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29 July 2008

Mr Russell Dumas
Director, Gas and Rail Access
Economic Regulation Authority
Level 6, Governor Stirling Tower
197 St George's Terrace
PERTH WA 6000

Dear Russell

RAILWAYS (ACCESS) ACT 1998 – THE PILBARA INFRASTRUCTURE PTY LTD

You have advised, by way of an email dated 19 June 2008, that the ERA intends to release an issues paper as part of the process of determining a Weighted Average Cost of Capital for The Pilbara Infrastructure Pty Ltd's railway. You also agreed that TPI could make a submission in advance of the issues paper being prepared. An attachment to this covering letter refers.

This paper is provided to ERA to highlight some key risks associated with TPI's railway. These risks need to be compensated as they must be borne by TPI and cannot be mitigated. The attached document provides an overview of possible methodologies that can be applied to quantify the residual risks. These risks need to be reflected in either the cash flows (preferable) or in the future WACC calculation by the Regulator. TPI seeks that such issues be raised in the forthcoming issues paper to be released by ERA as part of the WACC calculation.

If you require additional information or clarification of comments in this letter and the attachment, please do not hesitate to contact me.

Yours sincerely

FORTESCUE METALS GROUP LTD

GREG DELLAR
for
The Pilbara Infrastructure Pty Ltd

Asymmetric Risk and the TPI Railway

Stranding Risk

The Pilbara Infrastructure Pty Ltd (TPI), a subsidiary of Fortescue Metals Group Ltd (Fortescue), has recently completed construction of a railway from the Cloud Break iron ore mine to Port Hedland. The rail line is 260 kilometres in length and it currently services one mine and one port, with only one customer. The rail line will have an initial capacity of 70 Mt/a, with provision for expansion, and will be open to third party access. It is anticipated that the third party traffic on the rail infrastructure will service junior miners that are likely to have a greater risk of closure than larger more established miners in the region.

TPI is not unique in being exposed to investments of a sunk and irreversible nature. The resources sector in particular is exposed to such investments as an ore-body cannot be moved to another location and a mine does not have an alternative use. Capital markets understand this and price resource companies accordingly. Stranding risk for a rail network provider servicing the resource sector has similar drivers and commercial consequences.

TPI's network can be compared to other freight networks in Australia. Whilst each heavy haul rail network in Australia serves mines that present stranding risks to varying degrees, TPI's stranding risk is likely to be higher. First, this is because the network is new (that is, it is a greenfields investment). Second, its revenue risk is highly concentrated, based on a single commodity. Its prospective customers are likely to be few in number, and, being junior miners, will be relatively vulnerable to downturns. TPI's entire network could be stranded if there was a significant downturn in the iron ore market.

The possible regulatory treatment of stranding risk will be considered further below.

Should stranding risk be compensated

In a competitive market, a business has a number of alternatives in relation to risk. First, it can seek to mitigate the risk. Risk can generally be reduced by either reducing the probability of occurrence or by reducing the impact of the risk on the business (rarely both). A deterioration in commodity markets is beyond the control of both TPI and the users of its network so the focus is more likely to be on strategies that could reduce the impact on the business. An infrastructure provider exposed to stranding risk (through exposure to a single mine or portfolio of mines), could for example:

- require upfront capital contributions, a deed of arrangement and/or other commitments from mines (taxation and legal costs can reduce the effectiveness of these mitigation techniques), noting that this option was never available to TPI; and/or
- employ accelerated depreciation with a view to say, recovering its full return on and return of capital over the life of the contracts with users.

If the risk cannot be substantially reduced, the interaction of supply and demand will mean that (subject to issues of capacity to pay) a supplier will generally secure a return commensurate with the risk involved in providing the service via higher prices (provided the risk that it is bearing is not due its own inefficiency).

