

Betas and other CAPM parameters for Australia Post's Reserved Letter Business

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Introduction and Executive Summary

Australia Post has asked us to provide an independent assessment of certain inputs to estimating its cost of capital for the Reserved Letter Business. We understand that it is to be used for both internal and regulatory purposes.

We address four areas of work as requested:

1. Determine a new asset beta and equity beta for Post's reserved letter service;
2. Update the more generic Capital Asset Pricing Model parameters such as the market risk premium, imputation adjustment;
3. Provide a brief survey of recent Australian material (e.g. regulator's decisions) on item 2 issues; and
4. Provide a brief survey of overseas and Australian research on the impact of price regulation on the cost of capital of regulated firms.

At this time we have not found any research that deals directly with the fourth area, consequently we have not reported on it.

We have also reviewed the most recent ACCC decision of an appropriate rate of return for Australia Post. We noted that the ACCC estimates of an asset and an equity beta were well below past estimates provided by VAA. We undertook a study of the reasons for the difference.

We are of the view that the ACCC estimates are biased downwards, largely due to its use of weekly data with the attendant thin trading issues. We also found that betas of comparables were higher in the second 5 year period of the 10 year period used by the ACCC. This also explains the difference in the estimates given VAA used the 5 most recent years of data whereas the ACCC use 10 years of data. As a result of this analysis we are of the view that the use of five years of monthly data provided better estimates of beta than those arising from the unusual ACCC approach using 10 years of weekly data.

Our research provides the following recommendations as inputs to cost of equity and the weighted average cost of capital estimates.

Parameter	Recommendation	ACCC 2010 Decision
Beta of Assets	0.6	0.355
Beta of Equity	0.8	0.463
Market Risk Premium	8%	6.5%
Gamma	0.30	0.65
Gearing	30%	30%
Debt spread (over 10 year CTB)	140 bp	271 bp
Risk Free Rate	10 yr yield close to decision	



Asset and Equity Beta for Reserved Letters

The beta of equity captures the risk of equity that is rewarded by the market whereas the beta of assets reflects the operational risk rewarded in the market. The asset beta can be viewed as the risk of the business 'as if' it is financed by equity alone.

The difference between these two measures of risk arises from part debt funding of the business. The beta of equity will rise above the beta of assets when debt funding is employed. This comes about because debt investors contract for lower risk than the beta of assets thereby 'passing' risk to equity investors. This financing activity does not affect the beta of assets (operational risk) – it simply leads to a differential sharing of the risk between equity and debt capital providers.

This relationship is captured below.

$$\beta_A = \beta_D \frac{D}{V} + \beta_E \frac{E}{V} \quad (1)$$

Where:

β_a = beta of assets

β_D = beta of debt

β_E = beta of equity

D/V = gearing with D being the market value of debt and V = sum of the market value of debt and equity

E/V = (1 – D/V) where E is the market value of equity.

Re-arranging this equation provides the relationship between the beta of equity, debt and assets.

$$\beta_E = \beta_A + (\beta_A - \beta_D) \frac{D}{E} \quad (2)$$

These relationships are required to estimate the beta of assets, essentially because it usually cannot be estimated directly from market data, whereas the beta of equity can be estimated using market data.

When used to estimate the cost of capital both beta estimates should be forward looking. However, typically the beta of equity is estimated directly from the historical relationship of the return on equity relative to the return on a market index. Further, since neither Australia Post nor the Reserve Letter Business ["RLB"] is a listed company, the beta cannot be estimated directly. Consequently it is estimated by reference to comparable companies.

Unfortunately, for these purposes, there is no comparable business for Reserve Letters in Australia (or overseas for that matter). Consequently, we have selected listed companies that are considered closest to the Reserve Letter business to estimate our selection of an equity and asset beta. Descriptions of these comparables' activities are included in Appendix 2.

To assist in this judgement, it is useful to recognise what we do know about the underlying generic drivers of an equity beta. These include:

- i) **Revenue Beta** i.e. how the revenue from the asset(s) is expected to co-vary with the overall market revenue.
- ii) **Operating leverage** i.e. the proportion of fixed operating costs to total costs. The combination of Revenue Beta and Operating Leverage determine the Asset Beta. If operating costs are all variable then the Asset Beta will be the



same as the Revenue Beta. The larger the operating leverage the larger will be the Asset Beta (for positive Revenue Betas), ceteris paribus.

