

The Allen Consulting Group

## **Review of gearing issues raised in AER Issues Paper**

21 September 2008

Report to Energy Networks Association, Grid Australia and APIA

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## Executive summary

### **The Brief**

Energy Networks Australia (ENA), Grid Australia and the Australian Pipeline Industry Association (APIA) have engaged the Allen Consulting Group (ACG) to review a number of issues relating to the gearing assumption applied in estimating the regulatory cost of capital, which have been raised by the Australian Energy Regulator (AER) in its recent Issues Paper.

The Brief required us to provide an opinion on the gearing ratio issues raised by the Issues Paper, as well as whether gearing for a regulatory WACC should reflect an actual company or a benchmark company, and whether it is appropriate to include data from the current ‘credit crunch’ in the analysis.

### **Summary of findings**

#### *Benchmark vs actual gearing*

Under the incentive/benchmark regulatory frameworks prevailing in Australia, benchmark gearing reflecting a regulator’s view of the efficient level of gearing in the regulated industry has been applied, rather than the actual gearing that has been observed for the particular entity in question. The efficient level of gearing has typically been determined from observations of levels of gearing amongst comparator firms (the underlying assumption being that observed levels of gearing in the market will tend towards efficient levels). Benchmark gearing is applied in order to provide an incentive for regulated businesses to adopt efficient gearing structures, and has an advantage of not exposing consumers to the vagaries of gearing levels adopted by individual businesses.

In Australia there has been a high degree of consistency in setting the regulatory gearing level at 60 percent. In the UK, which has a similar regulatory framework to Australia’s, the regulatory gearing level for energy distribution and transmission has tended to converge towards a narrow range around a level of approximately 60 percent.

In the US, where the rate-of-return regulatory framework dominates, there is a tendency to pass through embedded debt costs to customers. However, even in the US the capital structure is examined for its efficiency, and a different structure may be applied if the actual structure is found to be grossly inefficient.

#### *Definition of debt and equity*

The definition of debt and equity for capital structure calculations is not controversial. Standard & Poor’s provides a sound definition of book debt and equity. Book values have an advantage in being relatively stable, but are not seen as appropriate for valuation purposes.

### *Book vs market measures of gearing*

In theory and in commercial valuations the market value of equity and book value of debt are generally defined and calculated such that the book value and market value of debt are generally close. Some empirical evidence has shown that book and market values of debt can diverge when there is a sharp change in interest rates, which is the recent experience. This means that caution should be exercised when considering market-based gearing ratios observed during the last year.

### *Selection of the comparator group*

When measuring an industry benchmark gearing ratio it is advisable to take care in selecting an appropriate group of comparable businesses. In particular, it may be necessary to take account of non-regulated activities of some comparable businesses and the effect that those activities might have on the observed levels of gearing. Since the number of Australian comparators is small, it may be necessary to examine appropriate international comparators.

### *Treatment of hybrid securities*

Hybrid securities such as convertible debt should be classified as debt until converted. Shareholder loans need to be subtracted from the value of debt when they are stapled (and therefore the value of the equity will reflect their economic value) and classified as equity.

### *Double leverage*

Double leverage refers to situations involving a vertical structure, where an amount of debt is carried by an operating subsidiary, while an additional amount of debt is carried at the holding company level. Double leverage should also be taken into account to estimate the level of gearing appropriate to the regulated asset. We note in a Spark Infrastructure case study (see Appendix A) that an additional level of debt needed to be added in order to obtain an objective picture of the total gearing relating to the underlying regulated assets.

### *Treatment of unusual periods*

Unusual short-term fluctuations in gearing levels should be treated with caution. We have already noted that care should be exercised in the analysis of a period in which there has been a large and rapid increase in interest rates, as there has been in the last 12 months in Australia. Under these conditions it is likely that the common gearing measure using the market value of equity and book value of debt will overstate the level of market gearing, since the book value of debt will overstate the market value of debt.

### *Measurement of Debt/RAB gearing*

We have considered the Debt/RAB ratio because the Issues Paper has called for comments about it. As market values of gearing (or book values as a second-best alternative) are available, and since the enterprise value of regulated businesses exceeds the Regulatory Asset Base (RAB), it is not appropriate to apply the Debt/RAB ratio of gearing. In commercial practice, this measure is only used as a secondary metric indicating ability to meet debt commitments.

### *Estimates of gearing*

Examining the available information for Australian regulated energy businesses we found that:

- Standard & Poor's measures the Total Debt/RAB at approximately 95 percent;
- Standard and Poor's measures the book Total Debt/Total Capital at approximately 60 percent, although there was a considerable range around these values and not all these businesses could be considered appropriate comparators;
- We have measured the average 'market gearing' (Net Debt/Net Debt plus Market Capitalisation of Equity) of five comparable businesses to be almost precisely 60 percent over the period from 2003 to 2008.
- Market gearing has tended to reduce slightly over the last 5 years, with a small increase in the last year that is due to rapidly rising interest rates (and falling equity values) emerging from the credit crunch.

Overall, we conclude that there is no persuasive evidence to cause the regulatory gearing level to be moved from the prevailing level of 60 percent. Based on available evidence, we believe that 60 percent debt gearing is a good representation of the optimal gearing level.

## Chapter 1

# Introduction

### 1.1 The Brief

Energy Networks Association (ENA), Grid Australia and the Australian Pipeline Industry Association (APIA) has engaged the Allen Consulting Group (ACG) to review a number of issues relating to the gearing assumption applied in estimating the regulatory cost of capital, which have been raised by the Australian Energy Regulator (AER) in its recent Issues Paper.<sup>1</sup>

Our Brief requires us to provide an opinion on the following gearing issues raised by the Issues Paper:

- 3.1 What is an appropriate time period and frequency for estimating the benchmark gearing ratio from available market data?
- 3.2 Are objective market valuations for debt and equity available to estimate gearing ratios?
- 3.3 If an objective market valuation measure does not exist, then should the percentage of debt be measured relative to the value of the RAB be applied, or book values of debt to debt and equity?
- 3.4 What definition of debt and equity should be applied where data is available?
- 3.5 Which items should be excluded and or included when measuring an industry benchmark gearing ratio?
- 3.6 If hybrid securities and other forms of quasi debt are included in the measurement of the benchmark gearing ratio, how should specific types of hybrid securities be classified in terms of debt or equity?

In addition, ACG was asked to provide an opinion as to whether:

- 3.7 Regulatory WACC gearing should reflect an actual company or a benchmark company.
- 3.8 Data from the current ‘credit crunch’ is necessarily appropriate to include in the analysis.
- 3.9 There might be persuasive evidence to move away from the prevailing level of 60 percent gearing.

### 1.2 Structure of the report

The remaining report is structured as follows:

- Chapter 2 examines the application of regulatory gearing within the context of the Australian incentive/benchmark regulatory framework.

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<sup>1</sup> Australian Energy Regulator (August, 2008), *Issues Paper: Review of the weighted average cost of capital (WACC) parameters for electricity transmission and distribution*.



- Chapter 3 examines the definition of debt and equity, and the alternative gearing measures that may be applied.
- Chapter 4 presents empirical evidence on the gearing levels that have been observed among Australian energy transmission and distribution businesses over recent years under alternative measurement approaches.

### 1.3 Cross-reference to AER Issues Paper

It should be noted that we have not addressed the issues in the Brief in the order that they were presented, which was determined by the AER Issues Paper. Our report sets out the issues as cross-referenced in Table 1.1.

Table 1.1

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**ORDER TO ADDRESS ISSUES IN THE BRIEF**

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Brief Issue	Description of issue	Section of Report
3.1	Timing and frequency of measurement	4.2
3.2	Objectivity of market debt and equity measures	3.1 and 4.1
3.3	Book gearing and Debt/RAB	4.4 and 4.5
3.4	Definition of debt and equity	3.2
3.5	Items to include/exclude	3.2 and 3.3
3.6	Classification of hybrids as debt or equity	3.2, 3.5, Appendix A
3.7	Actual or benchmark gearing	2.2 and 2.3
3.8	Use of data from current credit crunch	3.3, 3.4 and 4.5
3.9	Whether there is persuasive evidence to move away from the 60 percent gearing level	Entire report and Executive Summary

## Chapter 2

# Application of regulatory gearing

Box 2.1

### CONCLUSIONS ON APPLICATION OF REGULATORY GEARING IN AUSTRALIA

- In Australia there has been a high degree of consistency among regulators, who have adopted a benchmark 60 percent gearing ratio (Debt to Debt plus Equity) for electricity transmission and distribution.
- A benchmark gearing approach provides firms with an incentive to adopt optimal financial structures, and does not penalise customers in the event that firms choose to adopt sub-optimal structures.

