TELSTRA CORPORATION LIMITED

ULLS Undertaking

Weighted Average Cost of Capital (WACC)

4 April 2008

Contents

A Introduction

1. This paper details Telstra's views on the appropriate weighted average cost of capital (WACC) to use for the assessment of Telstra's ULLS undertaking. The WACC is an input in Telstra's TEA model that is used to convert the investment cost of the Customer Access Network (CAN) into an annualised cost.

2. A reasonable value of the WACC in this context should be no less than the minimum expected return that an investor requires as compensation in return for making an investment in the CAN. The higher the risk associated with an investment in the CAN, the higher the returns that are required in order to attract that investment from investors and, therefore, the higher the WACC. The level of risk will differ according to whether investment funds are provided by way of debt or by way of equity. Debt is lower risk because debt investors, generally, have a higher degree of repayment security, at least so long as the risk of bankruptcy is low. Equity is higher risk because equity investors can claim only residual earnings after secured debt has been repaid. The WACC is, as the name suggests, a weighted average of the cost of debt and the cost of equity with the weights reflecting the relative amounts of debt and equity funds appropriate for the CAN investment.

3. Although determined in capital markets, the cost of equity cannot be observed directly and must be estimated using models which tend to be based on and rely upon significant judgement in the face of imperfect information. There are a number of different models that have been developed to estimate the cost of equity and hence the WACC for different contexts. These include, but are not limited to:

    a. The Capital Asset Pricing Model (CAPM)[1]

    b. The Arbitrage Pricing Theory Model (APT)[2]

    c. Fama-French 3 Factor Model

    d. Dividend growth model

    e. Williams (1977) heterogeneous expectations model[3]

4. The models differ according to, among other things, their underlying assumptions, the factors they consider important in determining the cost of equity and debt, flexibility, accuracy and ease of use etc.

5. Probably the most commonly used model in regulatory proceedings for estimating the cost of equity associated with the WACC, because of its simplicity, is the CAPM. Similarly, for the purposes of assessing whether Telstra's ULLS undertaking is reasonable, the CAPM framework should be used as an element in estimating the Telstra WACC.

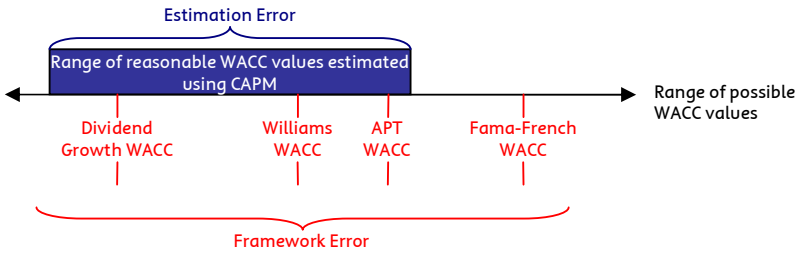
B There is a range of reasonable WACC values

6. In using the CAPM framework to estimate the WACC (or another framework), it is important to recognise that there are generally two types of error that need to be

[1] Sharpe, W. (1964), "Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk", *Journal of Finance*, Vol. 19 (3).
[2] Ross, S. (1976), "The arbitrage theory of capital asset pricing", *Journal of Economic Theory*, v13 (3).
[3] Williams, J.T. (1977), "Capital asset prices with heterogeneous beliefs", *Journal of Financial Economics*, Vol. 5, pages 219-239.

considered. The first type of error (estimation error) occurs as a result of uncertainty in the estimation of the CAPM parameters and other parameters associated with a CAPM WACC. The second type of error (framework error) arises because of uncertainty as to whether the CAPM framework is an accurate framework for estimating the true WACC. Estimation error and framework error are illustrated in figure 1 and discussed in sections B.1 and B.2, respectively.

Figure 1. Stylised example of estimation error and framework error associated with the WACC



Note: Other frameworks also have estimation errors that are not reflected in the diagram above. The order of the results from the different frameworks is hypothetical in this stylised example.

B.1 Estimation error

7. The estimation of several important parameters in the CAPM and WACC is an imprecise exercise and results in estimation error. For example, the market risk premium is one CAPM parameter that is not directly observable from financial markets and, therefore, subject to estimation error.

8. As there is a range of reasonable values for many of the parameters, there will be a range of estimates of the CAPM WACC. All estimates within this range are reasonable estimates of the CAPM WACC. The range of reasonable estimates of the CAPM WACC can be determined by estimating the sets of reasonable and internally consistent CAPM parameters that produce the lowest and highest reasonable values of the CAPM WACC.

B.2 Framework error

9. A number of studies have found that the CAPM does not adequately predict the true cost of equity used in the WACC.[4] To a large extent, this is due to the simplifying and, in some cases unrealistic, assumptions underpinning the CAPM. Alternatives and adjustments to the CAPM have been developed and proposed in an attempt to address issues relating to the CAPM's restrictive assumptions.[5] The following paragraphs discuss some of this research.

[4] A summary of such studies can be found in Fama, E. F. and French, K. R. (2004), "The Capital Asset Pricing Model: Theory and Evidence", *Journal of Economic Perspectives*, Vol. 18 (3), pages 25-46.
[5] For a summary of some extensions to the CAPM, see Copeland, T. E. and Weston, J. F., *Financial Theory and Corporate Policy*, Third Edition, Addison-Wesley: Reading Massachusetts, from page 205.

10. First, the APT model relaxes many of the CAPM assumptions, in particular, about the distribution of asset returns. Copeland and Weston describe the CAPM as a special case of the APT and provide the following analogy:

> *"Using the CAPM is a little like being lost in the clouds while piloting a private plane. You call the air controller and ask, 'Where am I?' If the controller is using a unidimensional model like the CAPM, he or she is likely to respond, 'Two hundred miles from New York City.' Obviously, this is not a very helpful answer. A multidimensional model like the APT would be more useful. It would be nice to know the latitude, longitude, and altitude.*[6]

11. Second, several models show that the cost of non-systematic risk, which is assumed to be diversifiable in the CAPM and hence ignored, should be taken into account when estimating the WACC.[7] Indeed, investors in major projects (especially infrastructure projects) account for non-systematic risks in their calculation of required returns for investment projects.[8]

12. Third, studies show that asymmetric regulatory risk should also be taken into account when estimating the CAPM WACC.[9] The CAPM incorrectly assumes all risk is symmetric. It is particularly important to take account of truncation risk: the risk that access seekers will use the access service when the returns from doing so are high, but not when they are low. This will truncate the distribution of returns to the access provider. Unless the regulator can guarantee that all costs associated with providing the declared service are covered (which requires a form of rate of return regulation quite different from that provided for under Part XIC), the access provider will lose the "upside" associated with strong demand without equally losing the "downside" associated with low demand. As the Productivity Commission has emphasised, this will distort efficient investment in facilities.[10]

13. Fourth, several studies show that the CAPM WACC needs to be adjusted to account for the cost of real options to delay investments.[11] The CAPM incorrectly assumes these costs do not exist. Empirical estimates suggest the correction to the WACC that is required to correct for "real options" effects is material.[12]

14. Considerable work needs to be undertaken to determine the extent to which the CAPM model must be adjusted to eliminate framework error. However, it is notable that many of the factors driving framework error show that the CAPM systematically understates the cost of equity (e.g. ignoring the costs of non-systematic risk, regulatory and truncation risk and real options). This implies that the high end of the range of reasonable values for the WACC is larger than that suggested by an application of the simple CAPM.

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[6] Copeland, T. E. and Weston, J. F., *Financial Theory and Corporate Policy*, Third Edition, Addison-Wesley: Reading Massachusetts, page 223.

[7] Goyal. A. and Santa-Clara, P. (2003), "Idiosyncratic risk matters", *The Journal of Finance*, Vol. 58 (3), pages 975-1007.

[8] Esty. B. "Returns on project-financed investments" Journal of Applied Corporate Finance, 15, 71-86.

[9] Ergas, H. Hornby, J. Little, I. and Small, J. (2001), "Regulatory Risk", *ACCC Regulation and Investment Conference*, 26-27 March 2001. See also generally Guthrie, G. (2006), "Regulating Infrastructure: The Impact on risk and Investment," *Journal of Economic Literature*, 925-972.

[10] Productivity Commission (2004), *Review of the Gas Access Regime*, Report no. 31, Canberra, p.107.

[11] Pindyck, R. S. (2005), "Pricing Capital under Mandatory Unbundling and Facilities Sharing", *NBER Working Paper*, No. 11225; Hausman, J. (1999), "The Effect of Sunk Costs in Telecommunications", in Alleman, J. and Noam, E. (eds), *The New Investment Theory of Real Options and its Implications for the Cost Models in Telecommunications*, Kluwer Academic Publishers.

[12] In the context of telecommunications Hausman calculates the value of the required markup to be around 3.2 to 3.4. These findings are consistent with academic research which finds that corporation use hurdle rates for investment that substantially exceed their costs of capital, i.e. their WACC. See for example Summers, L. (1987). "Investment Incentives and the Discounting of Depreciation Allowances," in M. Feldstein (ed.), *The Effects of Taxation on Capital Accumulation*, University of Chicago Press.

B.3 Determining the range of reasonable WACC values

15. The above sub-sections showed that (i) the extent of estimation error can be estimated by determining the sets of reasonable and consistent parameters that produce the lower and higher reasonable values of the CAPM WACC and (ii) framework error is likely to increase the high end of that range. The range encapsulating both estimation and framework error is illustrated below.

Figure 2. Range of reasonable WACC values

16. A quantitative approach is adopted to estimate the extent of estimation error associated with the parameters, as set out in Attachment 1. A conservative approach has been adopted. The higher and lower values for each of the parameters have been chosen so the range is narrower than the statistical measures of maximum and minimum values. This ensures that the higher and lower values of the range of reasonable CAPM WACC values are not overstated and understated, respectively.

17. To estimate the extent of framework error, however, is much more difficult. Hence, for the purpose of this submission, rather than attempting to quantify framework error, this should be treated as a consideration that should be taken into account when choosing a value from the range derived from considering estimation error alone. The process of choosing a value for the WACC from the range of reasonable alternatives is discussed in the following section.

18. In summary, the resultant range of reasonable estimates of the CAPM WACC that encapsulates estimation error but not framework error is summarised in the table below.

	High	Low
Cost of equity	16.16%	11.48%
Proportion of equity	70%	70%
Cost of debt	8.65%	8.20%
Proportion of debt	30%	30%
Post-tax WACC	13.91%	10.49%

C Choosing the WACC from the range of reasonable alternatives

19. To estimate the cost of ULLS to support Telstra's undertaking, one WACC value is typically chosen from the set of reasonable alternatives.[13] In making that choice it is important to recognise two considerations.

20. First, as discussed above, the range of reasonable values is determined by estimation error alone and not framework error. Hence, consideration must be given to the likelihood that framework error will extend the upper value of that range by more than it extends the lower value.

21. Second, consideration must be given to the asymmetry in the ultimate effects of choosing an incorrect WACC from the range of reasonable alternatives. The following discussion shows that this asymmetry would lead a sensible decision maker to choose a WACC higher on the range of reasonable alternatives.

22. If the chosen WACC is below the true WACC, Telstra's incentives to invest in new CAN infrastructure and replace old will be less than optimal. A low WACC and the resultant low prices will discourage investment by alternative network owners supplying services that are substitutable with ULLS and related services. A WACC that is too low will also reduce incentives for CAN owners to modernise the network (for example, replacing parts of the copper network with higher-capacity fibre) and introduce new services (for example, video delivered over the Internet). These effects are all the greater as such a too-low WACC will inevitably have a "demonstration effect" both with respect to other investments by Telstra and by access seekers (as well as with respect to other regulated industries). **Society will be deprived of the entire benefit of these investments.**

23. Conversely, if the chosen WACC is above the true WACC, the prices paid by access seekers and ultimate consumers will be higher. This will have the effect of transferring wealth from access seekers and end customers to CAN owners (in the form of higher prices paid by those consumers who continue to purchase services after the price increase) and cause a reduction in the level of consumption that would otherwise occur. **Society will be deprived of the net benefits foregone due to lower consumption**.

24. It could be argued that a "too high" WACC will distort investment by the access provider through Averch-Johnson effects. [14] The Averch-Johnson effect refers to the impact on the input choices of a monopolist of a regulatory constraint that continuously (that is, without any lag) limits the monopolist's rate of return to an amount that is *less than* the unconstrained monopoly rate of return but *more than* the competitive rate of return. The monopolist is assumed to face a production function (that is, a function defining the level of output it secures from each combination of factor inputs) that allows it to substitute capital for other factors and to select the combination which allows it to maximise its

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[13] Of course one could choose a number of alternative WACC values to test the sensitivity of the resultant cost estimate with respect to the WACC. Indeed, the TEA model allows any user to adjust the WACC as they see fit and assess the resultant cost of ULLS.

[14] Harvey Averch and Leland L. Johnson (1962), "Behaviour of the Firm under Regulatory Constraint", *American Economic Review*, Vol. 52 pp. 1053-1069. There is a vast literature on Averch-Johnson effects, with important contributions including: Elisabeth, E. Bailey and Coleman, R.D. (1971), "The Effect of Lagged Regulation in the Averch-Johnson Model", *Bell Journal of Economics and Management Science*, Vol. 2, pp. 278-92; David P. Baron, and Taggart, Robert A. (1977), "A Model of Regulation Under Uncertainty and a Test of Regulatory Bias", *Bell Journal of Economics and Management Science*, Vol. 8, pp. 151-67; William S. Baumol, and Klevorick, Albert K. (1970), "Input Choices and Rate of Return Regulation: An Overview of the Discussion", *Bell Journal of Economics and Management Science*, Vol. 1, pp. 162-190; Davis W. Dechert (1984), "Has the Averch-Johnson Effect been Theoretically Justified?" *Journal of Economic Dynamics and Control*, Vol. 8, pp. 1-17; Robert Spann (1974), "Rate of Return Regulation and Efficiency in Production: An Empirical Test of the Averch-Johnson Thesis." *Bell Journal of Economics and Management Science*, Vol. 5, pp. 38-52; and Akira Takayama (1969), "Behavior of the Firm under Regulatory Constraint", *American Economic Review*, Vol. 59, pp. 255-260.

total profits subject to the rate of return constraint. It is also generally assumed that once the firm has selected an input mix (that is, determined a capital stock), it operates that capital stock to a given and fixed level of utilisation. Given those assumptions, the rate of return constraint effectively lowers the cost to the firm of increasing its capital intensity (since the decreased marginal product of capital is partly offset by the higher-than-competitive return on the added capital stock), with the result that the firm chooses an input mix that is too capital intensive.

25. As with any other model, whether Averch-Johnson effects occur depends on the degree to which the model's assumptions hold. Some of these assumptions are technical in nature: for example, the assumption of a long run production function that is smooth and continuous, while the capital stock is operated at a fixed level in the short run. Whether these technical assumptions hold for most conventionally regulated industries is questionable.

26. Other important assumptions involve the regulatory context. More specifically, the model assumes a very particular form of regulation, in which the regulated firm faces an especially "low powered" set of incentives – in other words, has few disciplines on it to be efficient. Thus, the regulated firm in the Averch-Johnson model is exposed neither to the conventional regulatory "sticks" nor to the conventional regulatory "carrots". This assumption plainly does not apply in respect of the current proceedings, as Telstra's asset base is determined on an optimised basis. Given that approach to determining the asset base, Averch-Johnson effects seem of no relevance.