- iii) **Financial leverage** i.e. the proportion of 'fixed' interest claims to the value of the business. With no debt, the beta of equity will equal the beta of assets. Funding with debt (which is typically of lower risk than that reflected in the beta of assets) will pass risk to equity and increase the Equity Beta relative to the Asset Beta.

Ideally, comparable companies would be Australian based thereby facing similar market, tax and regulatory conditions to RLB. Further, since beta is a measure of risk that is relative to that of a well diversified portfolio, it is preferable to use a portfolio that is reflective of the holdings of Australian investors. A home bias in investing means we would ideally want to assess RLB risk relative to a market index that was predominantly Australian based.¹ However Australian comparable companies are limited, leading us to examine overseas companies.

If the comparable is from another economy then the beta of equity is usually estimated against an index of the 'home' country.

Comparable Companies

The RLB can be described as the collection, handling, sorting and delivery of letters in addition to the production and sale of postage stamps. This primarily involves domestically generated mail but also involves international incoming mail. Distribution logistics is an essential component of the activities.

We have selected listed Australian Distribution and Logistic companies as one set of comparable companies to reflect this component of the RLB business. The other set is international listed postal companies (see Appendix 2 for descriptions).

The screening process we followed to derive comparables was:

- Establish a set of companies using GICS Code (and country in some cases);
- Think laterally about the drivers of RLB systematic risk and what other types of business would have similar drivers;
- Assess whether revenue of the comparable has revenue that can be seen as letter or distribution based representing at least 50% of total revenue;
- Reject if there are less than 48 continuous monthly share market return observations.

This led to four international postal companies, five domestic logistics companies plus three domestic companies that have similar businesses. The first two sets are similar to those considered in the past and by the ACCC.²

¹ We are assuming that the investor base of interest is Australian.

² See ACCC, "Australia Post's Draft 2009 Notification" December 2009 p146-149 and re-affirmed in the 2010 Final Decision, p 78



Estimate of Betas

The beta of assets of 0.6 was derived from the beta of equity of the set of comparable companies.

The process involved delevering the beta of equity using the relationship captured in equation (1) above. The key inputs for this are the equity beta, the beta of debt and market value gearing.

The beta of equity was estimated from using ordinary least squares regression of the return on the comparable company against the return on the market. Sixty monthly observations were used in the regression analysis, when available, with a requirement that there be a minimum of 48 pair-wise observations. Research into the estimation period generally recommends 5 – 7 years of monthly data.³

The AER acknowledge this is common practice for the data providers:

*"In estimating equity betas, the common data series providers generally use an estimation period of five years (using monthly observations)."*⁴

Nonetheless, we note that the ACCC used 10 years of weekly observations when estimating the betas of comparables in the Draft and Final Decision. The estimates obtained by this unusual approach were below those estimated by VAA. We have analysed why the differences arose and a summary of our findings is presented in Appendix 1. In brief, it was found:

- That the ACCC estimates were low due to thin trading in the weekly data. The 'thin trading' implies that not all stocks were traded at the same time so that the same piece of information would be impounded into stocks as they traded at different time periods leading to serial correlation in the index and lowering the relationship between when a stocks trades and movements in the index. The result is a downward bias in the beta estimates. Even monthly returns suffer from this problem but not to the extent of weekly returns;
- The beta estimates rose over the second of the two five year sub-periods which also partially explained the difference because VAA used the most recent five years.

Our analysis supports the use of monthly relative weekly data for beta estimates. Also, we believe that the ACCC used weekly data over ten years leading to downward biased betas which were used in their determination of a WACC. The beta of assets (and equity) estimated for this report are consistent with historical estimates used by the ACCC. We are firmly of the view that the ACCC's estimate of 0.355 in the 2010 final decision⁵ seriously under-estimates the beta of assets and therefore seriously underestimates the regeared beta of equity. the ACCC's estimate of the beta of equity was 0.463. This also suffers from inconsistent treatment of the beta of debt when delevering comparable betas and then relevering at the selected gearing for RLB. The ACCC used a zero beta of debt when delevering but a beta of debt of 0.1 when relevering. This biases both the beta of assets and the beta of equity.

