for train operations). This is evident in the relative stability of the contribution to common costs changes in Table 6 within this paper. Accordingly we would not expect EBIT to change in the same order of magnitude as changes in sales.

Taking these factors into account Aurizon Network considers that while its operating leverage is unlikely to equate to that of a vertically integrated railway, the analysis presented above does support the proposition that degree of operating leverage will make a contribution to the asset beta. It has also been demonstrated that the relativity of Aurizon Networks proposed asset beta is commensurate with operating leverages of US Class 1 Railroads and energy utilities.

Exclusion of Foreign Comparators

Aurizon Network notes that the suggestion that US comparators are unreliable due to being listed in a different market is contradictory to Castalia's own approach. For instance, one of the comparator firms considered by Castalia is the Sydney Desalination Plant (SDP), where the report notes the equity beta for this firm approved by the Independent Pricing and Regulatory Tribunal is 0.7.[29] However, what the report does not address is that the SDP regulatory determination was benchmarked against foreign listed water businesses, qualified by SFG Consulting in correspondence with the AER, many of which are US based firms. [30]

The Mackenzie and Partington report similarly dismisses the Class 1 railways but this is also inconsistent with other statements made in that report. The Mackenzie and Partington paper argues that US Class 1 Railroads are an outlier and that consideration should also be given to additional foreign listed railways as included in the cited Domadaran data sets. This would appear contrary to the argument that foreign listed firms are of limited relevance. Aurizon Network notes that no analysis was undertaken by the authors and no evidence was presented to support the suitability of these additional firms. This matter is discussed further in section 3.2.3.

Finally, Aurizon Network notes that Incenta make no such qualification as to the usefulness of foreign comparators with the large proportion of non-coal firms being comprised of foreign listed entities.

3.2.2 US Surface Transportation Board

In addition to the SFG empirical analysis of US Class 1 equity betas within the 2013 DAU, the equity margin for US Class 1 railroads is also periodically assessed by the United States Surface Transportation Board (STB).

Cost of capital determinations made by the STB are used in a number of different contexts. Firstly, they are used to assess railroad revenue adequacy by comparing the firm's return-on-invested-capital against the cost of capital determination. Secondly, they are also used in the application of the stand alone cost test when assessing a rate complaint. Importantly, and in contrast to many other regulatory regimes, the decisions by

[29] Castalia, 2013, pg. 29
[30] SFG Consulting, 2013, *Submission to AER Draft Decision on Equity Beta, Better Regulation: Rate of Return Guideline*, available at http://www.aer.gov.au/

the STB have very limited influence on total revenues. Therefore there is unlikely to be circularity in the earnings forecasts and the regulatory decision. As a result, a key advantage of this approach is that dividend growth model estimates of expected cost of equity are directly observable from market data and can inform regulatory decision making.

In determining the cost of equity for US Class 1 Railroads the STB currently applies the mid-point of an estimate based on the CAPM and an estimate derived from a multi-stage discounted cash flow model (MS-DCF). The STB applies the Morningstar/Ibbotson three stage model as shown by the following equation:

In applying this model the growth assumption (*g*) in each stage is determined as follows:

$$P = \underbrace{\sum_{i=1}^{n1} \frac{D_0 (1+g_1)^i}{(1+R_E)^i}}_{Stage\ 1} + \underbrace{\sum_{i=n1+1}^{n2} \frac{D_{n1} (1+g_2)^i}{(1+R_E)^i}}_{Stage\ 2} + \underbrace{\frac{\frac{D_{n2}(1+g_3)}{(R_E - g_3)}}{(1+R_E)^{n2}}}_{Stage\ 3}$$

> *"Growth of earnings is also calculated in three stages. These three growth rate stages are what make the Morningstar/Ibbotson model a "multi-stage" model. In the first stage (years 1-5), the firm's annual earnings growth rate is assumed to be the median value of the qualifying railroad's 3- to 5-year growth estimates as determined by railroad industry analysts and published by Institutional Brokers Estimate System (IBES). In the second stage (years 6-10), the growth rate is the average of all growth rates in stage 1. In stage three (years 11 and onwards), the growth rate is the long-run nominal growth rate of the average U.S. economy. This long-run nominal growth rate is estimated by using the historical growth in real GDP and the long-run expected inflation rate."* [31]

As the cost of capital determination is dependent on actual market data for the period, the determinations are made with a lag. The most recent determination is the 2012 determination, which is summarised in table 8.

Table 8 – US STB 2012 Return on Equity (ROE) Determination[32]

Parameter	Value
Risk-free Rate	2.54%
Market Risk Premium	6.7%
Beta	1.15
Debt %	22%
CAPM ROE	10.27%
MSDCF ROE	16.53%
Midpoint	**13.40%**

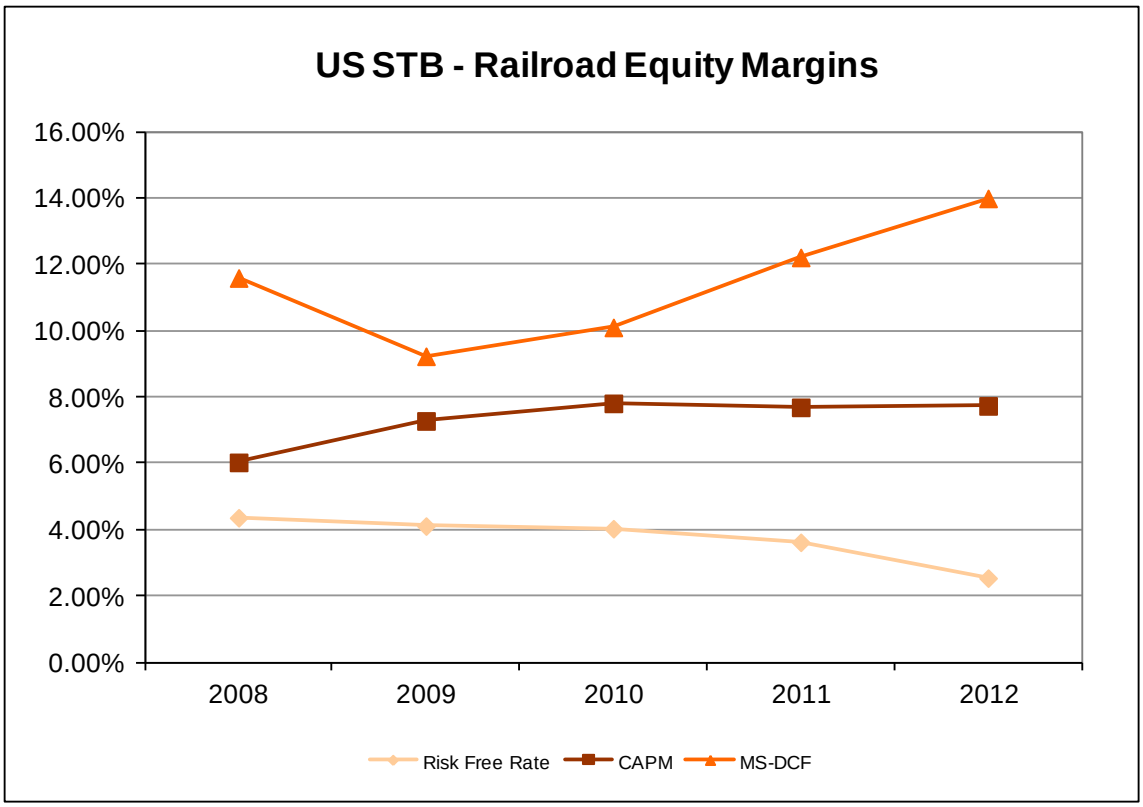
[31] Surface Transportation Board (2009) Ex Parte No. 664, Sub-No. 1, pg.6
[32] Surface Transportation Board (2013) Ex Parte No. 558, Sub-No. 16

This determination only includes market data for three, US Class 1 firms which meet the following criteria:

- Are listed on either the New York or American Stock Exchange;
- Have paid dividends throughout the year;
- Had rail assets greater than 50% of its total asset; and
- Had a debt rating of at least BBB (Standard and Poor's) and BAA (Moody's).

The following figure shows the equity margins under both the CAPM and MS-DCF approaches for the past five years. It is evident that the equity margin without adjusting for financial leverage under the CAPM approach has been approximately stable at 8%. Yet more importantly, investor expectations as reflected under the MS-DCF approach require an equity margin in the order of 10%-12%. The most interesting observation from the graph is the inverse relationship between the risk-free rate and the equity margin. Specifically, as the risk-free rate decreases, equity investors require a higher premium to reflect the increase risk.

Figure 4 – US STB Cost of Equity Determinations for FY08 to FY12



This determination is consistent with the proposition that investors in rail infrastructure currently require higher returns than those assumed under the standard CAPM assumptions. It is not unreasonable to anticipate that those expectations would extend to investment in rail infrastructure within the CQCR.

3.2.4 Canadian Regulated Grain Revenues

Aurizon Network also observes that the Canadian Transport Authority (CTA) includes the equity betas for Canadian Pacific and Canadian National (on both Canadian and US stock exchanges) in its cost of capital determinations on Western Grain Revenue Caps.[33] While the regulatory framework applies to an integrated service, the regulatory arrangements are typical of those applying to a regulated below rail service provider. Historically, assets within the revenue cap are also primarily below rail assets, with wagons owned by the Saskatchewan Grain Car Corporation and excluded from the cap. Again this suggests that observed North American integrated rail betas could be expected to be closer to the betas of below rail businesses than typically assumed.

There are two important features of the regulatory framework which are comparable to Aurizon Network:

- It is subject to a revenue cap form of regulation; and
- The revenue caps are indexed annually by a volume related composite price index, which closely track expected changes in the underlying costs of Canadian National and Canadian Pacific.

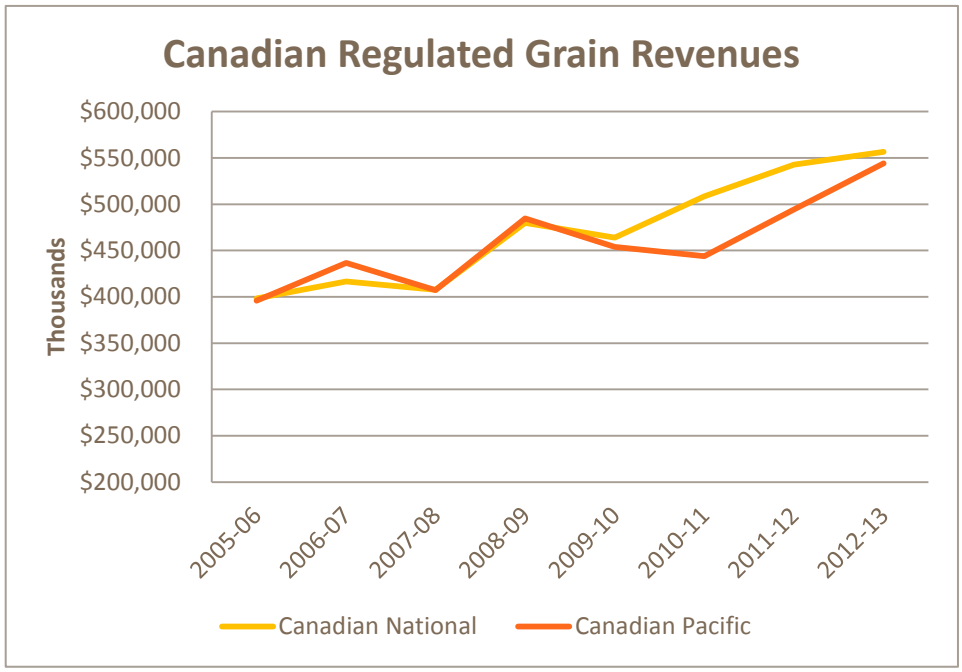
However, the service providers are exposed to some volume risk due to the volume adjusted revenue cap. Nevertheless, even though grain volumes are primarily subject to weather variations, growth has remained relatively robust as is shown in Figure 5. This high degree of correlation in the grain movements also suggests limited competition for volumes (and hence the probable need for regulation). While prior to 1997 the regulator applied a negative risk premium due to government subsidies paid to the railways, it has since applied the equity beta applicable to entire railways business. In response to the regulators review of the risk premium, Canadian Pacific noted that:

"…the risk now faced is a broader public policy risk that if railway companies cannot earn a sufficient return on capital, the sustainability of their networks and their ability to serve their customers would be compromised. CP considers that this is a risk not specific to grain, but rather to the broader supply chain. CP maintains that "the inclusion of a grain risk adjustment would be contradictory to the Agency's objective to have a methodology that is reasonable, reliable, and pragmatic." [34]

In summary, Aurizon Network notes that the primary economic risk – that of long term stranding of assets associated with structural changes to the grain industry and that short term revenue volatility – is offset by alternate traffics and commodities. Importantly in establishing the revenue cap cost of capital, the regulator determined that the equity beta applicable to the diversified firm's total earnings, appropriate consideration would include all the firm's business segments as well as its commodity mix.

[33] Canadian Transport Agency, 2011, *Review of the methodology used by the Canadian Transportation Agency to determine the cost of capital for federally-regulated railway companies*, Decision 425-R-2011, December 2011.
[34] Canadian Transport Agency, 2011, *Appendix B to Decision No. 425-R-2011*, paragraph 176, available at https://www.otc-cta.gc.ca/eng/appendix-b-decision-no-425-r-2011#tc-tm_2

Figure 5 Canadian Transport Authority Reported Regulated Revenues



3.2.4 Other Rail Comparators

Obtained from industry beta spreadsheets produced by Damodaran, the Mackenzie and Partington paper includes a summary table of equity and asset betas for railways from around the world. For reference purposes the table is re-produced below:

Table 9 – Mackenzie and Partington - (Table 3) Betas for Railways around the World

Country Region	Number of Firms	Average Beta	Market D/E Ratio	Tax Rate	Unlevered Beta
Global	56	0.68	65.38%	21.56%	0.45
Europe	9	0.86	101.28%	16.74%	0.47
Japan	19	0.33	156.93%	27.21%	0.15
Emerging Markets	13	0.83	23.48%	16.91%	0.69
USA	12	1.32	23.46%	28.60%	1.13

Based upon this data, the Mackenzie and Partington paper concludes:

> *"However, comfort can be taken from the fact that the estimates of [Aurizon Network] triangulate reasonably well with the estimates for railways from the rest of the world, with the exception of the USA. The one exception to the rule of relatively low railroad betas is the USA where the equity beta and asset beta are substantially higher than anywhere else. It is also evident that the US railways have lower*

*levels of financial leverage relative to other **developed economies**. So, there is clearly something about American railways that makes them different to the rest of the world."* [35]

There are errors of both fact and logic in these statements which renders both conclusions and recommendations on equity beta within the report as unreliable. Specifically, the main characteristic as to why American railways are different from the rest of the world is when undertaking a review of the actual firms in the dataset, the American sector is the only one which is comprised predominantly of firms providing freight services.

This point is particularly relevant to the Japanese firms which have a low beta and high gearing. Pointedly, the firms within the sample are providers of passenger transportation services who generate significant revenues from real estate associated with development of passenger terminal airspace. The exclusion of these firms – approximately one third – would have significant impacts on the global averages.

The relevance of the firms is further tested when the 9 European firms are examined. With the exception of one firm, PCC Intermodal SCC, the sample is comprised of either:

- Passenger railways and bus operators;
- Wagon manufacturers;
- Excursion railways and winter sports facilities; or
- Gondola cableway.

This leaves only emerging markets and US railways within the relevant sample. MacKenzie and Partington (2013) incorrectly observe that "…US railways have lower levels of financial leverage relative to other **developed economies**". Aurizon Network does not consider emerging markets to represent developed economies. Hence caution should be exercised given the significant and changing growth rates of those economies and the different industry sectors within those economies. There is also a large variance in the equity betas within this sample which also questions regarding the sample's usefulness.

A review of the firms in the emerging markets sample also shows a strong focus towards passenger railways. Yet only one firm has revenues primarily attributable to coal transportation services. Daqin Railway Co Ltd's revenue for the financial year ending December 2012 was comprised of 80% coal and 11% passenger traffic. Aurizon notes that the weekly equity beta for the last sixty weeks of Daqin was 0.68 (without a Blume adjustment), with a gearing ratio of 16.4%. Given the low level of gearing, the unlevered beta can be considered commensurate with Aurizon Network's proposed asset beta of 0.6.

In relation to financial leverage levels within the sample, a common factor associated with low geared firms is the firm's capital expenditure profile. As retained earnings are preferable to debt raising, many expanding firms will adopt lower gearing levels to finance future capex. However, MacKenzie and Partington (2013) do not consider any of the relevant firm characteristics applicable to target capital structures.

In summary, MacKenzie and Partington (2013) argue that Aurizon Network's proposed equity beta is comparable to foreign passenger railways which have typically lower betas than freight services. Accordingly,

[35] MacKenzie and Partington, 2013, *Report to the Queensland Resources Council: Review of Aurizon Network's Draft Access Undertaking*, October 2013, pg. 27, available at www.qca.org.au

Aurizon Network considers this further demonstrates the reasonableness of the proposed unlevered asset beta of 0.6 and equity margin of 7.0%.

3.3 Other Comparators

In the 2013 DAU, Aurizon Network noted there are significant differences between the provision of regulated coal carrying train services and energy network utilities. As the only common feature is regulation, Aurizon Network believes this does not represent an appropriate argument to rely solely upon when assessing the reasonableness of Aurizon Network's proposed UT4 equity margin.

Aurizon Network considers that the energy utilities provide some guidance as to the lower bound and not the point estimate for the purpose of this exercise. The Castalia (2013) report significantly miscategorises the risk profile of both Aurizon Network and the comparator regulated utility firms. When these issues are addressed – as demonstrated in Section 4 and 5 of this report – Aurizon Network's proposed UT4 equity margin is commensurate with the different risk profiles of these comparator firms.

Incenta (2013) has also included tollroads in its comparator analysis. However as explained below, Aurizon Network does not consider tollroads to be an appropriate comparator for the CQCN and these are not included in the subsequent comparator analysis.

3.3.1 Tollroads

The Incenta report considers tollroads as a comparator industry to Aurizon Network. In making this comparison Incenta state:

> *"We consider that the 0.49 asset beta observed for tollroads defines the upper boundary of a reasonable range for Aurizon Network's asset beta."* [36]

This conclusion being formed on the basis that:

> *"…[they] share some similar risk characteristics to Aurizon Network but, in our view, are subject to significantly more volume (revenue) risk (p.4); and*
>
> *the tolls for tollroads are typically prescribed but not subject to period review (often set as the outcome of an initial tendering process), and as such are more subject to cyclical economic activity than Aurizon Network, and are subject to greater asset stranding risk (p.16)."*

The report provides no facts, data or modelling to support this hypothesis. Aurizon Network considers this concerning, especially when expert opinions are relied upon in determination of a revenue stream that is based upon $5-$6 billion worth assets.

Aurizon Network also notes that the nature of tollroads means that the beta most likely represents the risks of the tollroads in operation. The most significant risk to investors in tollroads is the initial forecasting error

[36] Incenta, 2013, pg. 60

associated with volumes and construction costs, both of which would be reflected as a risk premium required to finance the investment (refer Box 1). However, the estimation of beta through market data does not consider greenfield investment returns where most of the volume risk is realised.