## 2.1 Introduction

In this section we provide an opinion on the central issue of whether the regulatory WACC gearing should reflect an actual company or a benchmark company. To investigate this issue we review the nature of the incentive regulation framework that has been applied in Australia and the UK. For comparative purposes we also consider rate-of-return regulation, which is applied in the US.

## 2.2 Gearing in access price determinations under incentive regulation

Under the National Electricity Rules the nominal weighted average cost of capital must be calculated in accordance with the following formula:<sup>2</sup>

$$WACC = k_e(E/V) + k_d(D/V)$$

Where:

$k_e$  is the cost of equity (determined using the Capital Asset Pricing Model);

$k_d$  is the cost of debt;

E is equity;

D is debt;

E/V is the market value of equity as a proportion of the market value of equity and debt, which is 1-D/V; and

D/V is the market value of debt as a proportion of the market value of equity and debt, which is deemed to be 0.6.

The gearing level applied to the regulatory WACC has in the past been set on the basis of observations of gearing of comparator firms in the regulated industry, under the presumption that observed levels of gearing will be, or will tend towards, efficient levels.

<sup>2</sup>

AEMC (1 July, 2008) *National Electricity Rules*, Version 21, Chapter 6A.6.2(b) – Economic Regulation of Transmission Services, p.567.

By setting the gearing level at a benchmark the regulator will provide businesses with an incentive to make efficient finance-related decisions, and will protect consumers from the effects of imprudent decisions.

### ***Gearing benchmark in Australia***

As noted above, the NER has adopted a value of 0.6 for electricity transmission. As noted by the AER Issues Paper, Australian regulators of energy assets have consistently adopted a 60:40 gearing ratio for electricity distribution (i.e. 60 percent gearing), and persuasive evidence would need to be provided to show that this ratio is not appropriate for regulating electricity distribution assets.<sup>3</sup>

The National Electricity Rules (NER) require that:<sup>4</sup>

Where a parameter cannot be determined with certainty, the ... AER must have regard to the need for persuasive evidence before adopting a value or method that differs from the value or method that has previously been adopted for it.

### ***UK regulatory treatment of gearing***

Australia has a similar incentive/benchmark regulatory framework to the UK, and there are similarities in their financial institutions, laws and tax rules.<sup>5</sup> It is therefore useful to compare the regulatory decisions on gearing that have been made in the UK, even though there is only one listed energy transmission and distribution business (National Grid).

As shown in Table 2.1 below, compared with Australia, in the UK there has been less unanimity with respect to the gearing level to apply in calculating a regulatory WACC, although since the formation of the Office of Gas and Electricity Markets (OFGEM) in 1999,<sup>6</sup> the gearing levels assumed for electricity distribution and gas distribution have tended to converge to a range of between 57.5 percent and 62.5 percent, with an average of 60 percent. Again, it should be noted that these are regulatory gearing benchmarks, rather than actual observations of UK businesses.

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<sup>3</sup> AER (August, 2008), p.20.

<sup>4</sup> AER (August, 2008), p. 20.

<sup>5</sup> From 1973 up to 1999 the United Kingdom had an imputation tax system.

<sup>6</sup> OFGEM was formed as a result of merging the Office of Electricity Regulation (OFFER) and the Office of Gas Supply (Ofgas).

Table 2.1

**UK REGULATORY DECISIONS ON GEARING**

Year	Gas Distribution	Electricity Distribution	Gas &/or Electricity Transmission
1999		50.0% <sup>(d)</sup>	
2000			60%-70% <sup>(f)</sup>
2001	62.5% <sup>(a)</sup>		62.5% <sup>(a)</sup>
2004		57.5% <sup>(e)</sup>	
2006	62.5% <sup>(b)</sup>		60% <sup>(g)</sup>
2007	62.5% <sup>(c)</sup>		
Last Decision	62.5%	57.5%	60%
Average of latest Decisions			60%

Sources:

(a) Review of Transco's Price Control From 2002 - Final Proposals, September 2001, Section 5.4

(b) Gas Distribution Price Control Review - One Year Control Final Proposals, December 2006, pg. 30

(c) Gas Distribution Price Control Review - Final Proposals, December 2007, pg. 104

(d) Reviews of Public Electricity Suppliers 1998 to 2000: Distribution Price Control Review - Final Proposals, December 1999, Section 5.5

(e) Electricity Distribution Price Control Review - Final Proposals, November 2004, Section 8.52 pg. 108

(f) The Transmission Price Control Review of the National Grid Company from 2001: Transmission Asset Owner - Final Proposals, September 2000, Section 5.8

(g) Transmission Price Control Review - Final Proposals, December 2006, Section 8.16 pg. 54

***Gearing under US rate-of-return regulation***

Under US rate-of-return regulation the approach has been to use book values of debt and equity to calculate the WACC. The embedded (i.e. actual) cost of debt is applied and the market cost of equity is estimated using the Gordon Dividend Growth Model, an Equity Premium approach, the CAPM and/or the Comparable Earnings approach.

Although the use of book values to calculate the level of gearing is not appropriate for valuation purposes, it is justified in the US on the basis that book values are:

- observed for all regulated businesses, even if they are not listed on the market, or a part of a larger listed business;
- more stable than market values, which are subject to continuous changes if shares are listed;
- a reasonable approximation for market values; and
- the regulatory asset base (RAB), that under regulation should approximate market values.

However, even in the US there is a view that only the use of market value weights by regulators will ensure “that the commitment of funds to investment projects by utilities will earn a rate sufficient to cover these costs”.<sup>7</sup>

<sup>7</sup> Morin, Roger A. (1994), p.412.

### **2.3 Benchmark vs actual gearing**

Under the incentive/benchmark regulatory frameworks prevailing in Australia and the UK, benchmark gearing reflecting a regulator's view of the efficient level of gearing has been applied, rather than the actual gearing that has been observed for the particular regulated entity. While reference has been made to observed gearing levels in Australia and the UK, a fixed benchmark has been applied irrespective of the actual gearing observed for individual firms, which might have gearing levels that are higher or lower than the benchmark. In the US actual gearing and embedded debt costs are applied unless the actual gearing structure is obviously sub-optimal.

In Australia there has been a high degree of consistency in setting the regulatory gearing level at 60 percent. In the UK there has been a tendency for the regulatory gearing level for electricity distribution and transmission to converge towards a narrow range that is approximately 60 percent.

## Chapter 3

# Definition of gearing

Box 3.1

### CONCLUSIONS ON THE DEFINITION OF GEARING

- The most appropriate measure of gearing for valuation purposes is the ratio of the Market Value of Debt to the Market Value of Debt plus Market Value of Equity.
- Gearing measured in terms of book values has the advantage of being more stable than gearing based on market values, however using book values will generally result in valuation errors.
- In commercial practice it is common to measure gearing as the ratio of the Book Value of Debt to the Book Value of Debt plus Market Value of Equity on the assumption that the book value of debt will approximate the market value.
- During the last 12 months the market value of equity and market value of debt of comparator firms for the Australian regulated electricity sector have fallen, and the commonly used measure of Book Debt to Book Debt plus Market Equity will therefore over-estimate the true level of market gearing.
- We have considered Debt/RAB because it was raised in the Issues Paper. It is not appropriate to apply the Debt/RAB multiple as a measure of gearing, since (like book gearing) it distorts the actual level of market gearing, and is used by analysts only as a secondary metric indicating an ability to meet debt commitments.

### 3.1 Introduction

In this section we consider the following issues:

- What definition of debt and equity should be applied where data is available?
- Which items should be excluded and or included when measuring an industry benchmark gearing ratio?
- If hybrid securities and other forms of quasi debt are included in the measurement of the benchmark gearing ratio, how should specific types of hybrid securities be classified in terms of debt or equity?
- Are objective market valuations for debt and equity available to estimate gearing ratios?
- If an objective market valuation measure does not exist, then should the percentage of debt be measured relative to the value of the RAB, or book values of debt to debt and equity?