³ An example is Gonedes, N.J., "Evidence on the Information Content of Accounting Numbers: Accounting-Based and Market-Based Estimates of Systematic Risk," Journal of Financial and Quantitative Analysis, Vol. 8, 1973, pp. 407-433.

⁴ AER "Electricity transmission and distribution network service providers: Review of the weighted average cost of capital (WACC) parameters. Final Decision" May 2009 p271

⁵ See p 77 of Final Decision



Many practitioners assume that the beta of debt is zero however this is rarely the case. Debt is a risky asset and much of the risk is systematic. There is no doubt that credit or debt spreads (the difference between the debt return and a government debt security) are affected by general economic conditions. The greater the risk of debt the more closely it resembles equity and therefore the more the spread is affected by market conditions and the greater its beta. The assumption that the beta of debt is zero is unrealistic and will tend to bias downwards any estimate of the asset beta derived from equation 1.

Where possible we used the credit rating to 'back-out' a beta of debt. If this data was not available then we used a default beta of debt of 0.2. The CAPM relationship was used to 'back-out' the beta of debt since debt is a risky asset just as is the case for equity. This relationship is:

$$r_d = r_f + \text{MRP} \beta_d$$

where r_d is the observed yield on debt
 r_f is a risk free rate of return
MRP is the market risk premium and
 β_d is the beta of debt

Thus:

$$\beta_d = (r_d - r_f) / \text{MRP}$$

The default beta of debt of 0.2 was derived from an observed longer run average of BBB debt yields being 120 basis points above the risk free rate.

There are a number of different relationships between the beta of assets and the beta of equity in addition to equation (2). In general the "delever / relever" process leads to similar betas of equity if the same relationship is used to delever to an asset beta and subsequently relever to the appropriate gearing. It appears that the ACCC have not been consistent in this regard. The ACCC delever the equity beta of comparable companies using a beta of debt of zero (see Table 5.6 and 5.7 in the 2009 Draft Price Notification page 148)⁶ but then relever using a beta of debt of 0.1 (see Table 9.5 on page 159). This underestimates the resultant beta of assets and of equity.

ACCC report a beta of assets of 0.355 and a beta of equity of 0.463 in Table 9.5 (p159). If there was consistent use of a beta of debt of zero the beta of equity should be 0.506 when relevered. If, on the other hand there was a consistent use of a beta of debt of 0.1 then the beta of assets should be 0.378 and the beta of equity should be 0.497.

There appears to be either a typographical error or calculation error in Table 5.7 for K&S Corporation. We are unable to replicate the 0.407 for the asset beta. If we use the beta of equity and gearing in the Table then the beta of assets is 0.359 and this changes all other numbers. We are not sure which numbers are correct however, as we point out in the Appendix, we are of the view that the betas of equity are downward biased due to thin trading and a change over time. Consequently we are of the view that the betas are not appropriate in any case.

The market value gearing for each comparable company was based on an average of the last five years market value based gearing. The average of the last 5 years was used for three (related) reasons:

⁶ These are the same numbers used in the Final Decision and summarised in Table 5.3 of that Final Decision.



- The theoretical guidance is that the share price will reflect expected gearing. This may differ from current gearing consequently the objective is to assess a long term expectation;
- Academic research⁷ suggests firms act as if they target a particular gearing ratio but move away from it, in either direction, for expediency and cost reasons. Since raising funds is costly and subject to economies of scale then it is prudent to be 'lumpy' in these raisings. This means observed gearing at any point of time may not be reflective of the target however an average over time will better reflect the intention;
- Equity values will vary over time and there may be delays in adjusting internal debt levels accordingly. An average will provide some 'correction' for this.

Tables 1 - 3 capture the outcome from this research. Table 1 contains the most recent beta and gearing estimates for the international postal comparables. Table 2 contains the most recent estimates for the Australian logistics comparables while Table 3 contains the most recent estimates for other companies considered to face similar systematic risks. Our primary focus is on the first two sets of comparables with the third providing an additional reference point.

