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# TSLRIC of Interconnect Services – Cost of Capital

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# TSLRIC of Interconnect Services – COST OF CAPITAL

## Cost of Capital Issues to be Discussed with the Commerce Commission

- Appropriate Maturity of Risk Free Rate
  - Asset Life
  - Commission's determination
  - Consistency with PTMRP
- Asset Beta
- Debt Margin



# TSLRIC of Interconnect Services – Forward Looking Costs

## Overview of Nature of Regulations

- Commission view that “*TSLRIC should be based on forward looking costs which reflect the cost of providing services using best-in-use technology with modern equivalent assets*” (Paragraph 39 – TSLRIC Discussion Paper).
- Commission states that, to the extent possible, “*the cost base upon which interconnection prices are set should be ‘decoupled’ from the access providers actual costs.*” (Paragraph 23)
- TSLRIC is forward looking for the long-run (long run refers to a period over time in which all resources are variable (Paragraph 29)).
- Prices are set for a set duration.

## Implications of this are:

- An access provider will need to make a long term investment decision for a set of assets whereby the value of those assets at the end of each period of determination is uncertain. Given that the value of those assets are uncertain, the depreciation and cost base upon which a fair return is calculated is uncertain. This uncertainty exists over the life of the asset.
- Renegotiating prices (or having the Commerce Commission redetermine prices) at the end of determination periods does not reduce uncertainty in relation to the value of the cost base.
- “Demand shock” will occur prior to the next redetermination stage and Telecom will not have any ability to react to such shocks.
- Telecom’s competitors have the right, but not the obligation to use its interconnect services (although it is acknowledged that in the short term, Telecom’s competitors are likely to require the services).



## TSLRIC of Interconnect Services – Maturity Alternatives

**The appropriate maturity risk free rate alternatives are:**

- Life of Asset
- Regulatory Period
- Consistency with Post Tax Market Risk Premium
- From a Corporate Finance practitioner viewpoint:
  - For a “single period” CAPM (the cost of equity over one given period), the risk free rate over that single period.
  - For a “multiple period” CAPM (the cost of equity must be considered for more than one future period), the risk free rate is:
    - The risk free spot rate for each future period over which cashflows are to be received; or alternatively.
    - The five year or 10 year rate depending on the number of future years cashflows are expected on the project.



## TSLRIC of Interconnect Services – Previous Decisions

### Previous decisions of the Commerce Commission include:

#### Airfields

- Maturity aligns with regulatory period (five year rate)

#### Electricity

- Maturity aligns with price set period (three year rate)

#### Fonterra

- Maturity based on that used for valuing shares (10 years)

#### Implications

- In previous reports, the Commerce Commission has suggested that consistency with previous rulings is important. The Commerce Commission has used both regulatory period (Airfields and Electricity) and “lifetime of asset” (Fonterra) in relation to maturity period of the risk free rate. Therefore, the Commission will be both consistent with and inconsistent with previous rulings when it provides its Interconnect Services TSLRIC determination.
- The Commerce Commission should select the maturity which is appropriate for this individual circumstance.
  - For Airfields the cost base is historical cost and therefore the value of the assets at the end of the regulatory period is known with certainty. Given that the cashflows are known to up to the beginning of the next price setting period, and the cost base of the assets at the beginning of the next price setting period are known, CAPM can potentially be considered a “one period” model and the appropriate interest maturity term (potentially being the term of the regulation) could be set.
  - For the Electricity, the entity is also able to elect historical cost as a cost base and therefore the value of the assets at the end of the regulatory period is known with certainty. The same will apply to Electricity (using the historical cost base option) as Airfields.
  - For Fonterra, the amount of dividend and value of shares was not known and the Commerce Commission (correctly) used the longest maturity rate available to align the rate with the life of the asset (the shares). A one period CAPM is not appropriate under such circumstances because the future value of assets are not known and therefore future cashflows are not known. Therefore a multi period CAPM was appropriate and should be used.
- The long run nature of the Interconnect Services investment decision and the uncertainty of the future cost base means that the investment decision for assets is more than a single period and therefore is a multi period CAPM. This is similar to the Fonterra circumstance and therefore the Commerce Commission should be consistent with its Fonterra ruling.