27. It might also be claimed that too high a WACC would induce inefficient bypass by access seekers. While it is likely that some bypass would occur, it seems difficult to believe that erring towards the high side could be a material factor in this respect. Additionally, even if some inefficient bypass did occur, this would not be a pure loss, as it would allow a diversity of sources of supply, and inject greater "head to head" competition than has characterised Australian telecommunications in recent years. Such facilities-based competition would bring benefits in terms of innovation, greater discipline on pricing and the scope to wind back direct regulation.

28. An additional and incorrect claim might be that the distribution of investors' perceptions of the true WACC might be such that setting the WACC too low will not adversely impact investment.[15] However, within the CAPM framework, it is an assumption that all investors have the same information and consequently the same view about the expected return from assets (that is, investors have homogeneous expectations). Consequently, to make such an argument one needs to abandon the CAPM framework and assume investors have heterogeneous expectations. But even doing so, other frameworks that assume investors' expectations are heterogeneous result in a single (consensus) market-clearing required return for all investors.[16] If a firm's WACC is below that required return then there will still be a shortage of investment funds available to the firm. Indeed, such models typically find the market-clearing required return to be higher under heterogeneous expectations than they would be were expectations homogeneous. As a result, if it is the ACCC's view that expectations are in fact heterogeneous, then it will need to mark up the conventional CAPM WACC.

29. The adverse effects of choosing a WACC that is below the true WACC will almost certainly be greater than the adverse effects of choosing a WACC that is above the true WACC. This is because the foregone benefits of investment (the entire consumer and producer surplus) are, under any reasonable assumptions, greater than the loss of surplus

[15] This argument is flagged in Telstra Corporation Ltd (No 3) [2007] ACompT 3, at paragraph 442.
[16] See, for example, Williams, J.T. (1977), "Capital asset prices with heterogeneous beliefs", *Journal of Financial Economics*, Vol. 5, pages 219-239.

associated with marginally higher prices. Telstra will continue to work to establish this fact. Prior to this work being complete Telstra considers that a value of 12.28% for the WACC (the calculation for which is set out in Attachment 1) should be used. However, for the reasons discussed, it should be expected that a higher value for the WACC will be appropriate when assessing whether or not Telstra's $30 undertaking price is reasonable.

Attachment 1 The CAPM and its parameters

30. This attachment sets out the estimation of the sets of parameters that define the higher and lower values for the range of reasonable CAPM WACC values. The WACC is simply a weighted average of the (different) returns expected by providers of debt and equity funds. The formulas used by Telstra to calculate the vanilla WACC and component inputs into that WACC formula are set below:

31. The nominal vanilla WACC is calculated using the following formula:

$$WACC = R_e (E/V) + R_d (D/V)$$

where

R_e = cost of equity capital, calculated as set out in paragraph 33;

R_d = cost of debt capital, calculated as set out in paragraph 32;

E= market value of equity,

D = market value of net debt, and

V = market value of the firm (E+D).

32. The cost of debt capital is calculated using the following formula:

$$R_d = R_f + DRP + DIC$$

where

R_d = cost of debt capital

R_f = risk free rate of return

DRP = debt risk premium, and

DIC = debt issuance cost

33. The cost of equity capital is calculated using a version of the CAPM as set out below:

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

where

E(.) = indicates the variable is an expectation,

R_e = cost of equity capital

R_f = risk free rate of return

R_m = market rate of return, and

β_e = systematic risk parameter for equity ("equity beta")

EIC = equity issuance costs

34. A conservative approach has been adopted to estimate the range of reasonable CAPM WACC values. The upper and lower values for each of the CAPM parameters have been chosen so the range is narrower than the statistical measures of maximum and minimum values. This ensures that the upper and lower values of the range of reasonable CAPM WACC values are not overstated and understated, respectively.

1 Risk free rate

35. The risk free rate is used as an input into the formulae for estimating both the cost of equity capital and the cost of debt capital. From a theoretical perspective the risk-free rate represents the yield available on a notional risk-free investment, which is typically assumed to be a government bond. Although government bonds do have some residual risk, they are generally regarded as free of default risk and therefore application of a government bond on a yield-to-maturity basis is generally considered as not materially distortionary in WACC estimation.

36. Telstra has consistently used a 10-year government bond as a proxy for the risk-free investment and the yield thereon as an indicator of the risk-free rate for WACC purposes where the underlying asset lives are expected to be quite long. This construct matches the useful life of the assets with the duration of the risk-free investment. This approach is consistent with Professor Bowman's view[17]. Furthermore, this matching maintains the principle established by the Australian Competition Tribunal in the GasNet Decision[18] and is reasonably standard across Australian regulators.

Traditional Approach to the Maturity of the Risk-free Investment

37. The CAPM is a single period model but is typically applied to multi-period analysis (e.g. valuation of cash flows and discounted cash flow analysis) and does not provide any clear guidance as to the appropriate period for analysis (and by extension to the appropriate maturity of the risk-free investment).

38. The starting point for determining the appropriate maturity of the risk-free investment for application in the cost of debt should be that which is effected by commercially focussed, unregulated enterprises investing in long-lived assets. An unregulated company investing in long-lived assets (such as the CAN) will generally finance with debt, the maturity of which is set to match the useful lives of those assets. This allows the company to structure its debt-related payments to ensure that the revenues generated by the assets over their useful life are sufficient to service its debt-related obligations, including interest repayments. Given that this is what occurs in competitive markets, it should represent a benchmark for regulatory intervention. Unless there are strong reasons to depart from this benchmark, the primary focus for determining the maturity of the risk-free investment in regulated circumstances should be the lives of the relevant assets (or an approximation thereto but consistent with well operating bond markets).

[17] The Bowman Report May 2007, section 6.1.2.
[18] Australian Competition Tribunal, Application by GasNet Australia (Operations) Pty Ltd [2003] ACompT 6,

39. Moreover, this is exactly what Telstra does in structuring its debt and considering its maturity profile when funding long-lived assets. Significant competitive and commercial incentives mean there are real economic consequences for Telstra of sub-optimal capital structure. Consequently, gearing is an important financial and strategic decision for Telstra and its management. As a result, Telstra (like most major businesses) has very strong commercial incentives to maintain an optimal capital structure, including its term structure of debt (i.e. suite of debt maturities) and often have Treasury teams devoted to this function.

40. Although regulators can and do form views about (optimal) capital structure for regulated businesses, including Telstra, they generally do not have the detailed information available to Telstra management that educates this decision. Moreover, regulators do not ultimately face the economic consequences of their views and often do not have the experience and expertise available to Telstra management (including in-house Treasury support).

41. Consequently, it seems presumptuous for a regulator when considering the WACC to effectively determine that the management of a company does not effect sound capital structure decisions (including around term structure of debt) that are in the best long-term interests of the company. This relates as much to the term structure of debt as to the overall gearing.

42. Telstra is not aware of any evidence suggesting that it is not acting in its best interests (including those of capital providers) in determining its capital structure, including its choice of maturities. Given that regulation should seek to mimic efficient outcomes; there is no evidence that Telstra's capital structure is sub-optimal and that it is generally preferable to fund long-lived assets with long-lived debt, regulators should generally apply a risk-free investment calibrated with the useful life of the relevant assets.

43. The three credit ratings agencies that focus on Telstra debt and its credit-worthiness have not questioned the appropriateness of Telstra's gearing or term structure in their deliberations. These ratings agencies analyse quite intensively all aspects related to Telstra's debt raisings and its ability to service debt with special focus on gearing, term structure and roll-over risk (amongst many other things). Their lack of concern about Telstra's gearing and term structure of debt reinforces the commercial appropriateness of Telstra's term structure and overall gearing.

44. Further empirical support for Telstra's term structure of debt is based on the average time to maturity of telecommunications companies raising funds in the euro-bond market. The average time to maturity of bonds in the Euro iBoxx telco index[19] is currently around 6.7 years. This implies that telecommunications companies accessing the Euro-bond market typically borrow for periods beyond 10 years.

45. Given that Telstra actually funds long-lived assets with long-maturity debt (i.e. applies the matching principle outlined above) and the Commission has not presented any evidence that this is an inferior or sub-optimal approach to term structure for Telstra, the WACC should be calculated with reference to a long-maturity risk-free investment. This will provide a better guide to the annualised capital costs actually incurred by Telstra which should be recovered via access pricing.

CAPM and Maturity of the Risk-free Investment

[19] Published by the International Index Company. The telco index currently comprises 81 bonds, with a minimum volume of Euro500m which must be investment grade (i.e. rated BBB- or higher), with a time to maturity of more that 1 year. Sourced from confidential advice provided to Telstra by Deustche Bank.

46. As noted above, the CAPM is a single period model but typically applied to multi-period analysis and does not provide any clear guidance as to the appropriate period for analysis. Nevertheless, there is a convention in CAPM around the appropriate horizon for equity being linked to the useful life of the relevant assets. This reflects the fact that even equity investors with an expected or likely short holding period will take a long-term perspective in evaluating their hold/sell decision. In this context, the average life of the CAN assets is around 35 years suggesting a long-lived government bond is appropriate. Most market practitioners hold a view that the longest-dated bond that is actively traded in a relatively liquid market in Australia is the 10-year government bond. Given this, it is appropriate to adopt the yield on the 10 year government bond as the risk-free rate in the cost of equity calculation.

Application of CAPM post GasNet

47. In its access arrangements, GasNet proposed to use 10 year government bonds to determine the risk free rate. The Commission did not accept GasNet's risk free rate set by reference to 10 year government bonds as opposed to one based on 5 year government bonds adopted by the Commission in its calculation of the WACC. The Commission decided to maintain its approach of using bond rates corresponding with the length of the regulatory period, on the basis that by using rates corresponding to the regulatory period (for example, five years rates for five year regulatory periods) the present value of future cash flows matched the value of the initial investment.

48. GasNet appealed against this to the Australian Competition Tribunal and submitted that the Commission had erred and ought to use a risk-free rate based on ten year government bonds.

49. The Tribunal accepted these submissions, relevantly stating that:

> *…Whilst it is no doubt true that the CAPM permits some flexibility in the choice of inputs required by the model, it nevertheless requires that one remain true to the mathematical logical underlying the CAPM formula…*
>
> *The Commission erred in concluding that it was open to it to apply the CAPM in other than the conventional way to produce an outcome which it believed better achieved the objectives of s8.1 In truth and reality, the use of different values for a risk free rate in the working out of a Rate of Return by the CAPM formula is neither true to the formula nor a conventional use of the CAPM. It is the use of another model based on the CAPM with adjustments made on a pragmatic basis to achieve an outcome which reflects an attempt to modify the model to one which operates by reference to the regulatory period of five years. The CAPM is not a model which is intended to operate in this way. The timescales are dictated by the relevant underlying facts in each case and for present purposes those include the life of the assets and the term of the investment.*
>
> *The Tribunal is satisfied that the use by the GasNet of a ten year Commonwealth bond rate to determine a Rate of Return on equity… was a correct use of the CAPM and was in accordance with the conventional use of a ten year bond rate by economists and regulators where the life of the assets and length of the investment approximated thirty years in the MRP calculation and the risk-free rate.*[20]

50. As referred to above, the specific issues directly considered by the Tribunal in the GasNet decision included whether:

[20] Australian Competition Tribunal, Application by GasNet Australia (Operations) Pty Ltd [2003] ACompT 6, paras 44, 46, 47-48.

- the appropriate maturity of the risk free rate should be governed by the regulatory period or the life of the relevant assets; and

- consistent application of the risk free rate across the CAPM is necessary.

51. In providing its views on these issues, the GasNet decision informs two important aspects of how the risk free rate component of the WACC should be considered and measured in the context of the Undertakings. These are discussed below.

52. The GasNet decision by the Tribunal clearly rejected the Commission's previous view that the regulatory periodicity was a constraining factor on the maturity of the risk-free investment. Instead the decision reinforced the long held convention that the appropriate maturity of the risk free rate should be educated by the useful life of the relevant assets. The Tribunal's view is that the adoption of any other maturity (including using the regulatory period) is not a valid and correct use of the CAPM as it was designed and has been applied by practitioners for many years.

53. If the Commission were to apply a regulatory period (however arbitrarily determined) as the maturity of the risk-free investment it would be applying the CAPM in a manner that is inconsistent with the long-held principles and conventions around its application. Effectively, this would mean that the Commission is not adhering to the CAPM principles and conventions and therefore is not really applying the CAPM.

54. The Commission should therefore persist with the application of a 10 year government bond as the risk free investment in subsequent WACC-related deliberations, at least in relation to the CAN.

55. There is a push for the Commission to re-consider its view on the risk-free rate, in particular claims that the GasNet decision[21] has no direct relevance in the telecommunications context and therefore the risk-free rate should again be calibrated with the regulatory period.

56. Telstra accepts that if certain conditions are met, it could be sensible to match the maturity of the risk-free investment to the regulatory cycle. The requirements for application of this approach include:

    (a) there is a clearly identifiable, enforceable and fixed regulatory cycle;

    (b) the implications of each regulatory intervention are critical to the overall economic returns and long-term financial viability of the regulated asset base;

    (c) output over the future life of the asset is known; and

    (d) operating expenses over the future life of the asset are known.

No Identifiable Regulatory Period

57. The proponents of matching the maturity of the risk-free investment to the regulatory period do not clearly define what they mean by regulatory period in general or in this particular context. Clearly precise definition of the regulatory period is critical in this approach and this inability to define makes it problematic to match the maturity of the risk-free investment to some indeterminate regulatory period. In Telstra's view there is

[21] Australian Competition Tribunal, Application by GasNet Australia (Operations) Pty Ltd [2003] ACompT, paragraph 47

no clear and obvious regulatory cycle identified or implicit in Part XIC of the Act. Under the current regime, the central focus of the relevant legislation is the desirability of commercially negotiated outcomes. Only where negotiation fails is recourse to the regulator available. These negotiations are occurring multilaterally and at different times for each pair of access seeker/access provider[22]. Also the tenure of the negotiations may well vary across the different access seekers depending on the negotiating parties' relative appetites for certainty, amongst other considerations. Given this diversity, identifying a single regulatory period around which the risk-free maturity can be proxied appears extremely problematic.[23]

58. Given that regulatory intervention only follows breakdown of negotiations there is no certainty that the regulator will be involved whenever negotiations around access prices for the period after the current undertaking commence. Therefore, there is no guarantee that the regulator will be able to re-set access prices to reflect moves in the risk-free rate.

Regulatory Intervention Critical to Overall Economic Returns

59. The regulatory period could also be relevant if the regulatory arrangements operated to ensure that over the asset's entire useful life *ex ante* returns established by the regulator were always achieved *ex post* with certainty. The regulatory regime operative around access to telecommunications assets does not:

- provide the regulator with the capability to significantly influence the overall returns of the CAN;
- allow the regulator to insulate the CAN provider from future interest rate and inflation risk;
- allow the regulator to ensure a pre-determined return on investment in the CAN is achieved.

60. In the telecommunications context, regulatory decisions on access pricing do not have the same centrality to the overall returns on the CAN as is the case in the gas and electricity sectors. This is because for the CAN there are a number of different revenue streams rather than those directly dependent on the outcome of the regulators decision on appropriate access charges. As a result the regulator cannot ensure that the regulated asset base (i.e. the CAN) will earn the appropriate overall *ex post* return required *ex ante* by investors (or set by the regulator). Moreover, the regulator cannot make the access provider immune from long-term interest rate risk partly because only a part of the overall revenue stream of the CAN is exposed to direct regulatory intervention and also partly because there is no necessity for the regulator to be involved in future price setting. For this reason Telstra (or the ULL provider) should determine the maturity of its funding independently of the regulatory period (if one could be identified).