Box 1 Example of Greenfield Tollroad Arrangements

Brisbane Airport Link Key Facts[37]

Base Case Equity Return:	post tax nominal IRR of 17%
Opex-to-assets:	1.3%
Capex (Yrs. 11 – 20) to Assets:	1.3% (significantly correlated with volumes)
Material Adverse Effect Regime:	Ability to renegotiate with, or obtain compensation from, the state for certain events to restore unit holders to base case equity return (i.e. opening of competing tunnel or closure of connection roads)

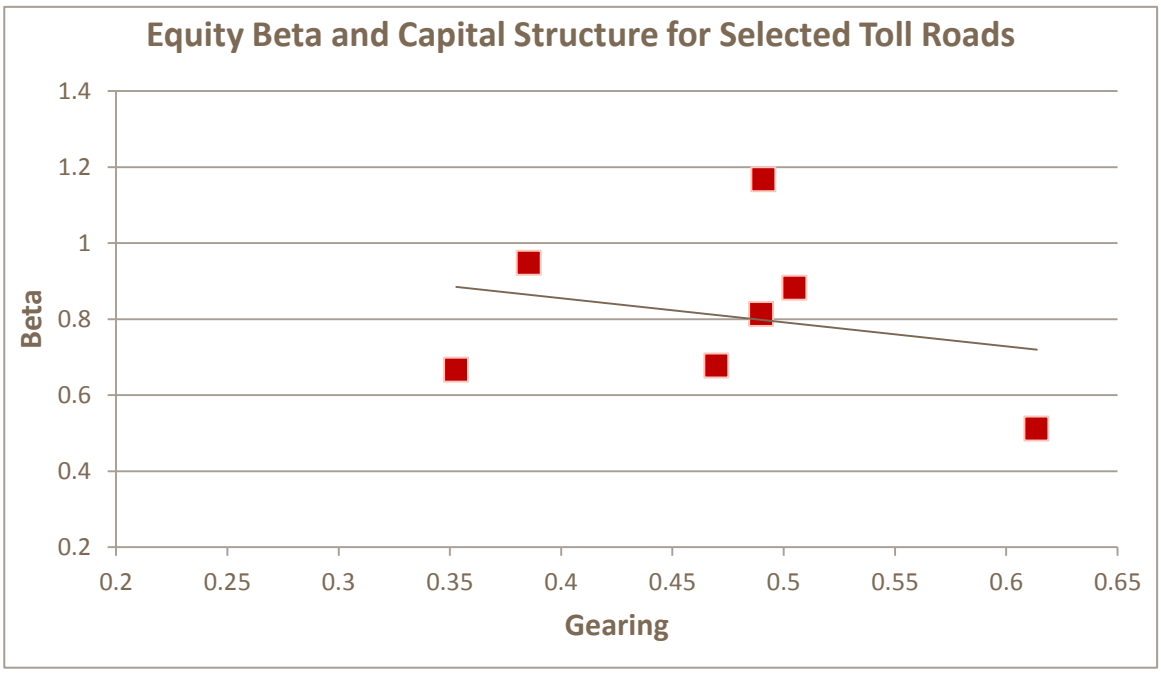
Additionally, EBIT risks are likely to be lower as debt is normally issued with very long tenures. Accordingly, there would be limited need for a periodic price reset mechanism as this would simply expose the tollroad to increased systematic risk by exposing EBIT to market and interest rate risks. Similarly, as shown in Box 1, the degree of operating leverage is low where the opex-to-asset ratio is less than 25% of that of the CQCN. As such even large variations in operating costs would be expected to have minimal impact on EBIT outcomes.

The development of a tollroad may also involve some form of government co-contribution or debt underwriting. It is therefore a complex exercise to consider 'each tollroad' from a first principle perspective without a detailed review of its business model, which may further differ substantially between countries and within the industry.

This is evident in the variance between equity beta and capital structure within the tollroad comparator group as shown in Figure 6 overleaf. For instance, the comparator group displays a large spread between the highest and lowest beta around the 50% capital structure level. In other words the upper limit could also be described as an equity beta of 1.2 at a gearing of 0.48.

[37] BrisConnections, 2008, Product Disclosure Statement: Airport Link Project, June 2008, available at http://www.brisconnections.com.au/media/7760/final_pds_noapplication_20june_2008.pdf

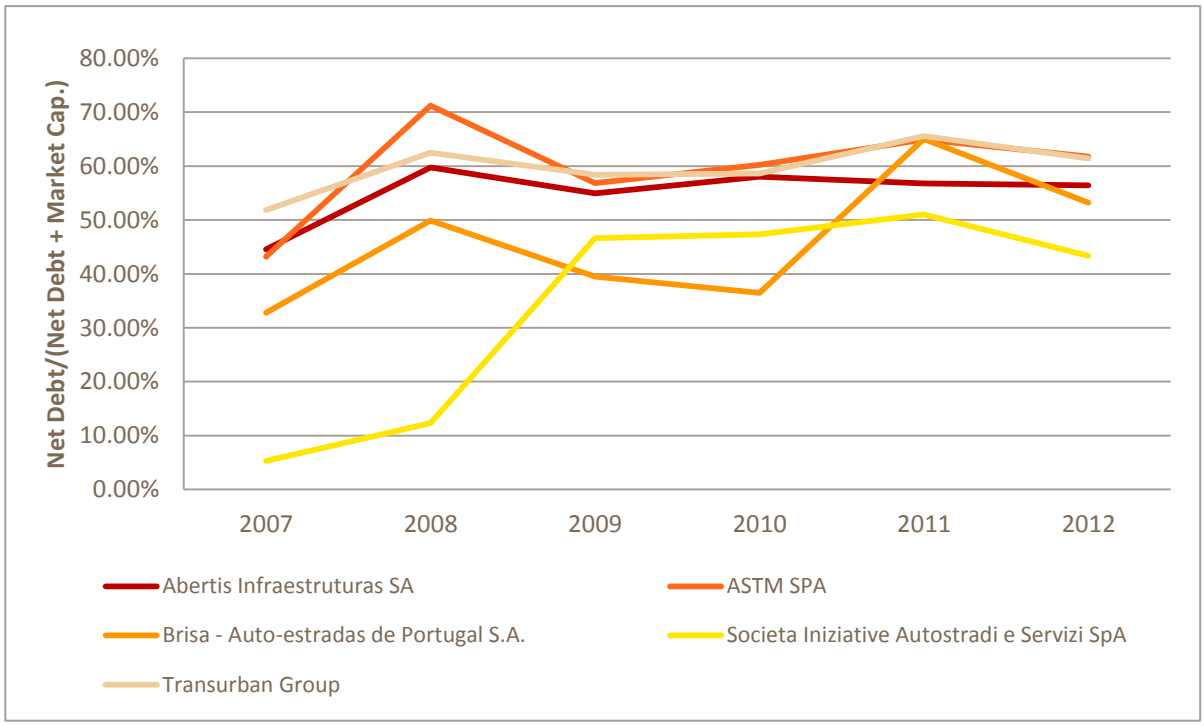
Figure 6 – Toll Road Comparator Group Equity Beta Variance



Source: Incenta, Aurizon Network analysis

Aurizon Network also has concerns regarding the stability of equity beta estimates and the gearing assumptions which are applied to obtain the asset beta. As the equity beta is derived from monthly observations over at least five years, then derived asset betas require a reasonably stable gearing ratio to improve the robustness of the estimate. The following figure shows that the Brisa and SIAS gearing do not appear to satisfy this stability condition.

Figure 7 - Gearing Levels for Tollroad comparators



3.3.2 Regulatory Risks

All tollroads listed are subject to regulation of one form or another. The main difference being that Aurizon Network faces full economic regulation whereas, the most heavy-handed form of regulation faced by three of the comparator tollroads is a form of price capping.

In the Australian context, this may come across as light-handed regulation, but over time the European regulation of tollroads has become increasingly more complex as the rate of private ownership of tollroad infrastructure has increased. With an increased amount of private construction of tollroads as evidenced by the companies in the comparator group, it should be assumed that the complexity of regulation will continue to increase. This was outlined in a 2009 study:

> *"The state reregulates the market once privatized by increasing the sophistication of regulatory rules—in our case, price regulation—and this is a common feature, independent of institutional frameworks…The cases of Spain, with the longest experience with private ownership, and Italy and France, with their important and recent privatization reforms, show how this process emerges and how regulation evolves to accommodate the new ownership patterns. On the one side, it has been shown that Spain and Italy have the most sophisticated mechanisms of price regulation and these mechanisms have been adapted overtime as private management has increased. Thus, price cap schemes in these countries take into account several factors."* [38]

There are numerous examples of the varying levels of tollroad regulation in the European context. For example:

- In Italy, tollroads are able to adjust prices annually, with prices increasing by 70% of CPI plus an "X factor" that is a set IRR on a suite of enhancements agreed on in conjunction with the government in 2002. In addition, a "K factor" – which represents any new investments made by the company – this works on a RAB system with a return on investment equal to a pre-tax WACC.[39]
- Tollroads in Spain are able to recover through a price cap mechanism, where both the rate of inflation and an adjustment for the difference between real and forecast traffic represent rather sophisticated regulatory schemes.
- Portugal has the lightest form of regulation with toll companies only being able to recover 90% of inflation through an increase in tolls over the annual period.[40]

It is therefore apparent that all tollroads in the comparator group are subject to regulation albeit, with varying levels of complexity. Given Incenta's first-principles analysis that Aurizon Network's asset beta should be capped at that of tollroads because of the absence of strict regulation, the fact that there is regulation in the tollroad comparator groups means that Aurizon Network would experience a similar amount of systematic risk.

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[38] Albalate, D., Bel, G. and Fageda, X. (2009), *Privatization and Regulatory Reform of Toll Motorways in Europe*. Governance, 22: 295–318. doi: 10.1111/j.1468-0491.2009.01436.x

[39] CIPE Directive no. 39/2007

[40] Table 4, Albalate, D., Bel, G. and Fageda, X. (2009), *Privatization and Regulatory Reform of Toll Motorways in Europe*. Governance, 22: 295–318. doi: 10.1111/j.1468-0491.2009.01436.x

3.3.3 Revenue Risks

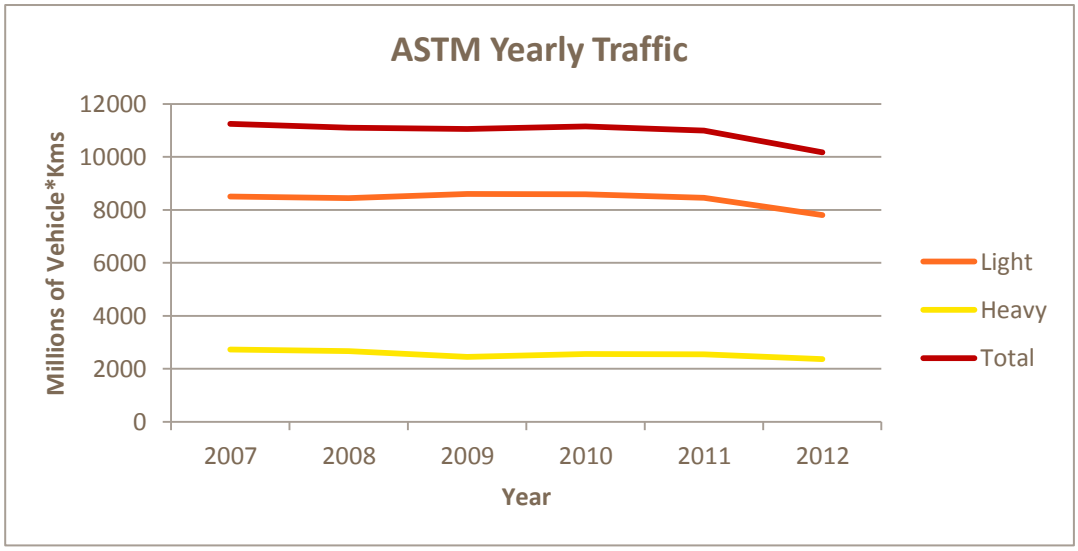
Many of the tollroad comparators also operate subsidiaries that provide ancillary services for tollroads, or are in completely different sectors to toll concessions. Below is a list of comparator company's subsidiaries that serve a function of diversifying revenue streams and therefore, decrease the overall volatility of earnings.

- **Abertis –** Telecommunications and Airports (Ownership, concessions and management);[41]
- **ASTM –** Technology, Engineering and Construction;[42]
- **Atlantia –** International Electronic Tolling Systems;[43]
- **Brisa** – Via Verde toll payment system, Vehicle Inspection Centres; and [44]
- **Grouppe Eurotunnel –** Above rail freight services, Freight, passenger and vehicular ferry operations.[45]

Aside from the diversified business activities listed above – which examples of diversifying against non-systematic risk – it should also be noted that all of the comparator companies have tollroad holdings in more than one geographical location within their home country. In addition, all except ASTM/SIAS have international tollroad investments, arguably providing a level of protection against risk bought on by national or regional (EU) systematic risks. Aurizon Network does not have the same amount of protection against systematic risks as the above examples show.

A further illustration of the minor exposure to cyclical economic activity is the relative stability of the comparator traffic numbers throughout the GFC. ASTM provides an example of this.

Figure 8 – Stability of ASTM Traffic Levels



[41] Abertis 2012 Annual Report

[42] ASTM Financial Statements and Consolidated Financial Statements as at 31 December 2012

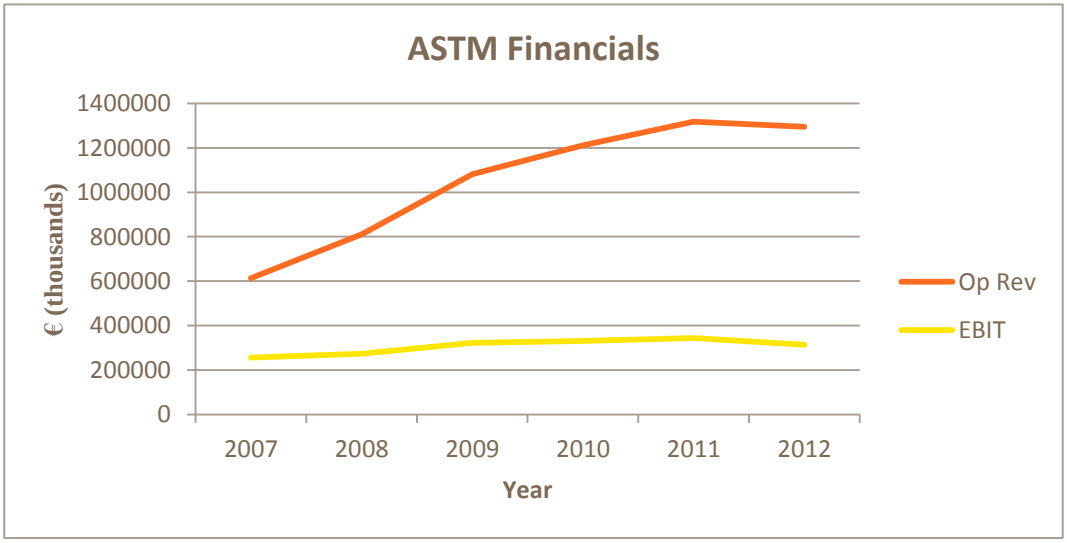
[43] Atlantia Annual Report 2012

[44] Brisa Annual Report 2012, Consolidated

[45] Groupe Eurotunnel 2012 Registration Document

Over the course of the GFC, ASTM's traffic numbers for its Italian tollroads stayed relatively level. It also managed to increase its operating revenue and maintain a stable EBIT throughout the downturn. This is a pertinent example of the resilience of the tollroads to broader economic activity.

Figure 9 – Stability of ASTM EBIT



Another example of the non-volatility of the tollroads traffic and revenue is Brisa's performance over the course of the GFC. Whilst they have had a slight decline in their average daily traffic numbers, they were been able to maintain operating revenues and increase their EBIT. This is illustrated below.

Figure 10 – Brisa Traffic Levels

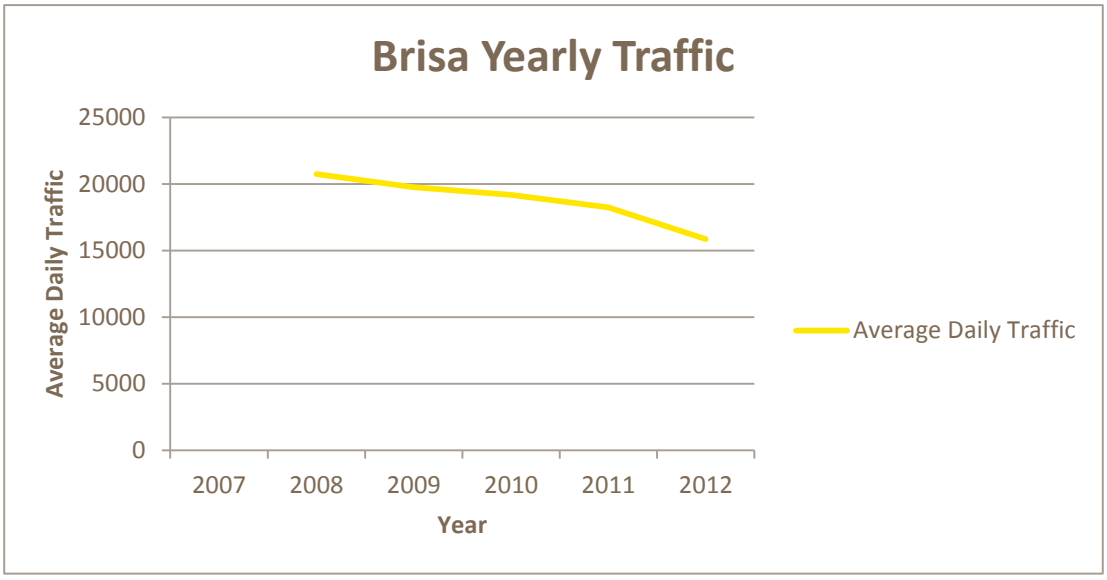
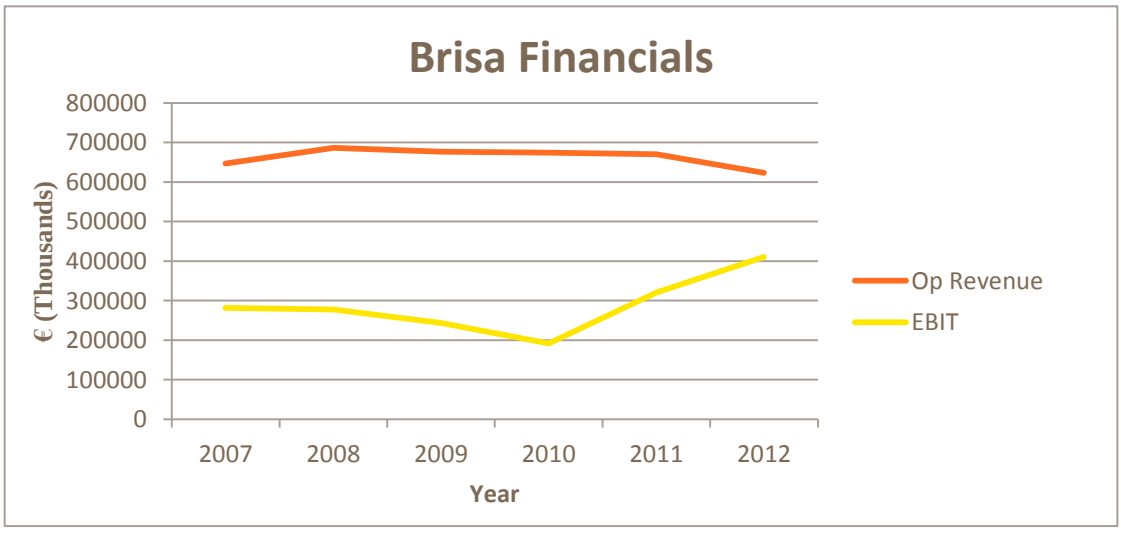


Figure 11 – Stability of Brisa operating Revenue pre and post GFC



From this evidence, it is clear that there is very little volatility in the traffic and revenues of the European toll market. This view is shared by the market, with Italian tollroad owner Atlantia being able to procure around €4.5 billion of debt capital during the height of the GFC. The sources were as follows[46]:

- European Investment Bank (24/11/2008) – 1.5bn Euro at 2.9% with an average maturity of 15.5 years (0.5bn of the facility still undrawn);
- CDP-European Investment Bank Loan (19/12/2008) – 0.85bn Euro at 2.2% with an average maturity of 16 years (0.35bn of the facility still undrawn);
- New Bond issues (06/05/2009) – 1.5bn Euro at 3.7% with an average maturity of 7 years;
- Private placement bond (10/12/09) – 0.149bn Euro (issued in Yen) at 5.3% with an average maturity of 29 years;
- CDP-SACE Loan – 1bn Euro at 2.4% with an average maturity of 15.5 years; and
- Revolving Credit Facility – 1bn Euro at 2.75% with an average maturity of 5.5 years.

It should also be noted that the EIB, CDP-EIB and CDP-SACE loans are all backed by a government body of some type. This is unique to the European context but further illustrates the forward-looking view that tollroads have relatively low risk profiles in regards to revenue and EBIT.