## TSLRIC of Interconnect Services – Maturity based on Asset Life

### Baumol, Ordover & Willig state in testimony to the US Regulator:

*““Reasonable profit,” to economists, is a return on investment exactly equal to -- and not exceeding -- the firm’s cost of capital. “Reasonable profit,” or zero economic profit, is the return on investment permitted over the long run in competitive markets, and is the cost of capital built into TSLRIC.”*

(Reply Affidavit of William J. Baumol, Janusz A. Ordover, & Robert D. Willig – Footnote 6, Appendix B to Reply Comments of AT&T Corporation, In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Docket No. 96-98., 30 May 1996.)

### TSLRIC is not rate of return regulation

- TSLRIC is an economic concept – the relevant regulatory question is being framed as:
  - What is the hypothetical market price for the service if this were a competitive market in long run equilibrium (servicing commercially viable customers)?
- The frequency with which this regulatory question is addressed does not affect the answer to the question at any point in time.
- The regulatory question is not being framed as:
  - what is a fair rate of return on existing assets between now and the next period prices are set?
- Analysis of the relevant maturity of the risk rate from rate or return regulatory settings is inappropriate.
- The relevant cost of capital is that which pertains to a long run return on investment in competitive markets.
- The TSLRIC is a multi period CAPM issue, not a single period CAPM issue.



## TSLRIC of Interconnect Services – Maturity based on Determination Period

*“The major argument for basing the maturity of government bonds on the duration of the Commission’s determination is that it can act to reduce interest rate risk faced by the company. In the event that the Commission is required to determine interconnection charges on an on-going basis, setting charges for the period of the determination allows for the risk-free rate to be adjusted at that time. This reduces the interest rate risk associated with long-term investments in fixed PSTN assets.”*

(Discussion Paper – Paragraph 261)

**This argument assumes a rate of return regulation which sets prices periodically. However, TSLRIC regulation is economic concept of a hypothetical market price for a service in a competitive market in the long run.**

In any event, under any CAPM investment decision, the risk free rate selected is based on the period that cashflows are expected. This is notwithstanding that once the investment is made, in an unregulated, competitive market, revenues on the project can be adjusted for interest rate movements instantaneously, as they occur (the investor does not need to wait for a future redetermination period).



## TSLRIC of Interconnect Services – Maturity Based on Determination Period

- **Lally Paper (“Regulation and the Choice of the Risk Free Rate)**

- Lally’s paper advocates use of the risk free rate over the regulation period (the determination period in this instance). The justification is:

*“By setting an allowed rate of return at the beginning of each period, the value of the project at the end of the period [period defined as the regulatory period] inclusive of the cash flows received at the end of the period is certain. Consequently there is no risk over one period the appropriate rate of return must then be the one period risk free rate.”*

- Lally’s paper is applicable to regulatory regimes whereby all (prudent) historical costs are able to be recovered and will earn a return. Under such a circumstance, period end asset values are known with certainty and cashflows up to the period end are estimated. This is a “single period” CAPM model with the period defined as the term over which prices are set.
- In the case of a TSLRIC analysis of Interconnect Services, the value of the project (the cost base of the Interconnect Services assets for the next pricing period) at the end of the period is not known and therefore the value of the project at the end of the period is not known. The value of the project can only be determined over the life of the assets and with each new price set, a new cost base is determined and a new time period needs to be modelled. There is risk beyond the next determination.
- Under the TSLRIC, the recovery of historical costs is uncertain at the time the investment is entered into. Consequently a “one period model” is inapplicable, whilst a “multiple period model” is applicable.
- The Lally paper is in effect, “proof” that a historic cost regime can be viewed as a “one period” CAPM by using the risk free rate over the term of the price determination. However, it is inapplicable to a TSLRIC Regulatory regime. It would be wrong to use such a paper as support for selection of maturity periods for the TSLRIC regime.