61. The situation above contrasts with that of the gas and electricity sectors where the regulated assets commonly have no alternate sources of revenue other than that dependent on the prices established by the regulator at the mandated price reviews. In that context, the regulator has greater potential to ensure *ex post* outcomes are closer to the *ex ante* expectations of investors and to reduce long-term interest rate risk. In that regard in the gas and electricity sectors:

[22] That is, Telstra may be negotiating with a particular access seeker at one point of time and then others at different points of time.
[23] The potential for undertakings does not alter this central position as there is no set timeline for how long they are to be effective. For instance previous undertakings have been for a period of 2 years; 2.5 years and 3 years.

- there is a clear and mandated regulatory cycle for price setting;
- there is not the multiplicity of access seekers to regulated gas and electricity assets as there are to the CAN; and
- there is no opportunity for negotiated terms and conditions (including price).

Uncertainty of future outputs and operating expenses

62. There is considerable uncertainty around aspects of demand for CAN-related products, including demand for a basic access service given the strong continuing preference for and shift to mobiles (including as the only source of telephony capability into a rising number of households).

63. This demand uncertainty necessarily implies commensurate uncertainty around variable operating expenses and hence significant uncertainty around the overall level of operating expenses.

64. Given this uncertainty around demand and operating expenses there is considerable doubt around the ability of the regulator to ensure an adequate commercial return over the entire asset life. Given this, it appears simplistic to suggest that adopting an otherwise sub-optimal debt maturity (i.e. matched to the regulatory cycle instead of the useful life of the assets) with periodic re-setting of the cost of debt can ensure that *ex ante* returns set by the regulator are achieved over the useful lives of the relevant assets.

Conclusion on Regulatory Period

65. The maturity of the risk-free investment should broadly match the expected life of the assets involved in the CAN, so long as there are no market thinness issues associated with a market for such investments.

Internal Consistency Between the Risk-Free Rate and the Market Risk Premium

66. Some have argued that even if the Commission was to adopt a short maturity risk-free rate it should persist with a market risk premium (MRP) estimate based on a longer bond maturity. The effect of this is to apply a lower MRP than would be warranted and would be consistent under the CAPM.

67. Telstra has consistently maintained the view that the risk free rate and the MRP need to be interdependently determined and that the estimate of the MRP will generally vary inversely with the maturity of the risk free investment chosen, assuming a normal upward sloping yield curve. Thus, the Commission cannot apply the same MRP estimate across situations where it adopts different maturities of the risk free investment. The Commission had previously taken the view that, whilst internal consistency may be desirable and the adoption of approximations and estimates for many of the component parameters may result in some internal inconsistency, it does not invalidate the CAPM.

68. The Tribunal accepted as inevitable a certain degree of flexibility in determining values for many of the component parameters of the WACC. However, in the Tribunal's view, this does not extend to contravening the basic mathematical logic underlying the CAPM formula. In particular, the value ascribed to the risk free rate has to be consistently used in the CAPM in all places that it appears. If the risk free rate is not applied consistently across the CAPM formula then not only is internal inconsistency compromised but the logic underpinning the CAPM is also invalidated.

69. The necessary consequence of this view is that the value chosen for the MRP must be set with direct reference to the maturity of the risk free investment applied.

70. This perspective is reinforced by examination of the underlying CAPM equation depicted at paragraph 33. Note that R_f occurs twice in this equation and is not described as different in either theory or value in the two occurrences. The necessary corollary of this is that the MRP must be calibrated with the risk-free rate as that is the purpose behind its second occurrence in the CAPM formula.

Compensation for Un-borne Risks

71. Some claim that the application of long-term rates in calculating the cost of debt will compensate the access provider for risks that it is not bearing. In Telstra's view the correct perspective on this is that Telstra prudently borrows at such long-term maturities and therefore incurs the associated costs. The relevant debt providers thereafter expect that Telstra continue to service this interest burden over the remainder of the life of the debt. On this basis, allowing a cost of debt based on the 10 year government bond reflects the actual cost of debt prudently incurred by Telstra which the debt provider expects will be met. It should be regarded as a cost not as over-compensation of risk.

Relevance of Other Costs

72. If the Commission persists with a shorter maturity risk-free rate and suggest it is prudent for the CAN provider to adopt short-term debt matched to the regulatory cycle (whatever that is in the ULL context) it needs to recognise consequential impacts. Critically, there would be actual administrative costs incurred when debt was initially established **and** each time it was subsequently rolled over. Additionally there would be re-contracting risk that when more frequent roll-overs occurred Telstra would be rolling over at higher interest rates. These costs and risks would need to be factored into either the cash flow or the WACC if a short maturity bond was used for WACC purposes.

Application of WACC in the TEA Model

73. The annualisation of capital costs is undertaken via a building block approach which distributes the capital cost over the useful life of the asset and ensures only full-cost recovery (in net present value terms). The discount rate (WACC) applicable in this calculation is effectively applied across the entire expected useful life of the relevant assets. The WACC, therefore, must be relevant across the entire useful life of the asset. Given this, the WACC must be based on a risk-free investment whose maturity matches that of the relevant assets. On this basis, the WACC applied in the annualisation calculations is "valid" in years of the assets useful life beyond the expiration of the initial regulatory period (however defined).

74. If the maturity of the risk-free rate is matched to the "regulatory period"[24] the resulting WACC is not relevant over the useful life of the relevant assets and is not relevant to an annualisation formula that is applied over the entire expected useful life of the assets. Therefore, the WACC calculated with a risk-free rate calibrated to the "regulatory period" will not be the appropriate WACC to be applied.

75. This is particularly important when capital costs are levelised of the life of the relevant assets. Critically, levelising using a WACC underpinned by a 2-year maturity risk-free investment (assuming the regulatory period is 2 years on some basis) will produce

[24] Assumed to be shorter than the assets expected useful life.

distorted results for years beyond the risk-free maturity chosen and thus compromise the levelisation results.

76. Therefore a WACC based on a risk-free investment with maturity significantly less than that of the relevant assets (as may occur if the regulatory period was applied) contravenes the logic of CAPM and is also not appropriately specified for application in any of the standard annuity formulas. A shorter maturity risk-free investment is not readily applicable in the annuity calculations because it contravenes the long-term perspective necessarily required and ordinarily applied in implementing the TSLRIC principles.

Range for the risk-free rate

77. The vexed regulatory question of the appropriate maturity on which to base the risk-free rate is important in considering the appropriate range for the risk-free rate. In Telstra's view it is not appropriate to include in the range analysis estimates that straddle both a 10-year and a 5-year maturity risk-free yield. This is because the distributional properties and error characteristics associated with 5-year bond yields are different to those of 10-year bonds. Moreover, a significant portion of the volatility if measured on a combined basis is due to approach error rather than estimation error. In Telstra's view approach error is not relevant in identifying the appropriate range for this analysis.

78. Similarly, with the issue of the appropriateness of averaging bond yields over a particular span of trading days to determine a so-called more representative estimate of the risk-free rate. In Telstra's view, there is a decision point for WACC practitioners and the regulator around the appropriate approach which should pre-date consideration of the estimation error relevant for identifying the appropriate range. The estimation error included in the range analysis should only incorporate pure estimation error and exclude variability due to different approaches. Again the estimation error impounded in an averaged estimate will be different to the error impounded in an estimate on a single day and hence they should not be conflated into consideration of the appropriate range.

79. Given that the bond yield (at 10-year maturity) at close of trading on 31 December 2007 is observable, the only error possible relates to how well that yield translates to an opening yield on 1 January 2008. In Telstra's view the closing yield on a particular trading day is the best unbiased estimate of the opening yield on the next trading day and any divergence from this is likely immaterial from a WACC perspective (despite risk that at end-of-calendar-year this divergence could be greater than for other trading days). As such Telstra does not apply a range to the risk-free rate.

Conclusion on Risk-free Maturity for CAPM and Cost of Debt

80. Given the above considerations Telstra submits that the 10-year Government bond is the most appropriate risk-free investment for estimating both the cost of equity (applying the CAPM) and the cost of debt. The key reasons are:

- there is no meaningful regulatory cycle associated with these assets to which the maturity of the risk-free investment could sensibly be calibrated;
- the regulator does not have a permanent central role in setting access prices and therefore does not have the ability to ensure particular returns for the CAN;
- it is common commercial practice for long-lived assets to be funded by long maturity debt;
- there is no evidence suggesting anything sub-optimal about Telstra's gearing (including term structure) at either the Telstra or CAN assets level;

- there are conceptual issues associated with using a risk-free investment with a maturity shorter than the lives of the relevant assets to construct a WACC estimate to be applied in an annuity context consistent with TSLRIC principles.

Averaging is Not Appropriate

81. Telstra's view is that the WACC applicable for annualising capital costs relates to a particular date at which the relevant assets are valued (costed) and that therefore all the components in the WACC calculation, as much as practicable, should be estimated on or projected to that same date. This then enables the identification of the true opportunity cost of the relevant assets in a manner consistent with the TSLRIC pricing principles. This concurs with the view of Professor Bowman.[25]

82. The Commission has in the past advocated averaging of the observed risk-free rate rather than applying a rate-on-the-day as proposed by Telstra. The Commission contends that this approach reflects the need to account for day-to-day volatility in government bond yields. However, the Commission does not explain why short-term volatility needs to be redressed and presents no evidence that anomalous market fluctuations exist in relation to the bond market being considered in general or at and around the times relevant in this context. Nor does the Commission explain how a simple averaging of daily closing yields across an arbitrary period will specifically address these anomalous fluctuations. Finally, the Commission does not explain any adverse implications for the determination of an appropriate risk free rate that might flow from using the rate on the day (i.e. from not averaging over some arbitrary period).

83. Application of the WACC in its CAPM form rests on the assumption that market parameters, including the risk-free rate, reasonably reflect the best information available to market participants. It follows that the rate on the day does not supplement but supplants the rate on previous days, because it contains and reflects more information than those previous rates did. As a result, it is only appropriate to average or otherwise blend rates on different days when there are reasons to believe markets are functioning poorly – say because they are too thin – or anomalously (say because they are distorted by temporary "*noise*" or "*bias*" in the information available), and hence are incapable of properly reflecting in prices (and hence yields) the best information available. The Commission has not provided any factual basis to suggest that relevant contemporary Australian bond markets are impacted by noise, bias or thinness. Professor Bowman considers the market for government debt in Australia to be sufficiently liquid at least for maturities up to 10 years.[26] Therefore, all the components of the WACC must be estimated (to the extent practicable) at the same date as the asset valuation and/or construction (that is the date on which the TSLRIC costing is based). Adopting the rate-on-the-day also ensures that the resultant WACC estimate will be applied to asset valuations specific to a certain and consistent date.

84. Additionally, only using the rate on the day enables quantification of the true opportunity cost associated with the asset base as at the relevant date (i.e. the construction and/or valuation date often the beginning of a relevant financial year). More specifically, it is not possible for an access provider that did not proceed with the network investment notionally on the construction date to invest in Government bonds (or an alternate investment) at yields averaged over a range of preceding trading days. Telstra therefore submits that the opportunity cost (or WACC) should not be based on a smoothed bond yield unavailable in the market at the relevant date (i.e. the valuation or construction date).

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[25] The Bowman Report May 2007, section 6.1.1.
[26] The Bowman Report May 2007, para 37.

85. The appropriate yield should be that available in the relevant government bond market at the time the provider of the assets (in this case the CAN-related assets) notionally commits to their construction at which point the assets are notionally sunk and the opportunity cost of foregone alternative investments effected. This requires a bond yield at the opening of the markets on the valuation and/or construction date. This opening yield is reliably proxied by the closing yield from the previous trading day.

86. Therefore, reflecting the foregoing perspectives Telstra recommends that the appropriate risk-free rate should be educated by an observed contemporary yield on a Government 10-year bond. The observed yield should be based on opening yields on a particular date linked to the valuation and/or construction date and proxied by closing yields on the day previous. This information is sourced directly from the Reserve Bank of Australia's (RBA) website (http://www. rba.gov.au).

87. Consistent with the valuation date underpinning the cost modelling Telstra recommends application of the observed closing yields on the previous trading day to 1 January 2008. The RBA data provides a closing yield on government 10-year bonds of 6.33% as at market closure on 31 December 2007. This rate has been applied as an unbiased estimate of the rate applicable at the opening of trading on 1 January 2008.

2 Debt Risk Premium

88. The debt risk premium (DRP) is the margin above the risk-free rate that a particular entity must offer to attract debt funding. The quantum of the DRP will reflect the underlying riskiness of the relevant business and will reflect the credit rating attributed to that business or the debt of a similar business by the ratings agencies. The DRP that is relevant in this context is that which would apply to a standalone provider of the CAN-related assets but as Telstra does not issue debt specifically hypothecated to those assets the DRP is not observable at that level.

89. Given that the DRP is a component of the cost of debt it must be set relative to and consistent with the risk-free rate. This ideally requires the DRP to be quantified:

    - As a margin that would apply to debt issued by the provider of the CAN-related assets of similar maturity to that assumed for the risk-free rate. Given the application of a 10-year government bond as the risk-free investment this requires the DRP to be measured at the 10-year maturity;

    - As at the same date as the risk-free rate underpinning the WACC estimate. In circumstances where the risk free rate is determined on a day, the DRP should also be quantified on that same day. This requires the DRP to be estimated at the construction and/or valuation date applied in considering the risk-free rate;

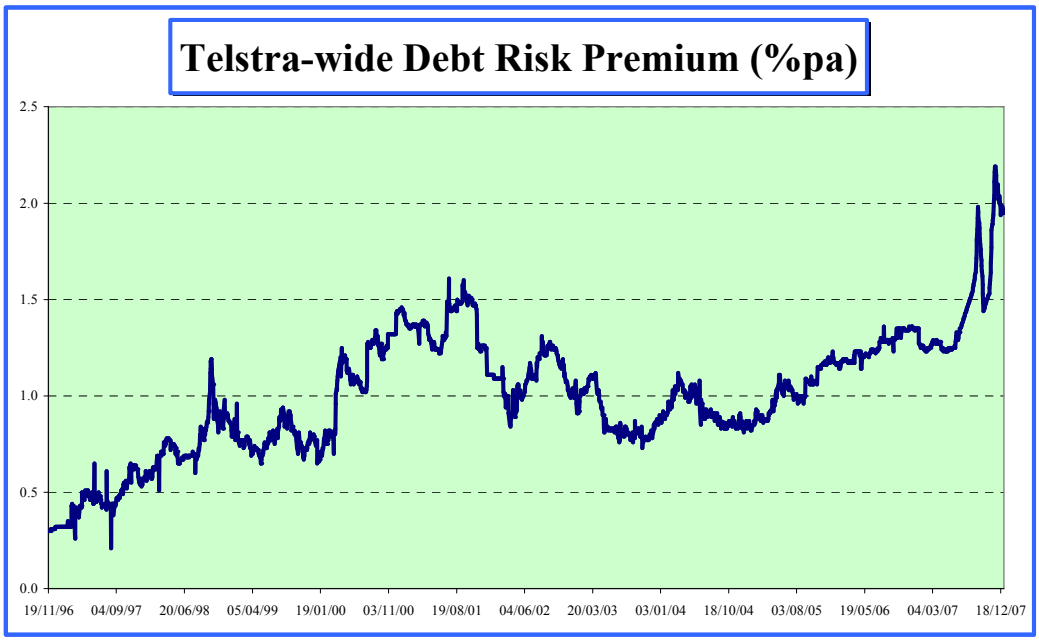
    - With the same extent of averaging as applied around the risk-free rate. Given Telstra's application of the "rate on the day" without averaging around the relevant construction and/or valuation date, this requires the DRP to also be a "rate on the day" without averaging.