3.3.4 Asset Stranding Risk

In the tollroad comparator group there are only two examples of asset stranding and both were in the last 24 months. Both were also in the Portuguese market and were experienced by the same tollroad comparator, Brisa[47].

The first is the Littoral Centro concession (70% held by Brisa) – The A17-Marinha Grande-Mira stretch runs 92.7 km alongside the A1 and the coast north of Lisbon. In 2012, an Arbitral Court was set to decide on the application for financial rebalancing submitted by the Brisa to the Government. The opening of the

[46] Atlantia – Update on Group Financing, 23 December 2009
[47] Section 3 – Other Motorway Concessions, Brisa Annual Report 2012, Consolidated

infrastructure established an uninterrupted link between Lisbon and Oporto, giving rise to a period of strong growth in traffic levels. After a year of strong traffic growth, the trend was reversed in October 2010 due to the introduction of tolls in Costa de Prata concession, a feeder road to the Littoral Cento concession. The introduction of tolls in the said concession considerably increased travelling costs in the corridor, becoming more expensive than the A1 alternative and effectively stranding Brisa's originally successful concession.

The second example was the Douro Litoral concession. Acting as a link between Lisbon, Coimbra and Oporto, 2012 saw Brisa apply for financial rebalancing following the Portuguese Government's unilateral decision to abandon the construction of sub-concession Auto-Estradas do Centro, thus failing to ensure the continuity of the A32 motorway up to Coimbra.

Both of these examples resulted in the removal of the concessions off Brisa's consolidated financial statements. Despite being examples of asset stranding, both were caused by political unsystematic risks that Aurizon Network would not necessarily be exposed too. Specifically, the first example involved the introduction of a tolled feeder road that changed consumer preference of travelling the entire tollroad. The second involved the cancellation of a sub-concession due to austerity measures instigated by the government. In both circumstances, Brisa let the assets restitiute to the government owned toll company Estradas de Portugal S.A.[48]

In most cases it would be commercially prudent for commercial protections to be included within the concession agreement regarding bypass. Fiscally austere governments are also highly unlikely to expend public funds to bypass an existing tollroad which is uncongested. In contrast, competitive risks for the CQCN come from a broader global market for the supply of coal, not from local or regional passenger vehicle movements.

In light of these examples, Aurizon Network through the nature of its operations is open to more stranding risk than the tollroad comparator group. The fact that the comparator's traffic figures – and the revenues derived from said traffic flows – seem to have a distinct disconnect from the underlying macroeconomic fluctuations, single-handedly indicates that the comparator tollroads have lower systematic risk and less stranding risk than Aurizon Network.

3.3.5 Summary

The analysis of the tollroads in the comparator group does not support the proposition that they provide an upper limit to Aurizon Network asset beta. The comparators can be categorised as having limited systematic risk exposure due to:

- Having a low levels of operating costs;
- Asset renewals being highly correlated to volumes;
- Long term debt tenure and alignment with initial pricing formula;
- No demonstrable correlation of demand or EBIT with broader macroeconomic variables; and
- Limited asset stranding risk exposure related to systematic risks.

[48] Pp. 22, Section 3 – Other Motorway Concessions, Brisa Annual Report 2012, Consolidated

4. Understanding Aurizon Network's Commercial and Regulatory Risks

Stakeholder submissions have raised concerns that the proposed UT4 regulatory framework has 'de-risked' Aurizon Network without off-setting reductions to the equity beta. However, this represents an over simplification of efficient risk allocation and the nature of the risks relevant to determining the equity beta. Specifically, there is no justification for reducing the asset beta on the basis of any changes in risk allocation as:

- Any changes in risk allocation which have been made relate to asymmetric risks. The transfer of asymmetric risks to customers yields lower tariffs than might otherwise prevail should the QCA be required to include the costs associated with insuring for those risks, or alternatively, including additional compensation or risk premiums within the cash flows;
- There has been no empirical valuation by stakeholders of the materiality of any change in risk allocation;
- No empirical evidence has been presented to demonstrate that systematic risk changes as consequence of the nature of the risk allocation (i.e. price cap versus revenue cap); and
- Previous regulatory determinations by the QCA have not compensated Aurizon Network for changes in risk allocation as evident in the following statements:

  "Given the evidence raised by QR and other stakeholders, the Authority considered that, to the extent that QR faces volume risk, that risk was largely uncorrelated with Australian market returns, i.e. the risk was non-systematic in nature. The Authority therefore concluded that volume fluctuations would not have a material impact on QR' systematic risk, as reflected in the value of its asset beta and therefore the cost of capital." [49]

  "The Authority accepts the arguments presented by both QR Network and the QRC that any assessment of the WACC should be in the context of the risks faced by QR Network. Some of the risk reduction measures proposed by QR Network appear to be unrelated to covariance risk, (e.g. long term asset stranding) and are, therefore, not normally reflected in WACC estimates.
  With respect to asset stranding risk, the Authority considers that the measures that it is proposing to accept as part of this draft decision, in particular accelerated depreciation for new capital expenditure and the greater ability to seek access conditions (e.g. capital underwriting) for major projects, combined with strong coal demand (in particular in relation to metallurgical coal), and the highly competitive position of Queensland coal producers, means that QR Network's asset stranding risk is minimal." [50]

On the basis of these statements, it is difficult to conclude that any changes proposed by Aurizon Network in relation to asymmetric risks so as to ensure that the revenue adequacy requirements of s.168(A) are satisfied could substantiate a reduction in the beta, especially for the transfer of risk that the Authority assumes to be minimal and not systematic.

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[49] Queensland Competition Authority, 2007, *Draft Decision on QR's Proposed Schedule F Amendment*, April, pg.3, available at: http://www.qca.org.au/Files/R-DraftDecision190407.pdf
[50] Queensland Competition Authority, (2009, *Draft Decision on QR Network's 2009 Draft Access Undertaking*, December, pg. 11-19, available at: http://www.qca.org.au/files/R-2009DAU-QCA-QRN09DAU-DraftDec-1209.pdf

Importantly, Aurizon Network also notes that no empirical analysis was undertaken to quantify the reduction in the asset beta from 0.5 to 0.45. Aurizon Network does not consider that this reduction would have incentivised private sector investors to provide the capital necessary to fund the expansions which have occurred. In particular, much of the basis for those decisions appears to relate primarily to revenue risks which have not been robustly assessed and do not address the benefits to customers from changes in the risk allocation framework. Nevertheless, the literature review undertaken by Incenta in relation to the impact of the form of regulation on beta and the conclusion that cash flow betas for regulated utilities are negligible, would mean that any transfer of a systematic cash flow risk to customers would also not reduce the asset beta.

The objective of this section is to properly characterise Aurizon Network's risk profile and address errors in the Castalia and Incenta submissions. For comparative purposes, the following sections address the same risks included in the Castalia paper.

4.1 Revenue Risks

Regulatory revenues are largely influenced by aspects of the regulatory framework including price structure and units, capacity reservation charges, take-or-pay and the approach to variations from expected revenues. For example, a well-designed pricing framework with a fixed capacity and variable charge which aligns to fixed and variable costs, can provide greater revenue mitigation than a combination of a revenue cap and take-or-pay mechanism.

Revenue risks should also be considered from the perspective of short term (monthly), medium term (annual) and the long term (regulatory).This section reviews the role and objectives of these arrangements as they apply to Aurizon Network.

Incenta (2013) considered the form of regulation in the context of a decomposition of the asset beta to a cash flow beta and a discount rate beta. The report cites the work of Campbell and Mei (1993) who, not unsurprisingly given the predominant cost plus form of regulation, found that US utilities possessed low cash flow betas.[51] However, a low cash flow beta is not a precursor to a low overall beta as noted by Campbell and Mei:

> *"Cyclical industries such as basic industries, capital goods, and textiles have high cash flow betas, whereas stable industries such as utilities and services have low (indeed slightly negative) cash flow betas. This pattern is not just a replication of the pattern of overall betas; services, for example, is an industry with high overall beta but low cash flow beta. Our model attributes the high overall beta of this industry to the fact that its expected return is highly sensitive to market expected returns. It is important to note, however, that the standard errors for cash flow betas are always rather large."*

It is also unclear how the more recent work by Campbell and Vuolteenaho (2004) is applicable to the impact of the form of regulation, as it tests changes in asset prices against changes in news which might impact

[51] Campbell, J.W. & J. Mei, 1993, *'Where do betas come from? Asset price dynamics and the sources of systematic risk'*, Review of Financial Studies, 1 , No. 2, pp. 195-228.

future cash flows, not just current cash flows, and it does not consider changes in actual cash flows.[52] Accordingly, it is not clear from studies in relation to the determinants of systematic risk what time horizon regarding cash flow variability is particularly relevant. It is more likely that prices would adjust to reflect longer term changes in cash flow associated with uncertainty of regulatory resets and longer term demand (asset stranding). Aurizon Network considers both of these risks to be substantially more prominent for the CQCN than electricity networks.

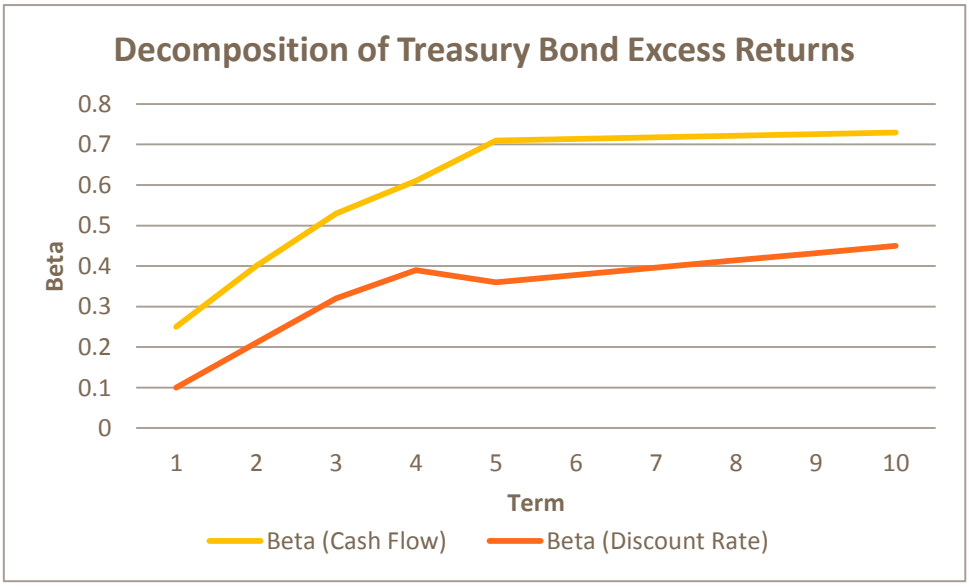
An interesting observation from the work by Chen and Zhao (2009) is the concept of a 'duration' beta where beta increases with the economic life of the asset being priced.[53] The result of their decomposition of the excess returns on Treasury bonds into both the cash flow beta and discount beta is illustrated in Figure 12

This is consistent with Cornell's (1999) conclusion that:

> *"This implies that the survival of corporate practice of discounting longer term projects at higher rates is not irrational but an intuitive response to correctly perceived risks. In fact, given the difficulties associated with estimating betas, the duration of the project may be one of the most accurate ways of assessing its systematic risk."* [54]

Given the uncertainty of the frequency of cash flow volatility relevant to determining systematic risk, Aurizon Network has considered the cash flow and earning impacts across a range of horizons.

Figure 12- Beta Characteristic of Bonds (Fama bond portfolios)



Source: Chen and Zao (2009) Table 1, Panel B, p. 5225

[52] Campbell, J.W. & T. Vuolteenaho, 2004, *'Bad Beta, Good Beta'*, The American Economic Review, Vol. 94, No . 5, pp. 1249-1275.
[53] Chen, L. & X. LZhao, 2009, *'Return Decompostion'*, The Review of Financial Studies, Vol. 22, No.12 pp. 1249-1275.
[54] Cornell, B., 1999, *'Risk, Duration, and Capital Budgeting: New Evidence on Some Old Questions'*, Journal of Business, Vol. 72, No. 2, pp 183-200

4.1.1 The Objective of the Revenue Cap

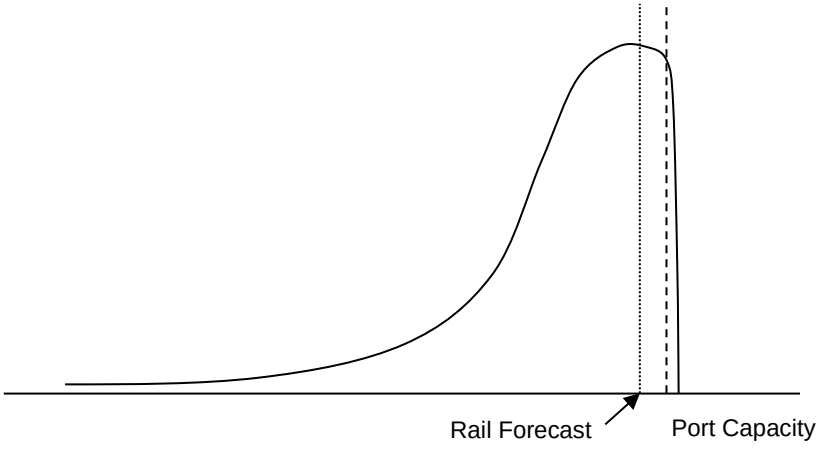
A revenue cap form of regulation will represent the most efficient form of managing volume risk where that risk is able to be diversified across a broader industry base; is asymmetric in nature; and there is a high degree of error in the estimation of the risk premium associated with compensation for that risk.

As customers remain best placed to efficiently forecast and manage those risks, the prices are materially lower than they would otherwise be given if additional compensation by way of a risk premium was necessary.

While a price cap form of regulation prevailed in UT1, it was only appropriate due to the substantial latent capacity in the rail system and the supply chain as evidenced by the low level of capital expenditure during that term. However, as expansions became necessary in both the rail system and ports, and where volume forecasts are based on full utilisation, then there is no opportunity to 'outperform the price cap'. This is particularly relevant to the rail system.

While it can accommodate additional train services through increased congestion costs to operators, the throughput levels are ultimately constrained by the in-load and out-load rate at the ports. The resultant probability distribution for revenue under a price cap becomes highly asymmetric, as shown in
Figure 13Figure 13

Figure 13 - Probability Distribution for Revenue
Under a Price Cap Form of Regulation with Capacity Constraints



There are two important properties of this distribution. The cumulative probability (the area under the curve) associated with railing below the volume forecast is substantially greater than the cumulative probability of exceeding this forecast, indicating that the expected revenue outcome is less than 0 NPV. Also the magnitude of the possible losses is substantially larger than the possible gains.

Research in behavioural economics has shown that the concept of loss aversion, where a dollar gain is preferred to a dollar loss, has some explanatory power for excess return. [55] In market practice, when

[55] For example, see Benartzi, S. & Thaler, 1993, *'Myopic Loss Aversion and the Equity Premium Puzzle'*, NBER Working Paper 4369, May 1993, available at www.nber.org

investors exhibit loss aversion and the rail forecast represents their point of reference, significant excess returns would be required to attract capital to those investments under a price cap. In other words, if the volume risk is borne by the business, it will charge a premium to bear this risk given it is not able to efficiently mitigate it.

The revenue cap therefore provides lower costs to customers through efficient management and transfer of those risks as opposed to the retention of those risks by the service provider and efficient compensation via higher reference tariffs.

Accordingly, the revenue cap form of regulation does not reduce the systematic risk of the business but does avoid the requirement for material excess returns to be included in the allowable revenue to compensate for loss aversion and asymmetric return outcomes. Aurizon Network's UT4 proposal does not include excess returns.

4.1.2 The Objective of Take-or-Pay

Aurizon Network notes that contractual obligations relating to capacity reservation are typically addressed through various mechanisms such as:

- Capacity reservation charges;
- Connection fees; or
- Ship/use/take or pay.

The objectives of take or pay are quite diverse and are targeted towards reducing risks to customers associated with a revenue cap form of regulation, particularly in relation to common user pricing frameworks.

Take or pay therefore aims to promote efficient utilisation of rail infrastructure by imposing a financial obligation on capacity hoarding, where the financial incentive seeks to ensure that an access seeker who obtains access rights incurs a liability commensurate with the opportunity cost of underutilisation. This serves to optimise network configuration by avoiding capital expenditure through improved utilisation of the existing facility, with capacity ultimately allocated to its most valued use. However, Aurizon Network acknowledges that the combination of the low proportion of below rail costs as an input cost to coal exports; and the pricing on volume forecasts and not contract levels, significantly diminishes the strength of these incentives.

Take or pay also reduces cost transfer between both current and future access seekers/access holders associated with a customer's underutilisation of capacity. This is particularly relevant where the coal system has been expanded to accommodate the additional access rights where either those additional access rights are underutilised; or existing access rights are underutilised and the full scale of the expansion was avoidable. In such circumstances, pricing of the common user charge transfers those costs to users who utilise there contracted capacity levels. Aurizon Network also notes that take or pay assists in reducing the materiality of the revenue cap adjustments and therefore provides for more efficient pricing by reducing price volatility from under or over-utilisation in previous periods.

It is also important to note that take or pay does not cover all of Aurizon Network's fixed costs as it only applies to the AT2-4 tariff components. As such, a material proportion of Aurizon Network revenue relating to the supply and sale of electricity to rail operators remains exposed to volume risk, as is shown in Table 10.

Table 10 – Proposed Electric and Non-Electric Revenues in UT4

	FY14	FY15	FY16	FY17	Total
Track Assets Revenue (take or pay)	$892,097	$995,600	$1,078,396	$1,121,146	$4,087,239
Electric Asset Revenue (no take or pay)	$164,856	$191,774	$214,481	$201,356	$772,467
Percent Non-Take or Pay	15.6%	16.2%	16.6%	15.2%	15.9%

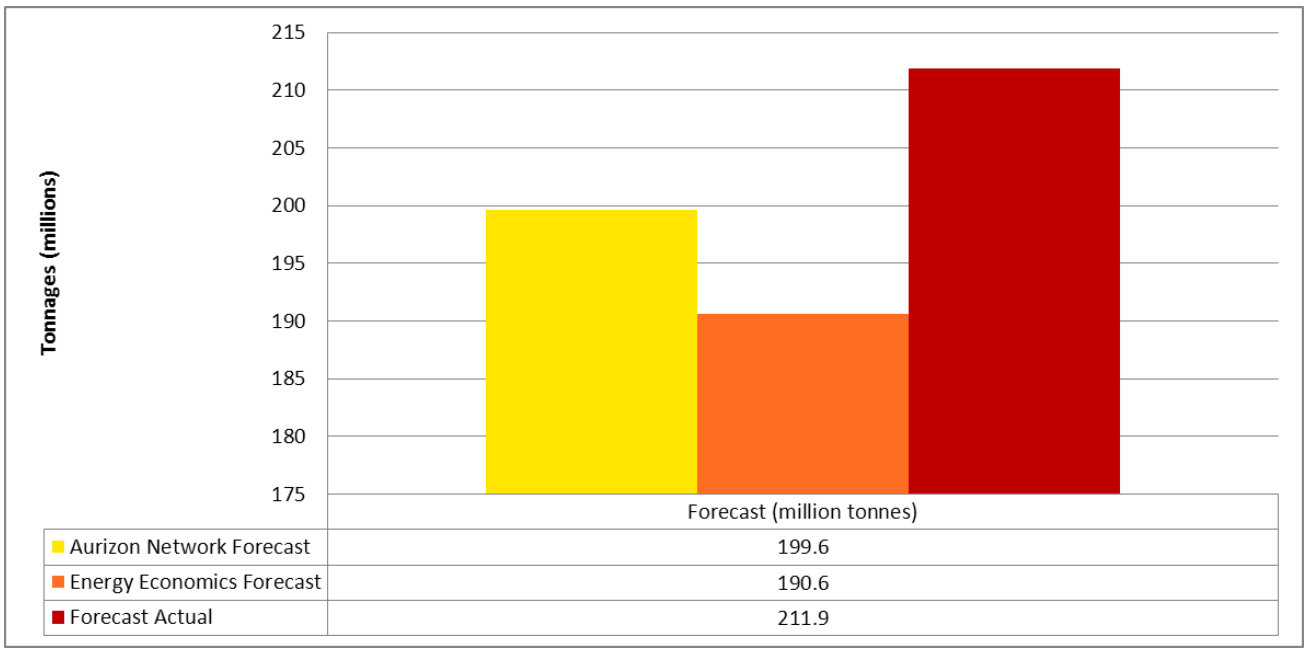
Source: 2013DAU Volume 3

In contrast to Dalrymple Bay Coal Terminal[56] and the Hunter Valley Coal Network[57] where take or pay is collected monthly, Aurizon Network only collects take or pay on an annual basis. As a consequence, Aurizon Network has much greater working capital risks and financing risks than reflected in these and potentially all the direct industry comparators identified in Section 3.1.