TABLE 1: BETA OF ASSETS AND BETA OF EQUITY OF COMPARABLE COMPANIES

Comparable	Market Cap (AUD M)	Beta Equity	Gearing	Beta Assets
TNT NV	10,463	1.1	17%	0.9
DEUTSCHE POST	22,800	1.2	51%	0.7
SINGAPORE POST	1,851	0.5	15%	0.4
Average		0.9	28%	0.7
OESTERREICHISCHE POST	2,093	0.2	8%	0.2
Average of all four		0.7	23%	0.5
Relever 3 comparables			30%	0.9

Data as at end September 2010

The average beta of equity for the international postal comparables is 0.9 compared with 0.7 if we include the Austrian service, Oesterreichische Post. In our view the Austrian company should be excluded on the grounds that it has not been listed long enough to provide a reliable estimate. There are 52 rather than 60 observations and beta estimates of early listing companies are generally unreliable. There are too few observations to observe how the beta estimate has behaved over time and its beta (and gearing) is quite different from the other comparables.

Re-leveraging the average beta of assets for the three comparable postal companies with an assumed gearing for Australia Post of 30% provides a beta of equity of 0.9. This becomes 0.7 if the fourth company is included.

Betas are estimated with error moreover, the estimates can change over time. Figure 1 shows how the average beta of both equity and the assets of the postal companies have behaved over time. The figure shows a rolling average beta i.e. it commences with the average beta of the three⁸ companies estimated using 60 monthly return observations for the company and the relevant index. The second point on the graph is derived by rolling each beta estimate forward by one month i.e. adding the next month but dropping the first month. This process continues until September 2010 which is the last point on the

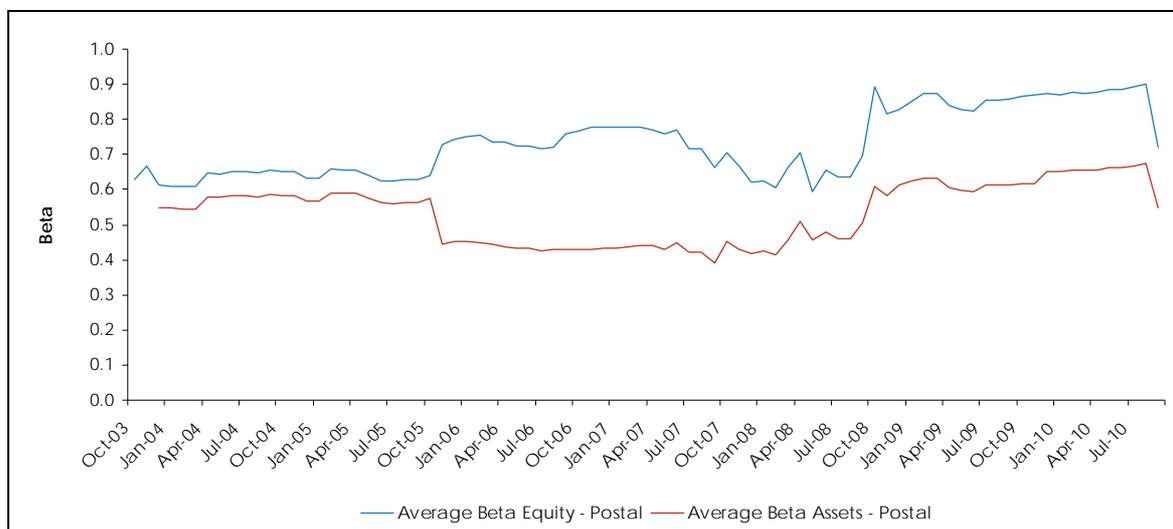
⁷ See for example Hovakimian A, T Opler & S Titman, "The Capital Structure Choice: New Evidence for a Dynamic Tradeoff Model," Journal of Applied Corporate Finance, Spring 2002

⁸ There is insufficient data for Oesterreichische Post for all but the last point.



graph. The beta of assets lies below the beta of equity. We did include Oesterreichische Post in the plot to show how its inclusion leads to a change in the series (the last point in the graph).