90. The DRP relevant in this context is one that would pertain to a stand-alone provider of the relevant CAN-related assets. There is no direct empirical support for this metric as Telstra does not issue debt hypothecated to or relevant only to CAN-related assets. Nevertheless, given the share of CAN-related assets in total assets and the centrality of the CAN-related assets to Telstra's overall business, the Telstra-wide DRP will provide some market-based guide to the likely size of the DRP that would likely apply to the CAN-related assets.

91. The likely quantum of the DRP is affected in part by the ratings ascribed by various ratings agencies to particular debt issuers. In broad terms the current ratings attributable to Telstra by the various ratings agencies are likely to be indicative of the likely rating applied by similar agencies to a stand-alone provider of CAN-related assets. This reinforces the view that the Telstra-wide DRP is an appropriate indicator of the DRP relevant for the CAN-related assets.

92. Telstra considers that in estimating the various WACC parameters reliance should be placed on market determined information as much as practicable. Although no direct market information on the DRP for CAN-related assets is available, there is market-derived information available at the Telstra-wide level which provides some reasonable guidance for the DRP of the CAN-related assets.

93. The Telstra-wide DRP for debt with (approximately) 10 years to maturity over much of the last decade is plotted in the chart below. It is quite apparent that the Telstra-wide DRP has risen sharply through late-2007 reflecting the impact of financial market turbulence in the aftermath of the near-collapse of US sub-prime mortgage. The consequent illiquidity heightened credit spreads including for low risk corporations like Telstra.



Source: Telstra Treasury

94. On balance, Telstra contends that the Telstra-wide DRP at 10-year maturity is a reliable guide to the DRP applicable to the CAN-related assets.

95. The Commission has previously advocated the uncritical application of a benchmark debt risk premium for an A-rated benchmark bond[27]. The Commission does not provide the detail on the source of this estimate nor any insight into the relevance of this observation, nor does it establish the relevance of the benchmark bond rating to the particular context (the LSS in that case). Further, the Commission does not provide any detail as to the range of companies sampled in the A-rated benchmark. Telstra submits

[27] ACCC, "*Assessment of Telstra's ULLS Monthly Charge Undertaking*" Final Decision, Public Version, August 2007, page 107

that these companies will invariably differ to Telstra to some extent in terms of at least the following which matter for the likely DRP:

- industry structure or competitive dynamics;
- company specific growth or life-cycle dynamics;
- perspective of ratings agencies (e.g. whether on credit watch negative/positive or not); and
- differential liquidity and/or gearing of A-rated corporations.

96. Given these differentiating factors, the range of company-specific DRP's embedded in any estimate of the average would likely be quite wide and specifically identifying where the CAN-related assets would be located in this spectrum would be extremely problematic. The arbitrary adoption of the simple average, without any adjustment for the factors that in practice would lead the DRP to vary from company to company, is simplistic and potentially distorting.

97. In Telstra's view it would be preferable to use something closer to the actual context. In other words adjusting from the Telstra-wide DRP is more straight-forward and practical than attempting to adjust an average from a cohort of diverse corporations with sometimes significant differences across parameters that matter for the DRP. This is especially so for the CAN-related assets given their centrality and criticality in Telstra's broader operations suggesting that the observable Telstra-wide DRP would be a reasonable guide to that applicable to the CAN.

98. Given the above, Telstra suggests application of the Telstra-wide DRP as the most reliable, market-driven guide to the DRP likely relevant for the CAN assets. The Telstra-specific DRP as at close of trading on 31 December 2007 was 1.95%.

99. Similar issues to those described above for identifying the appropriate range for the risk-free rate emerge in considering the appropriate range for the DRP. These include the appropriate maturity and the extent if any of averaging. Telstra's views on these issues in the DRP context are consistent with those in the risk-free rate context. In summary, issues concerning different approaches should not be conflated with issues of estimation error. Only the latter is relevant for considering the appropriate range for the DRP.

100. Another source of potential estimation error for the DRP (that does not apply to the risk-free rate) is the adaptation of the Telstra-wide observed DRP for use in the context of a stand-alone CAN provider.[28] The stand-alone CAN provider business is a sub-component of the entire Telstra business to which the observed Telstra-wide DRP pertains. This adaptation therefore potentially introduces estimation error into the estimate of the DRP applicable to the stand-alone access provider. Estimation error associated with this should be part of the range in the DRP applied in the high-low calculations of the CAN WACC.

101. On balance Telstra considers the likely range to be around 15 basis points either side of the recommended point estimate. Arguably this could be conservatively low given the extreme recent volatility in global financial markets and the aggressive heightening in the observed Telstra-wide DRP.

3 Debt Issuance Costs

[28] This includes the potential to simply use the observed Telstra debt risk premium in the access provider context.

102. Debt issuance costs relate to the transaction costs involved in raising new debt and/or in renegotiating or extending current debt instruments. These costs include various fees associated with underwriting and management, coverage by ratings agencies, legal advice, audit scrutiny and accounting advice. They are typically incurred as once-off costs at the establishment of the debt (expensed at that time) and involve significant scale economies. This has been included as a component of the cost of debt consistent with the equation detailed at paragraph 32 above (equally these costs could be recovered as part of recognised operating expenses).

103. These costs are legitimately incurred in the long-term provision of the CAN-related assets and need to be recouped to ensure appropriate full-cost recovery. Telstra advocates the inclusion of a margin in the cost of debt to cover the costs associated with the issuance of debt rather than the alternative of specific recognition of these costs in the notional cash flows. This is consistent with the recognition by various Australian regulators of debt issuance as a cost requiring recovery and legitimately includable in the WACC.

104. The Commission has previously recognised the appropriateness of including debt issuance costs as a margin on the cost of debt. This has resulted in the allowance for debt issuance costs of the order of 10.5 to 12.5 basis points being recovered in electricity and gas decisions,[29] and the Tribunal's allowance of 25 basis points being recovered in the context of the GasNet Access. In its final decision regarding Telstra's undertaking in respect of PSTN and LCS[30] the Commission recommended application of a benchmark (annualised) rate reflecting debt issuance costs developed by the Allen Consulting Group[31] (ACG) to reflect annualised debt issuance costs.

105. The most cited analysis of issuance costs[32] provided empirical support for the existence of scale economies associated with these costs and provided detailed estimates of the indicative extent of the costs relative to the quantum of debt raised. Telstra relies on this empirical information to estimate the extent of debt issuance costs associated with the CAN-related assets. Given the likely asset valuation of the CAN-related assets and the extent of debt funding (30% debt), the debt required to fund these assets is likely in the highest dollar range identified by Lee and others (i.e. above US$500m). This suggests that total debt issuance costs are likely to be around 1.53% of the gross amount of debt raised. Arguably this estimate understates the contemporary cost burden associated with debt-raising given the greater complexity involved today and hence likelihood of higher charges.

106. Alternate in-house estimates covering some of the costs associated with debt-raising suggest that debt issuance costs total around 0.49% of the gross amount of debt raised.

107. Given that these costs associated with debt issuance are typically incurred on a once-off basis (although there can be costs associated with rolling over debt) they need to be converted into annualised amounts for inclusion in the WACC or alternatively for inclusion as an operating expense. Quantified correctly Telstra is indifferent between these two approaches to recouping debt issuance costs. However, consistent with emerging regulatory best-practice it seems sensible to include these costs as part of the cost of debt (and hence WACC).

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[29] Australian Competition Tribunal, Application by GasNet Australia (Operations) Pty Ltd [2003] ACompT
[30] ACCC, Assessment of Telstra's PSTN and LCS Undertaking, Final Decision, Public Version, 29 November 2006
[31] Allen Consulting Group, "Debt and Equity Raising Transaction Costs – Report to the Australian Competition and Consumer Commission, December 2004, p xvii
[32] I. Lee, S. Lochhead, J. Ritter and Q. Zhao, "*The Costs of Raising Capital*" Journal of Financial Research, Spring 1996, pp 59 – 74.

108. These once-off costs are converted to an annual amount suitable for addition in the cost of debt using the logic of net present value and the coupon yield of the relevant bond as the discount rate. This suggests an annualised margin for debt issuance costs for the CAN-related assets of between 7 basis points (applying the in-house partial estimate) and 22 basis points (applying the US empirical estimates), with a mid-point around 15 basis points.

109. The Commission has in the past accepted the appropriateness of including debt issuance costs in the WACC partly because they are not otherwise captured in the cost modelling.[33] However the Commission contends that Telstra's estimated debt issuance costs were too high and relied on benchmarking analysis undertaken by ACG to support its view that debt issuance costs quantified at 8 bps in the network context.

110. The debt issuance costs that Telstra has recommended have been loosely based on overseas empirical estimates and the costs associated with a **particular** debt-raising by Telstra. This may create potential for estimation error if the particular debt raising was not typical for Telstra. Further, this Telstra-wide estimate has been proxied as applicable at the stand-alone CAN provider level. Obviously there is potential for further estimation error in the application of the Telstra-wide estimate to the stand-alone CAN provider level.

111. The extent of debt issuance costs (expressed as an annualised % of debt) will vary with the size of debt assumed to be raised (reflecting scale economies in some of the related costs) and the life of the assets involved (reflecting the period over which the debt issuance costs can be amortised). This suggests that the add-on for debt issuance for the higher valued and longer-lived network assets will be lower than for the lower valued and shorter-lived assets.

112. The distributional characteristics of the debt issuance costs are difficult to portray. Given the low values and the fact that debt issuance costs must be positive it is likely that the distribution is positively skewed.

113. Reflecting the above Telstra considers that an indicative figure for annualised debt issuance costs for the CAN-related assets would be within the range of 7 to 22 basis points (with a mid-point of approximately 15 basis points).

4 Market Risk Premium

114. The market risk premium (MRP) relevant in the CAPM is the premium that investors in a fully diversified portfolio expect to earn above the relevant risk-free rate over some indeterminate forward period. The *ex ante* MRP relevant for the CAPM is therefore expectational and thus not directly observable and it is not readily apparent how persuasive historical returns (which are at least observable on an annual *ex post* basis) will be in educating expected returns.

115. Telstra recognises the inherent difficulties in quantifying the ex ante MRP and relies on a number of sources to derive a reasonable estimate of the Australian MRP.

Historical estimates

[33] ACCC, "Assessment of Telstra's PSTN and LCS Undertaking", Final Decision, Public Version , 29 November 2006, see pages 83-84.

116. The first strand of analysis relates to various historical estimates of the MRP for Australia. These various estimates are summarised in a paper by Gray and Officer[34] which details estimates of the simple arithmetic mean of ex post observed excess returns for the Australian market over the risk-free rate (proxied by 10-year government bond yields). The estimates range from a low of 6.43% (covering 1955 to 2004 inclusive) to a high of 7.70% (covering 1975 to 2004 inclusive). The averaging of the ex post MRP is undertaken over different time periods (see table 1) partly to test whether there is any discernible movement (or trend) in the ex post MRP over time. Gray and Officer consider that the acute year-to-year volatility in ex post returns makes identification of any reliable trend impossible. Gray and Officer appear to prefer a long time period for analysis as "the preferred approach is to analyse a larger data set that contains both positive and negative shocks" and does not recommend the exclusion of particular years affected by seemingly once-off events (such as 1987) as others do on the basis that they may not be repeated in the forward period for which the MRP applies (or ever). Telstra concurs with this long-term approach to averaging ex post returns as this best captures the range of events that will guide investors in considering expected returns into the future.

117. On this basis Telstra suggests that the preferred estimate of the ex ante MRP should be based on a simple average of a long time series of ex post MRP estimates. Based on Gray and Officer's calculations Telstra's preferred estimate is 7.17% covering the 120 years from 1885 to 2004 inclusive. If a shorter time period is considered, possibly to test whether the ex post MRP has declined, Gray and Officer find that the average ex post MRP over the 30 years from 1975 to 2004 inclusive is 7.70%, the highest estimate presented by Gray and Officer covering different time periods. Telstra considers that the analysis of Gray and Officer supports an ex ante MRP of 7% as reasonable to the extent that ex post returns provide guidance on the true ex ante MRP.

118. Gray and Officer find that the ex post MRP is substantially above 6% whether data covering 30, 50, 75, 100 or 120 years is employed in the averaging process.[35] They ultimately conclude that there is nothing in the recent data or in their paper (and those they review) that suggests that a regulator should move from the 6% figure that has become regulatory precedent in Australia. Gray and Officer go on to argue that varying the MRP rate traditionally applied will "increase the variability of estimates and the risks of valuation." However, in Telstra's view the Gray and Officer analysis supports a perspective that 7% is the appropriate MRP to apply in regulatory contexts in Australia. The issue is not about whether moving from the historically applied low MRP (6%) to a more valid estimate (7%) will cause some difficulties to regulators, regulated entities and investors; but whether persisting with the historically applied rate is valid given that it appears low. The fact that the historically applied rate is significantly below the rate implied by Gray and Officer's analysis suggests that there is heightened risk of under-recognition of the true MRP and hence the WACC applied in many regulatory costing exercises. This in turn implies that, ceteris paribus, equity providers will not earn an adequate risk-adjusted return relative to the risk-free rate.

Benchmarking approach

119. The second approach relied on by Telstra is that developed by Professor Bowman and detailed in various previous reports lodged with the Commission[36]. Bowman's estimation of the MRP was based on a benchmarking approach which specifically recognised that the Australian specific MRP is now established in an environment where the Australian market is more open and more integrated into the international market. Older estimates

[34] S. Gray and R. R. Officer, "*A Review of the Market Risk Premium and Commentary on Two Recent Papers*" A Report Prepared for the Energy Networks Association, 15 August 2005
[35] Ibid page 2
[36] The Bowman Report May 2007, section 6.2

of the Australian MRP (before the mid-1980's) were in the context of a highly regulated and non-integrated Australian market and thus not representative of the forward-looking *ex ante* MRP that would pertain today in a less regulated, globally integrated market environment. Estimates of the Australian *ex post* MRP based on years prior to the mid 1980's are thus likely to be downwards biased in terms of their application in a forward-looking *ex ante* perspective (as required in WACC).

120. The Australian-specific MRP could thus be based on the United States' estimated MRP of 5.5% plus a margin to reflect net incremental risks associated with investment in the Australian market, including taxation, market differences and country risk. This avoids the problem that estimates of the MRP applying observed outcomes before the mid-1980's are not useful for estimating future returns. This problem is encountered with many estimates of the Australian MRP based on long-term data of the observed *ex post* MRP (including those of Gray and Officer discussed above as well as other estimates of the Australian MRP applying data prior to the mid-1980's).