### 3.2 Definition of debt and equity

As noted above, the National Electricity Rules require that the market values of debt and equity are applied in the WACC formula. In general, debt and equity can be defined as follows:

- **Debt** - Debt securities oblige a company to make a specified series of fixed, floating, and/or terminal payments in the future. The form of payments can be called interest, coupons or dividends. In the case of default, debt holders rank above equity holders (and therefore do not bear residual risk). Finance lease obligations are also part of debt. Debt can be further classified into long and short-term debt (which matures within 12 months). The market value of debt can be calculated by discounting the expected future cash flows to debt holders at the discount rate (rate of interest) appropriate to the risk that is borne. If the debt is traded in a liquid market there will be a market price that can be applied to calculate the market value of debt.
- **Equity** – Equity securities are distinguished from debt by the fact that future returns are generally not specified. Equity shareholders are the residual risk bearers, who have a claim to the cash flows of the business after all other claims have been satisfied. The market value of equity can be calculated by discounting the expected future cash flows to equity holders at the discount rate (rate of return) appropriate to the risk that is borne. If the equity shares are traded in a liquid market their price can be applied to calculate the market value of equity.

Hybrid securities have a mix of debt and equity characteristics, as they may provide a fixed or floating coupon, interest payments or dividends, but may also be convertible into equity under certain circumstances. As such they may have option-like characteristics:

- **Redeemable preference shares and convertible notes** – These securities should be treated as debt, since they are not long-dated (are redeemed or converted) and do not bear residual risk.
- **Shareholder loans** – These are a hybrid instrument that should be classified as equity if they are stapled to shares and therefore bear residual risk. If classified as debt in the balance sheet they should be subordinated and added to equity, as their value will be reflected in the share price in any case.

There are other issues that may be considered when distinguishing the debt and equity components of a firm's capital structure.

- **Operating leases** – Non-cancellable operating leases should be seen as a debt instrument since they involve a set of commitments to pay an outside entity, and are an alternative to using debt finance to purchase property plant and equipment.
- **Minority interests** – Minority interests are claims by outside shareholders over a proportion of the company's cash flows. They arise in cases where not all of the shares of another business have been acquired, or the company sells a portion of a subsidiary to another business.
- **Provisions** – To the extent that a provision for such items as workers' compensation are not separately identified and paid to another entity they become a liability of the equity holders.<sup>8</sup> Therefore, in market terms the value will be incorporated into the share price, and in accounting terms the value would need to be added to the equity value.

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<sup>8</sup>

This principle was recently put forward in a paper by R.R. Officer and S.R. Bishop (4, October, 2007), *Current and Non-Current Assets as part of the Regulatory Asset Base* (The Return to Working Capital: Australia Post).

### 3.3 Book and market concepts of gearing

#### *Book values of debt, equity and hybrid securities*

In valuing a business, it is the market values of debt and equity that should be employed to calculate gearing for the WACC formula. Although the book value of debt and market value of debt may be close, in normal commercial circumstances there will be no necessary connection between the market value and book value of equity. For example, a significant minority of listed companies with positive market equity will have negative equity in their balance sheets.

The ratings agency Standard & Poor's measures the book value of debt and equity as part of a suite of ratios and other analyses that are used in the assessment of a company's debt rating.

The ratio of Total Debt-to-Total Capital (TD/TC) is defined by Standard & Poor's as:<sup>9</sup>

$$\text{Total Debt – to – Total Capital (\%)} = \frac{\text{Total Debt}}{\text{Total Capital}} \times 100$$

Where,

Total Capital - is defined as the sum of total debt and equity.

Equity - consists of paid-up capital, capital reserves, long-dated subordinated loans, perpetual subordinated notes, unappropriated profits and minority interests, less treasury stock. Redeemable preference shares and subordinated convertible notes and bonds are excluded from equity.

Total Debt – includes (current and non-current, secured and unsecured debt) bank overdrafts, loans including loans from related companies, finance lease liabilities, redeemable preference shares, nonrecourse debt, debenture stock, promissory notes, convertible notes, and bills payable (non-trade).

Shareholder Loans - For utility companies Standard and Poor's does not include shareholders' loans as part of total debt where they are deemed to have significant equity characteristics.

From the above definitions applied by Standard and Poor's, it is evident that Standard & Poor's considers that the important characteristic distinguishing equity from debt is the long-term (permanent) nature of the security, and the acceptance of residual risk. It should also be noted that Standard & Poor's values long-term operating leases using a Discounted Cash Flow (DCF) methodology. In other words, the Book Total Debt-to-Total Capital analysis applied by Standard & Poor's may also use market valuation.<sup>10</sup>

It is also apparent from these definitions that such items as provisions, accounts payable and receivable, and deferred tax liabilities are excluded from the calculation of a benchmark capital structure.

<sup>9</sup>

Standard & Poor's (June 2004), *Australia & New Zealand CreditStats 2004: Cashed Up & Ready to Buy*, p. 39

<sup>10</sup>

This appropriate for calculating a book value of gearing. However, for regulated businesses market gearing values should be used.



### **Market values of debt and equity**

#### **Market value of equity**

The current market value of equity can be calculated accurately when the stock is listed on the stock exchange and exhibits sufficient liquidity. Estimating the market value of equity for unlisted businesses becomes much more subjective, as it usually requires analysis of comparable businesses. Theoretically, it is the value of future cash flows to shareholders discounted to the present at a rate of return that reflects the risks associated with that stream of cash flows.<sup>11</sup>

In practice, regulatory examination of market gearing levels has employed the common convention that is used more generally in business valuation, and that is to use book value of debt as a proxy for the market value, but use an observed market value of equity when this has been available. In other words, the ratio of ‘market gearing’ that is used by regulators and market analysts is actually an amalgam of the market value of equity and book value of debt, where the book value of debt is assumed to be close to the market value of debt.

#### **Market value of debt**

In recent times there have been some market analysts and finance academics that have advocated estimating the market value of debt. Like the value of equity, the market value of debt equals the present value of the future cash flows to debt holders discounted at a rate that reflects the risk inherent in that cash flow stream.<sup>12</sup> Empirical estimates of the impact of using market valuations of debt as inputs to a WACC calculation rather than book values have been undertaken for some time. Sweeney, Warga and Winters (1997) carried out empirical research on this issue, concluding that the use of book values of debt distorts cost of capital calculations.<sup>13</sup>

The methodology applied by Sweeney, Warga and Winters was to extrapolate to the total value of a firm’s debt the market value of the portion of debt for which good price data could be found. As expected, they found that from 1978 to 1985, during a period of high interest rates, the market value of debt was less than the book value of debt. From 1986 to 1991 there was a relatively close correspondence between market and book values of debt. While the approach set out by Sweeney, Warga and Winters is generally accepted in the financial economics literature, in practice book values are seen as a reasonable approximation of market values of debt as long as there has not been a sudden change in interest rates.

The market value of debt can be observed readily when the debt is a traded bond with a fixed coupon. The trading price of the Envestra Victoria (2015) 6.25 percent coupon bond is shown in Figure 3.1 for the period between 2003 and 2008. The valuation fluctuated around \$100 (issue price was \$99.90) until the events of the credit crunch caused a sharp increase in interest rates, and the price of the bond declined to \$90 around March 2008. During March 2008, the financial guarantor of the bond, XL Capital Assurance Inc. was sued by Merrill Lynch over its CDO obligations, and the market price of the Envestra 2015 bond dropped to \$85 on the news.

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<sup>11</sup> See Brealey, R. S. Myers, G. Partington, and D. Robinson, (2000), *Principles of Corporate Finance*, Chapter 4.