FIGURE 1: BETA OF ASSETS AND BETA OF EQUITY OF COMPARABLE COMPANIES



Both the average beta of assets and the average beta of equity show some relative stability since October 2008 despite considerable volatility of the underlying individual comparables. This provides comfort that a beta of equity in the range 0.8 – 0.9 and a beta of assets of 0.6 – 0.7 is a reasonable estimate derived from these comparables. We have selected the lower bound of 0.6 as representative of this group of comparables. A beta of assets in this range is also consistent with the beta of assets used by the ACCC in prior determinations viz. 0.55 in 2002 and 0.5 in 2008 but quite inconsistent with the 2010 decision which selected a beta of assets of 0.36. As previously noted, the estimate of 0.36 suffers from errors arising from thin trading and inconsistent treatment of the beta of debt.

Table 2 and Figure 2 show similar output to the international postal companies but in this case it contains information for the Australian Logistics comparables. There are 6 companies included with one, Lindsay Australia, being an ACCC selection.

TABLE 2: BETA OF ASSETS AND BETA OF EQUITY OF COMPARABLE COMPANIES

Comparable	Market Cap (AUD M)	Beta Equity	Gearing	Beta Assets
CTI LOGISTICS	45	1.1	30%	0.9
K & S CORP	206	0.5	24%	0.4
TOLL HOLDINGS	4,639	0.8	28%	0.6
WRIDGWAYS AUSTRALIA	89	0.9	0%	0.9
CHALMERS	16	0.6	40%	0.5
Average		0.8	24%	0.7
LINDSAY AUSTRALIA	43	0.6	65%	0.3
Average		0.8	31%	0.6
Relever to beta equity			30%	0.8

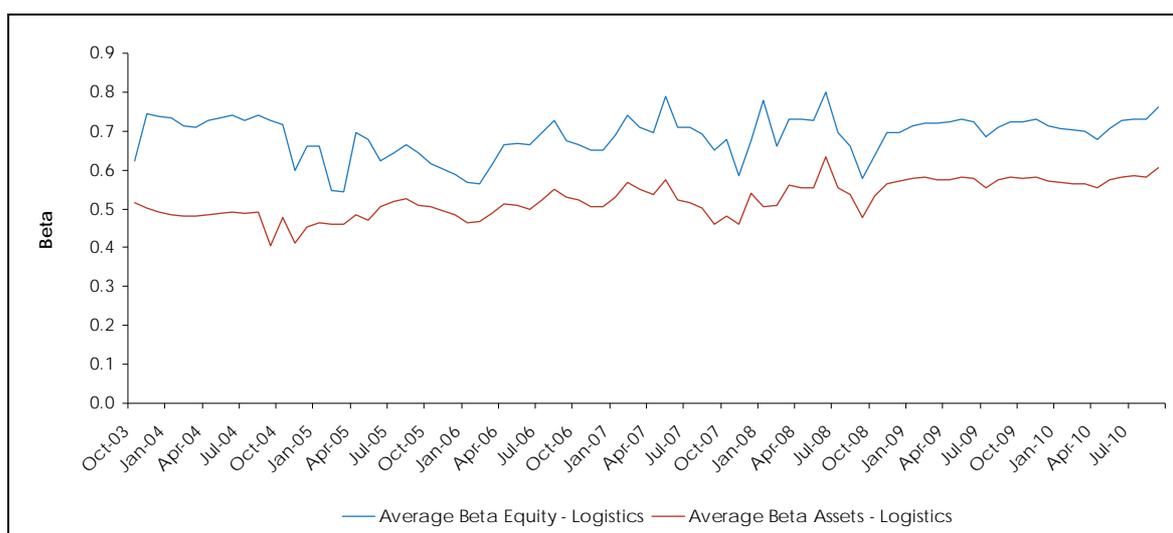
Data as at end September 2010



The overall average beta of assets in Table 2 is 0.6 leading to a levered beta of equity using 30% gearing of 0.8.

Figure 2 shows the average beta of equity and beta of assets for these companies over time. Once again the stability is evident despite considerable volatility in the estimates of the individual companies (not shown). This provides additional support for recent estimates of the beta of assets of circa 0.6 and a beta of equity of greater than 0.7 as presented in Table 2.

FIGURE 2: BETA OF ASSETS AND BETA OF EQUITY OF COMPARABLE COMPANIES



The ACCC used an average of both sets of comparables as its estimate of the beta of assets. If we follow the same procedure then the average beta of assets of the 10 international and domestic comparables is 0.64 and a levered beta of equity is 0.83 with the rounded estimates to 0.6 and 0.8 to avoid spurious accuracy.