4.1.3 The Objective of Annual Volume Resets

The annual volume resets were introduced in UT3 to overcome the material regulatory risk of volume forecast error. In contrast to other direct industry comparators – where prices are based on contract volumes or where demand and load are both reasonably stable, predictable and therefore easier to predict using sophisticated forecasting models – individual coal system volumes forecasts are uncertain and volatile.

Figure 14 – Forecast Tonnages for the 2013/2014 year



Source: Energy Economics, Aurizon Network, Aurizon Network analysis

[56] DBCT 2011 Standard Access Agreement, Schedule 2. Monthly payment (MP) = Terminal Infrastructure Charge (TIC) x Annual Contract Tonnage/12

[57] ARTC Indicative Access Holder Agreement, Clause 5.2(a) '*On the Effective Date and at the beginning of each Month, ARTC will issue to the Access Holder an invoice for TOP Charges for that Month or part of the Month if applicable*'

So far, the FY13/14 year has been characterised by above average tonnages in the CQCN. Figure 14 on the previous page shows the Aurizon Network forecast against the Energy Economics forecast as calculated in previous UT4 submissions. There is also an additional estimation of the forecast end of year tonnages based on the current tonnage trend. This end-of-year forecast is also adjusted to account for the traditional seasonally-affected tonnages that occur from January through March. It should be noted that the seasonally-affected tonnages for this year should be well within the historical average based on the tropical cyclone season outlook from the Australian Bureau of Meteorology[58]

Taking this forecast of the end of year actual tonnages based on current trends, *ceteris paribus*, the Aurizon Network forecast will be well within a 10% error margin for the financial year. Given the volatility in the volume forecasts for individual systems in the CQCN, this represents a reasonable and satisfactory outcome in terms of forecasting error. Whereas, the Energy Economics forecast falls outside a 10% error margin and displays a greater forecasting error.

Given that this comparison is being made on the first 6 months of the UT4 forecast period, the inclusion of an increased error from so early in the period casts doubt over the validity of the Energy Economics forecast moving forward.

Resetting prices annually also benefits customers by mitigating exposure to take or pay. However, this benefit comes at the expense of price volatility which is somewhat offset through reductions in revenue cap adjustment amounts.

4.1.4 Short Run (Monthly) Revenue Risks

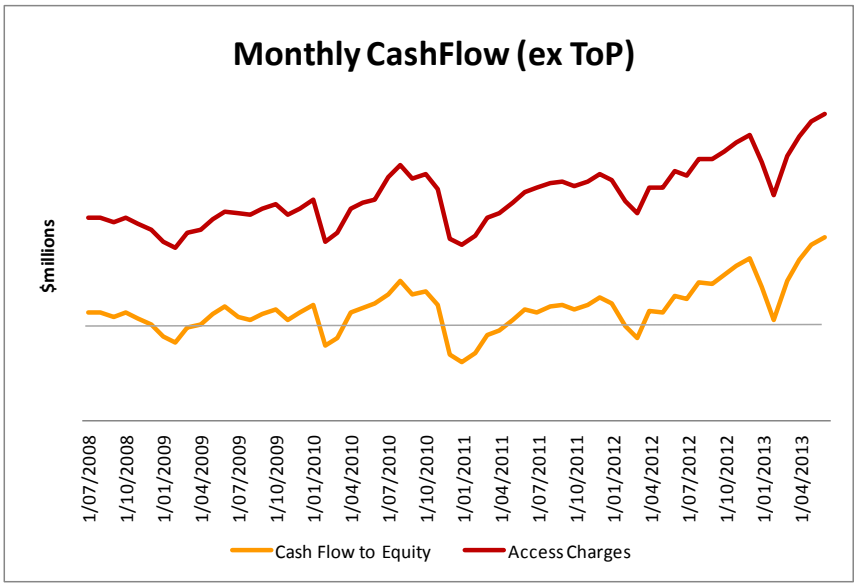
As noted above, Aurizon Network's monthly revenue is highly volatile. However, this can be contrasted with the statement by Castalia (2013) that:

> *'…take or pay…arrangements substantially mitigate even the cash flow timing differences from volume fluctuations.'* [59]

Aurizon Network considers this statement to be inaccurate as there are significant cash flow timing impacts associated with the volume fluctuations, exhibited in the Figure 15 overleaf which shows access charge revenues over the period of FY2009 to FY2013.

[58] 2013-2014 Australian tropical cyclone season outlook, accessed at http://www.bom.gov.au/climate/ahead/tc.shtml
[59] Castalia, 2013, pg. 14

Figure 15 - Indicative Cash Flow Variability for the CQCR



Source: Aurizon Network analysis

The graph also includes an indicative cash flow to equity estimate applicable to a benchmark firm by deducting from the access charges:

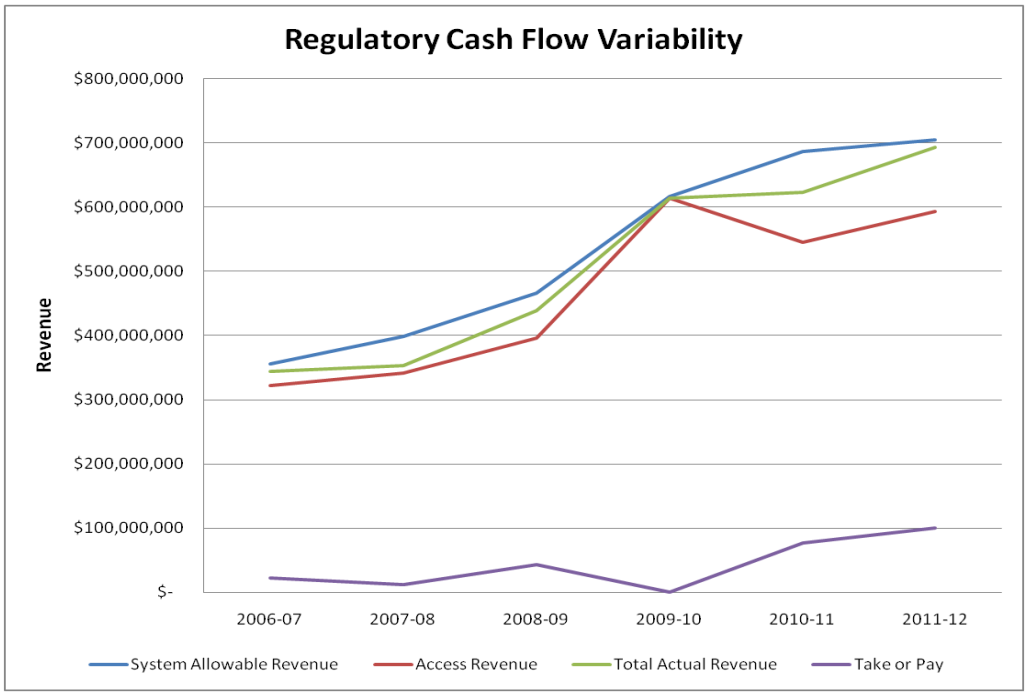
- A monthly interest expense, based on the QCA approved cost of debt, multiplied by the midpoint of opening and closing RAB roll-forward values, multiplied by the benchmark gearing level of 55%;
- A monthly tax expense for the firm benchmark firm, based on QCA approved gamma adjusted tax amounts, adjusted upwards to reflect statutory tax rate of the firm (i.e. 30%); and
- The operating and maintenance expenditure amounts reported in below rail financial statements for the CQCR divided by 12. For FY13 the expenditure amounts for FY12 have been rolled forward.

The last of these deductions is unlikely to represent the actual timing of cash outlays. For example, it is expected that there will be a strong negative correlation between periods of low revenue and increased maintenance costs due to weather related asset availability, suggesting that the variation of cash flow to equity would be much greater. Importantly, the cash flow to equity line, at the benchmark gearing level, shows periods of negative cash flow. This arises despite not giving consideration of any cash flows required for investment in renewals or capex expansions. As a consequence, Aurizon Network reiterates that its working capital and financing risks associated with cash flow timing are significantly more material than the direct industry comparators and other regulated utilities in Section 3.

4.1.5 Medium Term (Annual) Revenue Risks

Aurizon Network acknowledges that the customer benefits of take or pay will reduce the variance between annual revenue earned and the target revenue for that year. However, as noted above, take or pay does not extend to the overhead power system meaning Aurizon Network will be exposed to greater revenue risk than other direct industry comparators. The following figure shows Aurizon Network's actual revenue performance for the period of FY07 to FY12.

Figure 16– Aurizon Network Actual and Allowable Revenues (AT_{2-5})



Source: Aurizon Network Revenue Cap Submissions

Notwithstanding the variance in revenue, Aurizon Network considers any mitigation of systematic risks is more substantially outweighed by (1) the impact of fixing those revenues over the regulatory period; and (2) the subsequent valuation changes of the firm relative to the market over the business cycle. While the regulatory financial model assumes a NPV=0 assumption, this assumption only holds within the strict confines of that model. It is reasonable to assume that the market continuously evaluates the value of the stock based on relevant market conditions at the time; on the basis that price includes all relevant and current information.

As investors are free to buy, hold, or sell their interests in the firm, then an efficient market price will be continually marked to market and reflect the most current valuation of the cash flows. As a consequence, where the equity beta is determined from monthly price covariance with the market and not the return to the firm over a holding period aligned to the regulatory period, the NPV=0 assumptions becomes increasingly irrelevant. As investors are neither required to hold an asset for the economic life of the facility nor the term of the regulatory control period, the systematic risk would be strongly influenced by changes to the discount rate.

This can be demonstrated simply through the following commonly used valuation equation where the price is the present value of the discounted future cash flows:

$$P_0 = \frac{D_1 + D_2 + D_3 + D_4 + TV}{(1+r)^4}$$

At the start of the regulatory period the price is commensurate with the RAB value. At P_1 however, the discount rate will reflect the risk-free rate prevailing in the market at that time. However, the regulatory framework has fixed the firm's earning on the basis of the risk-free rate that prevailed at P_0. As a

consequence, equity holders are exposed to systematic market risk through periodic repricing of the relatively fixed forecast cashflows. In addition, the terminal value (TV) is also highly uncertain as ambiguity exists regarding a range of macroeconomic variables such as future real interest rates.

In contrast, firms which are not subject to regulatory control are able to periodically review pricing to optimise systematic risk of both the numerator (forecast earnings) and the denominator (discount rate). Accordingly, Aurizon Network does not consider that there is sufficient empirical evidence to support the hypothesis that the regulatory regime substantially reduces systematic risk.

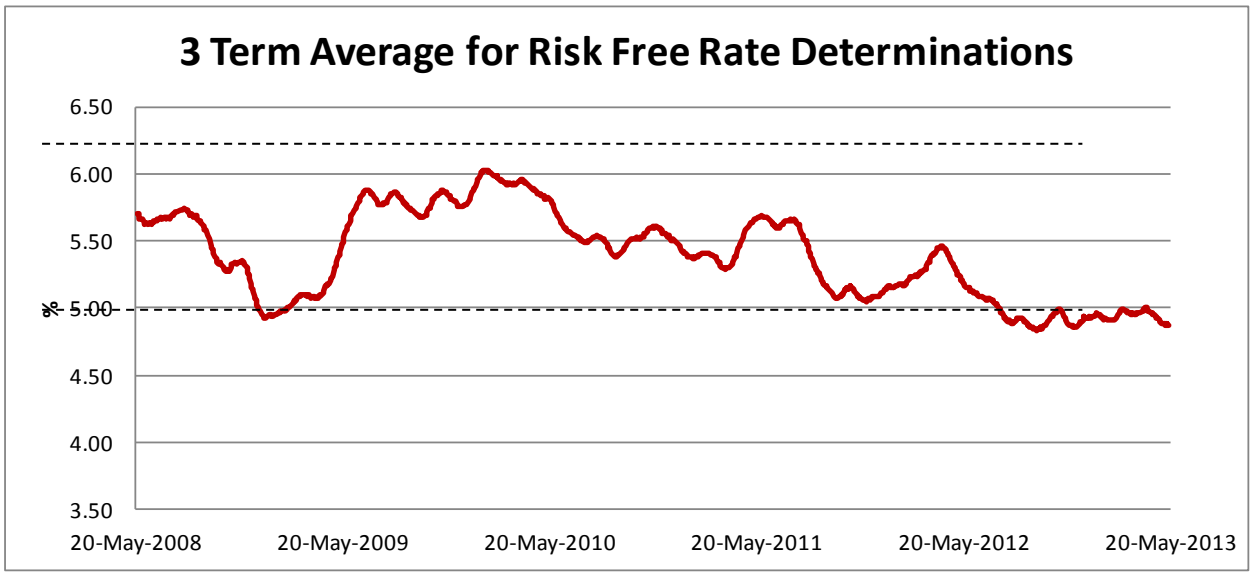
4.1.6 Regulatory Reset Revenue Risks

Regulated service providers for export supply chain infrastructure are particularly exposed to business cycle risk due to the timing of the regulatory resets. The general presumption might be that on average over multiple resets, this would lead to little or no variance in expected revenue outcomes based on the timing of the market averaging period for the risk-free rate.

There are couple of problems with this presumption. First, the presumption does not recognise that economies are subject to structural change and there may be systematic factors which substantially alter the projects IRR and the risk-free rate over the economic life. Second, the timing of the business cycle may also coincide with the frequency of regulatory resets. This is demonstrated in Figure 17 which shows the average for the 20 business days over three, five yearly resets. For example, the observation 20 May 2008 would also include the outcomes for resets over the 20 business days prior to 20 May 2003 and 20 May 1998.

Importantly, the figure shows that there is a potential 120 basis point spread based on the timing of the regulatory determination with the business cycle. In other words, long term investors in a business with a market averaging period in January 2013 would expect to achieve an IRR over a 15 year period approximately 120 basis points higher than similar investors in a business whose last reset occurred in March 2009. Aurizon Network notes that this risk is common to most regulatory businesses.

Figure 17 – Average Risk-free Rate Settings Based on Timing of Market Averaging Period



Source: Aurizon Network analysis of Reserve Bank of Australia statistics

4.2 Inflation Risks

Inflation is widely regarded as having a substantive impact on systematic risks, as periods of unexpected inflation can have considerable wealth effects. Accordingly, most commercial contracts and supply agreements include some measure to escalate or review prices to accommodate changes in the broad consumer price index. Aurizon considers that the Castalia paper has substantially misunderstood the nature of inflation risk in relation to the CQCR regulatory framework.

4.2.1 RAB Roll-forward

Castalia (2013) asserts that Aurizon is subject to:

> *"…the standard building block model used in Australia in that reference tariffs are set in real terms and the RAB is rolled forward by applying actual inflation between regulatory control periods".* [60]

While Castalia is correct in relation to maintaining the value of the RAB for the next regulatory period, in real terms the realised return on equity during the regulatory period is subject to inflation risk. This is because prices are not adjusted for changes in asset related charges with movements in actual CPI over the term. Representing a substantive factual error in the Castalia analysis, revenues and prices are only adjusted for movements in inflation in relation to maintenance and operating costs.

As an example, the nominal rate of return within the UT3 period of 9.96% was equivalent to a real post tax WACC of 7.28% (assuming a CPI forecast of 2.5%). If actual CPI for a year was 3.0%, then the firm would forego the additional depreciation and return on the higher RAB asset value within that period, with the firm earning a negative NPV commensurate with the lower real rate of return (and vice versa).

As a consequence, Aurizon Network is highly exposed to inflation risk, where the real internal rate of return for the holding period which aligns to the regulatory term is eroded in periods where the actual inflation exceeds the forecast inflation.

Aurizon Network considers that its risk profile is substantially greater than the comparator group where revenues are escalated annually for actual changes in CPI to the entire cost base.

4.2.2 Operating and Maintenance Cost Escalation

The Castalia (2013) asserts that via annual CPI and MCI adjustments, Aurizon Network is insulated from changes in actual costs relative to forecast costs.

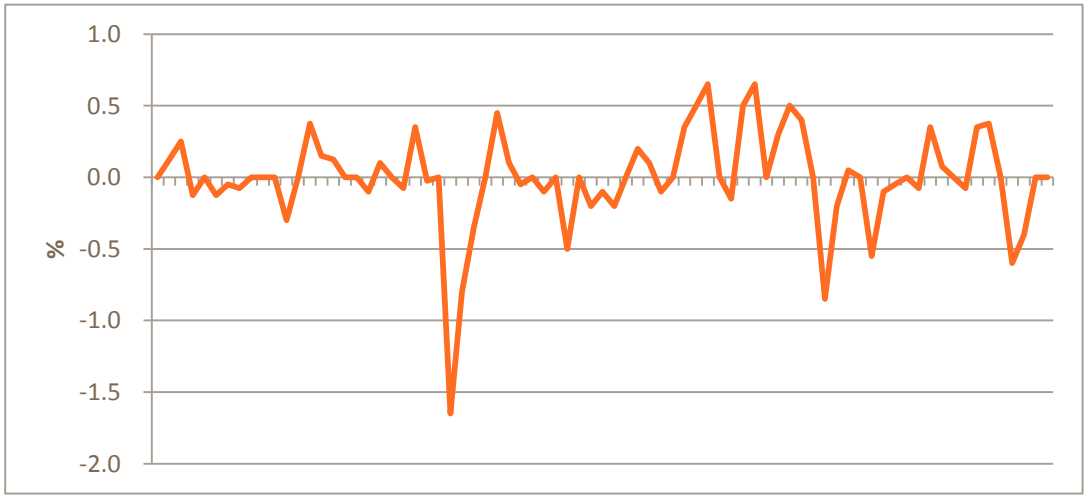
While it is reasonably anticipated that costs will be partially correlated with the index values, in practice material variations remain between actual costs and indexed costs. For example, labour costs which represent a large proportion of the operating and maintenance costs will often by determined and fixed under a negotiated award.

[60] Castalia, 2013, pg. 15

Similarly, the applicable index is unlikely to be representative of the actual composition of the firm's costs structure. This is particularly relevant to the maintenance cost index that – while more representative of maintenance costs than CPI – is still an imprecise representation of maintenance costs and how the firm's actual costs will change during the regulatory term. That is, maintenance costs will still deviate or vary from the escalated costs.

There is also likely to be some significant residual risks associated with sample period bias within the index construction. For example, as many of the index movements, such as accommodation and fuel, are samples at the end of the period, they may not reflect material movements in those costs between the sample periods. As a simple example, the following graph shows the variance of the quarterly inflation measures from interpolation of the Brisbane All Groups June index values. It is evident from the graph that for an index as stable as the CPI there can be material inter period variations from trend.

Figure 18 – Quarterly CPI Variance from Linear Annual Change in June Index Values



Source: Aurizon Network analysis of ABS Cat. 6401, Series A2325816R

This is likely to be particularly relevant for costs such as fuel where the index variation is based on two measurement periods within the year, but the price of diesel fluctuates significantly between those periods.

The purpose of the indexation is not to insulate Aurizon Network from operating cost risk but to ensure that the prices reflect efficient costs on an ongoing basis as is required under an incentive based regulatory model. The framework is therefore not a cost-pass framework and certainly does not mitigate risk to the extent envisaged by Castalia.

4.2.3 Electricity Supply Cost Pass-Through

Castalia (2013) asserts that:

> *"…there is a mechanism to ensure that Aurizon can vary its reference tariffs to compensate for differences between forecast and actual energy costs for energy supplied in connection with the electrical traction system."* [61]

This position is misleading and not relevant to a beta comparison with other regulated utilities. Supply of energy is an unregulated service and not relevant to the WACC on the regulated service. It is also a service which is directly transferable to rail operators and is supplied efficiently through an on-selling model without working capital compensation or margins.