## TSLRIC of Interconnect Services – Maturity based on Determination Period

### TSO Draft Determination states:

*“The Commission remains concerned that the use of a risk-free rate greater than the regulatory review period will overstate the TSO net cost in the presence of an upward sloping term structure of interest rates. Hence liable payments (including the “insurance” receipt from Telecom) to the TSO entity will be too high, and the TSO entity will likely earn an excess return on capital employed.”*

(Discussion Paper – Paragraph 147)

### The statement is flawed

- The market indicates the correct return for a given risk. This may result in an upward sloping, flat or downward sloping term structure of interest rates if the market believes such a slope is warranted.
- The correct return (hence the correct maturity profile) is that which matches the risk.
- If the correct risk is (say) a 10 year risk, then a maturity profile with an upward sloping term structure represents a signal by the market that a greater return is required for the risk undertaken.
- The presence of an upward sloping term structure will not overstate the cost of a risk – it simply signals the return required for a given risk.



## TSLRIC of Interconnect Services – The Fonterra Decision

**In the Fonterra Decision (Decision 501) the risk free maturity period was determined as follows:**

*“The Commission has adopted a risk-free rate of 6.6%, which is the average yield to maturity of ten-year Government bonds for May 2001. May 2001 is the last full month before the beginning of the 2001 – 2002 season and is therefore a suitable period for determining this forward-looking rate. The term chosen for the risk free rate must be that which is appropriate for valuing the shares. For companies in general, the valuation of shares should reflect the risk-free “spot” rates for each period in which dividends are received. Mathematically, this can be captured by a single rate, which is a non-linear ‘average’ over the risk-free spot rates applying to the set of dividends that are valued. Since the set of dividends extends to infinity, but spot rates are not observable beyond the ten-year rate (although subsequent rates are assumed to equal the ten year spot rate), then this average rate should place most weight on the ten-year spot rate and the remaining weight on shorter term spot rates. The ten-year yield to maturity approximates this”*

(Paragraph 94)

**Also:**

*“The discount rate is a forward-looking estimate of equity holders’ expected returns on their investment, where their expectations are taken from the beginning of the 2001 – 2002 season.”* (Paragraph 93)

This discount rate was essentially set to calculate the milk price for the following year.

**This decision is directly applicable for a TSLRIC analysis because:**

- Like shares in companies, the return and cashflows from the (notional) assets used in estimating TSLRIC asset will be earned over the long term.
- Redetermination of pricing at periodic intervals does not either increase or decrease the length of time or the uncertainty of future cashflows such uncertainty exists irrespective of the redetermination period. In any event, redetermination under TSLRIC is uncertain.
- The discount rate for the TSLRIC is a forward-looking estimate of expected returns when the investment is made.
- The investment in asset used to cost TSLRIC assets is directly comparable to a forward-looking investment in shares of a company.



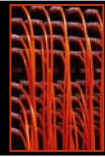
## TSLRIC of Interconnect Services – Telecom's Debt Structure

- Telecom's debt structure:
  - Average life of 4.65 years
  - Has term debt with maturities ranging from 4 to 15 years
  - Reflects Telecom Group's objective, not individual project objective



## TSLRIC of Interconnect Services – Conclusion on Interest rates

- All rational arguments for using a risk free rate equivalent to the period of determination are refuted for a TSLRIC regulatory regime.
- Persuasive and rational arguments exist for using a maturity term equivalent to the life of the assets. Such a maturity term is consistent with the Corporate Finance text books (see for example “The Search for Value, Measuring the Company’s Cost of Capital” by Michael C Ehrhardt – Chapter 5).
- Using a maturity term of the life of the assets would be consistent with the Fonterra decision.
- Using a maturity term equal to the life of the assets when estimating TSLRIC would be consistent with evidence given by the eminent economists Baumol, Ordover and Willig.
- We see no justification whatsoever for using a risk free maturity rate other than one which matches the life of the asset.