These estimates are consistent with ACCC decisions prior to 2009 / 2010 and, given the high error in the estimates, we recommend a beta of assets of 0.6 and a levered beta of equity of 0.8.

As a further check on the estimates, Australia Post, in consultation with VAA, considered three additional companies that were considered to have similar characteristics to the RLB. Descriptions of these companies are included in Appendix 2. Estimates of beta and gearing are presented in Table 3. Average market value gearing of 28% was similar to the 30% selected for Australia Post however the average beta of equity and of assets was higher than the two prior sets of comparables. We infer from this analysis that the selected beta of assets of 0.6 and selected beta of equity of 0.7 may be too low.

TABLE 3: BETA OF ASSETS AND BETA OF EQUITY OF COMPARABLE COMPANIES

Comparable	Market Cap (AUD M)	Beta Equity	Gearing	Beta Assets
SALMAT	621	0.9	24%	0.7
PMP	235	1.6	46%	0.9
COMPUTERSHARE	5,418	0.9	14%	0.8
Average		1.1	28%	0.8
Relever			30%	1.1

Data as at end September 2010



In summary, the estimate of a beta of assets for Australia Post is 0.6; Re-leveraging this beta of assets at a target gearing of 30% leads to an estimated beta of equity of 0.8.

Gearing

As noted the gearing used for relevering the asset beta was 30% which was close to the average of that employed by comparable companies. This approach is consistent with the ACCC's view that gearing and the cost of debt should be based on a benchmark company rather than Australia Post's actual gearing.⁹ We note that the ACCC used gearing of 30% in its 2009 Draft determination and also in the 2010 Final determination.

This gearing was used to relever the asset beta to an equity beta using the relationship described in equation (2) above. It is also the gearing that would be used when estimating the WACC.

Update of WACC Parameters

In this section we provide our view of the appropriate WACC parameters that would apply over a 5 year period. These are summarised in Table 4.

TABLE 4: SUMMARY OF CURRENT VIEW OF PARAMETERS

Parameter	Current Estimate	Comment
Risk Free Rate	5.23%	Current Yield on a 10 year CGS (5/11/10)
Market Risk Premium (medium term)	8%	The rate expected to prevail over the next 5 years.
Market Risk Premium (long term)	7%	A rate that incorporates imputation tax benefits
Debt Risk Premium	140 bp	AA corporate bonds. This excludes any issuance costs which should be included as a cost item for the revenue build up
Gamma	Not more than 44% but we argue 0 for Australia Post	44% is an upper bound for the average Australian Company. 30% is a more likely upper bound.

Risk Free Rate

There has been some debate about what is the appropriate risk free rate to use in the CAPM. The debate has not concerned the source of the surrogate "risk free" rate which is a Government Issued security. The recent debate concerned the duration or term of such a security together with the sampling method used for determining an estimate.

The CAPM is a single period model of no fixed duration and various government securities from government bills to long term government bonds have been used as a surrogate rate. In the context of CAPM theory there is no reason to pick one duration over another.

However, ideally the duration of the CAPM should be the duration of the planning period of investors for which the CAPM is to be used to estimate an expected or required return. Typically there is often an implicit assumption of a match between the asset life and investor's planning horizon. Ideally, the maturity of the CAPM should be the maturity of the planning period for which the CAPM is to be used to estimate an expected or required return. This means that if the planning horizon is a long term investment then a long term

⁹ P140



government bond is the appropriate maturity to use. That is, the rate of return we are attempting to estimate for regulated network assets is that appropriate for long term investments. It is not the regulatory period which artificially breaks up investor's planning periods into 5 year (or shorter) periods.

This point is consistent with the general guideline that firms should match the length of their financing maturity with the life of the asset to minimise risks associated with funding, a point which we discuss further in the next section.

Further and importantly, it has been conventional to use 10 year bond yields as the proxy of the risk free rate in the estimation of the Market Risk Premium in the CAPM. One of the reasons for choosing such a security to "anchor" the base return has been that it is usually a highly liquid security so that current yield estimates are readily available. The data bases relating to the estimation of the Market Risk Premium that have been assembled typically use such a bond as the surrogate risk free rate. It would be inappropriate to use a different duration for the risk free rate to that used in estimating the MRP.