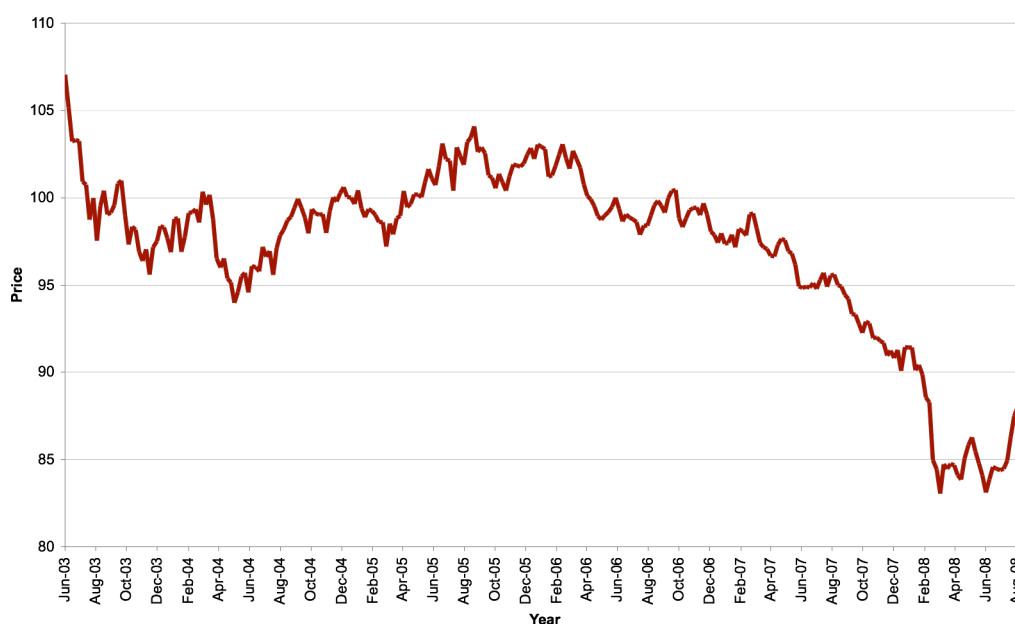
<sup>12</sup> Brealey, R. S. Myers, G. Partington, and D. Robinson, (2000), Chapter 23.

<sup>13</sup> Sweeney, Richard J., Arthur D. Warga and Drew Winters (Spring, 1997), *Financial Management*, Vol. 26, No. 1, pp.5-21.

It should be noted that there are difficulties in relying on the quoted prices for this bond as it has a small capital value (\$45 million) and is relatively illiquid. That is, there would be very few trades in this debt, and the prices are more reflective of trader valuations. This highlights the difficulty of accurately estimating changes in the market value of debt. Furthermore, one-off situations such as the problems experienced by the bond's monoline insurer in the US could not be seen as 'benchmark'.<sup>14</sup> There is no doubt, however, that the market value of debt has fallen during the 'credit crunch' experienced during the last year, which has resulted in the credit spreads attaching to bonds widening considerably.

It is not straightforward to extrapolate the implications of a change in the value of traded bonds to the remaining debt obligations of the firm. In the Envestra bond case study shown above, there was an additional valuation effect caused by the financial difficulties of a financial guarantor, which cannot be extrapolated to the other debt. Almost two thirds of domestic Medium Term Notes (MTNs) are issued as floating rate bonds, with the most common reference rate being the 3 month Bank Bill Swap Rate (BBSW).<sup>15</sup> Since there is a mechanism for the interest rate to fluctuate with market conditions, a proportion of the valuation impact will be absorbed through adjustments to the interest payments rather than the price of the bonds. Similarly, term loans and revolver loans will be linked to a reference rate that will move with market interest rates.

Figure 3.1

**ENVESTRA 2015 BOND: MARKET VALUATION**

Source: Bloomberg

<sup>14</sup> For a fee, 'monoline insurers' provide a guarantee to bond holders that that will make timely repayments of principal and interest when a bond defaults. In this way, the credit rating of the bond is raised and requires a lower yield as a result.

<sup>15</sup> ACG (December, 2004), *Debt and Equity Raising Transaction Costs*, Final Report to the Australian Competition and Consumer Commission, p. 39.

Having pointed out the difficulties of valuing debt, given the recent sharply increased credit margins applying in the debt market, it is highly probable that the value of debt held by Australian utilities has declined somewhat in the last year relative to book values, and that as a result the book value of debt is likely to overestimate the market value of debt. As a result, during the credit crunch experienced in the last year, the market gearing ratio (using market values of debt and equity) will have been lower than the traditionally applied market gearing ratio using market equity and book debt values. That is, while the reduction in the market value of equity has been observed, and factored into the calculation, the book value of debt has not fallen, and has been a poor proxy for the declining market value of debt.

### **Debt to RAB**

The Issues Paper has raised the question of whether it is appropriate to use the Debt/RAB ratio as a gearing measure.<sup>16</sup>

3.3 If an objective market valuation measure does not exist, then should the percentage of debt be measured relative to the value of the RAB be applied or book values of debt to debt and equity?

The Debt/RAB ratio for regulated businesses is sometimes referred to by analysts and rating agencies as a secondary measure of gearing, but never in the context of valuation of a business. Standard & Poor's assesses credit rating of debt, and the Debt/RAB ratio is sometimes reviewed as a secondary measure to the main book gearing ratio (TD/TC), and other key ratios that are used to assess the ability of the regulated business to meet its interest commitments. Market analysts assess the valuation of equity, and focus on market values of gearing, or use book debt/market equity plus book debt, which is an approximation to the market gearing. Like Standard & Poor's, market analysts sometimes look at Debt/RAB as another measure of the ability to meet debt commitments.

In Australia and the UK, which both apply incentive/benchmark regulation, there has been reliance on market ratios, even though it has been observed that the ratio of debt to RAB has been considerably higher than the observed market gearing ratios and accounting gearing ratios. For example, as at March 2003 it was noted that a number of leveraged refinancings had taken place in the UK water sector, where the average gearing of the firms rose to 83 percent of RAB.<sup>17</sup> However, the subsequent determination of the gearing ratio for the water sector was raised by OFWAT from 50 percent to only 55 percent.

For a number of reasons, the enterprise value (EV) of regulated businesses tends to be higher than the RAB. This is observed in Australia, the UK and the US. Therefore, the measurement of Debt/RAB is likely to overstate the gearing that is based on the market Debt/EV ratio, or the book TD/TC ratio. Since the regulated activities of the firm give rise to an EV that is greater than RAB, it would be inappropriate to base the assessment of the regulatory gearing ratio on the observed levels of Debt/RAB.

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<sup>16</sup> AER (August, 2008), p.24.

<sup>17</sup> Bucks, Peter, (2003), p.38.

### 3.4 Measurement of industry benchmark gearing ratio

Measurement of an industry benchmark gearing ratio is difficult for a number of reasons.

#### **Comparable businesses**

A common problem in measuring a benchmark gearing ratio is the selection of an appropriate set of comparators. The most important task is to select a set of appropriate comparable businesses. In an earlier analysis that was submitted to the Australian Energy Market Commission (AEMC) by the Electricity Transmission Network Owners' Forum, we began by reviewing a list of energy companies appearing in Standard & Poor's current *Industry Report Card: Australian Utilities*, and excluded the following types of businesses from consideration.<sup>18</sup>

- Wholly government owned businesses – because their gearing levels would be dominated by the financial position of the government owner rather than the commercial requirements of the business.
- Businesses with significant non-regulated activities – unless the non-regulated activities are able to support as much debt as regulated activities, the inclusion of businesses with un-regulated activities is likely to reduce the observed gearing below the level that is appropriate for the regulated business; and
- Businesses undergoing restructuring or rapid expansion – because such businesses may be maintaining excess borrowing capacity to provide the financial flexibility for the restructure or expansion.

Businesses were also excluded where Standard & Poors' had stated that the rating follows the rating of a parent company. Whilst this is appropriate when considering credit ratings, the gearing level of the business operating in Australia with a large component of Australian shareholders can still be expected to follow commercial gearing requirements.

We have recently seen a number of Australian infrastructure funds that began investing in Australian energy, now investing in international energy and water businesses. This adds another exclusion principle from the list of comparables.

- Businesses with significant international investments – because the gearing levels that are appropriate in other countries and in different regulated businesses (such as water) in other countries, may not be appropriate for an Australian regulated energy business.

#### **Abnormal conditions or gearing**

We have already noted above that businesses undergoing restructuring or rapid expansion should be excluded because such businesses may be maintaining excess borrowing capacity to provide the financial flexibility for the restructure or expansion. Or, such businesses may have recently undertaken a significant expansion, which increased gearing levels beyond the long-term optimum, and will be addressed by a future issue of equity or sale of non-core assets.

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<sup>18</sup> ACG (May, 2006), *Credit rating for a benchmark electricity transmission business*, Report to Electricity Transmission Network Owners' Forum.