# TSLRIC of Interconnect Services – Nature of Cashflows

To assess the correct beta (and appropriate comparator company) the nature of revenues needs to be considered.

	Interconnect Services	TSO	“Pure” WireLine	Electricity Lines Business
<b>Revenues</b>	Transmission of Telephony Services Local Calls National Tolls International Tolls Internet Access Mobile-to-Fixed Fixed-to-Mobile 0800 0900  (for both residential and business customers)	As for Interconnect Services plus: <ul style="list-style-type: none"> <li>▪ Access fees</li> <li>▪ Call Minder</li> <li>▪ Call Waiting</li> <li>▪ Call Messaging</li> <li>▪ Other value add services</li> </ul>	As per TSO plus: <ul style="list-style-type: none"> <li>▪ Main trunk lines</li> <li>▪ Data Services</li> <li>▪ Leased lines</li> </ul>	Transmission of Electricity  Access fees both fixed (based on time and capacity) and variable



## TSLRIC of Interconnect Services – Factors Underlying Asset Beta

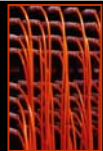
- A paper by Dr M Lally “Determining the Risk Free Rate for Regulated Companies” states “*The assessment of an appropriate asset beta should arise from a consideration of the factors underlying asset betas.*”
- Lally then describes eight factors relevant to the assessment of the asset beta. These are considered below for each of Interconnect Services, TSO, WireLine, Electricity Lines business.

Per Lally Paper	Interconnect Services	TSO (Ignoring any Insurance Effect)	WireLine	Lines Business
<b>First Factor:</b> <ul style="list-style-type: none"> <li>▪ Nature of product (elasticity of demand)</li> <li>▪ The lower elasticity, the lower the sensitivity to GNP shocks and the lower the beta</li> </ul>	Telephony Services (previously described)	Telephony Services (previously described)	Telephony Services (previously described)	Electricity Provision
	<b>Telephony services (in particular toll calls, and other discretionary services) have higher elasticity than electricity (which is less discretionary) and therefore telephone services will be more sensitive to GNP shocks than electricity transmission</b>			
<b>Second Factor:</b> <ul style="list-style-type: none"> <li>▪ Nature of customer Private/Public Residency mix Personal/business</li> </ul>	Mixed	More private than public More personal than business	Mixed	Mixed
	<b>Roughly equal</b>			



# TSLRIC of Interconnect Services – Factors Underlying Asset Beta

Per Lally Paper	Interconnect Services	TSO	WireLine	Lines Business
<b>Third Factor:</b> <ul style="list-style-type: none"> <li>Pricing Structure</li> <li>Fixed and variable elements re less risky than variable (variable are more sensitive to “demand shocks”)</li> </ul>	Variable	Fixed/Variable <ul style="list-style-type: none"> <li>Access fees</li> <li>Volume usage</li> </ul>	Fixed/Variable <ul style="list-style-type: none"> <li>Access fees</li> <li>Volume usage</li> </ul>	Fixed/Variable <ul style="list-style-type: none"> <li>Access fees</li> <li>Volume usage</li> <li>Capacity provision (fixed based on capacity)</li> </ul>
<b>Interconnect Services likely to be higher</b>				
<b>Fourth Factor:</b> <ul style="list-style-type: none"> <li>Duration of Contract with customers. Longer contract less risky</li> </ul>	Mainly monthly	Mainly monthly	Mainly monthly	As long as connection exists
<b>Roughly similar</b>				
<b>Fifth Factor:</b> <ul style="list-style-type: none"> <li>Price Regulation</li> </ul>	Different regulatory regimes. However, for Lines Businesses, the regulations allow for recovery of historic cost and a return thereon. As previously discussed, the TSO and Interconnect Services regimes have risk that historic cost is not recovered			
<b>Roughly similar</b>				