121. The factors Bowman identifies as supporting the case that the Australian specific MRP would be higher than that for the US, and that adjustment for these factors is necessary to robustly quantify the Australian specific MRP, include:

- the Australian market has a larger representation than the US market of resource companies with attendant higher systematic riskiness. This would tend to increase the systematic riskiness of the overall Australian market relative to other markets (eg the US) with relatively less resource companies. Associate Professor Hathaway does not refute the link between resource companies and systematic riskiness but questions its relative importance.[37] The resource sector is estimated to account for around 20.8% of the total market capitalisation of the ASX200[38];

- the Australian market is significantly smaller than the US market, as is reflected in Professor Bowman's statistics. It is indisputable that systematic risk and total risk are negatively related to size. That is, the smaller the size of the entity the likely higher is the related risk (both total and systematic);

- the Australian market and its component listed entities have lower liquidity than their US counterparts;

- the Australian market is comprised of smaller companies than the US market;

- there is less diversity in the Australian market than the US market; and

- there are fewer risk management opportunities in the Australian market.

122. Bowman estimates that the aggregate adjustment to reflect these differences is around 1.5%. Following these adjustments, the resulting MRP for Australia estimated by Bowman is therefore 7%. This estimate of the MRP is relative to a risk-free rate based on 10-year Government bond yields.

Other estimates applied by global investors

[37] Hathaway, N. (2006), "Telstra's WACC's for Network ULLS and the ULLS and SSS Businesses – A Review of Reports by Prof. Bowman", Capital research, 15 March 2006.
[38] Sourced from Bloomberg on 19 October 2007.

123. The third source of information relied upon by Telstra is the study by Dimson, Staunton and Marsh.[39] These estimates are globally renowned and often used by international investors, international fund managers and others considering investments in Australia. The ex post MRP estimates they present are 6.3% based on geometric averaging and 7.9% based on arithmetic averaging (both relative to government bond yields). Both estimates are based on long term time series (102 years of data covering 1900 to 2001 inclusive) reflecting their perspective that "in order to make inferences we thus need long time series that incorporate the bad times as well as the good."[40] Their perspective is similar to that of Gray and Officer that "investors think and are influenced by arithmetic average returns and hence it is this reason that arithmetic averages tend to be used to forecast future MRP's."[41] Telstra considers that the arithmetic average calculated by Dimson, Marsh and Staunton for Australia (7.9%) is a reasonable estimate of the ex ante MRP for Australia for inclusion in the CAPM framework.

124. Telstra notes that there is a wide range of estimates of the Australian ex post MRP, a selection of which are summarised in the table below. The high standard errors impounded in these estimates imply that the range of potential values for the Australian MRP is even higher than indicated by the point estimates.

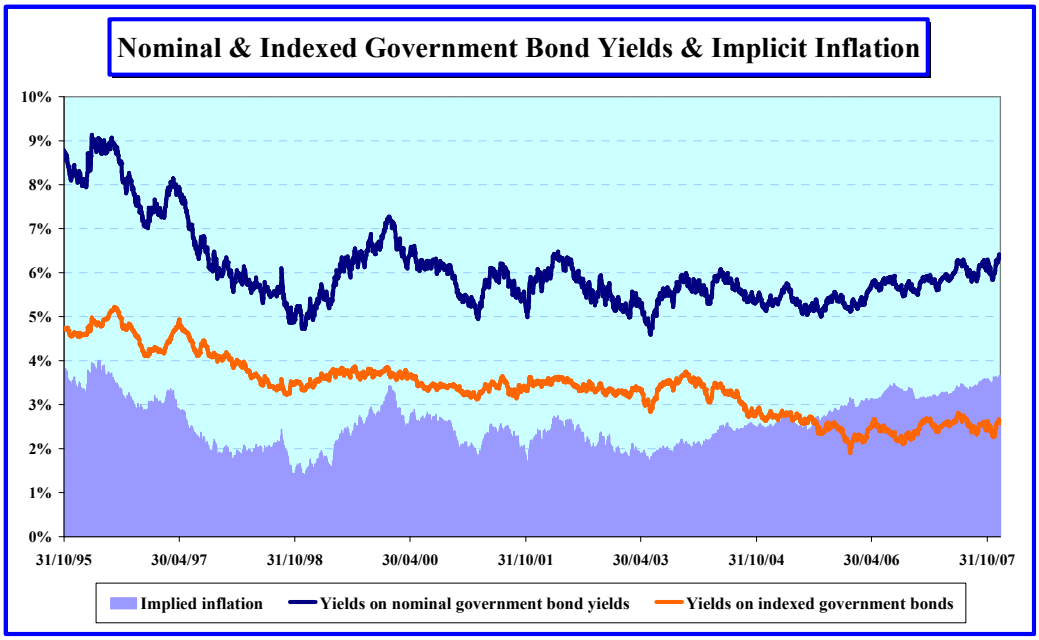
Source (period covered)	**Market risk premium**
Officer (covering 1882-1987)[42]	*7.2%*
Hathaway (covering 1882-1991 and 1947 - 1991)[43]	*6.6% - 7.7%*
NEC (based on 1952 – 1999)[44]	*6.6%*
AGSM (based on 1964 – 1995)[45]	*6.2%/8.1%*
Dimson, Marsh & Staunton (covering 1900 – 2001)[46]	*6.3%/7.9%*
Bowman (benchmarking approach)[47]	*7.0%*
Hancock (covering 1883 – 2004/1974 – 2003)[48]	*5.6% - 7.6%*

Structural shifts in bond markets and implications for MRP

125. Reduced bond issuance by the Commonwealth government as their net debt has been virtually eliminated has occurred almost simultaneously with the rapid growth of funds under management by superannuation funds, insurance funds and other institutional funds that have long-term liability profiles better matched by bonds. The combination of reduced supply (less bond issuance) and heightened demand (funds typically direct a relatively stable share of funds under management towards bonds) has

[39] E. Dimson, P. Marsh and M. Staunton "*Global Evidence on the Equity Risk Premium*", Journal of Applied Corporate Finance, September 2002.
[40] Ibid page 2
[41] S. Gray and R. R. Officer, "*A Review of the Market Risk Premium and Commentary on Two Recent Papers, A Report Prepared for the Energy Networks Association*", 15 August 2005, page 9.
[42] Ibid
[43] N. Hathaway "Market Risk Premia", unpublished manuscript
[44] National Electricity Code, schedule 6.1, section 3.2
[45] IPART, "NSW Electricity Distribution Pricing 2004/05 to 2008/09 Final Report, Other Paper No 23", June 2004, page 223. Estimates variously exclude and include October 1987.
[46] E. Dimson, P. Marsh and M. Staunton "Global Evidence on the Equity Risk Premium" Journal of Applied Corporate Finance, September 2002, table 1, page 5. Different estimates reflect geometric and arithmetic averaging.
[47] See the Bowman Report, section 6.2, page 11.
[48] Reported in S. Gray and Officer "Review of the Market Risk Premium and Commentary on Two Recent Papers" 19 July 2005.

pushed bond prices higher and consequently yields lower. The Reserve Bank of Australia (RBA) has noted that this effect has been more pronounced for indexed bonds than for nominal bonds in their view likely reflecting the more constrained supply of indexed bonds.[49] As a consequence the contraction in yields on indexed bonds has been more pronounced than on nominal bonds. The RBA has concluded that forward inflation estimates, often previously proxied or estimated by the difference in yields on nominal and indexed bonds, have been overstated as a consequence of this.



126. A recent report by NERA Economic Consulting (NERA) develops this theme and relates the relevant issues to the estimation of WACC in predominantly regulatory contexts.[50] NERA concludes that the "existence of an absolute bias has no effect on regulators' methodology for estimating the cost of debt – as this is benchmarked from nominal corporate debt. It would have an impact on the cost of equity assuming no change in the market risk premium."[51]

127. NERA outline the view that although government bonds have been impacted by this distortion corporate bonds have been relatively unaffected[52]. As a result the cost of debt estimates typically applied by regulators (sum of the risk-free rate and a margin for corporate specific factors, i.e. the debt risk premium) are not affected by this issue.

128. This holds so long as the cost of debt is to be estimated in nominal terms (as is the approach used by both the Commission and Telstra). In a nominal context the reduction in nominal bond yields due to the emergence of excess demand for bonds is offset by an increase in the implied DRP given that corporate bond markets have not been affected by any similar distortion. Consequently the reduction in the risk-free rate will match closely (if not precisely) the expansion in the DRP leaving the cost of debt unaffected in nominal terms.

[49] See Reserve Bank of Australia, Statement on Monetary Policy, February 2006, pages 48-49.
[50] NERA Economic Consulting, *Bias in Indexed CGS Yields as a Proxy for the CAPM Risk Free Rate, A Report for the ENA*, March 2007.
[51] Ibid, page 3.
[52] Ibid page 20.

129. If the cost of debt were to be estimated in real terms then the under-enumeration of the real risk-free rate due to higher excess demand for indexed bonds becomes problematic and needs adjustment. This reflects that the difference between real and nominal cost of debt estimates is inflation and the RBA analysis indicates that the normal approach to quantifying inflation in these contexts has been compromised. The correction required in the real context would be to lift the real risk-free rate to remove the distortion in real yields or to reduce the inflation estimate applied to convert from nominal to a real risk-free rate.

130. In Telstra's view the critical dynamic is that, although the government bond market has been "distorted" by excess demand, the corporate bond market has not been affected so that the required return to corporate debt providers has not changed. Hence the margin above the risk-free rate required by corporate debt providers has widened to offset the contraction in bond yields. Given this Telstra does not suggest that the risk-free rate needs to be heightened to reflect the under-enumeration of the risk-free rate in the cost of debt. The empirically estimated Telstra-specific DRP will already have incorporated and adjusted for this effect.

131. Corporations, including Telstra, still continue to raise debt at essentially unchanged yields (i.e. abstracting through all other factors other than this excess demand effect).

132. A similar dynamic likely applies in the context of estimating the cost of equity. Although it is more difficult to identify and reflect this, an adjustment to the MRP may be logical (although the size of the adjustment is minor relative to the variance in estimates of the unadjusted MRP).

133. Neither NERA nor the RBA suggest that the dynamic they identify has impacted equity markets and hence the expected equity market return will likely remain unaltered. This implies that the MRP widens to compensate for this effect. The equity markets have essentially efficiently factored into their deliberations information around the emergence of excess demand in government bond markets. This is consistent with views around how markets process information.

134. Telstra considers that the adjustment process in both the cost of debt and the cost of equity contexts is that markets require a higher risk premium to reflect the lower risk-free rate and unchanged riskiness in bonds and equities. This is visible in the case of debt where risk premiums are observable. It is less apparent in the case of equity.

135. The corollary of this is that in the context of estimating the cost of equity an adjustment to the market premium is required, similar to that effected by widening credit margins in the cost of debt context. This adjustment has to offset the downwards impact of excess demand on bond yields and therefore will operate to increase the estimated MRP from a forward-looking perspective.

136. Equity providers therefore will continue to expect an unchanged market return as their expectation is not affected by the excess demand in bond markets. However, this implies that their expectation regarding the MRP has widened to offset the reduction in measured bond yields driven by excess demand for bonds. If contemporary (nominal) bond yields are applied as the risk-free rate they will be lower than appropriate and the MRP needs adjustment to offset this.

137. Given that debt markets have essentially widened the premium on debt to accommodate this shift, to argue that equity markets would not do something similar is to argue that equity markets are less effective than debt markets. There is no empirical evidence to support this position.

138. The structural shifts that have generated excess demand in bond markets essentially occurred around 2004. This means that estimates of the *ex post* MRP for Australia prior to

2004 will not impound this effect and hence will understate the required *ex ante* MRP required by investors today. In Telstra's view the MRP applied in estimating the cost of equity therefore needs to be adjusted upwards to offset the structural shift lower in the risk-free rate and which has not otherwise been incorporated in MRP estimates. Contemporary bond markets are structurally different to those that operated historically and therefore the informational component of historical estimates of the MRP for forward-looking expectations of investors has been reduced.

139. In Telstra's view this would also maintain consistency in approach between the cost of debt where the lower bond rate was applied but the higher risk premium effected in the market (i.e. unchanged overall expected total return to debt) was applied. This is because Telstra considers that the same dynamic would apply in equity markets. That is, equity investors would continue to require the same overall return from equities and hence adjust their expected market premium relative to the lowered bond yield.

140. The required adjustment to the forward-looking ex ante MRP is undoubtedly upwards although the quantum of the adjustment is difficult to estimate accurately. Nevertheless, Telstra considers that it is provides critical support to the view that the MRP currently applied by the Commission is too low.

Estimation Error around the MRP

141. The MRP is possibly the most challenging component parameter from the perspective of identifying distributional characteristics and potential range free from approach variance. Typically estimates of the MRP are based on a number of different approaches and simply using all these approaches to determine a single distribution is not appropriate. A combined approach would conflate effects of different approaches with true estimation error.

142. There are a number of different aspects to estimating the MRP which relate to approach (rather than pure estimation error). These include:

- **Arithmetic or geometric averaging of historical estimates**. This relates to the method of calculating a representative MRP from historical data on the annual year by year *ex post* MRP. Geometric averaging represents a compounding of the rates to determine a (compound) average whilst arithmetic averaging is just a simple average of the observed MRP's. Even though the underpinning data is the same in both cases the MRP estimate is different and the error surrounding the estimates are therefore both different depending on the approach chosen for averaging.

- **Australian-specific or estimates for overseas countries.** In Telstra's view it is not acceptable to include in an analysis attempting to identify the distribution characteristics of the Australian MRP data on overseas MRP's. Unless the overseas estimates have been adjusted to be applicable to the Australian environment, they have no informational content for estimating the Australian MRP or its likely distributional characteristics.

- **Different risk-free maturity underpinning the different estimates of the MRP**. Although most estimates of the MRP are typically benchmarked relative to 10 year Government bonds not all estimates are. Consequently it is important to identify the risk-free investment benchmark applied in the studies. Variation in the estimated MRP which are dependent on or due to different maturity risk-free benchmarks is not a legitimate component of the distribution characteristics including the likely range.

- **Different time periods covered by the estimates**. Estimates that cover different time periods will likely differ from each other and the consequent error relative to the true contemporary *ex ante* MRP is different as is the distribution of that error. Consequently, care needs to be taken when inferring estimation error from estimates straddling different time periods. As Telstra has argued previously, estimates of the Australian MRP including large periods of time when the Australian market was segmented from global capital markets would not provide meaningful insights into the contemporary *ex ante* expectation of the MRP now that the Australian market is fully integrated into global capital markets. A necessary corollary of this is that it does not assist in ascertaining the appropriate distributional characteristics of the current *ex ante* MRP.

- **Imputation adjusted or not**. Estimates of the MRP for years pre-dating the introduction of dividend imputation capture the full return available to the market (capital gain and dividends). Since the introduction of dividend imputation though there has been another component of the market return which is often ignored – the benefit of dividend imputation to equity investors. Unless the historical post-imputation estimates of the MRP have been adjusted they will not capture the effects of imputation and hence will tend towards under-estimating the true ex ante MRP in an imputation inclusive market. Complicating this issue is the moves to limit trading in imputation credits and more recently to allow full usage by all domestic-based equity investors, including in generating tax refunds. Unless these factors are somehow controlled for the estimated distributional characteristics may not match the true characteristics needed for inclusion forward-looking WACC estimation.