In the regulatory context, the issue of asymmetric risk, and the need for appropriate compensation, has been a relatively long-standing issue for regulated entities and policymakers, particularly internationally. Over a decade ago it was recognised that:[1]

> Failure [by regulators] to account explicitly for regulatory and other asymmetric risk will usher in a new era of an undercapitalised public utility sector. Regulated firms will have strong incentives to defer investment and utilise small scale technology that is below minimum efficient scale.

and further:[2]

> ... asymmetric treatment of uncertainty — by which losses by the firm are treated differently by the regulator than extraordinary profits — leads to distortions in the firm's actions that operate against optimality ... asymmetry can actually induce the firm to make decisions in a way that ultimately works against the goals of the regulator and the welfare of customers.

In Australia, a consensus is yet to emerge on the regulatory treatment of asymmetric risk, with various regulators taking alternative views. However, the issue has been recognised at a policy level (and to a limited extent by regulators). The Commonwealth has legislated to establish a regime for third party access to services provided by infrastructure owners, as is the case with TPI railway. When an infrastructure owner is subject to such a regime, the Competition Principles Agreement stipulates that:

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1 Kolbe A., W. Tye & S. Myers (1993), Regulatory Risk: Economic Principles and Applications to Natural Gas Pipelines and Other Industries (Topics in Regulatory Economics and Policy Series), Kluwer, p.60.

2 Train K (1991), Optimal Regulation: The Theory of Natural Monopoly, MIT Press, p. 96-7.

6(5)(b) Regulated access prices should be set so as to:

(i) generate expected revenue for a regulated service or services that is at least sufficient to meet the efficient costs of providing access to the regulated service or services and include a return on investment commensurate with the regulatory and commercial risks involved;[3]

This clearly states that a third party access provider is entitled to compensation for commercial risks such as asset stranding. In addition, the National Gas Law introduced a range of measures for natural gas pipelines to ameliorate regulatory risk for greenfields investments, including access holidays and light-handed regulation.

Before considering regulatory precedent on this issue and possible solutions, we examine why the standard CAPM does not compensate infrastructure owners for these risks.

Applying the Capital Asset Pricing Model (CAPM)

Businesses are faced with a number of risks, for example, stranding, currency and interest rate risks. Typically these risks can be categorised as being either systematic or non-systematic in nature. Systematic risk is the variability in outcome caused by macro-economic or economy-wide events such as changes in interest rates, growth in the economy or changes in exchange rates – in other words, risks that can affect all businesses in the economy. Non-systematic risk is reflective of idiosyncratic issues that are specific to the business or industry (and hence can be eliminated by investors via diversification).

There is a relationship between systematic risk and expected return as represented by the Capital Asset Pricing Model (CAPM). It was derived in a world where investors can diversify across a variety of assets. In a competitive market arbitrage profits cannot be earned, on average, so investors are only rewarded for the risk that they have to bear and this risk is the systematic risk (also referred to non-diversifiable risk). The measure of the systematic risk of an individual business relative to the market is the equity beta.

3 Competition Principles Agreement – 11 April 1995 (As amended to 13 April 2007). Section 6, 5 (b) (i)

Under the CAPM the required return on equity is expressed as the risk-free return plus a premium over the risk-free rate for risk times units of systematic risk. The equity beta is a measure of the units of systematic risk. The CAPM is expressed as follows:

$$E(R_e) = R_f + \beta_e * [E(R_m) - R_f]$$

where: R_e = the cost of equity capital

R_f = the risk free rate of return

$[E(R_m) - R_f]$ = the market risk premium

E( ) indicates the variable is an expectation and

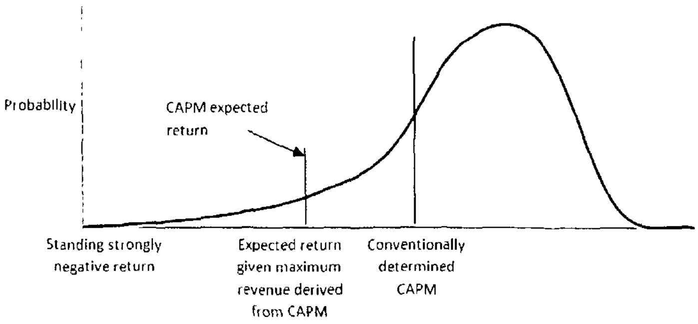
β_e = the systematic risk parameter (equity beta).