The Castalia position is analogous to the AER considering the electricity retail arrangements between the retailer and the customer when setting the WACC for an electricity distribution or transmission business. Accordingly, cost pass-through arrangements for electricity on-selling are not relevant to the reasonableness of Aurizon Network's proposed equity margin.

4.3 Asset Stranding Risks

A significant risk for service providers with large material sunk capital investment, is the prospect of reductions in demand which would require material discounting of the access charge to maintain or increase demand. Yet depending on the materiality and duration of the discounting, the service provider may not recover its initial investment. These risks are more significant where the industry is trade exposed and highly leveraged to a single use of the shipped commodity (i.e. thermal coal and metallurgical coal have limited value or use outside of energy generation or steel production). In contrast electricity distribution has an almost limitlessly diverse customer base and utilisation.

The Castalia paper asserts that Aurizon Network is not exposed to demand risk is it has removed the ability for the QCA to optimise the regulatory asset base for:

- A deterioration in demand as deteriorated to an extent that regulated prices would cause a further reduction in demand; or
- The possibility of actual bypass.

However, the conclusion by Castalia is erroneous and assumes that the pricing is independent of market conditions. Any warranty in the regulatory framework to not optimise is underwritten through the competitiveness and economic viability of the coal system for which Aurizon Network controls only a small proportion of the cost structure. While the regulator could make a commitment not to optimise under limited circumstances, in contrast to other regulated energy utilities where the lights will stay on, it is feasible for mines to shut down or reduce production levels to an extent which could require either deferral of cash flow or foregoing an economic return. The removal of these provisions has in no way altered the exposure to asset stranding risks.

[61] Castalia, 2013, pg. 15

The provisions were removed from the undertaking as they were effectively superfluous, as the firm would – in face of materially deteriorating demand conditions – rationally defer and capitalise income with the potential to recover in the future if market conditions improved. Hence, it is not necessary for the regulator to optimise assets as the market provides the necessary and relevant discipline.

The provisions to reduce the value of the RAB for deterioration in demand were also economically flawed in that they failed to:

- Specify what assets would be removed from the RAB;
- What the relevant circumstances would be for the costs to be reinstated in the RAB (including what capitalisation rate would apply, if any); and
- Recognise that the provisions are unlikely to be triggered within the term of the current undertaking and are non-binding on future regulatory decisions made by a different QCA Board. As the provisions were not fixed principles, Aurizon Network remains exposed to significant regulatory risk in relation to asset stranding and must rely solely on s.138(s)(f) of the QCA Act which requires the regulator to consider '…the effect of excluding existing assets for pricing purposes'.

The Castalia report asserts that the closure of an individual mine should not lead to asset stranding which is mitigated by long-term contracts. Aurizon Network agrees with this statement in relation to individual mines. However, the closure of an individual mine is a non-systematic risk and not relevant to the determination of the equity beta. Further, Aurizon Network is exposed to broader industry production declines that are likely to be highly correlated with the overall performance of the supply chain. Under such conditions, closures or reduced production rates would be expected to occur over multiple mines and systems. To the extent that changes in coal production are highly correlated between individual coal systems over the long term, then any perceived material diversification benefits are illusory.

Access contracts are typically ten years and may be relinquished while only paying 50% of the take or pay liabilities (assuming there is a solvent counterparty). These protections are reasonably weak and allow a mine to close with potentially minimal cost. In addition, as the security provisions only represent 3 months access charge there is a material risk of default. This can be contrasted with other service providers, with characteristics of higher equity margins, evergreen contracts with rolling terms and no cap or relief on take or pay liabilities. This issue was discussed in Aurizon's response to the QCA's Draft Pricing for Expansions Paper.[62]

While Incenta notes that contracts are typically concluded for terms of 10-15 years, this will not reflect the duration of contracts currently in place and relevant to the determination of the asset beta. To place this issue into further context, the weighted average remaining term of access rights for coal carrying train services in the Central Queensland Coal Region, excluding GAPE and WIRP, is approximately 5.5 years. Assuming all these contracts were UT2+ agreements, with an obligation to only pay a relinquishment fee of 50% of the take or pay, then the maximum financial protection from asset stranding is less than three years.

The Castalia paper also does not address the asset stranding risks associated with the provision of electric traction services. As a consequence of the declaration, Aurizon Network is required to supply rail infrastructure to support rail operators who wish to utilise electric train services which can be directly

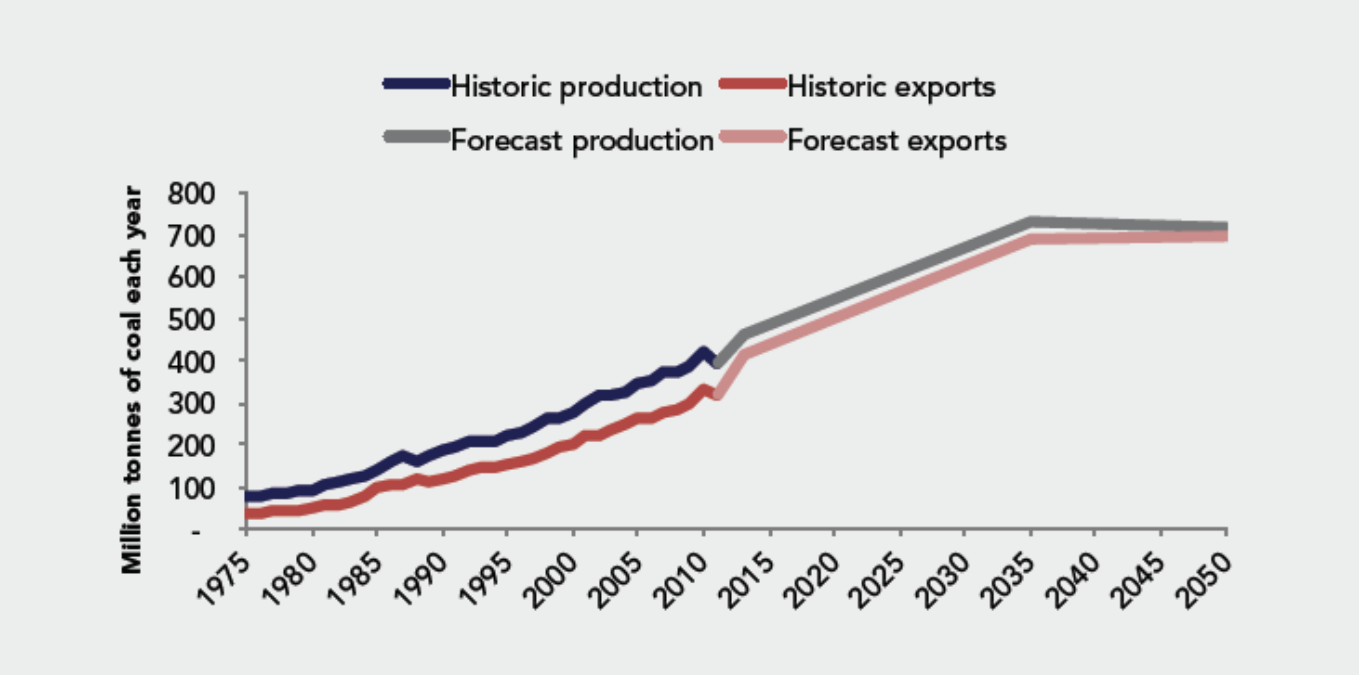
[62] Aurizon, 2013, *Response to the Queensland Competition Authority's Draft Reports on Pricing*, July 2013, pg.16-17, available at http://www.qca.org.au/files/X-Aurizon-Submission-RegObjDesImpPP-CapExpAccPriRP-0713.pdf

substituted and actually bypassed by diesel services. There remains substantial regulatory uncertainty in relation to the pricing and revenue adequacy of the Blackwater overhead power system. Even where a commitment not to optimise has been provided, Aurizon Network may still be required to defer revenue amounts which are then potentially at risk of the broader long term stranding of the track assets.

Aurizon Network is not aware of any such competitive risks within the direct industry comparator group. Further, Aurizon Network also notes that Castalia has made reference to Telstra's fixed copper line business, which has been subject to a compensation framework to Telstra Shareholders associated with the NBN proposal. Accordingly, Aurizon Network does not see Telstra as a reliable comparator for asset stranding purposes.

Incenta's primary basis for concluding that Aurizon Network is not subject to asset stranding risk is based on a forecast produced by the US Energy Information Administration (EIA), which expects world coal exports from Australia to increase to 600 million tonnes by 2040. A recent report titled '*Stranded Down Under*' includes a similar forecast which reflects ABARE forecasts which a reasonably commensurate with those of the EIA.[63] These forecasts are reproduced in Figure 19.

Figure 19 - Historic and ABARE forecast of Australian black coal production and exports



Source: Stranded Down Under, Figure 12, p. 24

[63] Smith School of Enterprise and the Environment, 2013, *Stranded Down Under: Environment-related factors changing China's demand for coal and what this means for Australian coal assets*, University of Oxford, 16 December 2013, available at http://www.smithschool.ox.ac.uk/

However, Aurizon Network considers there are two material oversights in the Incenta report which invalidate the report's conclusions:

- First, the EIA estimates reflect only thermal coal production and exports for energy generation purposes, and therefore does not capture the large proportion of the current export market utilising the CQCN; and
- Second, Incenta do not disaggregate that coal demand into relevant coal basins, with the general inference that all coal is produced in the central Queensland and will be exported via the existing CQCN rail infrastructure.

In relation to the latter point, the *Stranded Down Under* report also includes details of the 13 largest coal projects in Australia, which suggests that much of the additional demand and replacement demand for expiring existing CQCR mines would be met by mine developments which either:

- Would not be able to utilise existing CQCN rail infrastructure (Gunnedah Basin);
- Bypass the CQCN with dedicated rail infrastructure (Galilee Basin);
- Would not utilise the Blackwater or Goonyella systems (Galilee Basin and Surat Basin); or
- Utilise only a small proportion of the CQCN (Galilee Basin to Abbot Point and Surat Basin to Gladstone).

For reference the relevant figure from the report has been reproduced below. Of these projects, only the Moranbah South project would be required to utilise the Goonyella system.

While Aurizon Network does not support the conclusions in the Stranded Down Under report it is acknowledged that Australian coal networks are facing competitive pressure from the threat of new entrants with low cost production in Columbia, Mozambique and Mongolia. The analysis of replacement demand and its relevance to asset stranding was discussed extensively in section 6 of Volume 3 of the 2013 Draft Access Undertaking and is not repeated in this report. The issues discussed in section 6 were not addressed in stakeholder submissions or the Incenta report.

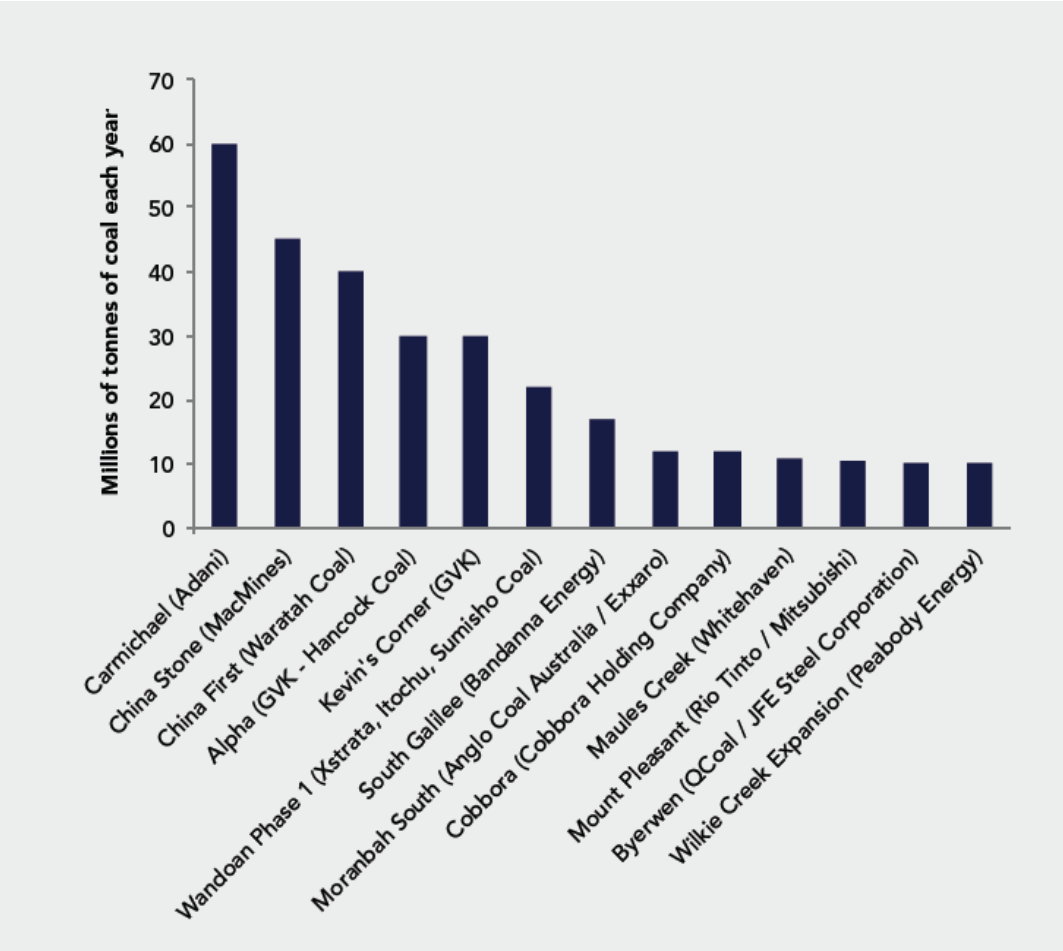
Incenta also holds the view that Aurizon Network:

> *"Ignores the fact that compared with US Class 1 Railroads, the returns from Aurizon Network's growth options are constrained by regulation, as are its risks. Hence the same growth options will have much less influence on Aurizon Network's beta."* [64]

Aurizon Network considers this view to be overly narrow and assumes that real options only have value (and therefore impacted by macroeconomic events) if it would lead to economic profits through the reduction in uncertainty. However, for regulated assets there is a value in the option of exercising commercial discretion and not expanding until uncertainty regarding future economic events become clearer. The value of these options therefore lies in avoiding sub-economic investments in terms of the impact on the return expectations on both the expansion assets and the long term demand for the existing assets.

[64] Incenta (2013), p. 38

Figure 20 - Estimated production of the 13 largest proposed Australian coalmining projects



Source: Stranded Down Under, Figure 4, p. 14

Therefore, the firm must be compensated for the value of these options, which have a strong systematic component due to the influence of factors such as labour costs, real interest rates, inflation and exchange rates on long term demand. Therefore, the regulated firm can either be compensated for foregoing the option, or it can defer investment until the value of the option is zero but forego the broader economic benefits of increased output.

In summary, Aurizon Network considers that it is exposed to long term demand risk that is materially more significant the energy utilities with a diverse and captured demand base.

4.4 Expenditure Risks

Castalia (2013) argues that:

> *"Aurizon has a number of mechanisms to ensure that there is little risk that that they will not be compensated for actual expenditures incurred. The mechanisms are:*
>
> - *Scope for adjustment to maintenance expenditure to account for changes in maintenance costs that are attributable to differences between the approved volume forecasts and any revised volume forecasts; and*
> - *A general pass thru of increases to maintenance costs where actual prudently and efficiently incurred costs are greater than the approved operating cost allowance, through the ability to either lodge an Amending Undertaking or rely on the review events in the existing Undertaking which may be triggered where Aurizon prudently and efficiently incurs maintenance costs which exceed allowances by more than 2.5%"* [65]

However, Castalia has overstated the materiality of these provisions. Aurizon Network has sought to retain the ex-ante risk on maintenance costs by apply a more empirically valid approach to how costs will change with volumes. The adjustments sought by Aurizon Network are supported by econometric evidence of the nature of cost variability to volumes.

The framework does not reduce Aurizon Network's exposure to differences between forecast and actual costs, as actual costs may still vary significantly from the approved maintenance allowance even though forecast maintenance costs are included in the revenue cap.

There is no evidence that Aurizon Network has or will rely on the provisions to review the maintenance cost allowance due to the material complexity of forecasting changes in the efficient costs. The practicality of relying on these provisions is substantially impaired due the complexity associated with identifying the incremental costs. This complexity is also amplified by the historical lack of transparency in the final approved maintenance cost allowance. Any application of these provisions may also require assessment of any efficiency dividend associated with an applied x-factor.

This can be contrasted with:

- Service providers in the direct comparator group who either incur no operating and maintenance costs (due to outsourcing of the terminal operations) or are subject to an annual total cost pass-through of efficient costs; or
- Energy utilities where benchmarking is viable and cost information is highly developed and any cost variations can be readily reconciled against the benchmark cost level. It should also be noted that these business transport a homogenous commodity and are not subject the asset and operational risks associated with a direct wheel to rail interface.

[65] Castalia, 2013, pg. 14

Castalia (2013) also asserts that:

> *"Aurizon bears little risk other than that the QCA may deem the final cost of capital expenditure to be inefficiently incurred and that this risk is further mitigated through the ability to obtain pre-approval of the procurement methodology."* [66]

This assumption overstates the protections associated with the pre-approval of the procurement strategy, as this mechanism has not been utilised to date even though it has been available since UT2. It is also likely to be viable only for major projects where the protections are limited primarily to the procurement model and not the management of the project. In addition, this risk is highly asymmetric as there is no basis for including more than what was incurred by the business in the RAB and therefore, of little or no relevance to the issue of systematic risk.

This can also be contrasted with the regulatory framework under the National Electricity Rules, which establish a symmetrical efficiency sharing model on capital expenditure outcomes. As noted previously, investors place a greater premium on losses than on gains. Accordingly, Aurizon Network considers that the 2013 DAU requires a higher risk premium than other regulated utilities.

The Castalia paper does not address the capital expenditure forecasting risks facing Aurizon Network. In truth, Aurizon Network is exposed to significant interest rate and financing risks associated with differences between both the quantum and timing of capital expenditure requirements. In particular, the risks closely associated in accurately hedging those forecast amounts, noting that hedging costs are not an operating cost expense and that such costs with over/under hedging are borne by equity holders. Hence while the capital carryover account is NPV adjusted, the cost of capital applicable to when those amounts are incurred may differ substantially from the approved WACC.

Some capital expenditure amounts may have also been unforeseen during the approval of the capital indicator, such as the need to undertake investment associated with transferred access rights, or capital expenditure (asset upgrades) associated with a force majeure. Some capital expenditure forecasts may also be based on concept or prefeasibility studies therefore including a level of forecasting risk associated the engineering, operational and commercial analysis. In addition, final contracted access rights and capacity allocations may require a different scope than that originally assumed in the costings for the capital indicator. Aurizon Network therefore notes that the flexibility of multiple integrated supply chains increases the risk of capital planning and costing relative to a port or simple rail system with a single common origin.

Finally, Aurizon Network notes there is a factual error in Table 3.1 of the Incenta paper, which states a mechanism was introduced to adjust the cost of electricity and transmission/distribution costs where these vary by more than 2.5%. This endorsed variation event was introduced in UT2 and is a general recognition that Transmission and Distribution costs are normally included in electricity retail pricing, therefore representing costs associated with the supply of electricity which would be passed through by an electricity retailer. Importantly, the costs are regulated or quasi-regulated charges under the National Electricity Rules. As a result, it would be inefficient to require the service provider to bear material risks regarding a cost which it is unable to control due to being a regulated input cost.

[66] Castalia, 2013, pg. 15

4.5 Regulatory Risks

Aurizon Network operates a narrow gauge, heavy haul railway with cost structures that are highly dependent on a complex range of drivers including (but not limited to) weather, geographical location and spread, network density, load, speed, safety management systems, possession frequency availability and coordination. The nature of these cost drivers makes it extremely difficult to make any relevant comparisons with other firms for maintenance and train management costs and as a consequence, there is a high risk of regulatory error in the exercise of regulatory discretion.