- **Studies of the *ex ante* or *ex post* MRP**. Although the MRP for inclusion in the CAPM is clearly expectational, most studies of the MRP use estimates of the achieved *ex post* MRP and apply that as a guide to the *ex ante* or forward-looking MRP. There have been a number of attempts to directly estimate the *ex ante* MRP. Again, including estimates of the MRP on both these bases and inferring distributional characteristics from this pooled data is flawed and provides misleading information about the range of the MRP reflective of only estimation error. Because of the innovative nature of the techniques involved, it is likely that the estimation error in the direct estimates of the *ex ante* MRP are likely higher than the *ex post* estimates.

143. All of these factors make it extremely difficult to identify robust distributional characteristics for the MRP absent the influences of approach variation. One potentially useful approach in this context is provided by the various estimates of Officer reported by the Essential Services Commission[53]. Officer also estimated the historical standard error of each of these reported MRP estimates. Although these estimates of standard error suffer from some of the short-comings discussed above they may provide useful guidance on how to delineate or estimate distributional characteristics for the MRP. The (simple) average standard error of the Officer estimates is 2.17% compared with a (simple) average MRP estimate of 6.82%. The standard error of historical, ex post estimates of the MRP is likely to underestimate the standard error in the forward-looking, ex ante MRP.

Conclusion on market risk premium

144. Based on the above it would appear that a reasonable range for the MRP would be around 5.5% to around 8.0%. The weight of empirical estimates though supports a value

[53] See Essential Services Commission, *Review of Gas Access Arrangements, Final Decision*, October 2002, page 324.

for the MRP closer to 7%. Telstra has applied a low estimate of 5.5% and a high estimate of 8.0% in calculation indicative ranges for the WACC applicable to the CAN assets.

145. The Commission has persistently applied a MRP of 6% in its decisions across the telecommunications and other regulated sectors. This estimate is proximate to the lower bound of the reasonable range suggested by empirical research. Given the distribution of MRP estimates highlighted above there is a significant probability that the 6% figure applied is too low relative to the "true" value and that as a result the resultant WACC estimate will also be significantly downward biased. The consequence of this is a very real probability that Telstra (and other regulated entities where a 6% MRP has been applied) will not actually recover its "true" cost of funds and capital providers will not receive adequate compensation for the risks they bear. The long-term implication of this is insufficient investment incentives for Telstra (and other regulated entities) with consequent reduction in investment effort by regulated entities.

146. Based on the above analyses Telstra recommends that the preferred, conservatively low estimate of the future ex ante MRP for Australia should be 7%. The estimates detailed above clearly indicate that retention of the 6% MRP historically applied by the Commission is too low and heightens the risk that Telstra will not earn sufficient returns with consequent diminution in long-term investment incentives. Telstra does not accept that regulatory difficulties involved in implementing a changed MRP quantum justify persisting with this artificially low rate.

5 Corporate Tax Rate

147. In a vanilla WACC costing context corporate tax is specifically captured as an on-going burden and allowed revenue adjusted to cover required corporate tax payments. The WACC is not used to cover corporate tax and therefore does not need to be pre-tax. In this construct the corporate tax rate is only relevant in WACC calculations to de-lever and re-lever beta estimates. Telstra has consistently applied the statutory corporate tax rate for application in various regulatory costing contexts. This is consistent with the views outlined by Professor Bowman.[54]

148. The effective tax rate will typically differ from the statutory tax rate as a result of differences between accounting depreciation and tax depreciation (e.g., from accelerated depreciation). The corporate tax rate that is relevant for estimating the WACC is the forward-looking rate for the years for which the WACC is being estimated.

149. Changes in tax law have virtually eliminated the potential for creating depreciation timing differences for assets purchased or constructed on or after 21 September 1999. In the context of CAN-related assets, Telstra considers that accelerated depreciation is not applicable as such is not available to forward looking costs of CAN-related assets notionally constructed in the years relevant to the current costing exercise (2007-08 and into future). As these years are well after the discontinuance of accelerated depreciation it is not relevant to build-buy or costing decisions today. To include accelerated depreciation in the costing of the buy context would distort build-buy decisions of access seekers who would not have access to accelerated depreciation if they built their own CAN-related infrastructure today.

150. The Commission has previously rejected this perspective and favoured its own estimate of the effective tax rate.[55] The basis for the Commission's rejection of the

[54] The Bowman Report May 2007, section 8.1.
[55] Detail on this view is found at ACCC, *Assessment of Telstra's Undertaking for the Domestic PSTN Originating and Terminating Access Services – Final Decision*, July 2000, See appendices 3, 4 and 6.

statutory rate appears that many assets were constructed prior to the discontinuance of accelerated depreciation and that therefore accelerated depreciation was available to Telstra in the real world. If that remains the Commission's perspective it should be noted that book depreciation would now likely be above tax depreciation such that the effective rate of tax is likely now above the statutory rate of tax for many of these assets.

151. Telstra also considers that the tax rate relevant in WACC-related considerations is that which is likely to be relevant over the entire useful life of the relevant assets. Capital providers are interested in likely returns over the asset's entire useful life. If accelerated depreciation is relevant it results in a lower than statutory effective tax rate in some span of early years followed by a period (to the end of the assets useful life) where the effective rate is actually higher than the statutory rate as there is no depreciation to claim at tax once the asset is fully depreciated (on an accelerated basis). On this basis, the average effective tax rate over the entire asset life (that is the tax rate relevant in WACC estimates) approaches the statutory corporate tax rate (although there is a timing advantage). This further reinforces the view that the statutory corporate tax rate is the tax rate applicable in WACC contexts.

152. The narrow application of the corporate tax rate in the re-levering and de-levering equations around beta also reinforces the view that the statutory tax rate is appropriate. Typically when de-levering observed equity betas the statutory tax rate is used. Telstra is not aware of any estimates of the asset beta that do not apply the statutory corporate tax rate in the de-levering process. This likely reflects the high informational demands involved in calculating the effective corporate tax rate. To ensure internal consistency across beta estimation it is imperative that the statutory corporate tax rate is also used in the re-levering process. To apply the statutory corporate tax rate in the beta de-levering process and then the effective tax rate in the beta re-levering process is inconsistent and distorts the resultant asset/equity beta estimates.

153. Both the Commission and Telstra reflect the corporate tax burden outside the WACC quantum in separate and specific modelling. In this modelling the effect of depreciation on the tax burden is captured by specific variables and therefore its impact does not need to be reflected in the corporate tax rate applied. To specifically apply an effective corporate tax rate in this modelling would double-recognise any advantage of accelerated depreciation (once via depreciation and again via the corporate tax rate applied).

154. In Telstra's view it would not be appropriate to ascertain a single distributional metric (range) from the combined sample of 20% effective rate and 30% statutory rate. The difference between these estimates is not estimation error but due to different approaches. Consistent with the foregoing, approach error is not relevant in describing the range relevant in this context.

155. Although there is ongoing risk that the statutory corporate tax rate could be altered at some stage over the forward life of the relevant assets, it is normally assumed to remain constant at the current rate. In fact, it is likely that investors would regard continued application of the current rate as sensible. As such it is not appropriate to apply a range to the statutory corporate tax rate.

156. Given the above Telstra considers that the statutory tax rate is appropriate when de-levering and re-levering beta estimates as is the only application of the corporate tax rate in a "vanilla" WACC construct.

6 Imputation

157. A system of dividend imputation was established in Australia from 1 July 1987. Until then Australia had a "classical" taxation system in which corporate profits were taxed twice - once as corporate profits and again in the hands of investors when distributed as

dividends. Imputation was introduced to remedy this and to eliminate this double taxation - at least for some investors. The imputation system operates by including with dividends that are paid out of profit after tax (i.e. corporate tax has been paid) a franking credit which recipient investors utilise as a credit against their individual investor tax liability. This credit reduces the investor tax burden and effectively results in a single tax burden on corporate income commensurate with the applicable rate of investor tax. Australian resident taxpayers can now fully utilise received franking credits whereas non-resident investors/taxpayers are not able to redeem their franking credits and thus they have no value to non-resident investors.

158. Under a "vanilla" WACC approach all tax effects including the benefit of imputation are captured in the notional cash flows rather than the WACC and therefore the value of franking credits is only relevant in the equations for re-levering and de-levering beta estimates. Imputation is only relevant in the WACC calculations due to its inclusion in the Australian-specific re-levering equation to convert an asset beta to an equity beta. Imputation is also relevant when ensuring the access provider earns sufficient capital returns after payment of corporate tax (i.e. in the modelling to incorporate the tax burden into allowable revenue).

159. Professor Bowman has provided an extensive report on dividend imputation covering a range of issues critical in quantifying the appropriate value for gamma (the variable capturing the effect of imputation on the cost of equity).[56] Interested readers are directed to that report for a comprehensive analysis around imputation issues.

160. Bowman's major conclusion is that, just as the marginal investor is critical in determining share prices, it is the valuation of imputation by the marginal investor that is relevant for quantifying gamma in a WACC-related context. The marginal investor for most (if not all) Australian listed entities is likely to be an international investor given their significant representation on share registers across Australia and the resultant implication that the domestic supply of capital (what domestic capital providers are prepared to provide by way of equity funds) is less than the domestic demand for capital (what domestic businesses need in terms of capital). On that basis, domestic listed entities need to attract overseas investors. Therefore, it is likely that the valuation of imputation by the marginal investor that establishes share prices is by an international investor that cannot utilise these imputation credits and therefore attaches no value to them. This does not mean that dividend imputation has no value to domestic shareholders – that is patently incorrect. However, it does mean that the marginal investor determines the share price at which the relevant market clears and also that domestic shareholders, who would have been prepared to pay a higher amount for those shares (reflecting their valuation of imputation credits), enjoy some consumer surplus (i.e. have a higher personal valuation than that implied by the market clearing price). Similar consumer surplus is a component of most markets.

161. Bowman also details a range of studies into imputation and the quantification of gamma in a WACC context[57]. These are summarised in the table below which is taken directly from the Bowman report. The overwhelming conclusion is that the estimates support a view that gamma is less than 0.5, with six estimates (of the 12 reported in the summary table) suggesting that gamma should be 0.

[56] The Bowman Report May 2007, section 8.2.
[57] The Bowman Report May 2007, table 13.

Study	Methodology	Time Period for Estimation	Value of franking credits (V)	Value of gamma (γ) *
Bruckner, Dews and White (1994)	Dividend drop-off	1987-1990	0.34	0.24
		1990-1993	0.69	0.49
Partington and Walker (1999)	Contemporaneous pricing of shares with and without franking credits	1995-1997	0.96 (average)	0.68
Hathaway and Officer (2004)	Dividend drop-off	1988-2002	0.5	0.36
Bellamy and Gray (2004)	Dividend drop-off (adjusted)	1995-2002	0	0
Cannavan, Finn and Gray (2004)	Analysis of futures and physical market (no arbitrage framework)	Pre- 45 day rule	Up to 0.5 (high-yielding stocks)	0.36
		Post- 45 day rule	0	0
Beggs and Skeels (2006)	Dividend drop-off	1987-2000, 2001-2004	0	0
			0.57	0.41
Gray and Hall (2006)	Consistency between WACC parameters and observed dividend and MRP data	Simulated data	0	0
Feuerherdt, Gray and Hall (2007)	Dividend drop-off for hybrid securities	1995-2002	0	0
Lonergan (2001)	Survey of independent experts' reports	1990-1999	0	0

* Assumes a distribution rate of 71%.

162. Telstra has previously supported the Commission's approach of applying a gamma of 0.5 despite a view that the marginal investor approach provides the superior logic around the valuation of imputation. This support reflected the lack of consensus on the precise

valuation of gamma and the adoption of the mid-point of the possible range seemed prudent in that context (especially given that Hathaway and Officer valued imputation at around 0.46)[58]. However, the Bowman paper illustrates that there does seem to be an emerging consensus around imputation with real central tendency around an estimate of gamma at 0. On this basis Telstra accepts that the imputation factor in the "vanilla" WACC (i.e. part of the conversion from an asset beta to an equity beta) should now be valued at 0.

163. To the extent that the earlier estimate of the imputation effect by Hathaway had been influential in the Commission's decision to apply 0.5 previously, it would now appear sensible that the Commission consider adopting the latest update by Hathaway and Officer. Hathaway and Officer's latest estimate of the value of gamma is 0.355[59]. Nevertheless, in Telstra's view adoption of the latest estimate by Hathaway and Officer would be second-best given the central tendency emerging around 0.

164. The distributional characteristics of the imputation factor depend in part on whether an average or marginal investor approach is taken to valuing the imputation effect. This is explained above but again, consistent with the views on other parameters, estimation differences caused by different approaches are not normally consistent with the distributional characteristics required for estimating the range applicable.

165. The imputation factor has minimal relevance in a vanilla WACC context and hence a range is not considered meaningful.

166. Overall, Telstra considers that recent studies indicate an emerging consensus well below 0.5 and central tendency around 0. Consequently it is now appropriate for the Commission to adopt a gamma of 0.

7 Asset beta

167. The asset beta reflects the level of non-diversifiable risk associated with a particular asset and is measured relative to a fully diversified portfolio of assets (typically proxied by a broad measure of the relevant equity market). The asset beta reflects the underlying extent of systematic business risk on an ungeared basis (i.e. essentially with no debt). From an equity providers perspective the adoption of debt increases the riskiness of equity returns which are after the debt servicing burden. The effect of gearing is therefore to increase the riskiness of returns to equity providers and this effect is incorporated into an equity beta. Normally (for listed entities) equity betas are calculated using information on the total return (dividends plus changes in market value) of a particular asset relative to the total returns of a well diversified portfolio. The market risk premium and the equity beta compounded together determine the risk adjusted premium required for a particular asset/project above the risk-free rate.

168. The asset beta required in this context is one narrowly related to a stand-alone provider of the CAN-related assets. Telstra is not aware of a listed entity that uniquely only provides services such as those provided over the CAN-related assets. Consequently, some judgement is required in determining a robust estimate of an asset beta for the CAN-related assets. Given the subjective nature of estimating beta for unlisted entities, information from a range of sources can be informative in this process.

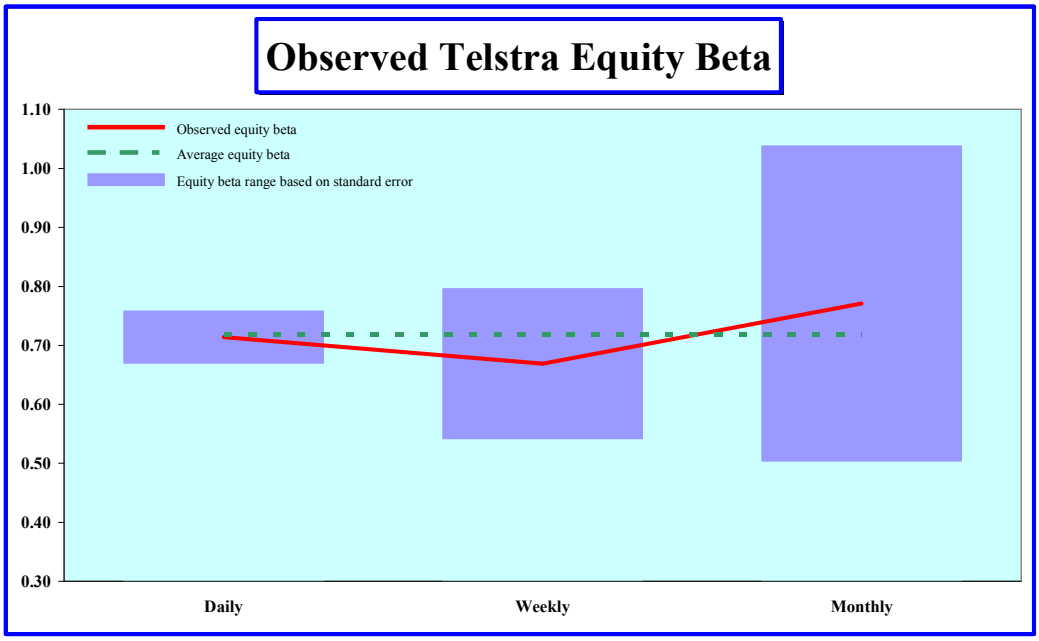
Telstra-wide beta estimates

[58] Hathaway N. and Officer R. R. "*The Value of Imputation Credits*" Working Paper, Melbourne Business School
[59] Hathaway N. and Officer R. R. "*The Value of Imputation Tax Credits, Update 2004*" Capital Research, November 2004

169. Telstra has a general perspective that Telstra-wide information will often be a useful starting point for quantifying CAN-specific values for many of the WACC parameters. Consistent with this, the data obtained from Bloomberg Financial Services on 11 February 2008 of various estimates of the Telstra-wide equity beta is summarised below.