The CAPM is a forward-looking model, that is, it estimates expected returns. To apply the CAPM, some measure of the equity beta is required and the market model provides this estimate. The market model is the *expost* version of the CAPM. In the market model, the equity beta is derived by regressing the historical returns of the firm against the returns on the domestic share market index. The equity beta is the slope of the line of 'best fit' from the regression. To have a valid and robust estimate, returns are required to be normally distributed. If returns are not normally distributed then the estimated beta will not be reflective of the 'true' beta.

If the beta is calculated by regressing returns of a firm exposed to truncated returns then the estimated beta will not be reflective of the systematic risk of the business and therefore the cost of equity will not be reflective of the systematic risk. Often the case is the calculation of an equity beta derived from proxy businesses with normal returns. The estimated beta is then used to calculate the cost of equity for a business with truncated returns. The calculated cost of equity will not correctly measure the systematic risk of the business in this case.

In a regulatory setting, the 'true' cost of equity may not be equal to the cost from applying a conventionally determined WACC in an environment where the distribution of possible cash flow outcomes is either skewed or truncated. This is illustrated in Figure 1 below.

Figure 1 Expected return less than WACC given asymmetric risk



Stranding risk may be systematic in nature to the extent that its drivers are correlated with domestic economic activity (for example, in a commodity-driven economy such as Australia, there will be a relationship between domestic economic activity and the demand for iron ore. However, it may also have non-systematic drivers.

In addition, stranding risk may be non-systematic. Consequently, for an infrastructure owner to be indifferent to making an investment it will also require compensation for the assumption of any non-systematic risk – at least where there are no investment opportunities with offsetting risk characteristics. In a conventional framework, non-systematic risk is normally compensated through cash flows rather than the WACC.

The key challenge is to ensure that the regulatory environment ensures that an infrastructure provider is adequately compensated for any risk that it cannot cost effectively avoid.

Regulatory treatment

The regulatory treatment of stranding risk is mixed. While some regulators have expressed sympathy for the principle, compensation has not always been provided. One of the reasons for this is because a robust and defensible means of quantifying the risk has not necessarily been provided.

One example where the prospect of regulatory truncation was expressly recognised by a regulator in respect of a greenfields investment was by ESCOSA for the Alice Springs to Darwin Rail Line. Other than the TPI rail infrastructure, the only significant greenfield rail infrastructure that has become subject to regulatory price setting in

Australia is the Alice Springs to Darwin rail line. In relation to this rail infrastructure, ESCOSA has observed:[4]

> In a greenfields project context, expected returns under certain states of nature can be lower than the cost of capital (WACC) such that the post-regulation mean expected rate of return (r') could be less than the WACC were regulatory price controls to put a ceiling on returns at the WACC. This possibility is referred to as 'regulatory truncation'.
>
> The greater the area under a project's pre-regulation probability distribution of expected returns that is to the left of the WACC, the greater the dilemma presented by the scope for regulatory truncation associated with the intersection of the WACC and that probability distribution.
>
> There are clear grounds for making some kind of adjustment or allowance to avoid regulatory truncation taking place in a greenfields context.
>
> The adjustment or allowance aimed at remedying regulatory truncation – whether in the form of an uplift factor on top of the WACC or an imputed self-insurance premium – should be calculated by reference to the area under the pre-regulation probability distribution of expected returns to the left of the WACC. In this way, the post-regulation mean expected rate of return will equal the WACC.