Even if an appropriate set of comparables has been selected, it will be necessary to examine the period over which the gearing levels are being measured. While we have said that market gearing is preferred, it may be less stable in changing economic conditions than the book gearing levels that are relied upon by Standard & Poor's. Having said that, Standard & Poor's relies on a number of other ratios in addition to the accounting Total Debt/Total Capital ratio when assessing a credit rating, and these will be sensitive to market conditions.

A particular issue currently at hand is the continuing disturbance in credit markets. The increase in interest rates precipitated by this situation has seen a reduction in the share prices of regulated energy businesses, and the as we have seen above, these conditions have had some negative effect on the market value of debt. While the accounting gearing level is unlikely to be affected much by these events, if the market level of equity but book value of debt are combined the measure of gearing is likely to appear inflated compared with a measure of gearing that applied both the market value of equity and the market value of debt.

Hence, if a market equity and book debt measure of gearing is applied (because of the difficulty of calculating the market value of debt) when there has been a sudden and rapid change in interest rates, there will be upward bias in the measured gearing level. As reflected in the Envestra 2015 bond example, the market value of debt has declined in the past year, which will impart an upward bias to the generally applied measure of Book Debt to the sum of Book Debt and Market Equity. This upward bias should be taken into consideration if gearing levels in 2007-2008 are included in the analysis.

### **Double leverage**

The term 'double leverage' refers to a regulated business that has an amount of debt in its regulated business, which is a subsidiary of a holding company that has an additional amount of debt. This means that the gearing level apparent at the level of the regulated business may not be an appropriate indicator of commercial gearing levels. The issue of double leverage has been raised in a number of regulatory cases in the US. While the regulatory response has varied, it has generally been concluded that in order to reflect the actual risks faced by equity holders, it is necessary to take account of the combined gearing implications.<sup>19</sup> An examination of Spark Infrastructure (see Appendix A) shows that a 'see through' analysis of the debt commitments at different levels of the structure needs to be considered in order to assess the actual level of gearing.

### **3.5 Treatment of hybrid securities**

The most common form of hybrid security is the convertible note, which incorporates a debt-like payment stream plus a convertibility feature into ordinary shares of the underlying security. We have seen that convertible securities are excluded from equity by Standard & Poor's. Convertible securities have also been excluded from equity by US regulators until they have been converted to equity.<sup>20</sup>

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<sup>19</sup> Goodman, Leonard (1998), *The Process of Ratemaking*, Public Utilities Reports Inc. Vienna, Virginia Vol. 1, p.653-654.

<sup>20</sup> Goodman, Leonard (1998), p.652.

The most common form of ‘hybrid security’ that is seen in the Australian regulated utility market is the Shareholder loan. Envestra is a case study of a Shareholder Loan Note that is included as part of debt for accounting purposes, but must be:

- subtracted from debt and added to book equity if an accounting gearing measurement is undertaken; and
- subtracted from debt and ignored if a market valuation is undertaken.

The distinguishing features of the Envestra Shareholder Loan Note (see Appendix A) are that they are stapled to each share, and have no separate existence without the share. Hence, the market value of the share of equity will already incorporate the value of the Shareholder Loan Note. With respect to the accounting gearing measurement described above, Standard & Poor’s subtracts the outstanding value of Shareholder Loan Notes, and adds the same amount to the value of book equity.

### **3.6 Conclusion**

Having reviewed both regulatory and market approaches to gearing definitions and measurements, our conclusions are as follows:

- The definition of debt and equity for capital structure calculations is not controversial. Standard & Poor’s provides a sound definition of book debt and equity. Book values have an advantage in being relatively stable, but are not seen as appropriate for valuation purposes if market values are available.
- In theory, and in commercial valuations, the market value of equity and book value of debt are applied on grounds that the book value and market value of debt are generally close. Some empirical evidence has shown that book and market values of debt can diverge when there is a sharp rise in interest rates, which is the recent experience in Australia.
- When measuring an industry benchmark gearing ratio it is advisable to take care in selecting an appropriate group of comparable businesses. In particular, it may be necessary to take account of non-regulated activities of some comparable businesses and the effect that those activities might have on the appropriate level of gearing.
- Hybrid securities such as convertible debt should be classified as debt until converted. Shareholder loans need to be subtracted from the value of debt when they are stapled (and therefore the value of the equity will reflect their economic value) and classified as debt.
- Double leverage should also be taken into account to estimate the level of gearing appropriate to the regulated asset. We noted in the Spark Infrastructure case study that an additional level of debt needed to be added in order to obtain an objective picture of the total gearing impacting on the underlying regulated assets.
- Care should be exercised in the analysis of a period in which there has been a large and rapid increase in interest rates, as there has been in the last 12 months in Australia. Under these conditions it is likely that the common gearing measure using the market value of equity and book value of debt will overstate the level of market gearing, since the book value of debt will overstate the market value of debt.

- As market values of gearing (or book values) are available, and since the enterprise value of regulated businesses exceeds RAB, it is not appropriate to apply the Debt/RAB ratio for market gearing. In commercial practice, this measure is only used as a secondary metric indicating ability to meet debt commitments.

## Chapter 4

# Measurement of gearing

Box 4.1

### CONCLUSIONS ON THE MEASUREMENT OF GEARING

- There are very few appropriate comparators to indicate an appropriate benchmark gearing level for an Australian regulated electricity distribution business.
- While the Standard & Poor's book gearing ratio (Total Debt/Total Capital) for all rated energy transmission and distribution businesses has averaged at 60 percent between 2004 and 2008, the sample includes GBEs and subsidiaries that may not reflect commercial gearing.
- The average Debt/RAB ratio was recently found by Standard & Poor's to average 95 percent for regulated energy businesses, but this is inappropriate to use as a measure of market gearing.
- Defining a smaller group of listed comparables (APA Group, GasNet, Envestra, SP AusNet, and Spark Infrastructure) we find that the average market gearing (Book Debt/Book Debt plus Market Equity) has been averaging about 60 percent over the last 5 years, with a recent rise to close to 65 percent due to a decline in share prices (and no account being taken of the decline in market value of debt).
- We conclude that there is no persuasive evidence to suggest that there should be a move away from the previously applied benchmark of 60 percent gearing.

## 4.1 Introduction

In this section we consider what is an appropriate time period and frequency for estimating the benchmark gearing ratio from available market data. We also provide an overview of measurements of gearing for the Australian regulated energy businesses using a number of different measurement approaches.

## 4.2 Time period and frequency of data

The time period over which gearing should be measured should not be so short that it captures potentially an unusual period. It should also not be so long that general economic conditions (including tax rates) have changed significantly. If a longer period is considered, and the experiences of a number of firms are averaged, there will be a greater likelihood that specific factors affecting individual firms will be neutralised. A measurement period of five years, similar to the period often applied in the measurement of equity betas, could represent a reasonable trade-off that averages the experience of a number of years, but still reflects relatively recent market conditions.

A practical limit to the frequency of estimates of gearing will be applied by the period of company reporting. The company's financial statements (and potentially those of associated securities) are necessary to calculate an accounting measure (such as TD/TC) and market-based measures of gearing. With bi-annual reporting it would be possible to provide 10 observations of gearing in a 5 year period, but it is not evident that this would improve the quality of the analysis.



### 4.3 Gearing based on book valuation of debt and equity

Gearing for all the Australian regulated energy transmission and distribution businesses with rated debt has been calculated by Standard & Poor's based on book valuation of debt and equity (TD/TC), and is shown in Table 4.1 below.

Table 4.1

#### GEARING OF RATED AUSTRALIAN ENERGY DISTRIBUTION AND TRANSMISSION 2004 TO 2008

	2004		2008	
	Gearing (TD/TC)	Rating	Gearing (TD/TC)	Rating
Alinta Ltd	56.2	BBB		
CitiPower Trust	54.1	AA-	53.8	A-
Country Energy	68.3	AA		
Diversified Utility and Energy Trust			73.2	BBB-
ElectraNet	72.6	BBB+	73.4	BBB+
Energy Australia	51.4	AA		
Energy Partnerships (Gas)	80.7	BBB	84.1	BBB
Envestra Ltd	80.8	BBB	86.4	BBB-
Ergon Energy Corp	49.3	AA+	51.1	AA+
ETSA Utilities Finance	63.5	A-	56.1	A-
GasNet Australia (Operations) Pty Ltd	68.9	BBB	57.5	BBB
Integral Energy	55.4	AA		
Powercor Australia	38.1	A-	41.6	A-
SP AusNet Group			57.3	A-
SPI Australia Holdings (Partnership) L.P.			42.8	A-
SPI PowerNet	79.8	A+	59.2	A-
TXU Australia Holdings	63.8	BBB		
United Energy Distribution	80.1	BBB	76.0	BBB
Average	61.3	A	61.6	BBB+

Source: Standard & Poor's (2004), Australia and New Zealand Credit Stats 2004, pp.33-34; Standard & Poor's (May 9, 2008), *Industry Report Card: Australian Utilities' Credit Prospects Dimmed by Looming Shadow of M&A, Climate and Regulatory Risks*, p.13.