	Adjusted beta	Standard error	Observations	R^2	Raw beta
Daily	0.714	0.044	504	0.252	0.571
Weekly	0.669	0.127	103	0.134	0.503
Monthly	0.771	0.267	23	0.223	0.656

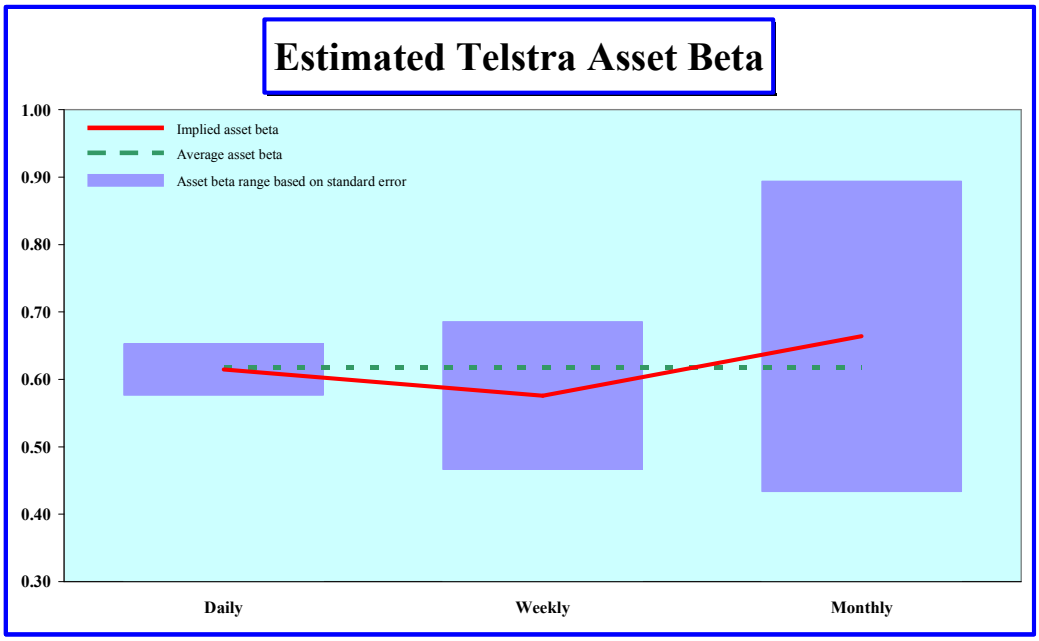
170. These estimates of the Telstra-wide equity beta are charted below.



171. These are then de-levered to estimate asset betas at the Telstra-wide level using the converse of the equation outlined below (i.e. with βa as the dependent variable). This reveals the following estimated asset betas and indicative standard errors (scaled relative to the Bloomberg standard errors for estimates of the equity beta).

	Implied asset beta	Indicative standard error	Indicative range
Daily	0.615	0.038	0.58 – 0.65
Weekly	0.576	0.109	0.47 – 0.69
Monthly	0.664	0.230	0.43 – 0.89

172. These estimates of the Telstra-wide asset beta are charted below.



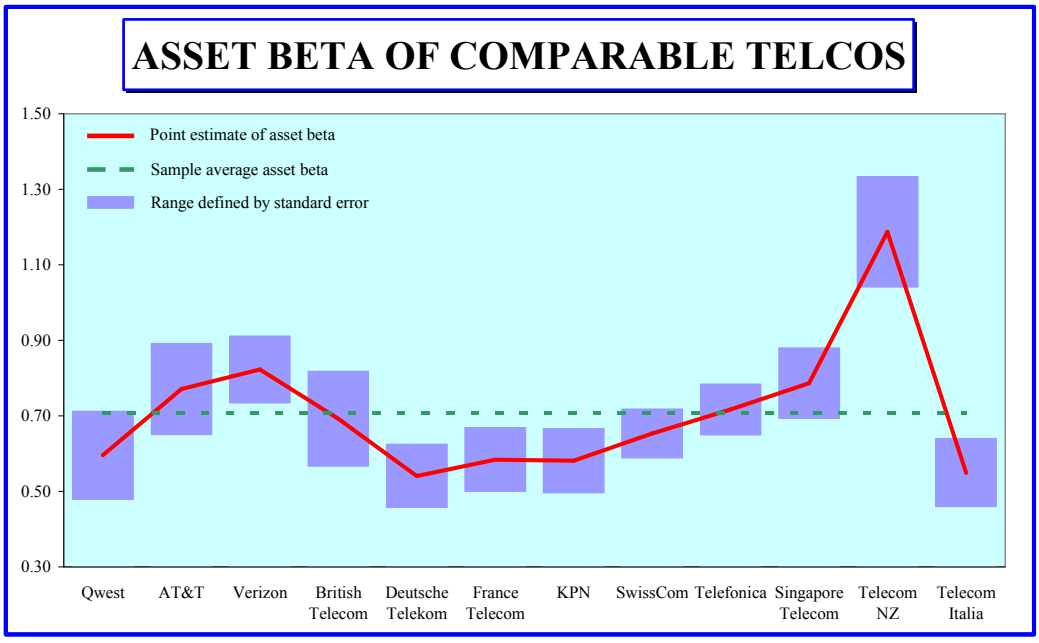
173. These data suggest that the Telstra-wide asset beta is somewhere around 0.60 to 0.75 with a simple average around 0.65. These estimates have a significant standard error and generally it is possible that the Telstra-wide asset beta could range from 0.43 to 0.89.

Applying Comparables

174. Another generally useful approach is to analyse estimated asset betas for a range of comparables to the target entity. This is a commonly applied technique for estimating asset betas used by practitioners and by regulators, especially when the target entity for which the WACC is to be estimated is not listed. If the analogues are reasonably close to the target entity in terms of business operations and exposure to systematic risk then the information obtained from this approach is indicative of the likely beta relevant for the target entity. However, the beta estimates obtained directly from the various information providers (in this case Bloomberg Financial Services) are generally in equity format and need to remove the impact of differential gearing.

175. As far as Telstra is aware there is no listed entity that uniquely and solely provides only the range of services supplied by the notional CAN-only provider, the subject of the WACC estimation exercise. However, Telstra considers that the remaining regional Bell operating companies (colloquially referred to as the "RBOC's") are reasonable analogues of the CAN-only provider. This includes Verizon, AT&T and Qwest. Moreover, given the centrality of the CAN to generalised telco operations (especially those biased towards fixed services) broader estimates of the asset beta for a select range of telecommunications companies will provide some information (essentially similar to the informational content of the Telstra-wide asset beta). In any case, averaging the estimates across the larger sample augmented by general carriers facilitates the curtailment of individual peculiarities in the beta estimates. As such a more robust estimate is generated with the larger peer group.

176. The results of this analysis are summarised in the chart below. The underlying data used to calculate the indicative asset betas was accessed from Bloomberg on 12 February 2008.



177. The average estimated asset beta of the remaining RBOC's (Verizon, AT&T and Qwest) is 0.67. The average estimated asset beta of the non-RBOC telecommunications companies is 0.74. The average estimated asset beta of the entire peer group is 0.72.

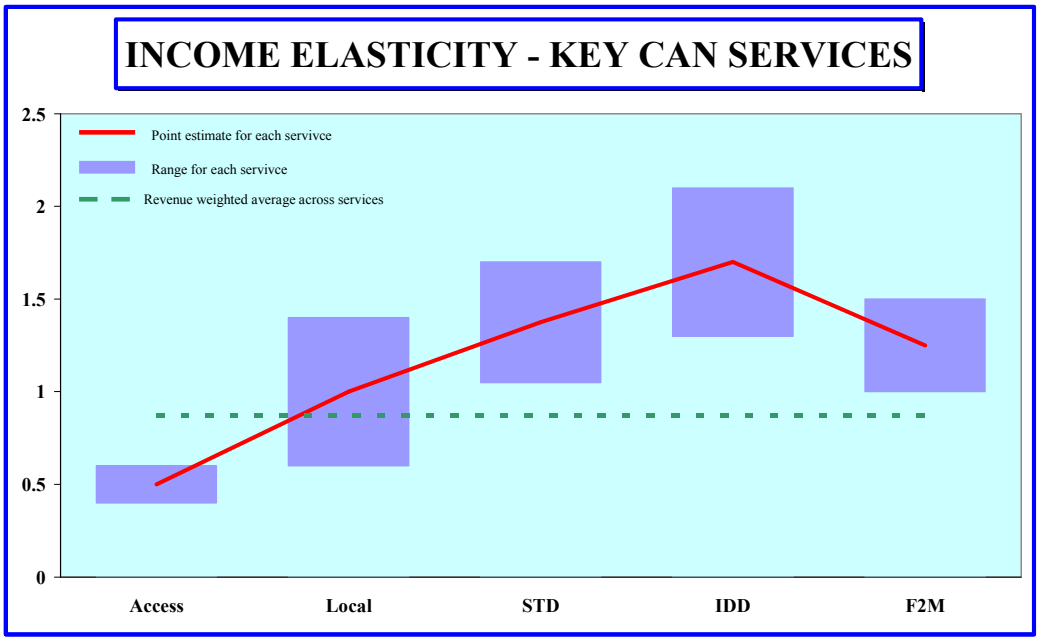
Income elasticity

178. Another approach that can provide useful guidance on the quantum of beta is based on estimates of income elasticity for the products traversing the CAN. Income elasticity measures the susceptibility of demand for a particular product or service to fluctuating levels of income. Since incomes will generally move directly with the economic cycle there should be a positive relationship between income elasticity and beta.

179. There are a range of estimates of income elasticity for various telephony products and services that are relevant to the CAN.[60] The analysis summarised below has relied on those of Taylor[61] as indicative estimates of income elasticity and internally consistent across the suite of products covered and reliant on the CAN.

180. The chart below plots the estimated income elasticity for a range of key products/services that rely critically on the CAN for their delivery. The income elasticity applied for fixed-to-mobile services is that of Taylor for intrastate toll calls. This is only indicative but unlikely to be significantly different to the likely true income elasticity for these calls or to materially distort the analysis. The product specific income elasticity estimates range from 0.5 (±0.1) for basic access; 1.0 (±0.4) for local calls; 1.35 (± 0.375) for STD calls[62]; 1.70 (±0.4) for international calls; and 1.25 (±0.25) for fixed-to-mobile calls.

[60] See Bowman, "Report on the Appropriate Weighted Average Cost of Capital for PSTN-OTA and LCS", March 2006, appendix F, page 7.
[61] L. Taylor, *Telecommunications Demand in Theory and Practice*, 1994 (Kluwer Academic Publishers, Boston).
[62] These are the simple averages of Taylor's estimates for intrastate and interstate toll calls.



181. The revenue weighted[63] average income elasticity across the products covered is 0.87, indicative of a product suite that is reasonably sensitive to fluctuations in income levels across the economy.

Standard error and the likely range

182. These standard errors only capture estimation error associated with estimating beta for a particular listed company. In determining the appropriate beta for the stand-alone access provider there are a number of other steps each of which introduces further potential for estimation error of the relevant beta. These other steps include:

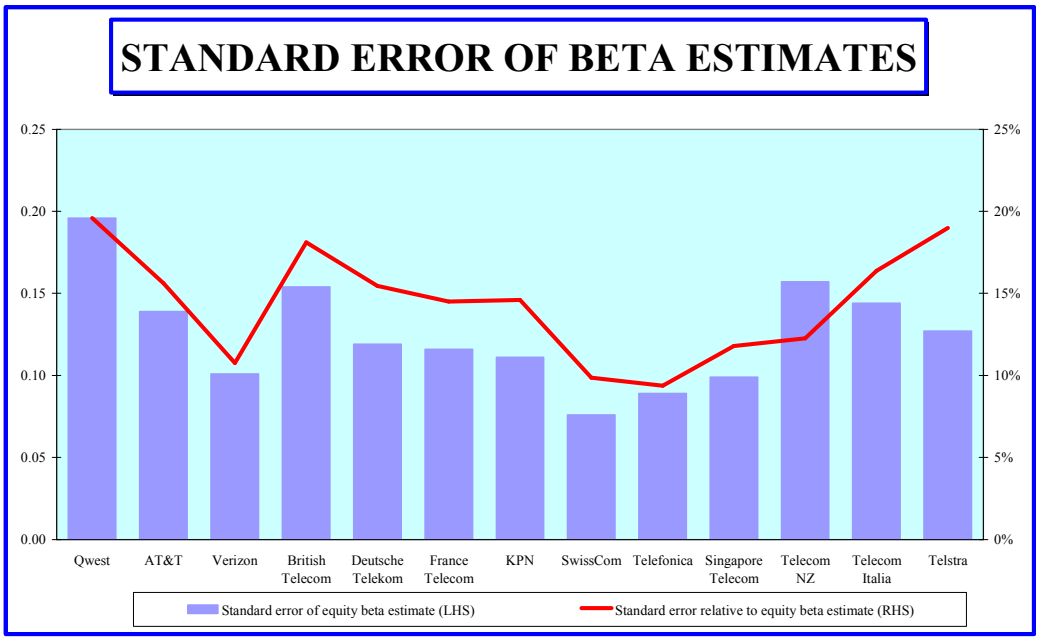
- The selection of listed comparable companies. Often it is difficult to identify listed companies that solely provide the service of the stand-alone access provider. To the extent there is a mismatch some degree of error is introduced;
- Observed equity betas need to be de-levered to remove the differential impact of gearing and then re-levered commensurate with the targets gearing. This can introduce estimation error around the gearing used in the de-levering;
- The averaging process may not be robust. Typically de-levered betas are simply averaged rather than perhaps market cap weighted. The choice of weighting may distort the averaging process and thus introduce further error;
- The Blume correction[64] also may introduce some estimation error that is unlikely to cancel out across the sample chosen;
- Historically determined betas are applied in an *ex ante* sense. The estimates of beta for an individual company are volatile through time and hence it is not clear than an *ex post* estimate of beta will be robust *ex ante*. There is therefore some

[63] Applying 2006-07 revenues for the relevant services.
[64] The Blume correction starts from the premise that betas have mean reversion towards 1 and hence makes a correction to the observed beta to push the corrected beta closer to 1. The simple formula is adjusted beta = 0.66 * observed beta + 0.33*1.

potential for estimation error based on historical betas applied in a forward-looking sense;

183. Given the starting point standard error in estimating beta for listed companies and the potential for further estimation error when adjusting to betas applicable to the stand-alone access provider, the potential for error is quite significant.