Another example of where compensation has been provided was by the QCA in its review of the Dalrymple Bay Coal Terminal (DBCT) in 2005, where it provided an uplift to the WACC in recognition of the significant investment risk that was seen to underpin the terminal's expansion. This uplift was not based on an explicit compensation however; instead, the QCA accepted the higher equity beta that was being proposed by DBCT Management.

There is a compelling case for the compensation of stranding risk where it can be shown to be material, with this compensation commensurate with the residual risk that is efficiently borne after any risk mitigation strategies have been taken into account. As noted above, a key issue is being able to quantify the risk and determine how it should be compensated.

Valuing asymmetric risks

Asymmetric risk needs to be valued and priced. Compensation may be reflected in the cash flows as an insurance premium or in the WACC applied to the cash flows. Whilst

4 ESCOSA (2003) Tarcoola-Darwin Railway: Regulated Rates Of Return, Provisional Determination, P 71

a cash flow adjustment represents the theoretically most appropriate approach, an alternative involves an adjustment to the maximum allowable rate of return so that the expected rate of return is equivalent to the WACC derived in a conventional manner. Finally, it is possible to consider the actual cost of debt as a proxy to inform the market's assessment of asymmetric risk. These approaches are discussed in turn.

Options

A methodology for valuing/pricing the risk is to use real option principles where the asymmetric risk is effectively a call option. The value of the call option needs to be determined.

The most familiar types of options are share options. For example, a call option on shares gives the holder a right, but not the obligation, to buy shares at a pre-determined 'strike' price. If market prices for that share are above the strike price on the expiration date of the option, the holder will exercise the option at the lower strike price. If market prices are below the strike price, the holder will let the option lapse. The value to the holder is therefore based on the difference between the strike price and the current market price.

The principles of financial options can be applied to asset and investment evaluations. This application is called *real options*. Real options allow firms to add value by acting to "amplify" or further exploit investment decisions that are proving profitable and/or mitigate losses where projects are failing to perform to expectations.

Most investments are like a call option on shares, in that it gives the holder the right, but not the obligation, to make an investment in a project. The introduction of asymmetric risk forces firms to give away some (or all) of the upside from the investment. In a regulated setting, users of the regulated service are effectively being granted a free call option as they are always able to purchase the service for the regulated price (the strike price), even if the market price of that service (were it cost reflective) would be in excess of this. The value of the option to users is equivalent to the value that would otherwise accrue to the regulated business if it was able to freely determine its prices in a competitive market.

Applying real option techniques to valuing asymmetric risk requires the estimation of a number of variables, including:

- the term to maturity. If the calculation is undertaken on a yearly basis, the term to maturity will be one year;
- the risk free rate of return. The yield on a Commonwealth bond with one year to maturity would be used as the discount rate;

- a measure of volatility. From a comparator analysis, firms would be identified that would have similar characteristics. The volatility of the cash flows of the comparator firms would be used as the proxy.

The other parameters we need to estimate are the equivalent of the 'strike price' (that is, the price of the regulated service) and the market price (or, the price that might be charged by the business if it could freely determine its prices in a competitive market). Determining these two variables requires some form of stochastic simulation. A stochastic simulation will model two sets of cash flows for the business, one reflecting asymmetric risk and one without it.

These variables are difficult to quantify in practice. If they can be quantified then the option pricing methodology determines a value for the call option based on:

- the probability of the business being a certain value as if it had no asymmetric risk; less
- the present value of the probability of the business being a different value because it is exposed to asymmetric risk.