While the averages of book gearing for these rated businesses is close to 60 percent in each of 2004 and 2008, this should not be taken as evidence that this is the appropriate level of gearing, as the sample is composed of GBE and subsidiary businesses that may not reflect commercial gearing levels. Neither should the large decline in average credit rating from A to BBB+ be taken as indicative of the decline in the credit quality of the sector. The ratings decline is due more to change in sample composition, rather than credit conditions, although there has been a small decline in the average credit rating of the group of companies that are common to both the 2004 and 2008 samples.

The group of business shown in Table 4.1 includes government owned businesses whose credit rating affects the credit rating of the rated business, and whose gearing is influenced by non-commercial issues. Many of the businesses listed in Table 4.1 (such as ETSA Utilities and Powercor Australia) are subsidiaries of other businesses. Therefore, it is difficult to place reliance on either the level of book gearing or average credit rating shown in the table.

#### **4.4 Gearing based on debt relative to RAB**

Gearing based on the estimated Debt/RAB ratio is shown in Table 4.2 below. The average Debt/RAB gearing ratio at the end of 2007 was estimated by Standard & Poor's at 95 percent, which as expected, is significantly higher than the book gearing (TD/TC) ratio of around 60 percent. The Debt/RAB ratios of some of these businesses may be due to the fact that they are subsidiaries. More generally, however, the high level of Debt/RAB is due to the fact that the EV/RAB ratio is generally greater than unity because of:

- The value of non-regulated businesses being included in Enterprise Value;
- Regulated businesses exceeding their operational and financing benchmarks; and
- A deliberate regulatory policy to promote continuing investment in essential infrastructure services.

As discussed previously, the EV/RAB ratio is sometimes used as a metric indicating ability to meet debt commitments rather than being an indicator of underlying optimal commercial gearing that is appropriate to use in the WACC formula.

Table 4.2

**DEBT-TO-RAB OF RATED AUSTRALIAN UTILITIES**

Company	Business	Date	Estimated Debt/RAB
Citipower Trust	Electricity	Dec. 2006	105%
ElectraNet Pty Ltd	Electricity transmission	June 2007	98%
Energy Partnership (Gas) Pty Ltd	Gas distribution	Dec. 2007	110%
Envestra	Gas distribution	Dec. 2007	96%
Envestra Victoria	Gas distribution	June 2007	123%
Ergon Energy Corporation	Electricity distribution & retail	Jan 2008	50%
ETSA Utilities Finance Pty Ltd	Electricity distribution	Dec. 2006	89%
GasNet Australia (Operations) Pty Ltd	Gas transmission	Dec. 2006	115%
Powercor Australia	Electricity distribution	Dec. 2007	85%
SPI PowerNet Pty Ltd	Electricity transmission	Dec. 2007	77%
Average			95%

Source: Standard & Poor's (May 9, 2008), *Industry Report Card: Australian Utilities' Credit Prospects Dimmed by Looming Shadow of M&A, Climate and Regulatory Risks*, p.13.

#### **4.5 Gearing based on market valuation of equity and book value of debt**

In Australia the number of businesses that can be relied on as appropriate market gearing comparators is relatively small. Applying the four comparables screening rules discussed in Chapter 3 above, we would select the following group of businesses for comparisons of gearing levels:

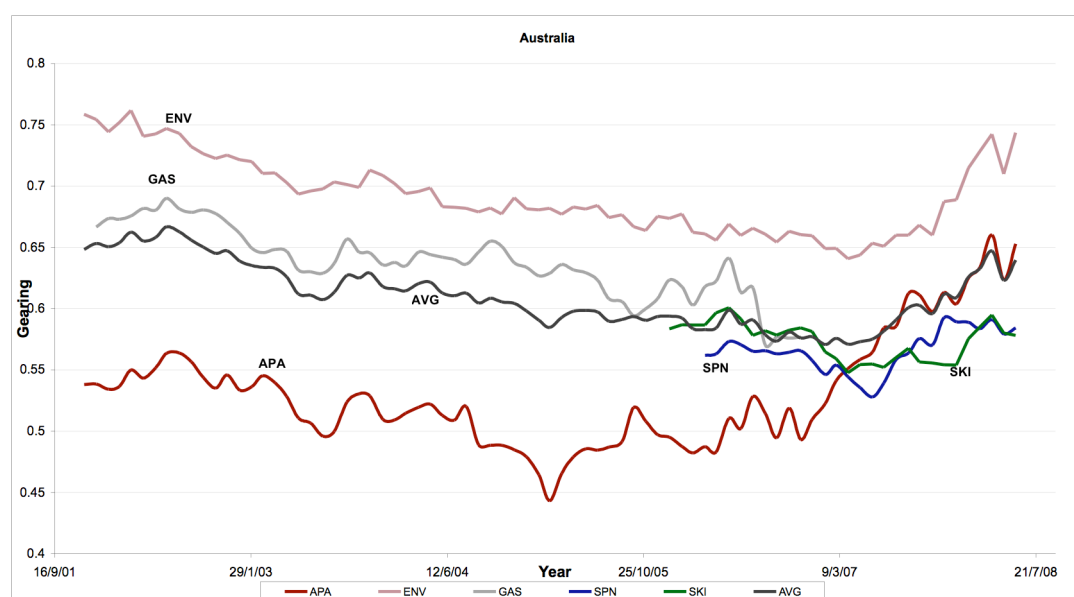
- APA Group
- Envestra
- GasNet
- SP AusNet
- Spark Infrastructure

We excluded all of the government owned businesses and the following privately owned businesses for the reasons given below:

- AGL – a large portfolio of significantly different businesses (such as generation and energy retailing).
- Alinta – a significant restructuring in its gearing ratios.
- Hastings Diversified Utilities Fund – significant operations in the UK water sector.
- DUET – significant operations in the US electricity sector.

While APA Group includes a significant component of non-regulated assets, we have included APA Group because the nature of the non-regulated assets is very similar to that of the regulated assets. That is, the non-regulated assets of APA Group are also mainly gas transmission pipelines. In Figure 4.1 we have shown estimates of gearing over the period from 2001 to 2008, measuring gearing as market equity to book value of equity plus market equity. We calculated the market value of equity from the quoted share price, used annual observations of debt levels, adjusted them for the implications of Shareholder loans and vertical structures, and interpolated between the annual observations. Hence, we developed monthly market gearing estimates, and calculated the average gearing for the five businesses in the comparator sample at each point over the five-year period.

Figure 4.1

**AUSTRALIAN REGULATED ENERGY: BOOK DEBT/BOOK DEBT + MARKET EQUITY**

Source: Bloomberg and company reports

The results in Figure 4.1 show that the market gearing of the sample group of businesses has fluctuated in a band from 50 percent to 70 percent, with an average very close to 60 percent for the past five years, which is consistent with the regulatory gearing assumption that has been used. From mid 2007 to mid 2008 the level of market gearing observed for the group average has risen to close to 65 percent. As discussed in Chapter 3, the latest year of observations is likely to overstate the market gearing if the likely recent fall in the market value of debt is taken into consideration. That is, since the market value of equity has been falling as interest rates have risen, by not also taking account of the fall in the market value of debt, the ‘market’ gearing ratio that is normally applied (Book Debt/ Book Debt plus Market Equity) will over-state the true level of market gearing (Market Debt/ Market Debt plus Market Equity).<sup>21</sup>

<sup>21</sup> Note that the rolling gearing estimates shown in Figure 4.1 are calculated to May 2008 based on market equity (number of shares times share price), while the corresponding book values have been held constant after the last reported balance sheet date (June 2007 for APA; December 2007 for ENV and SKI; and March 2008 for SPN)

It should also be noted that one of the comparators (SP AusNet) is rated A- by Standard & Poor's, which reflects the rating of its major shareholder.<sup>22</sup> On a stand-alone basis it is likely that the rating would be lower.