Regulatory error is particularly relevant to the potential of misspecification of efficiency dividends (or requiring an x-factor that is not econometrically derived and most likely unattainable). This risk is particularly acute where the there are no clear viable comparators for costing purposes due to material differences in inherent and inherited cost drivers. In this respect, determining efficient costs is a complex and imprecise exercise which only serves to amplify the scale of the regulatory error by forecasting prospective efficiency dividends. The lack of suitable and viable costing comparators also means that the exercise of regulatory discretion can introduce a systematic bias in the regulatory decision, with the regulator being more inclined to approve lower costs in recessionary environment and higher costs in an expansionary environment.

The Castalia paper asserts that:

> *"…it is debatable just how significant the lack of merits review is, given that judicial review is also generally seen (including by the NCC) as an appropriate review mechanism."* [67]

Castalia considers that 'judicial review does serve as at least a partial mitigant to the risk of regulatory error'. Yet this statement appears to confuse the concepts of due process with regulatory error as judicial review provides no remedy against regulatory error. The NCC considers:

> *"That is, a party may appeal an access determination on a question of law arising out of the determination. This is not dissimilar to the avenues of appeal from a Court judgment/order, in the sense that appeals from a Court judgment/order usually only have some prospect of success if the appeal is based on an error of law, rather than on a finding of fact.*
>
> *In the Council's previous certification recommendations, the Council has expressed the view that providing for appropriate review of the decisions of regulators is good regulatory practice."* [68]

In contrast to other regulated utilities where benchmarking is viable, there are no reasonable comparators to reduce regulatory forecast error. This is due to the material difference in cost drivers between businesses within the same industry, where a merits review could be seen as necessary for reducing the risk premium associated with the exercise of regulatory discretion. However, Aurizon Network does not have access to merits review.

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[67] Castalia, 2013, pg. 16

[68] National Competition Council, 2010, *FINAL Recommendation Certification Qld Rail Access Regime*, November 2010, pg.60, available at http://www.ncc.gov.au/images/uploads/CERaQldFR-001.pdf

4.6 Political Risks

Aurizon Network considers that the main political risks to Aurizon Network are changes to the regulatory regime via legislative amendments. This risk also extends to the development and approval of an access code by the responsible Minister. On balance, Aurizon Network considers its political risks to be broadly commensurate with energy utilities.

4.7 Force Majeure Risks

Force majeure (FM) risks are typically those that are not within the control of management, are extremely difficult to predict or value and will generally only be associated with negative revenue impacts.

The Castalia paper acknowledges that FM risks are asymmetric, and within normal competitive markets, a business offsets these risks through the ability to earn economic profit through uncapped returns.

Aurizon Network considers that its approach to management of FM risks is efficient in comparison to alternative arrangements, such as insurance which may only be procured at excess premiums or not available with the market at all. Accordingly, the regulatory framework supports lower tariffs for customers associated with efficient pass-through provisions. Yet, Aurizon Network also retains substantial cost risks associated with the frequency and quantum of force majeure events below the pass through threshold of $1 million and the variance to the actuarial estimates informed by a small but progressively expanding data sample.

The framework associated with the recovery of costs incurred in a FM event is also not a direct cost pass through model. The regulator may deem some costs not to have been efficiently incurred which would not be recovered. Accordingly, there is a residual regulatory risk associated with the exclusion of reasonably incurred costs.

5. Comparator Risk Analysis

In circumstances where there are insufficient 'pure play' comparators that allow for a statistically robust empirical estimate of an equity beta, it becomes necessary to make qualitative judgements against other relevant comparators. However, in doing so, caution should be applied in the exercise of regulatory discretion, noting that such qualitative judgements are prone to error where the consequences of negative errors are more significant than positive errors.

When making comparative assessments against firms in different industries, it is necessary that qualitative judgements are properly informed by evidence. It is also important that consideration is given to a broader range of comparators such as the direct, indirect and other non-industry comparators. Accordingly, Aurizon Network has augmented Castalia's analysis by including the direct industry comparators of Dalrymple Bay coal terminal (DBCT) and the Hunter Valley coal network (HVCN). Of note, Castalia (2013) does not explain why it has not considered these regulatory outcomes within its evaluation.

5.1 Approach by Castalia

The Castalia paper assesses relative risks of Aurizon Network against four comparators from across four different regulated industries. Three of which relate to energy utilities, which the Australian Energy Regulator had indicated that:

> *"The risks facing gas and electricity service providers are likely to be similar. Therefore, the risks that require compensation are sufficiently similar to warrant the use of a single benchmark between electricity, gas, transmission and distribution."* [69]

The remaining firm is a water utility, the Sydney Desalination Plant, which provides bulk water under a long term supply agreement with Sydney Water.

Castalia report compares the associated with these four businesses directly against Aurizon Network, summarising the relativity of the risks by indicating where Aurizon Network is expected to have a higher or lower exposure. The report concludes by suggesting that Aurizon Network has lower business risks than the comparators.

Aurizon Network has a number of concerns regarding how the Castalia methodology has been exercised, giving rise to erroneous conclusions on risk relativity. These concerns include:

- Castalia's misunderstanding of, and incorrect assumptions in relation to, the business risks faced by Aurizon Network as demonstrated in Section 4;
- Castalia's misstatement of the risks associated with its comparator firms;
- The selection bias in the comparator firms from within the relevant industry sectors and the report's exclusion of any consideration of the beta and risk relativity between the comparator firms (i.e.

[69] Australian Energy Regulator (2013) Better Regulation: Equity Beta Issues Paper, October, p. 13, www.aer.gov.au

GasNet has the same asset beta as Electranet, but Castalia concludes that GasNet is overall more risky than Aurizon Network compared to Electranet);
- The report does not consider relevant direct and indirect industry comparators; and
- The report is qualitative and not objective in that it provides no reference or evidence to support various statements, making limited effort to assess the materiality of variances in the risk.

Risk comparisons are therefore based on Castalia's opinion of risk as opposed to any demonstrated measure of risk. Once the methodology has been applied to address these issues, it becomes clear that Aurizon Network has a higher risk profile than other regulated utilities; including those in the Castalia comparator group and other direct industry comparators.

In undertaking a comparator risk analysis, Aurizon Network has retained Castalia's original risk rating framework, ranging from significantly greater risk to significantly less risk as denoted by the following symbols:

– –	Comparator has significantly less risk than Aurizon Network
–	Comparator has less risk than Aurizon Network
*	Comparator has similar risk to Aurizon Network
+	Comparator has greater risk than Aurizon Network
++	Comparator has significantly greater risk than Aurizon Network

5.2 Non-Industry Comparators

The section reviews the comparator analysis undertaken by Castalia on the following regulated businesses:

- Sydney Desalination Plant (Bulk Water Utility);
- Electranet (Electricity Transmission Utility);
- GasNet (Gas Transmission Utility); and
- Aurora (Electricity Distribution Utility)

5.2.1 Sydney Desalination Plant

Revenue Risk
Aurizon Network agrees with Castalia that the alignment of the fixed capacity charge and variable usage charge, combined with the actual cost structure, immunise the firm from annual cash flow risk relative to a revenue cap with a two year lag. Therefore SDP has lower revenue risk than Aurizon Network.

Castalia Rating: – Aurizon Network Rating: –

Expenditure Risk
Castalia considers SDP to have higher operating and capital cost risk than Aurizon Network on the basis that SDP appears to have limited processes to review costs.

In reaching this conclusion, Castalia have not reviewed the materiality of the relevant exposures. Firstly, the largest component of SDP's operating costs is energy cost, due to the energy intensity of recycling water which is subject to an effective pass-through. As noted above in Section 4, Aurizon Network's pass-through

arrangements relate to the unregulated service of on-selling and does not relate to provision of the declared service. On the basis of IPART's final decision, SDP also has an operating-cost-to-assets percentage lower than Aurizon Network at an average of approximately 4% over the regulatory term.

SDP capital expenditure program is also only $1.5 million over 5 years on a $2 billion RAB value. As a consequence, they bear minimal working capital or financial risks associated with interest rate risk management. In contrast Aurizon's asset renewal program on a forward looking basis is extensive.

As Castalia has not assessed the quantum of risk against the allowable revenue, they grossly overstate the risk relativity.

Castalia Rating: ++ Aurizon Network Rating: –

Inflation Risk

Castalia notes that SDP prices are expressed in real terms and the RAB is escalated by actual inflation. They then incorrectly assume that Aurizon shares retain similar inflation risk. As is indicated in Section 4, this is incorrect as Aurizon Network prices are expressed in nominal terms and not escalated by inflation.

Castalia Rating: * Aurizon Network Rating: –

Stranding Risks

Castalia considers that SDP's stranding or bypass risks are higher than Aurizon Network in the long run. It is difficult to envisage how the long run demand for water and the projected population growth in the Sydney region could lead to this conclusion that SDP, especially given the substitutability of coal for other energy sources.

SDP also provides water under a long term contract with Sydney Water. It is reasonable to expect that the term of this agreement would have addressed the asset stranding risk through a supply agreement with a sole purchaser in order for the investment to be economic. Castalia do not include any reference to the economic life or the contractual term. According to the NSW Auditor-General's Report to Parliament for 2012 SDP, has a 50 year supply agreement with Sydney Water and annual fixed charges and fixed electric costs for SDP are recovered via Sydney Water's pricing. This may also exceed the expected physical life of the plant.[70]

Further, it would appear irrational to suggest that an industry – that which will be positively impacted by climate change events – could be considered at higher risk than the future of thermal coal to those same events.

Castalia Rating: + Aurizon Network Rating: – –

Regulatory Risk

Castalia considers that SDP's regulatory risk is slightly greater than that of Aurizon Network, specifically as a result of the potential uncertainty created by the ability of NSW Minister to influence the issuance of IPART's terms-of-reference.

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[70] NSW Auditor-General, 2012, *NSW Auditor General's Report to Parliament*, Volume 6, 2012, Water Overview, pg.28, available at http://www.audit.nsw.gov.au/ArticleDocuments/255/05_Volume_Six_2012_Water_Overview.pdf.aspx?Embed=Y

Aurizon Network considers this risk to be extremely low. Regulatory pricing arrangements were developed prior to the sale of the SDP by Sydney Water for the explicit objective of determining a value for its acquisition. It is highly unlikely that the Minister would issue terms of reference which would adversely affect owners who paid $2.3 billion for that asset.

Aurizon Network also notes that the business is of very limited commercial and operational complexity, with little or no requirement to expand the facility. Costs are directly observable and constrained within the regulated business with little or no allocated costs. As a consequence there is little or no information asymmetry with the regulator with low risk of regulatory error.

Castalia also fails to recognise that the generic access regime in the QCA Act includes the ability for the Minister to approve an access code which could override a future voluntary undertaking for a declared service.

Castalia Rating:	+	Aurizon Network Rating:	– –

Political Risk

Castalia observes that as SDP does not have a review event for a change in taxes, this is a political risk. Castalia acknowledges that it is unlikely as IPART would refuse a request to review revenues for such an event, even though there is no explicit statutory process for these types of events.

Castalia do not consider the broader political risks associated with vertical integration and the higher compliance risks associated with operating an efficient and coordinated railway. They also do not consider the political risks associated with contractual misalignment across a supply chain associated with high degrees of information asymmetry and competitive and strategic conduct of end-users of the service.

Castalia Rating:	+	Aurizon Network Rating:	–

Force Majeure Risks

Castalia holds the view that the lack of any explicit force majeure provisions means that the risks facing SDP are slightly greater than those faced by Aurizon Network.

Castalia make no effort to describe the nature of those risks or how they may have been commercially dealt with in the contract between Sydney Water and DSL. Notwithstanding, it is anticipated that the DSL location on the coast at Kurnell will have a low exposure to a range of environmental risks such as bushfire, flooding and cyclone. Given the facility is also a geographically constrained site; it would be able to efficiently procure insurance such that its force majeure risks are limited to the policy deductible. SPD does not identify material FM risks in its proposal and includes an allowance for insurances.

As noted in the 2013 DAU, only nominated critical infrastructure is insured for FM events and there is residual regulatory risk that not all incurred costs be recoverable.

Castalia Rating:	+	Aurizon Network Rating:	– –

Summary

Aurizon Network considers that when an evidenced based approach is adopted to assessing the relativity of the business risk of SDP with Aurizon Network, that the risk of providing coal carrying train services in the

CQCN is significantly greater than providing desalinated water to Sydney Water under a 50 year supply agreement.

Overall Castalia Rating: +	Overall Aurizon Network Rating: – –

5.2.2 Electranet

Revenue Risk

Aurizon Network considers understates Castalia's its conclusion that Aurizon Network annual revenue risk is slightly greater than that of an electricity utility.

First, due to the volatility in market demand, production and supply variability arising from weather events as well as exogenous elastic end-user demand, Aurizon Network's monthly revenue risk is materially greater than electricity transmission and distribution businesses. While electricity transmission business will experience seasonal demand variations these are likely to be predictable. Second, as shown in Table 11 the annual revenue risk for Aurizon Network has been materially greater than that reported by electricity businesses.

Table 11 – Difference between Actual Revenue and Allowed Revenue

$ millions	2006-07	2007-08	2008-09	2009-10	2010-11
Transmission Revenue	1,872.73	1,950.80	2,157.10	2,341.50	2,474.40
Allowed Revenue	1,811.90	1,884.40	2,143.10	2,339.50	2,468.10
Difference %	**3.4%**	**3.5%**	**0.7%**	**0.1%**	**0.3%**
Aurizon Network (TAR v SAR)	**3.34%**	**11.31%**	**5.95%**	**N/A**	**9.31%**

Notes: 2009-10 is an outlier as tariffs and revenues were approved at the end of the financial year based on perfect information following approval of UT3 after commencement. For reference Aurizon Network in 2011-12 is 1.73%. Transmission revenue data sourced from Transmission Network Service Provider Reports producer by the AER at www.aer.gov.au

Castalia Rating:	–	Aurizon Network Rating:	– –

Expenditure Risks

Castalia incorrectly asserts that the Electranet must bear all risk, in that actual costs will be higher than forecast and that operating cost savings are to be shared with customers. The argument that the risk is asymmetric is inconsistent with the Transmission Efficiency Sharing Scheme which clearly states:

> *"An important characteristic of the scheme is that it rewards sustained gains and penalises sustained losses but has much less effect or impact on short-term gains or losses.*

The application of both positive and negative carryover amounts and the adjustments to be made in calculating carryover amounts mean that the magnitude of any negative carryover amounts are likely to be small compared to the total allowed revenue." [71]

The scheme actually operates to insulate the firm from material variations between its actual and approved cost allowances. In contrast, Aurizon Network is fully exposed to the total variation between its approved and actual operating costs, with a high degree of regulatory risk that any re-opening provisions available to Aurizon Network will not be successful.

The AER's Capital Expenditure Incentive Guideline also includes a capital efficiency sharing mechanism, whereby the service provider will be subject to a symmetric reward and penalty regime associated with timing variations between forecast and actual capex. The guidelines also introduce an ex-post assessment, whereby if the service provider overspends; the regulator is able conduct a prudency assessment.

This can be contrasted with Aurizon Network, where there is no pre-approved capital expenditure regime (in relation to asset renewals and non-expansion capex) and therefore, all capital expenditure is subject to cost optimisation.

However, the most significant differences between the CQCN and electricity transmission businesses will be the need to defer depreciation and revenue during ramp-up periods (as has occurred with the GAPE project) and the greater uncertainty in relation to future demand and capital expenditure requirements.

Castalia Rating:	+	Aurizon Network Rating:	–

Inflation Risk

Electranet's allowable revenues are amended annually by actual inflation for the previous period and its RAB is rolled forward by actual CPI. As a consequence, Electranet bears no inflation risk. As Castalia has mis-specified Aurizon Network's inflation risk, its ratings is also incorrect.

Castalia Rating:	*	Aurizon Network Rating:	–

Stranding or Bypass Risk

Castalia considers that Aurizon Network and Electranet face the theoretical possibility of bypass, but have options to mitigate the risk. According to Castalia the stranding risk is zero for all practical purposes.

Firstly, such conclusions are erroneous as there will always be strong demand for electricity, but there may not always be strong demand for that electricity to be generated from carbon intensive inputs such as coal. Second, as there is no possibility of a material reduction in the demand for electricity such that it would make network charges unviable, then Electranet is not exposed to long term demand risk or modal competition risk for its network.

[71] Australian Energy Regulator, 2007, *Final Decision: Electricity transmission network service providers – Efficiency Benefit Sharing Scheme*, September 2007, pg 2-3, available at www.aer.gov.au

The Australian Energy Market Commission has recently considered the optimisation risks for electricity business and characterised the framework as:

> *"Under the NER, the asset base is rolled forward from one regulatory control period to the next. The amount by which the asset base is increased is based on the total capex undertaken by the NSP during the previous regulatory control period. There is no requirement for an ex post asset utilisation review (nor an ex post prudency review) by the AER, nor a requirement for the asset base to be adjusted according to the degree of utilisation of an asset."* [72]

While Castalia refers to the potential for stranding of prescribed customer connections, the paper does not properly consider the provisions of the National Electricity Rules. In some circumstances they will be grandfathered arrangements and subject to Chapter 11, with the service provider having the opportunity to review the price and risk in the negotiation of a new connection agreement. Alternatively, where the assets continue to be grandfathered as prescribed services, in order to be removed from the RAB the value of the assets must no longer be contributing to the objectives of the NEM and:

> *"…the value of the asset (or group of assets), as included in the value of that regulatory asset base as at the beginning of the first regulatory year of the current regulatory control period, exceeds the indexed amount, as at the time of the AER's determination, of $10 million."* [73]

To the extent the value does exceed the $10 million (noting that it is possible that these assets are well depreciated) then the value is recoverable as:

> *"The AER may determine a separate amount which is to be included in the annual building block revenue requirement for a Transmission Network Service Provider for each regulatory year of a regulatory control period so as to compensate the Transmission Network Service Provider for the risk of the value of assets being removed from the regulatory asset base for the relevant transmission system."* [74]

In most circumstances, the declines in demand for coal carrying train services will be highly correlated across coal systems and Aurizon Network would lack the broader customer base with which to recover these losses. Accordingly, Aurizon Network considers that Castalia has substantially overstated the Electranet's asset stranding risk relative to that of Aurizon Network.

Castalia Rating: * Aurizon Network Rating: –

Regulatory Risk

Aurizon Network agrees with Castalia's assessment that the prescriptive framework within the NER improves regulatory certainty. However, Aurizon Network considers that given the low level of allocated costs, the limited variability of cost with load, the availability of a statistically significant sample size comparators and benchmarks, that there is a low level of regulatory risk, where material regulatory errors are able to addressed and remedied though merits review.

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[72] AEMC, 2012, *Final Decision on Rule Change Proposal on Optimisation of Regulatory Asset Base,* available at http://www.aemc.gov.au/Media/docs/Final-rule-determination-748833ea-0377-4372-8bdd-9728a439d5fb-0.pdf

[73] NER. S6A.2.3(a)(1)(ii)

[74] NER. S6A.2.3.(b)

The abundance of comparator firms for benchmarking purposes also significantly mitigates the risk of regulatory error associated with forecast operating and maintenance costs.

Castalia Rating: – Aurizon Network Rating: – –

Political Risk

Castalia do not consider the broader political risks associated with vertical integration and the higher compliance risks associated with operating an efficient and coordinated railway. They also do not consider the political risks associated with contractual misalignment across a supply chain associated with high degrees of information asymmetry and both the competitive and strategic conduct of end-users of the service.

Castalia Rating: * Aurizon Network Rating: *

Force Majeure Risks

Castalia considers that the pass through provisions in the National Electricity Rules are similar to Aurizon Network's undertaking and therefore the risks are similar.

Aurizon Network considers that the risk profile for electricity businesses is more likely to be understood with a greater degree of actuarial precision and that insurance will represent the most cost effective means of managing asymmetric risks. For example, the AER's Final Decision for Electranet's revenue proposal notes that:

> "*We consider insurance is likely to be available on reasonable commercial terms for natural disasters that are less than serious or significant.*" [75]

An additional pass-through mechanism is then employed for major events which exceed the insurance limits. Aurizon Network notes that it is common for transmission utilities to self-insure for line losses, where the magnitude of these premiums is broadly commensurate with the self-insurance premium for weather events proposed by Aurizon Network on the basis of relativity to RAB. Accordingly, Aurizon Network considers that Aurizon Network is likely to bear slightly higher force majeure risks mainly on the basis of the smaller sample of historical loss data.