This is represented by the following equation:

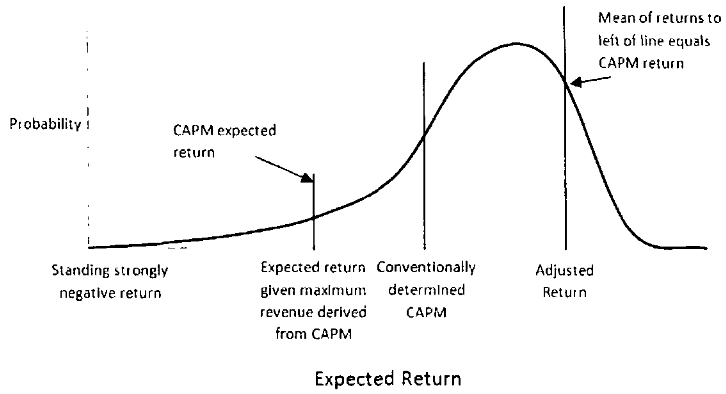
$$Call\ Option = No\ Asymmetric\ Risk \times N(d1) - With\ Asymmetric\ Risk \times e^{-r_f t} \times N(d2)$$

Probabilistic cash flow approach

The second approach that can be adopted is to make an adjustment to the conventionally assessed cost of capital so as provide the infrastructure owner with an expected return that is equivalent to the conventionally assessed cost of capital once the impact of asymmetric risk is taken into account.

Figure 2 illustrates this process and highlights that the essence of the process is to set a maximum allowable return that will allow an infrastructure owner to expect to recover its conventionally determined WACC given the nature of the risks to which it is exposed.

Figure 2 Getting expected return equivalent to WACC



Again, this approach requires considerable information concerning the probability weighting of future returns.

Practical approach

TPI (through its parent, Fortescue) has raised several tranches of debt to finance its Pilbara developments, including construction of rail and port facilities. These facilities range in value and size from over US$1bn to approximately $US250M.

Debt finance is usually structured in a manner that allows the lender to assign risk to the party that is best able to manage it. However, in the case of debt financing in this instance, lenders had no option but to bear the risk of stranding and for this risk to be priced into the interest rate.

Consequently, the debt margin required by lenders above the contemporary BBB debt margin provides an important insight into how debt markets priced the stranding (as well as the asymmetric) risk associated with the project. For example, if the interest rate on floating rate notes was 400 basis points above LIBOR and the BBB margin at the same time was 100 basis points above LIBOR, then this provides an indication that the valuation of asymmetric risk for the project was in the order of 300 basis points.

It is recognised that the attraction of this approach is its objectivity and transparency as opposed to its theoretical integrity. Nevertheless, given the considerable informational requirements of alternative approaches, actual debt financing costs provide reliable and transparent information as to how capital markets might value stranding risk.

Another concern with adopting such an approach relates to the incentives it provides to infrastructure investors. If an infrastructure provider can be guaranteed that it will recover its actual cost of debt, regardless of how high that might be, then it may not have an incentive to minimise its cost of debt. However, this is not the case with this debt raising – all debt is past debt and there would have been no consideration at the time of financing to achieve anything other than the minimising the cost of funding the development. In essence, this assumes that the infrastructure provider has raised debt in a manner consistent with an efficient benchmark firm.

Conclusion

As outlined above, TPI is exposed to significant stranding risk on its rail network investments. This risk is not currently compensated via WACC. We are of the view that there is a compelling case for this risk to be compensated, with any such compensation commensurate with the residual risk borne by TPI after any risk mitigation strategies are employed. The key issue revolves around quantifying this risk.

Three independent approaches have been suggested that provide a basis for estimating the compensation that is appropriate for asymmetric risk:

- option valuation approach – which provides the equivalent of an insurance premium to take into account the impact of asymmetric risk. This approach is theoretically sound, but difficult to quantify;
- an adjusted cost of capital – which involves increasing the maximum allowed cost of capital such that the expected return is equivalent to the conventionally determined cost of capital; and
- estimating the premium to the cost of capital by reference to the debt premium for the debt raised to finance the project, based on the margin above a normal BBB credit rating that was actually paid for the debt sourced by TPI. This approach is less defensible from a theoretical perspective but nevertheless provides an objective benchmark to inform the assessment of stranding risk.

Given that the three approaches are independent, it is possible to quantify the premium according to each of these techniques (when applicable) which in turn allows for a process of validation of the preferred approach.