184. The partial information presented above suggests that there is a reasonably wide range of potential values for the beta relevant for the CAN assets. Data on the standard error in the estimates of equity betas for the comparables and for Telstra may also provide information useful in determining the likely range of values for the CAN beta. The average standard error in the equity beta estimates for the comparables group is 0.14 or 15.7% of the equity beta estimate. This suggests that the range for the likely asset beta could be as much as 15% higher and lower than the point estimate.



185. From a technical perspective all the estimates presented above are backward-looking and hence to some extent will tend towards under-stating the likely true beta from the forward-looking perspective required for the WACC. This reflects the global evolution occurring in telecommunications companies toward a greater share of broadband-related traffic on the CAN enabled by xDSL technologies and the availability of LSS and ULL. The mix of services provided over the CAN going forward over the expected useful life of these assets is likely to involve a higher share of the more discretionary services (notably broadband) than captured in these historical backward-looking estimates. As a result the historical estimates need some (arbitrary) upwards adjustment to remain appropriate into the future.

Conclusion on asset beta

186. Reflecting the mix of information presented above a reasonable estimate of the CAN asset beta would be around 0.725. The likely reasonable range is from a low around 0.625 to a high of 0.825.

Conversion to equity beta

187. The recommended asset beta is then re-levered to incorporate the effect of the gearing likely for a stand-alone provider of the declared CAN-related assets. The beta estimate inclusive of the effect of financial risk is an equity beta (βe). This re-levering applies the following formula:

$$\beta e = \beta a + (\beta a - \beta d)\{1-\{Rd / (1 + Rd\}(1-\gamma)Te\} . D/E$$

188. Where:

βe is the equity beta

βa is the asset beta

βd is the debt beta

γ is the imputation factor

Te is the effective corporate tax rate

Rd is the return on debt, and

D/E is the debt to equity ratio

189. This formula is similar to that used by the Commission.

190. The debt beta applied in the above calculation is a measure of the systematic riskiness of the debt associated with the CAN. Consistent with Telstra's past practice this has been assumed to be 0.0. This assumption has also consistently been applied by the Commission in past deliberations on WACC.

191. The resultant equity beta from application of the above re-gearing equation ranges between 0.89 and 1.17 with a point estimate of 1.03.

8 Equity Issuance Costs

192. Similar to debt, a company will incur significant costs to raise equity finance. These costs relate to the preparation of financial information and documentation required for an equity issue and for underwriter fees. These are legitimately incurred expenses that need to be recouped through some mechanism, either via explicit recognition in the cost of equity or as a cash flow expense reflecting the annualised extent of these predominantly once-off costs.

193. In Telstra's view the legitimate costs involved with equity issuance should be estimated, converted to an annualised rate of return and included in the cost of equity capital. This mimics the approach recommended for debt issuance costs (which Telstra recommends should be incorporated into the cost of debt).

194. In its Final Decision on GasNet[65] the Commission decided to include an allowance for equity issuance costs but as a cost cash flow. If appropriately quantified Telstra is indifferent between recovering these costs as a specific cash flow or as a margin on the WACC, so long as they are recovered.

195. Telstra relies on the analysis detailed in a widely cited paper on issuance costs which presents empirical analysis that shows that the cost of raising equity reflects scale economies (similar to the situation for debt raising).[66] Based on this study (see table 2 of the cited report) and given the approximate value of the CAN-related assets and the equity gearing recommended the amount of equity relevant for the CAN-related assets suggests that the once off costs would amount to either 5.72% (assuming an initial public offering) or 3.25% (assuming a secondary equity offering) of the amount of equity raised. These costs associated with equity raising are essentially once-off costs that need to be annualised over some span of years.

196. There is debate around whether equity issuance costs should be annualised over the useful life of the relevant assets or into perpetuity. Telstra recognises that equity may well be perpetual but the ability to fund these costs will depend on cash flows generated by the assets and will disappear once the assets are no longer useful. On this basis Telstra advocates annualisation over a forward period matching to some extent the useful life of the assets for which the equity funds were raised (i.e. matched to the useful life of the CAN-related assets in this context). If this were not the case and equity issuance costs were annualised into perpetuity there would be a period beyond the useful life of the relevant assets in which there were no assets available to fund the issuance costs. Either that or the funding would need to be sourced from alternate assets thus distorting their price. Therefore Telstra annualises these costs over a period of 35 years based on the expected useful life of the CAN-related assets. After annualisation (over 35 years) this implies an add-on to the cost of equity of between 27 and 47 basis points.

197. The estimate of equity issuance costs will depend on the extent of once-off costs relative to equity raised, the period over which costs are annualised and the discount rate applied. Telstra estimates a margin for inclusion in the cost of equity for equity related issuance costs of between 27 and 47 basis points and recommends application of 40 basis points in the point estimate WACC. The point estimate of the EIC is heightened marginally from the mid-point of the identified range to reflect the increased complexity of contemporary equity raisings relative to those around 1990-1994 when the empirical estimates were made[67].

9 Debt gearing

198. The two primary sources of capital for any business, including those involved in the provision of the declared CAN-related assets, are debt and equity. Financiers and investors will have different expectations about their required return in order for them to invest. These expectations will reflect the differential riskiness attached with debt and equity (from the investor's perspective). The proportions of debt and equity employed by the business (that is, the gearing) are thus important for calculating the weighted average cost of capital.

199. The debt gearing recommended for the CAN-related assets is based on the Telstra-wide target market gearing. Telstra considers this to be a reliable broad indicator of likely

[65] ACCC, "*Final Decision GasNet Australia access arrangement revisions for the Principal Transmission System*" dated 13 November 2002
[66] I. Lee, S. Lochhead, J. Ritter and Q. Zhao, "The Costs of Raising Capital" Journal of Financial Research, Spring 1996, pp 59 – 74, table 2.
[67] Ibid.

gearing that would apply to the relevant CAN-related assets. Again there are no listed entities only providing services based on the CAN-related assets which could provide guidance about the typical or desired level of gearing for these assets or these businesses. Given this it seems sensible to use the Telstra-wide gearing as an initial benchmark and then modify as appropriate to as much as practicable reflect the context of the CAN-related assets.

200. The Commission's long-held position is that book gearing around the time of Telstra's initial partial privatization should be the central basis on which to determine the appropriate gearing for the combination of network assets and specific assets.[68]

201. The continued adoption of book gearing in the context of determining the WACC is counter to the theory of corporate finance that underpins the determination of the WACC. Those underpinnings hinge on the symbiotic relationship between cash flows, the market value determined WACC and the market value of assets. More specifically, if the WACC is properly determined, it will ensure that the present value of the expected net cash flows derived from a set of assets equals the market value of those assets. However, even if the individual components of the WACC are properly assessed, using book values to then weight their combination into an overall WACC will violate this identity. It will, in other words, cause a divergence between the present value of the expected net cash flows derived from those assets and the assets' market value.

202. Telstra submits that this commingling of an approach to the WACC based on the Capital Asset Pricing Model with the application of weights for determining that WACC that are economically arbitrary and unjustifiable amounts to the same error which the Tribunal found in the Commission's WACC methodology in considering the Application by GasNet Australia[69] and then more recently in the Application by East Australian Pipeline Limited.[70]

203. In Telstra's view, the Commission then compounds the error by relying on gearing from around the time of Telstra's initial partial privatization back in 1997. This is a further departure from accepted theory in that it mixes estimates that are now nearly a decade old (i.e. the gearing structure) with estimates based on contemporary market conditions (ideally the other components in the WACC calculation). This is not a sound basis for calculating a contemporary WACC estimate.

204. The only justification for this position provided by the Commission (in the past) has been that "*at privatisation, Telstra most closely resembled a pure PSTN provider*"[71]. This may well be true but it ignores radical shifts that have occurred over the years since 1997 in a number of areas of relevance to the estimation of gearing for telecommunications companies generally; and which would impact the way in which a telco would consider gearing for the stand-alone declared provider of the CAN-related assets. These include

- A structural shift in interest rates over this period (and hence the market value of debt and equity);
- Shifts and re-alignments in financial markets;

[68] ACCC, "*Assessment of Telstra's PSTN and LCS Undertaking, Final Decision, Public Version*" 29 November 2006, pages 77-78.
[69] Australian Competition Tribunal, Application by GasNet Australia (Operations) Pty Ltd [2003] ACompT 6, [47]
[70] Australian Competition Tribunal, Application by East Australian Pipeline Limited [2005] ACompT 1, [15] While the Tribunal's decision was overturned by the Federal Court upon appeal, the decision did not relate to this aspect of the Commission's findings.
[71] ACCC, "*Assessment of Telstra's PSTN and LCS Undertaking, Final Decision, Public Version*" 29 November 2006, page 7.

- The gyrations in Telstra's share price since initial listing late-1997 (and hence in the market value of equity);

- The inflation of the dot-com "*bubble*" and its subsequent bursting;[72]

- Rapid technological advance in the telecommunications sector; and

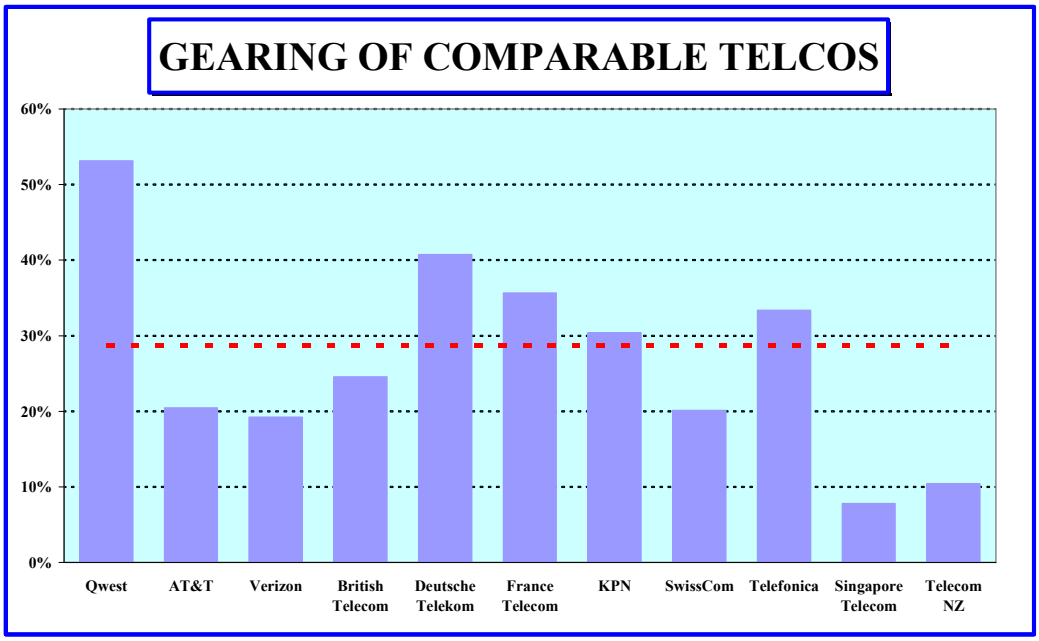
- The increased competitiveness of the Australian telecommunications industry associated with the shift to open competition in mid-1997 (only months in advance of the initial partial privatization of Telstra).

205. It is likely that these factors too would influence the gearing of the stand-alone provider of the CAN-related assets (as they clearly have at the Telstra-wide level). Furthermore, these factors would not have affected gearing at the time of Telstra's initial partial privatisation. As a result, the Telstra gearing at the time of initial partial privatisation is unlikely to be a meaningful, much less reliable, guide to the contemporary gearing at either the Telstra-wide level or for the CAN-related assets.

206. In November 2005 Telstra publicly announced that it was increasing its target *book* gearing ratio from a range between 45% to 55% debt to a range between 55% to 75% debt. These targets are presented in *book* terms because they were aimed at ratings agencies who because of their particular focus on debt tend to work in book gearing terms. For WACC calculations the gearing structure applied should be market based to ensure that opportunity costs are quantified in contemporary terms and on a target basis because equity investors are interested in likely returns over the medium-to-long term which are after future debt servicing. Consequently, the future direction of gearing is relevant for the future return to equity investors which is relevant for WACC. Applying an indicative contemporary share price for Telstra the target book gearing converts to an indicative target market gearing of between 20% debt and 40% debt. Reflecting the slow take-up of debt towards this revised target, an indicative target market gearing for Telstra therefore would be 30% debt.

207. Indicative gearing across a select group of comparable telcos is summarised in the chart below. The data is sourced from Bloomberg on 11 February 2008 and is based on book debt and the market value of equity. It shows a wide range of gearing across the telcos ranging from a high of 53.4% debt (Qwest) to a low of 7.8% debt (Singapore Telecom). The (simple) average across the peer set is 28.7% debt. The data suggests that market based gearing around 30% debt would be typical across comparable telcos.

[72] Including the impact on various market metrics which some argue has distorted beta estimates.



208. Note that changes in debt gearing do not materially impact the "vanilla" WACC estimate providing that the impact of changed gearing is endogenised in the estimate of the equity beta. In other words, increased (reduced) debt gearing increases (reduces) the extent of financial risk to which equity investors are exposed since any given level of investor return is less (more) likely to be met if debt is increased (reduced). This effect largely cancels out the weighting effect under which more (less) debt increase (reduces) the weight applied to lower cost debt and decreases (increases) the weight applied to higher cost equity. Over reasonable gearing ranges these effects largely offset and the resultant point estimates of the WACC are nor materially impacted by the gearing shift (especially relative to the estimation vagaries already inherent in the WACC).

209. In theory, the estimation error associated with gearing would not translate into significant error in the estimated WACC, provided the impact of gearing is endogenised in the calculation of the equity beta and ultimately the estimation of WACC. This would require that the CAPM/WACC model employed recognised the impact of debt gearing on the equity beta. If this were the case, the distributional characteristics of gearing are largely irrelevant as factors affecting the distributional characteristics of the WACC. Problems would emerge if the equity beta and gearing are assumed independent (either actively or by default).

210. Recognising the above Telstra considers it may be preferable to leave gearing as a constant across the high and low WACC estimates.

10 Recommended WACC Estimate for CAN-related Assets

211. Combining the recommended values for each of the WACC components parameters as outlined above results in a WACC estimate as at 1 January 2008 that ranges from 10.49% to 13.91%. The point estimate of the WACC is 12.28%. The details of this estimate are set out in the table below.

Parameter	Point estimate	High estimate	Low estimate
Risk free rate	6.33%	6.33%	6.33%
Debt ratio	30%	30%	30%
Debt risk premium	1.95%	2.10%	1.80%
Debt issuance cost	0.15%	0.22%	0.07%
Cost of debt	8.43%	8.65%	8.20%
Debt beta	0.0	0.0	0.0
Tax rate	30%	30%	30%
Asset beta	0.725	0.825	0.625
Equity beta	1.028	1.170	0.887
Equity issuance cost	0.40%	0.47%	0.27%
Market risk premium	7.0%	8.0%	5.5%
Cost of equity capital	13.93%	16.16%	11.48%
Vanilla WACC	12.28%	13.91%	10.49%