Castalia Rating: * Aurizon Network Rating: *

Summary

Aurizon Network considers the evidence within the regulatory framework, the medium and long term demand risk for electricity transmission businesses does not substantiate the Castalia conclusions of risk relativity. As a consequence, Aurizon Network disagrees with Castalia's assessment and considers that Aurizon Network has a higher risk profile than Electranet.

Overall Castalia Rating: + Overall Aurizon Network Rating: – –

[75] AER, 2013, *Final decision: ElectraNet Transmission Determination 2013-14 to 2017-18,* April 2013, pg. 193, available at www.aer.gov.au

5.2.3 GasNet

Revenue Risks

Castalia argues that as GasNet is subject to a market carriage model it is fully exposed to revenue risk. This can be contrasted with all other transmission businesses that are subject to contract carriage arrangements. Aurizon Network considers that Castalia has misrepresented the GasNet regulatory model which is not represented by a price cap. It is also pertinent that having noted this key difference in revenue risk, Castalia does not reconcile why the AER has not addressed this difference through a higher equity beta for GasNet compared to other gas transmission and distribution businesses.

However, the primary reason that GasNet is not fully exposed to revenue risk is through the relevant mitigation in its tariff control formulas. The following formulas represent the tariff control mechanism in schedule D of the GasNet Access Arrangement: [76]

> *(a) The revenue control model permits individual components of the Transmission Tariffs to be adjusted up or down for a given Regulatory Year after the first Regulatory Year provided that:*
>
> *(i) the NPV of the actual revenues (AR) (determined in accordance with clause D.2 below) achieved is to be no greater than the NPV of the adjusted target revenues (ATR) (determined in accordance with clause D.3 below); and*
>
> *(ii) no component of the Transmission Tariffs can be increased by more than (CPI - X)* (1 + Y) for any Regulatory Year, where:*
>
> *(A) X is the tariff path factor prescribed for that Transmission Tariff component in the Access Arrangement; and*
>
> *(B) Y is 2%.*

Importantly, the adjusted target revenue is the ratio of total actual volumes to weather adjusted volumes. While this will expose GasNet to some revenue risks, Aurizon Network does not possess and Castalia has not presented, any evidence showing how material any residual business volume risks is compared to the weather adjusted volumes.

However, Aurizon Network considers the demand forecasting risk to be adequately managed because:

- The demand profile is reasonably stable as evident by the throughput forecasts in the AER Final Decision;
- Forecasts are based on sophisticated demand models produced by both GasNet and the Australian Energy Market Operator and the inherently more predictable demand for gas; and
- In contrast to the fixed pricing approach for CQCR reference tariffs, GasNet can manage the risk of forecast error through flexibility in tariff structures to offset demand volatility.

Castalia produces no evidence to show what the actual annual revenue variance has historically been to support the reasonableness of their conclusions. Accordingly, Aurizon Network considers Aurizon Network is potentially exposed to similar level of revenue risk as GasNet.

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[76] APA GasNet, 2013, *Access Arrangement: 2013-2017*, Schedule D, available at www.aer.gov.au

Castalia Rating:	++	Aurizon Network Rating:	*

Expenditure Risks

Aurizon considers that GasNet's operating costs represent a similar proportion of the overall revenue requirement as Aurizon Network. However, similar to electric transmission infrastructure, maintenance requirements are likely to be reasonably stable and predictable. In contrast, rail maintenance costs are substantially influenced by a range of factors which materially increases the uncertainty of the maintenance task.

As Castalia has not properly assessed the viability of Aurizon Network pass through events, or reviewed the relative cost structures and expenditure volatility of either GasNet or Aurizon Network, it is not considered that GasNet is exposed to a higher expenditure risks to Aurizon Network where operating costs are highly dependent on the dynamic loads from the wheel rail interface. On the contrary, it is considered that GasNet is expected to be slightly lower risk than Aurizon Network due to the predictability of the operating and maintenance costs. For instance, actual operating costs for GasNet during the 2008-2012 period were reasonably stable, between $25 and $29 million per annum.[77] In addition, the opex-to-asset percentage for the regulatory period of 2013-2017 is approximately 5%, lower than Aurizon Network's percentage of 8%.

Castalia Rating:	++	Aurizon Network Rating:	–

Inflation Risk

Castalia incorrectly assumes Aurizon Network has the same inflation risk as GasNet. This is contrary to the price control settings in the GasNet Access Arrangement as follows:

> *All monetary calculations and figures used in calculations in this Schedule D are to be expressed in real dollar values using a CPI indexed at December 2012, and using the best estimate of the CPI at December of each year of the Fourth Regulatory Period and in respect to target revenues, the forecast CPI used in this Access Arrangement; and*
>
> *The NPV is to be calculated using a discount rate equal to the real WACC as approved for the Fourth Access Arrangement Period.*

This indicates that total revenues are periodically adjusted for actual inflation. As Castalia has incorrectly specified Aurizon Network's inflation risk their applied risk rating is erroneous.

Castalia Rating:	*	Aurizon Network Rating:	–

Stranding or Bypass Risks

Castalia believes that GasNet has a higher asset stranding risk in that major loads near gas fields could bypass. However, Castalia provide no examples of where this has, or could occur. They also note that the

[77] AER, 2012, *Draft Decision APA GasNet 2013-2017*, Figure 9.1, pg. 45, available at www.aer.gov.au

NGR does not have the same protections as the NER regarding reduction in the RAB. In this regard the AEMO notes:

> *"There is a capital redundancy provision (rule 85(1) of the NGR) which provides that a full access arrangement may include (and the regulator may require it to include) a mechanism to ensure that such redundant assets are removed from the asset base. However, this is a discretionary provision and there is no automatic provision that excludes these assets from the asset base."* [78]

Importantly, AEMO also note that this is also mitigated through discretion on depreciation:

> *There is a capital redundancy provision (rule 85(1) of the NGR) which provides that a full access arrangement may include (and the regulator may require it to include) a mechanism to ensure that such redundant assets are removed from the asset base. However, this is a discretionary provision and there is no automatic provision that excludes these assets from the asset base.* [79]

Given the current levels of asset utilisation even where some loads do bypass this would not have a material impact. The following extract from the AER's Final Decision shows the utilisation rates used to derive GasNet's current tariffs, representing low levels of capacity utilisation:[80]

The economic viability of Aurizon Network's assets would be severely stressed at these levels with limited or no scope to redistribute across a broader customer base (i.e. reallocate costs between pipelines). As noted in Section 4.1.1, these levels of utilisation also provide latent capacity for a price cap form of regulation to apply

Forecast capacity utilisation	2013	2014	2015	2016	2017
Longford to Melbourne	43.3%	43.3%	43.2%	43.2%	43.4%
South West Pipeline (from Iona)	32.6%	31.1%	34.3%	33.8%	33.5%
South West Pipeline (to Iona)	11.6%	11.6%	7.9%	7.9%	7.9%
Western Transmission System	43.4%	42.8%	42.5%	42.2%	42.2%
New South Wales Interconnect (to Vic)	3.0%	3.0%	2.5%	2.5%	2.5%
New South Wales Interconnect (from Vic (Summer))	22.7%	22.7%	36.7%	36.7%	36.7%
New South Wales Interconnect (from Vic (Winter))	68.8%	68.8%	67.3%	67.3%	67.3%

[78] AEMC, 2012, Rule Determination, 13 September 2012, pg. 29, available at www.aemc.gov.au
[79] AEMC, 2012, pg. 29
[80] AER, 2012, Final Decision – GasNet Access Arrangement 2013-2017, Table 10.2, pg. 152, March 2013, available at http://www.aer.gov.au/sites/default/files/APA%20GasNet%20final%20decision%20-%20Part%202_0.pdf

symmetrically, which may explain APA GasNet's retention of business related volume risk.

As the Castalia paper only selects a gas pipeline business with a market carriage model, it avoids the requirement to consider the typical length of contractual carriage agreements. Aurizon Network observes that the AER suggests that long term contracts with customers for gas businesses are typically in the order of 10 to 15 years.[81]

Accordingly, Aurizon Network considers that GasNet has a lower level of asset stranding/bypass risk than coal carrying train services in the CQCR.

Castalia Rating:	+	Aurizon Network Rating:	–

Regulatory Risks

Aurizon Network agrees with Castalia's assessment that the prescriptive framework within the NER improves regulatory certainty. However, Aurizon Network considers that given the low level of allocated costs, the limited variability of cost with load, the availability of a statistically significant sample size comparators and benchmarks, that there is a low level of regulatory risk and that material regulatory errors are able to addressed and remedied though merits review.

Castalia Rating:	*	Aurizon Network Rating:	–

Political Risk

Castalia also do not consider the broader political risks associated with vertical integration and the higher compliance risks associated with operating an efficient and coordinated railway. They also do not consider the political risks associated with contractual misalignment across a supply chain associated with high degrees of information asymmetry and competitive and strategic conduct of end-users of the service.

Castalia Rating:	*	Aurizon Network Rating:	–

Force Majeure Risks

Castalia considers that the pass through provisions in the GasNet Access Arrangements to be similar to those in Aurizon Network's undertaking and therefore the risks are similar.

Aurizon Network considers that the risk profile for gas businesses is likely to be understood with a greater degree of actuarial precision and that insurance will represent the most cost effective means of managing asymmetric risks. This is evidenced by the exclusion of a self-insurance component within the approved operating costs and a pass-through arrangement for losses exceeding the insurance cap. Accordingly, GasNet's asymmetric risks are considered to be both narrower in scope, uncertainty and magnitude than those faced by Aurizon Network.

Castalia Rating:	*	Aurizon Network Rating:	–

[81] AER (2013) Better Regulation: Equity Beta Issues Paper, October, p. 12, www.aer.gov.au

Summary

Aurizon Network considers that Castalia has incorrectly characterised the revenue risks applicable to GasNet, and thereby, not accurately considering the nature of typical gas network business risks and their relativity to Aurizon Network. Therefore on the basis of the evidenced reviewed, it is reasonable to conclude that Aurizon Network is of greater risk than GasNet.

Overall Castalia Rating: ++	Overall Aurizon Network Rating: –

5.2.4 Aurora

Revenue Risks

Castalia states that the AER has determined that Aurora Energy and all electricity distribution businesses are regulated by a price cap. They go on to conclude that Aurora energy has full exposure to revenue variations arising from volume fluctuations.

The assertions made by Castalia appear to be materially and factually incorrect. The final determination by the AER clearly states that Aurora is subject to a revenue cap:

> *"The AER accepts Aurora's proposal to apply a revenue cap control mechanism for standard control services. The AER accepts the…distribution use of system (DUOS) under and over recovery mechanism because it minimises price shocks. Aurora proposed that the under or over recovery of revenues be recovered from consumers over two consecutive regulatory years (rather than a single year) per clause 6.18.6 of the NER".* [82]

Further, the AER's preliminary positions paper on the regulatory framework and approach paper for Aurora state that:

> *"The current control mechanism [as applied by OTTER] for distribution network services applied to Aurora is a revenue cap, where the basis of control is an incentive based variant of CPI–X using a building block approach."*

Aurizon Network can only conclude from these statements that Aurora will and has been subject to a revenue cap form of control, and therefore, the rating by Castalia is not appropriate to the actual risks faced by Aurora. Accordingly, Aurizon Network anticipates that Aurora will retain similar revenue risks to Electranet which has been classified as have a lower risk rating than Aurizon Network.

Castalia Rating:	++	Aurizon Network Rating:	–

[82] AER, 2012, *Final Distribution Determination – Aurora*, April 2012., p.36., available at www.aer.gov.au

Remaining Risks

Aurizon considers the remaining risks are similar to electricity transmission businesses as reflected in the assessment of Electranet.

Summary

Aurizon Network considers the risk profile of Aurora is commensurate with that of Electranet and therefore represents a lower risk profile than that of Aurizon Network.

Overall Castalia Rating: +	Overall Aurizon Network Rating: –

5.2.5 Additional Reference – Telstra

Castalia also makes reference to the Telstra's fixed line service decision by the ACCC in 2010. Due to the regulatory complexity of this framework, further consideration and research would need to be undertaken to test the legitimacy of Castalia's opinions.

However, it is reasonably clear that Castalia make the same error in inflation risk as the other determinations. What is also not well understood is the number of third party service providers, who have actually contracted with Telstra on those terms.

Aurizon Network also considers that the arguments on asset stranding risks for Telstra in relation to competitive bypass are also overstated. Castalia argues that Telstra's fixed line services are subject to competitive bypass from mobiles and competing networks. While there has been some reduction in fixed line revenue from the termination of second fixed lines to the premises with the introduction of ADSL, Castalia do not provide any evidence of how the bypass that has occurred would impact on Telstra asset stranding risk.

It should also be noted that the Australian Government has entered into a compensation arrangement with Telstra for its fixed line assets associated with bypass by the NBN. Alternatively, the new coalition government may also decide to retain Telstra's fixed line infrastructure as part of its service offering which would substantially improve the long term demand prospects.

Also, pricing is based only on a three year period and further market share reductions will have been factored into the pricing. It is assumed that there is no stranding risk of the relevant service, but there is potential for revenue leakage associated with higher rates of termination of the fixed lines than assumed in the pricing determination.

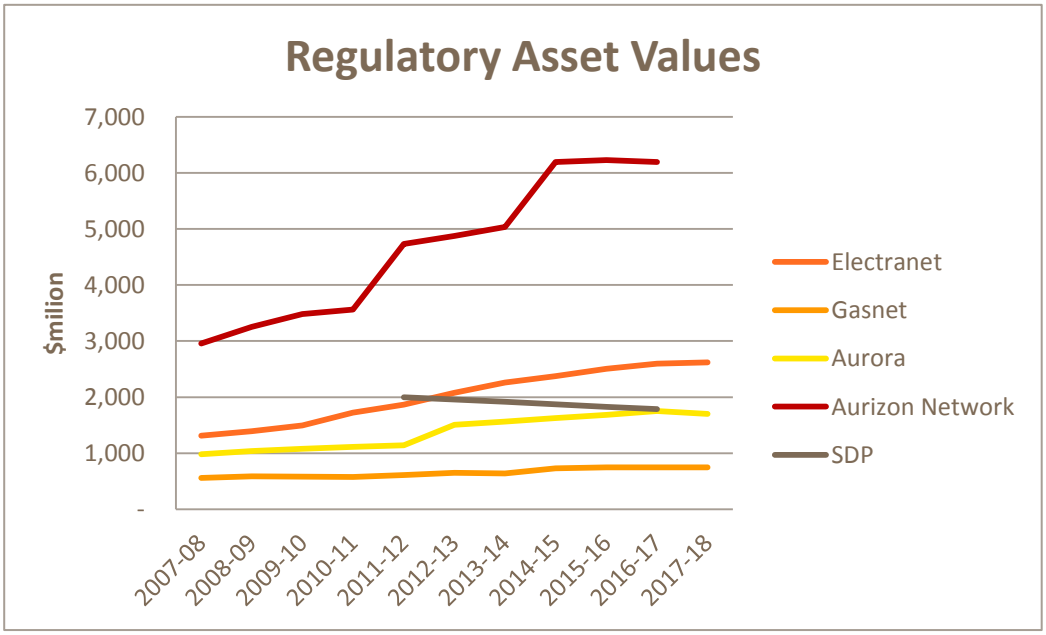
Lastly, Telstra has only been subject to the current form of regulation since 2011 and is currently subject to review. Accordingly, we do not consider the regulatory framework to be of sufficient maturity to be adequately reflected in equity beta calculations and therefore Telstra is a highly unreliable comparator.

5.2.6 Risk Summary for Non-industry comparators

An additional risk not considered within the Castalia analysis is the working capital and financing risks associated with capital expenditure. The following figure shows the change in the regulatory asset values for Aurizon Network and the nominated comparators since 2008. The CQCR RAB as increased by 109% since

2008, whereas GasNet's RAB – which Castalia considers to have the highest risk profile among the comparators – has increased by only 34%.

Figure 21 – Comparative RAB Roll-forward Values

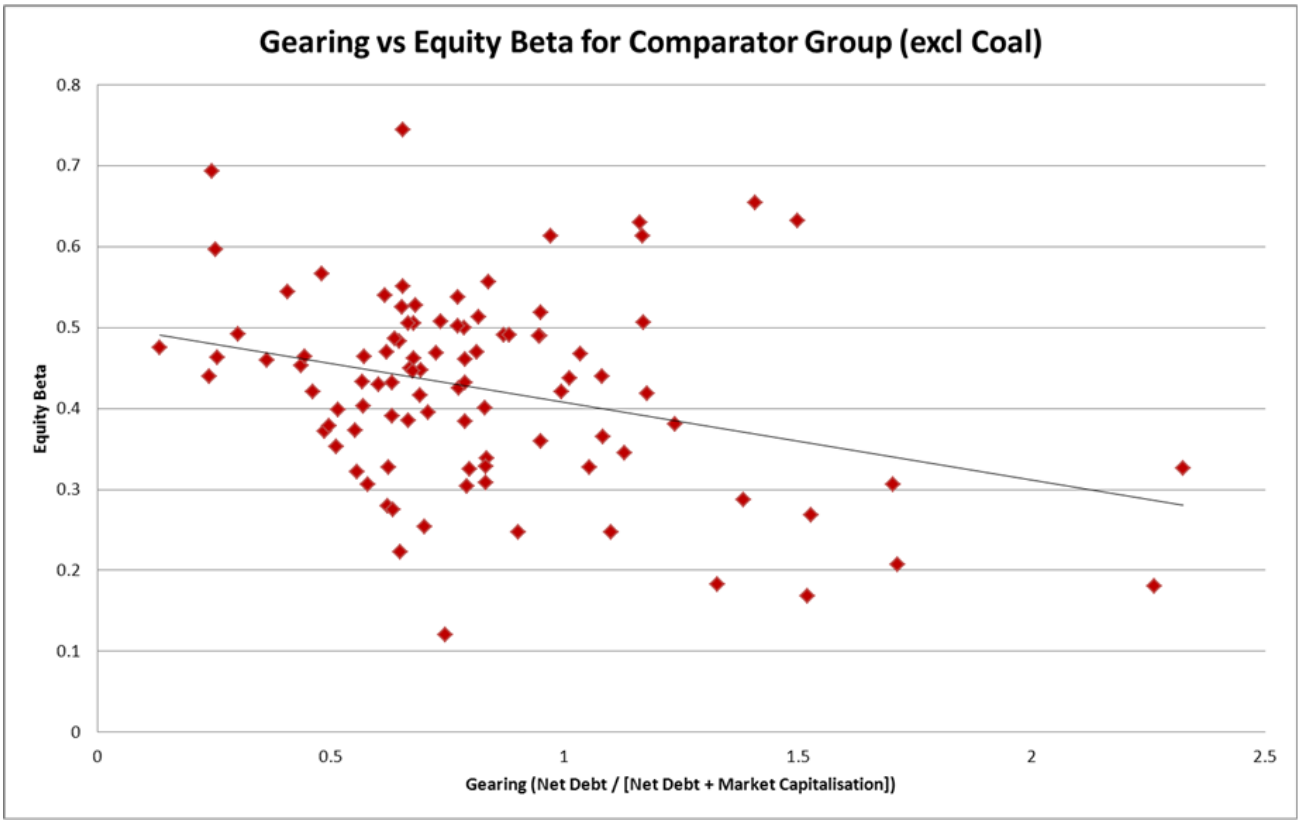


Source: AER, RAB Roll-forward models and Post Tax Revenue Models. QCA Annual RAB Roll-forward reports and 2013 DAU

As noted in Section 4.4, Aurizon Network finance and working capital risks are higher due to the monthly revenue volatility and uncertainty in relation to future project scope. This provides further supporting arguments that Aurizon Network has a greater risk profile than the comparators.

As a reasonableness check, Aurizon Network plotted the Incenta equity betas against capital structure. This was undertaken in order to determine whether a relationship exists between capital structures and equity beta. The expectation is that increased business risk would be associated with a higher beta, where the effect of business risk exceeds the effects of financial leverage. This expected relationship is shown overleaf in Figure 22.