#### 4.6 Comparison of measurement approaches

In Tables 4.3 to 4.5 we show side-by-side comparisons of alternative gearing measurements for three businesses, Envestra, SP AusNet and Spark Infrastructure, which are largely regulated. APA Group and GasNet have not been included in this group as the Debt/RAB multiple would be meaningless for the former due to its large unregulated business component, and GasNet was acquired in 2006. In each case we make adjustments that are discussed in Appendix A, for the impact of Shareholder loans or vertical company structure. The four gearing ratios displayed are:

1. Total Debt/Regulated Asset Base
2. Total Debt/Total Capital (using the Standard & Poor's book gearing definition)
3. Total Debt/(Total Debt plus Market Capitalisation of Equity)
4. Net Debt/(Net Debt plus Market Capitalisation of Equity)

Overall, the conclusion that becomes apparent from Tables 4.3 to 4.5 is that market gearing has been falling, possibly due rising equity values up to 2006, although this has not been an enduring trend. We have noted previously that the 'market gearing' measures (3 and 4) will be underestimated for 2007-2008 due to the fall in the market value of debt during that period. This is evident in the case of SP AusNet, where the rise in apparent 'market gearing' (3 and 4) from 54-55 percent in 2007 to 59 percent in 2008 is likely to overstate the actual rise in market gearing. Since there is no 2008 annual report for Envestra, the recent spike in gearing that we saw in Figure 4.1 above is not observed in Table 4.3.<sup>23</sup> The TD/RAB measure shows the highest level of gearing, with book gearing being higher than market gearing in the case of Envestra, but relatively similar to market gearing in the case of SP AusNet and Spark Infrastructure, which have been listed more recently.

Table 4.3

#### ENVESTRA: ALTERNATIVE MEASURES OF GEARING

Year	01	02	03	04	05	06	07
1. TD/RAB	1.04	1.03	1.02	1.03	1.05	0.98	0.94
2. TD/TC	0.80	0.81	0.81	0.81	0.85	0.85	0.86
3. TD/(TD+MC)	0.78	0.75	0.70	0.69	0.69	0.66	0.65
4. ND/(ND+MC)	0.78	0.75	0.70	0.68	0.68	0.66	0.65

Source: Bloomberg and company reports

<sup>22</sup> Standard & Poor's (May 9, 2008), p.13 notes a negative watch due to a negative watch being placed on the the parent, Singapore Power.

<sup>23</sup> For Envestra we assumed that Net Debt during 2008 was held constant at the value shown at the December 2007 balance sheet date.

Table 4.4

**SP AUSNET: ALTERNATIVE MEASURES OF GEARING**

Year	2006	2007	2008
1. TD/RAB	0.80	0.76	0.74
2. TD/TC	0.57	0.57	0.58
3. TD/(TD+MC)	0.56	0.55	0.59
4. ND/(ND+MC)	0.56	0.54	0.59

Source: Bloomberg and company reports

Table 4.5

**SPARK INFRASTRUCTURE: ALTERNATIVE MEASURES OF GEARING**

Year	2005	2006	2007
1. TD/RAB	1.05	0.97	0.97
2. TD/TC	0.63	0.61	0.61
3. TD/(TD+MC)	0.60	0.60	0.57
4. ND/(ND+MC)	0.58	0.58	0.55

Source: Bloomberg and company reports

It is also apparent from the two market measures of gearing (using Total Debt and Net Debt respectively)<sup>24</sup> that they are very similar due to a small amount of cash being on hand.

Finally, it should be noted that over the past 5 years the ‘market gearing’ (Net Debt/Net Debt plus Market Equity) of the ASX200 Index member companies has been only 34 percent.<sup>25</sup> That is, the average gearing of the sample of regulated energy businesses has been approximately twice as high as the gearing of the average listed company.

## 4.7 Conclusions

We conclude that an appropriate time period for measuring gearing could be 5 years, with an annual frequency for estimating the benchmark gearing level. Examining the available information we find that:

- Standard & Poor’s measures the Total Debt/RAB of regulated energy businesses at approximately 95 percent;
- Standard and Poor’s measures the book Total Debt/Total Capital of regulated energy businesses at approximately 60 percent, although there was a considerable range around these values and not all these businesses could be considered appropriate comparables;

<sup>24</sup> Net Debt is defined as Total Debt less Cash and Equivalents.

<sup>25</sup> Measured by Bloomberg over the five years to May, 2008.

- We have measured the average market gearing (Net Debt/Net Debt plus Market Capitalisation of Equity) of five comparable businesses to be 60 percent over the period from 2003 to 2008.
- Market gearing has tended to reduce slightly over the last 5 years, with a small increase in the last year that is likely due to rapidly rising interest rates (and falling equity values) emerging from the credit crunch.

Overall, we conclude that there is no persuasive evidence to cause the regulatory gearing level to be moved from the prevailing level of 60 percent. Based on available evidence, we believe that 60 percent debt gearing is a good representation of the optimal gearing level.

## *Appendix A*

### Case studies

#### **A.2 Envestra**

Envestra was formed to acquire the natural gas distribution networks of Boral Limited located in South Australia, Queensland and the Northern Territory by way of acquisition of the shares in the companies that owned the assets. Stapled securities were offered to raise funds to assist in this acquisition. Each Stapled Security comprised a share and a loan note in Envestra, which can only be sold or otherwise dealt with together. Accordingly, there is a single price for a Stapled Security. The Prospectus described the loan notes as follows:<sup>26</sup>

The loan notes are unsecured subordinated debts of Envestra. The Condition of Issue provides that, in a liquidation of Envestra, the rights of Noteholders to recover any moneys owing to them are subordinated or postponed to all other creditors in Envestra while Envestra has any Finance debt. This means that all debts and moneys owing by Envestra to all other creditors of Envestra are required to be paid or satisfied before moneys owing to Noteholders can be paid.

The principal amount of the Loan Note must be repaid by 2047. However, repayments of principal on the Loan Notes can be made at any time if the terms and conditions of Envestra's Finance Debt permit.

Interest rate on the Notes are capped at certain levels but it is only payable to the extent to which there is available cash for the relevant Interest Period and the payment of interest would not cause Envestra to breach its obligations under any Finance Debt arrangements. Where there is insufficient or no available cash for an interest period to make an interest payment up to the amount of the capped interest rates, investors will receive a lower rate of interest or no interest payment at all. A shortfall in any interest period will not be carried forward for payment later as investors have no entitlement to receive payment of interest shortfalls.

It is clear from the above description of the loan notes in the Prospectus, that Loan Note investors have a residual claim on the asset of Envestra. As the Loan Note is stapled to the share and can only be sold or otherwise dealt with together, the Loan Notes can be deemed as equity and the market value of each share of equity will incorporate the value of the share and the stapled Loan Note. However, for accounting purposes Envestra classifies the securities as debt in its financial reports. Consequently, to calculate gearing based on book values, the outstanding balance of the Loan Notes needs to be:

- Removed from the reported book debt balance; and
- Added to the reported book equity balance.

To estimate Envestra's gearing on a market value basis (assuming that book value of debt approximates the market value of debt) Envestra's debt exposure was measured net of the Loan Note balance, and the market value of equity was measured as share price multiplied by shares (each being a stapled security) on issue. We obtained information on the Loan Note balance over time from Envestra's website<sup>27</sup>. Over time the balance of the Loan Notes has been declining as the capital value of the notes has been distributed to security holders.