# TSLRIC of Interconnect Services – Factors Underlying Asset Beta

Per Lally Paper	Interconnect Services	TSO	WireLine	Lines Business
<p><b>Sixth Factor:</b></p> <ul style="list-style-type: none"> <li>Degree of Monopoly power (more monopoly power, the less the risk)</li> </ul>	<p>← Some competition (from alternative technologies) →</p>			Virtually no competition
	<b>Electricity Lines business less risky</b>			
<p><b>Seventh Factor:</b></p> <ul style="list-style-type: none"> <li>Option to adopt new products. More new products available, the greater the risk</li> </ul>	Significant technology changes and ability to adopt new products			No significant options
	<b>Electricity Lines business least risky</b>			
<p><b>Eighth Factor:</b></p> <ul style="list-style-type: none"> <li>Operating Leverage (the greater the leverage, the greater the risk)</li> </ul>	High level of fixed costs and large operating leverage			
	<b>Similar risk for all businesses</b>			



## TSLRIC of Interconnect Services – Factors underlying Asset Beta - Conclusions

- Out of the eight factors, four showed less risk to Electricity Lines business than the Interconnect Services business whilst four showed roughly equal risk. No factor suggested a greater risk to Electricity Lines than Interconnect Services.
- Comparison with the TSO shows one factor more risky for Interconnect Services. The remainder are roughly equal.
- Comparison with Wirelines shows one factor more risky for Interconnect Services and the remainder roughly equal.

### Conclusion:

1. The asset beta for Interconnect Services, TSO and Wireline companies must be **GREATER** than an Electricity Lines business. The beta for an Interconnect Services asset cannot be equal to or less than the beta for an Electricity Lines business.
2. The Electricity Lines business operates in a different sector to the Interconnect Services business and is not a good comparator for beta.
3. It is incorrect to “anchor” the Interconnect Services asset beta to the Electricity Lines business (the Interconnect Services asset beta cannot be less than or equal to the Electricity Lines business asset beta, the Interconnect Services asset beta must be greater – and the market will signal by how much).
4. A better comparator for the Interconnect Services asset beta is a Wireline or (properly determined) TSO beta.



## TSLRIC of Interconnect Services – Other Beta Issues

1. There is no “insurance effect” similar to the TSO. (We do not believe an adjustment is required for the TSO insurance effect but in any event, this should be ignored for Interconnect Services). Therefore, if the Commerce Commission (incorrectly in our view) reduces the asset beta for the TSO insurance effect, the Interconnect Services asset beta must be greater than the TSO beta by at least that amount.
2. We have reviewed the decisions of Oftel, ACCC, Canadian and US regulators in relation to TSLRIC type regulations. None of the decisions used an Electricity Lines business as a comparator for an Interconnect Services (or TSO) business. All these regulators used Wireline or Integrated Telecommunications companies as comparators. An Electricity Lines business is a different business, with different risks operating under different regulations.
3. The Commerce Commission would break new ground if it sought to construct abstract arguments why it can use other, unrelated industries as a better risk benchmark. A more robust (and conventional) approach is to start with actual own industry evidence, then determine if this needs to be (objectively) adjusted for any specific points of difference.
4. Based on the above a Wireline asset beta provides the best comparator to the Interconnect Services business. We have previously submitted significant data indicating reasonable asset beta for a WireLine business is 0.72 – 0.94.



## TSLRIC of Interconnect Services – Debt Premium

1. Debt costs should be based on borrowings with a term roughly equivalent to the life of the assets. Otherwise, an investor is accepting a short term borrowing risk for a long term asset.
2. The Debt premium should be added to the risk free rate which aligns with the life of the asset (not the length of the redetermination period). The borrowing period is the life of the asset – not the life of the regulatory period (or length of determination).
3. The debt premium should include all costs of raising debt including swap costs and issue costs.