Figure 22 - Equity Beta and Capital Structure of Incenta Comparators



Source: Incenta, Aurizon Network analysis

Aurizon Network agrees with the conclusion by Incenta that:

> *"Aurizon Network is potentially subject to more earnings volatility than Australian energy networks (which have a benchmark gearing level of 60 percent), and on this basis the application of a slightly lower benchmark gearing level of 55 percent may be more appropriate."* [83]

On the basis of the demonstrated relationship between equity beta and capital structure, it is expected that Aurizon Network's equity beta would also be greater than that of an Australian energy network.

The following table summarises the relative risk of Aurizon Network to the nominated non-industry comparators selected by Castalia.

[83] Incenta (2013) p.14.

Table 12 Aurizon Network Assessment of Risk Relativity with Non-Industry Comparators

Risk	SDP	Electranet	GasNet	Aurora
Equity Beta	*0.7*	*0.8*	*0.8*	*0.8*
Revenue	–	–	–	–
Expenditure	–	–	–	–
Inflation	–	–	–	–
Stranding and Bypass	– –	–	–	–
Regulatory	– –	– –	–	– –
Political	–	*	*	*
Force Majeure	– –	*	–	*
Summary	– –	–	–	–

It is evident from the above summary that Aurizon Network's commercial and regulator risk profile is greater than each of the nominated comparators. Further Aurizon Network believes there is no compelling evidence for a regulatory determination to arrive at an equity margin below that of an energy utility and certainly not below SDP as argued by the QRC.

5.3 Relevant East Cost Coal Comparators

Aurizon Network considers that DBCT and the HVCN are also highly relevant comparators that provide a benchmark for investor return expectations in coal export supply chain infrastructure. This analysis will show that additional commercial and regulatory risks associated with the provision of coal carrying train services within the CQCN are relative to those facilities. It is anticipated that investors are also likely to command a risk premium relative to these benchmarks.

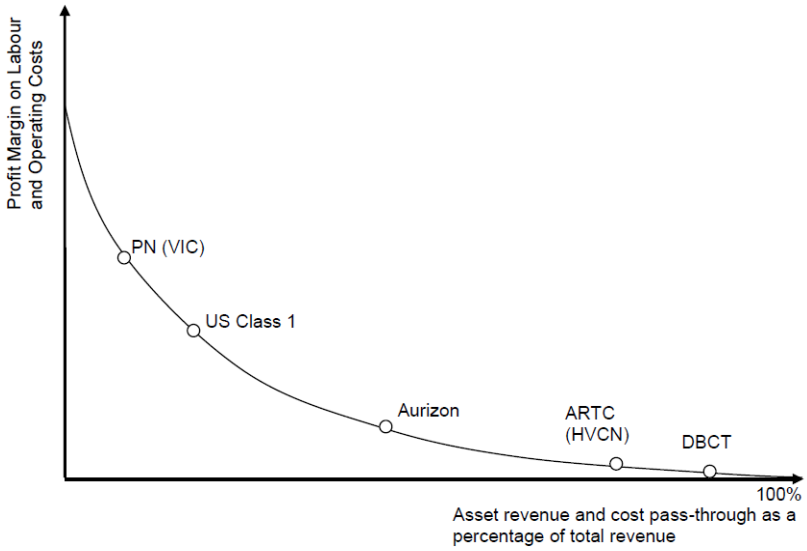
The most significant difference in the relative risk of CQCN to DBCT or ARTC is in relation to the revenue risks. As discussed in Section 4.1.2, the take or pay framework for both DBTC and ARTC is effectively a fixed monthly payment of 1/12 of the annual contracted volumes. Accordingly, there is expected to be no monthly revenue volatility and annual revenue volatility would be limited to any end of year adjustments.

Of particular relevance is that neither business is exposed to inflation risk, with annual allowable revenues reflecting the RAB roll-forward to account for inflation in the previous period. In addition, both businesses are subject to limited operating expenditure risks with:

- DBCT's operating costs limited to only corporate overheads which represent less than 3% of its allowable revenue; and
- ARTC operating costs are subject to an effective cost pass through model, where its annual unders-and-overs balance reflects the difference between its revenue for that year and its actual costs for that same period.

Aurizon Network has previously demonstrated this operating cost risk relativity graphically in its December 2012 submission, the proposed Standard User Funding Agreement, in relation to an operating and performance risk allowance on third party funded assets.[84] The graph is reproduced in Figure 23
Figure 1and clearly shows Aurizon Network has substantial operating cost risks relative to DBCT and ARTC.

Figure 23 – Relationship between fixed costs and operating margin.



Aurizon Network also considers the long-term asset stranding risks of these assets to be lower than the CQCN for the following reasons:

- The Dalrymple Bay Coal Terminal also maintains a large catchment for Bowen Basin mines and given its geographical location, places it a significant cost advantage to respond to reductions in demand; and
- The HVCN in relation to the constrained pricing zones, has a matched economic life to weighted average mine production lives. As a high density and geographically small catchment with short haul distances supported by a locally available labour force, the HVCN enjoys substantial cost advantages over competing coal supply chains. Aurizon Network considers the HVCN asset stranding risk to be lower than the CQCN.

A more detailed risk comparison between the CQCN, DBCT and HVCN is provided in Attachment A. On the basis of the analysis within Attachment A, Aurizon Network considers the commercial and regulatory risks associated with provision of coal carrying train services in the CQCN to be greater than DBCT and ARTC. This analysis is summarised and presented overleaf in Table 13.

[84] Aurizon Network, 2012, *Standard User Funding Agreement: Regulatory Notes*, Volume 3, December 2012, pg. 77, available at http://www.qca.org.au/rail/2010-DAUamend/SUFADAAU12/

Table 13 - Aurizon Network Assessment of Risk Relativity with Regulated East Coast Coal Comparators

Risk	HVCN	DBCT
Revenue	–	–
Expenditure	– –	– –
Inflation	–	–
Stranding and Bypass	–	*
Regulatory	*	–
Political	–	–
Force Majeure	–	–
Summary	–	–

6. Conclusions

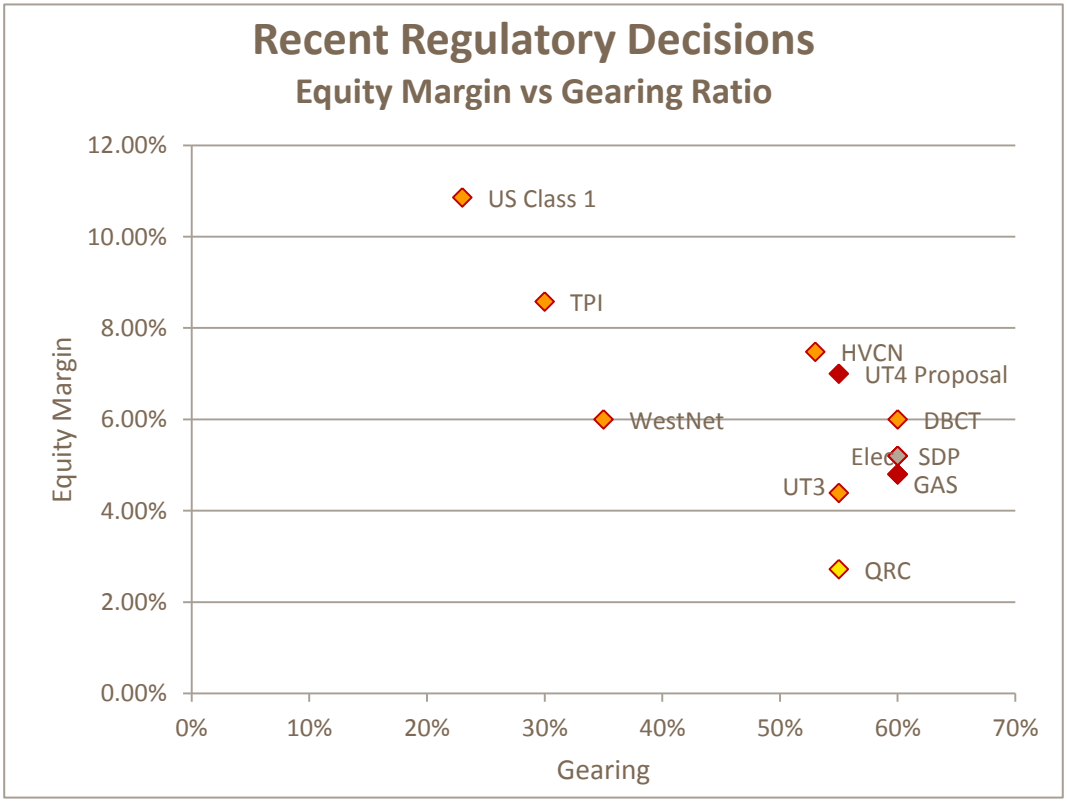
The absence of pure play comparators with which to derive both a statistically robust and reliable empirical estimates of Aurizon Network's equity beta, necessitates the consideration of a broad range of relevant financial information to guide the determination of a reasonable and precise equity beta.

The analysis in this report has shown that when regard is given to relevant evidence and facts, the commercial and regulatory risks associated with the provision of coal carrying train services is:

- Greater than direct industry comparators such as DBCT and ARTC;
- Unlikely to be commensurate with US Class 1 railways, however the extent of the differential may not be as material as has previously been asserted and it would be erroneous to maintain this based on the current evidence;
- Greater than tollroads when consideration is given to brown-field systematic risks; and
- Greater than non-industry comparators such as other regulated utilities in Australia.

On balance, having regard to these relativities it is reasonable to conclude that Aurizon Network's equity margin should sit within the range of the direct industry comparators and the US Class 1 Railroads. The following figure shows Aurizon Network's proposed equity margin relative to nominated comparators.

Figure 24 Equity Margins in Regulatory Determinations for Industry and Non-Industry Comparators



 # Details of the calculations and sources are provided in Attachment B.

The equity margins for Australian firms, in the previous figure, have been derived by subtracting the relevant yield on the 10 year Commonwealth Government securities over the applicable market average period from the approved post tax return on equity. [85]

The following observations can be made from this graph:

- The Aurizon Network's proposed equity margin of 7.0% is:
  - Less than the HVCN and necessarily greater than DBCT;
  - Substantially below US Class 1 railways equity margin of 10.86% on direct comparison and materially below that benchmark on the basis of differences in financial leverage; and
  - Higher than WestNet primarily on the basis of financial leverage.
- The QRC proposed equity margin of 2.65% cannot be substantiated on any basis of reasonableness; and
- The QCQN equity margin of 4.39% applicable in UT3 represents the lowest equity margin of any regulated rail or energy utility in Australia and is not appropriate to promote investment in the declared service.

Aurizon Network also notes that direct comparisons with the market portfolio with an equity beta of 1 are inappropriate, especially without adjusting for the material difference in the average financial leverage of the market and benchmarking gearing level of 55%.

In addition to these comparisons, Aurizon Network also recognises that there is additional financial information and evidence on return on assets for unregulated supply chain infrastructure, as well as potential information from secondary market transactions, which provide further insight to the requisite return expectations for investment in coal export supply chain infrastructure.

Aurizon Network therefore considers that its proposed equity margin of 7.0% is both reasonable and potentially understated with respect to relevant comparators. It is anticipated that the application of an equity margin less than that proposed by Aurizon Network must be supported by compelling evidence in relation to equity investor preferences and return expectations for investment in rail infrastructure within the CQCN.

[85] US Class 1 Equity Margin has been derived from deducting the STB's applied average yield to maturity in 2012 for a 20 year Treasury Bond. See STB EP 558 No. 16

Attachment A - Comparative Risk Summary of CQCN with Direct Industry Comparators

	Aurizon Network UT4 Proposal	ARTC	DBCT
Equity Margin	UT3 Decision - 4.39% UT4 Proposal – 7.0%	ARTC Proposed: 7.48%*	QCA Endorsed: 6.0%
Revenue Risks	• Reference tariffs reviewed annually for change in forecast volume • Take or pay is only paid annually • Take or pay does not include overhead power system fixed costs • Monthly revenue is volatile and dependent on throughput levels and originating mines in a large geographically disperse network • Two year lag on revenue cap adjustment amounts. • Annual allowable revenue based on four year cost forecast with potential cost/revenue misalignment due to capex timing and revenue smoothing. • Complex multi-part tariff structure which do not align to changes in cost.	• Reference tariffs published annually to recover ARTC's forecast costs for that year from contracted volumes. (HVAU Cl. 4.20a) • Take or pay paid monthly (IAHA Cl. 5.2) • Differences between actual revenue and actual costs for that year recovered by unders and overs accounting (HVAU Cl. 4.9) • Unders and overs accounts will be brought back to zero (HVAU Cl. 4.9(b)(vi) • Unders and overs amounts may need to be adjusted for ACCC determination on annual compliance. Timing of adjustment dependent on timing of decision. (HVAU Cl. 4.9(a) • Very limited monthly revenue variability and annual revenue variance primarily based on difference between ARTC's forecast and actual costs for that year. • Implicit annual reference tariff based on forecast costs for that year. • Two-part fixed and variable charge components which align to fixed (subject	• QCA approves annual allowable revenue each year. • Annual allowable revenue requirement closely aligned to expected annual costs. • Take or pay paid monthly. • Annual reconciliation process (excess tonnages rebate) ensures annual revenue outcome closely aligned to actual costs • Low levels of capital expenditure with monthly take or pay translates to low working capital and financing risks. • Single fixed terminal access charge to cover effectively 100% fixed costs. • Intra-period discounting of free cash flows increases working capital risk on timing of debt obligations (i.e. debt is not an annual bullet payment)

		to full take or pay) and variable costs substantially minimises risk of revenue and cost misalignment.	
Operating Cost Risk	• Operating costs approved ex-ante for term of regulatory period. • Cost-pass-through only applies to costs associated with electricity connection to National Electricity Market. • Operating costs escalated by CPI which may not be representative of changes in actual costs, including labour costs.	• Efficient operating costs are reviewed ex-post with a presumption all costs incurred are efficient and model operates effectively as cost-plus regulation. • No requirement for index escalation of benchmark costs as forecast revenues and unders and over accounting reflect actual costs.	• Operating costs are comprised only of largely fixed corporate overhead which represent less than 3% of total revenue. • Small risk that actual overhead costs will not align with ex-ante approved corporate overhead allowance.
Maintenance Cost Risk	• Maintenance costs approved ex-ante for term of regulatory period. • No reliable and comparable benchmarks renders top-down efficiency analysis unreliable, materially increasing risk of misalignment between approved and actual maintenance costs. • Maintenance scope also highly correlated with weather events, which increases uncertainty of approved maintenance allowance. • Complex and information intensive review event procedure for material variance on expected maintenance costs and regulator approved maintenance costs. • Review event provisions untested and misalignment between regulatory costing and internal accounting practices increase	• Efficient maintenance costs are reviewed ex-post. • Presumption all costs incurred are efficient and model operates effectively as cost-plus regulation. • No requirement for index escalation of benchmark costs as forecast revenues and unders and over accounting reflect actual costs.	• No maintenance costs incurred.

	complexity of identifying incremental cost changes. • Costs escalated by Maintenance Cost Index (MCI) which may not be representative of changes in actual costs, including labour costs.		
Capital Expenditure Risk	• Capital planning complicated through integrated and geographically dispersed network configuration. • Financing, working capital and hedging risks associated with inclusion of forecast capital expenditure within the allowable revenues • Prudency risks primarily associated with project delivery. Potential to be partially mitigated through pre-approval of procurement strategy. However, process is untested and may unduly delay project commencement. • Ex-ante optimisation risks based on prudency of costs.	• Capital planning simplified through small geographically constrained network configuration (i.e. all train services have choice of only one unloading precinct). • Prudency risks mitigated through customer engagement framework and coordinated planning model • Financing, hedging and working capital risks mainly associated with variance between capital budgeting and project delivery.	• Capacity constrained terminal with little capital planning risks. • Little financing, hedging of working capital risks with risk-free rate being reset and added to fixed WACC margin for project capex.
Inflation Risks	• Material exposure to inflation risk on return on equity due to variance between forecast CPI and actual CPI within the regulatory term.	• No inflation risk with annual forecast costs and expected revenues for the pricing year being based roll-forward of RAB for previous period actual inflation.	• No inflation risk as annual allowable revenue approved by QCA annually which incorporates roll-forward of RAB for previous period actual inflation.
Stranding and Bypass Risks	• Asset stranding risk mitigated by weighted average mine life depreciation profile • As reference tariff is sensitive to utilisation rates material reductions in demand may	• Asset stranding risk mitigated by weighted average mine life depreciation profile • Low average access charge and substantial capacity to absorb sustained	• Asset stranding risk due to misalignment between weighted average mine life and applied 50 year economic life for depreciation profile. However, expected to

	adversely affect Bowen Basin competitiveness • Long term asset stranding risk to thermal coal exposure. • Limited financial coverage under relatively weak relinquishment fee provisions and fixed contract term, normally 10 years	reductions in demand. • Strong contractual financial coverage through full term take or pay liability under evergreen (always 10 year term) access agreements. • Long term asset stranding risk to thermal coal exposure. However, development of Gunnedah Basin will utilise HVCN.	be adjusted in next regulatory reset or following revocation. • Low terminal infrastructure charge and some capacity to absorb sustained reductions in demand with terminal servicing higher margin metallurgical coals. • Strong contractual financial coverage through full term take or pay liability under evergreen (always 10 year term) access agreements.
Regulatory Risk	• High risk of regulatory error due to unavailability of suitable benchmark data • Appeal rights limited to Judicial Review • Highly complex operational environment • Increased risks through provision of power transfer services • Compliance risks under highly prescriptive regulatory framework.	• Risk of regulatory error mitigated due to availability of suitable benchmark data (standard gauge) and more benign environmental factors. • Ability to appeal regulatory determination on its merits. • Operational complexity mitigated through single geographically constrained supply chain.	• Risk of regulatory error constrained to capital charges.
Political Risk	• Prospect of legislative change or development of an industry code	• Prospect of legislative change or development of an industry code	• Prospect of legislative change or development of an industry code
Force Majeure Risk	• Flood cover only available on reasonable and efficient terms for nominated critical assets. • Actuarial estimate of expected losses for events less than $1 million. Material confidence interval in actuarial estimate and exposure to difference between	• No requirement for actuarial assessment of exposure to uninsured risk or deductibles due to the cost pass through model. • Ability to obtain full flood cover on reasonable and efficient terms.	• Ability to obtain insurance for most risks under competitive terms given absence of self-insured risks in MAR. Review event to vary allowable revenue to recover any uncompensated losses.

	expected losses and actual losses. • Significant regulatory risks associated with 'incremental cost' capture and demonstration in pass-through arrangements.

** This figure has been inferred based on ARTC's Revised Proposal in 2011*

Attachment B Comparator Equity Margin Derivations and Reference Sources

Firm	Industry Sector	Return On Equity	Risk-free Rate	Equity Margin	Gearing	Reference
The Pilbara Infrastructure (TPI)	Railways	11.86%	3.28%	8.58%	30%	ERA May 2013
US Class 1	Railways	13.40%	2.54%	10.86%	23%	US Surface Transportation Board August 2013
HVCN	Railways	12.45%	4.97%	7.48%	53%	ARTC Revised Proposal 2011
DBCT	Ports	11.08%	5.08%	6.00%	60%	QCA Decision Letter October 2010
UT3 CQCN Decision	Railways	9.99%	5.60%	4.39%	55%	QCA June 2010
WestNet	Railways	9.28%	3.28%	6.00%	35%	ERA May 2013
UT4 CQCN Proposal	Railways	10.15%	3.15%	7.00%	55%	Aurizon Network April 2013
QRC Position	Railways	5.70%	2.98%	2.72%	55%	QRC Submission October 2013
GasNet	Gas Transmission	8.02%	3.22%	4.80%	60%	AER Final Decision March 2012
Roma to Brisbane Pipeline (RBP)	Gas Transmission	7.75%	2.95%	4.80%	60%	AER Final Decision August 2012
Electranet	Electricity Transmission	8.71%	3.51%	5.20%	60%	AER Final Decision April 2013
Sydney Desalination Plant (SDP)	Water	9.10%^	3.90%	5.20%	60%	IPART Final Report December 2011
Aurora	Electricity Distribution	8.69%	3.89%	4.80%	60%	AER Final Decision April 2012
Powerlink	Electricity	9.37%	4.17%	5.20%	60%	AER Final Decision April 2012

^ *Aurizon Network notes the WACC decisions implied a nominal post tax cost of equity of between 8.8% and 9.1%.*