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<sup>26</sup> Envestra Prospectus

<sup>27</sup> See [http://www.envestra.com.au/share\\_info/stapled\\_securities.html](http://www.envestra.com.au/share_info/stapled_securities.html)



Table A.1

**ENVESTRA: GEARING COMPONENTS (\$ MILLIONS)**

Envestra	A	B	C	D	E	A - C	B - C
	Total Debt	Net Debt	Loan Note	Cur. Mkt. Cap	Total Capital	Adj. TD	Adj. Net Debt
2001	2047	2007	298	494	2176	1749	1709
2002	2060	2025	301	585	2174	1760	1724
2003	2056	2046	265	778	2218	1792	1781
2004	2076	1989	234	816	2280	1842	1755
2005	2104	2054	187	862	2250	1917	1867
2006	1997	1970	148	941	2171	1849	1823
2007	1949	1937	102	984	2158	1847	1835

Source: Bloomberg and ACG Analysis ; Item A,B,D,E from Bloomberg

Table A.2

**ENVESTRA LOAN NOTES**

Year	Loan Note Balance	Number of Shares	Loan Value \$m
1998	0.65	353.00	228.68
1999	0.60	352.94	212.40
2000	0.55	588.64	321.93
2001	0.49	609.41	297.82
2002	0.43	705.26	300.87
2003	0.36	727.46	264.87
2004	0.30	769.66	233.67
2005	0.24	769.66	186.87
2006	0.18	814.30	147.71
2007	0.12	852.28	102.27

Source: Envestra Website and ACG Analysis

**A.3 SP AusNet**

SP AusNet is a diversified energy infrastructure business that owns and operates electricity transmission and distribution, and gas distribution networks in Australia. Prior to listing on the ASX on 21 October 2005, SP AusNet Distribution entered into a Stapling Deed with the following entities:

- SP Australia Networks (Transmission) Ltd
- SP Australia Networks (Finance) Trust

The Stapled Group is SP AusNet<sup>28</sup>. Each security of SP AusNet consists of one share in each of SP AusNet Transmission and SP AusNet Distribution, and one unit in SP AusNet Finance Trust. The shares and unit are stapled together such that any one share cannot be transferred, or otherwise dealt with, without the others<sup>29</sup>.

SP AusNet Transmission and SP AusNet Distribution own the assets comprising the electricity transmission business and electricity and gas distribution businesses through operating subsidiaries. The principal activity of SP AusNet Finance Trust is to lend money to the other entities of the Stapled Group, i.e. SP AusNet Distribution and SP AusNet Transmission and their controlled entities, for the purpose of financing the acquisition of transmission and distribution businesses<sup>30</sup>.

For statutory reporting purposes, SP AusNet Distribution was identified as the acquirer in the Stapled Group and is consolidated in the financial report of SP AusNet. We combined book values of SP AusNet Distribution with the fair values of the identifiable assets, liabilities, and contingent liabilities of SP AusNet Transmission and SP AusNet Finance Trust from the date of stapling.

The notes to financial statements for the financial years 2006 to 2008 indicate that loans from SP AusNet Finance to other entities of the Stapled Group are not reflected in the liability section of the consolidated financial reports. The primary liabilities in the consolidated financial reports are syndicated bank borrowings, domestic medium term notes, US senior notes and working capital borrowings. Consequently, no debt adjustment was undertaken for SP AusNet.

Table A.3

**SP AUSNET: GEARING COMPONENTS (\$ MILLIONS)**

SP AusNet	Total Debt	Net Debt	Cur. Mkt. Cap	Total Capital
2006	3496	3488	2720	6110
2007	3560	3551	2972	6213
2008	3671	3659	2532	6282

Source: Bloomberg

**A.4 Spark Infrastructure**

Spark Infrastructure was established to develop a diversified portfolio of utility infrastructure assets. At the time of establishment, the company issued Stapled Securities to acquire 49% interests in CitiPower and Powercor through CHEDHA and ETSA. Each Stapled Security is comprised of the following:

- 1 unit of Spark Infrastructure Trust
- 1 share in Spark Infrastructure Company 1
- 1 share in Spark Infrastructure Company 2
- 1 CHESS Depository Interest (CDI) representing one share in Spark Infrastructure 3

<sup>28</sup> SP AusNet (2006) *Annual Report 2006*, p. 40

<sup>29</sup> SP AusNet Prospectus and Product Disclosure Statement Section 1.2

<sup>30</sup> SP AusNet (2006) *Annual Report 2006*, p. 194

- 1 Loan Note issued by the Responsible Entity a trustee of Spark Infrastructure Trust

The Loan Notes have a 100-year, non-amortising term and accrue interest at 10.85% of the face value on a cumulative basis. The notes are used to subscribe subordinated debt in the asset companies – CHEDHA and ETSA<sup>31</sup>.

For accounting purposes, the Loan Notes are treated as debt items in the Balance Sheet. However, on an economic basis, the loan notes behave like equity. The Loan Notes cannot be traded separately from the equity portion of the stapled security. Furthermore, the loan notes are subordinated debt, which is owned by equity holders. In other words, equity holders have residual claim to the debt exposure, and anyone who purchases a security purchases the whole package.

Therefore, in order to analyse the actual debt exposure for Spark Infrastructure, a bottom up approach is required. We constructed the firm's 'see through' debt via the debt exposure of its asset and other debt facilities used to purchase an interest in CHEDHA and ETSA. The Spark Infrastructure Prospectus indicated that Spark Infrastructure raised \$425 million in addition to its issuance of Stapled Securities. The reported debt information for CHEDHA and ETSA for the financial period between 2005 and 2007 were obtained from a Spark 'Analyst Information Pack'. The reported figures in the balance sheets of CHEDHA and ETSA include subordinated debt from the owners.

The 'see through' debt exposure for Spark Infrastructure includes the debt at both levels of the structure. We adjusted the asset debts of ETSA and CHEDHA for Cash and Shareholder Loans to obtain Net Debt. As Spark Infrastructure has a 49 percent interest in the ETSA and CHEDHA assets, we attributed a 49 percent proportion the debt exposure to reflect the ownership by Spark Infrastructure. Lastly, the adjusted asset net debt was added to the Spark Infrastructure's net debt to obtain Spark Infrastructure's total debt exposure.

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<sup>31</sup> Spark Infrastructure – Prospectus and Product Disclosure Statement: Section 11.8.3 pg. 140

Table A.4

**SPARK INFRASTRUCTURE: GEARING COMPONENTS (\$ MILLIONS)**

Asset Debt		CHEDHA	ETSA	Total	= 49% * Total	Spark	Total
<b>2005</b>	Short Term Debt	173	93				
	Long Term Debt	3976	2779			425	
	Cash	298	108			5	
	Shareholder Loan	1822	648				
	Equity	N/A	N/A				
	<b>Net Debt<sup>1</sup></b>	<b>2028</b>	<b>2117</b>	<b>4145</b>	<b>2031</b>	<b>420</b>	<b>2451</b>
	<b>Total Debt<sup>2</sup></b>	<b>2326</b>	<b>2224</b>	<b>4551</b>	<b>2230</b>	<b>425</b>	<b>2655</b>
	<b>Total Capital<sup>3</sup></b>	N/A	N/A				N/A
<b>2006</b>	Short Term Debt	679	150				
	Long Term Debt	3325	2719			425	
	Cash	94	143			49	
	Shareholder Loan	1799	648				
	Equity	640	1116				
	<b>Net Debt</b>	<b>2112</b>	<b>2079</b>	<b>4190</b>	<b>2053</b>	<b>376</b>	<b>2429</b>
	<b>Total Debt</b>	<b>2205</b>	<b>2221</b>	<b>4427</b>	<b>2169</b>	<b>425</b>	<b>2594</b>
	<b>Total Capital</b>	<b>4644</b>	<b>3985</b>	<b>8629</b>	<b>4228</b>		<b>4228</b>
<b>2007</b>	Short Term Debt	457	106			200	
	Long Term Debt	3611	2797			225	
	Cash	116	168			62	
	Shareholder Loan	1720	648				
	Equity	733	1256				
	<b>Net Debt</b>	<b>2232</b>	<b>2088</b>	<b>4319</b>	<b>2117</b>	<b>363</b>	<b>2480</b>
	<b>Total Debt</b>	<b>2348</b>	<b>2256</b>	<b>4604</b>	<b>2256</b>	<b>425</b>	<b>2681</b>
	<b>Total Capital</b>	<b>4801</b>	<b>4160</b>	<b>8960</b>	<b>4391</b>		<b>4391</b>

Source: Spark Infrastructure and ACG Analysis

1 Net Debt = Short Term Debt + Long Term Debt – Cash – Shareholder Loan

2 Total Debt = Short Term Debt + Long Term Debt – Shareholder Loan

3 Total Capital = Short Term Debt + Long Term Debt + Equity

Table A.5

**SPARK INFRASTRUCTURE: GEARING (\$ MILLIONS)**

Spark Infrastructure	Total Debt	Net Debt	Cur. Mkt. Cap	Total Capital
2005	2655	2451	1750	4228
2006	2594	2429	1750	4228
2007	2681	2480	1997	4391

Source: Spark Infrastructure and ACG Analysis