When a shorter term rate has been proposed it has been usually a 5 year rate on the grounds that this was consistent with the period of the regulatory decision, the approach the Commission has adopted. The objective of the regulator's decision should be to provide an adequate return to support the on-going funding of existing assets and new investment, and insofar as most of these assets are long lived assets a long term bond as a surrogate for the risk free rate is more appropriate.

We consider that the most appropriate risk free rate to use in the CAPM is the 10 year government bond yield.

The date at which the yield on a government bond should be taken as the surrogate for the risk free rate is the date closest to the date of the pricing decision since the yield is meant to reflect the risk free rate that could be expected going forward. It has been common practice amongst regulators to take an average over a particular period e.g. 20 days, on the grounds that a single days' rate may be affected by "unusual events" and be unrepresentative. When interest rates are changing in one direction (e.g. they are "on the rise") the most recent rate is going to be a better reflection of the rate going forward. In these circumstances the shorter the period of averaging should be better.

The consequence of using a 5 year rate, as was previously proposed by the AER, is that will be inconsistent with the rate used or implied in the Market Risk Premium.

While we prefer the use of a spot rate over an average rate, we note that the ACCC and Australia Post use an average of the yield on CTBs over 30 days as close to the decision date as is practicable. We make no further recommendation in this regard.

Market Risk Premium

Key Points

The required return of equity investors (or cost of equity) is generally derived from the CAPM. The CAPM is a forward looking model – it guides an assessment of what equity investors require to compensate them for time and risk over the period of interest.

The ex ante MRP is of the most critical and yet elusive measures of modern approaches to valuation. Ex-post it is impossible for this variable to be a constant because if it were constant there would be no risk and no risk premium. However, this does not mean the ex-ante estimation of this variable cannot be represented by a stable distribution with constant parameters; it is the ex-post measure which is stochastic. Moreover, the inherent



stochastic nature of the ex-post MRP and its importance to estimating the ex-ante MRP, inevitably, will make its estimation a subject of controversy and debate.

It is usual to use historical data to estimate the ex ante MRP however the stochastic nature of the historical MRP leads to a wide confidence interval around a point estimate required for the ex ante estimate. We are of the view that an estimate in the range 6 - 8% is reasonable under normal conditions and have argued for 7% as an estimate that reflects the imputation tax yield in the market return.

However, our view is that the ex-ante MRP is not constant and probably cannot be adequately represented by a stable distribution. Unfortunately, however, the theory as to what might cause the parameters of the distribution (and thus the mean ex-ante MRP) to change is not well developed. This makes forecasting changes difficult. Moreover, given the volatility of ex post market excess returns, even detecting such a change after the event is not easy. Given this state of knowledge about the MRP we usually recommend caution before changing an MRP estimate without strong evidence such as the effect of the Global Financial Crisis.

Nonetheless, there is an approach that is gaining acceptance to estimate MRP's in the light of changing economic conditions. The approach - which has some currency among UK academics, and which is applied by some professional fund managers and valuation firms in Australia - does not give a theory as to the causal factors for changing MRP but it does provide estimates of changes in MRP under changing economic conditions. The approach involves estimating an MRP from applying a constant risk premium per unit risk to a forward view of the risk (volatility) of the market.

Regulatory practice is to recognise the impact of volatility on the cost of debt but not the cost of equity i.e. a spot market risk premium is used to estimate the cost of debt but an average risk premium is used to estimate the cost of equity. This leads to narrowing of the spread between the cost of debt and the cost of equity in circumstances like those being experienced currently. This does not make sense. Further, it could lead to the debt premium being higher than the equity premium (beta times MRP) which again does not make sense.

Consequently, in our view, it is important to estimate a cost of equity that reflects the same economic effects that affect the cost of debt. The approach to estimating the MRP described above does this and our profile of the equity MRP largely mirrors that prevalent in the corporate debt market in Australia.

A current view of market risk or volatility can be derived from trades in options on the ASX 200 Index. The Black and Scholes option pricing model can be used to estimate the implied volatility of the market. By construction it is therefore a forward looking estimate of the risk of the market. We note that Professor Franks comments to the New Zealand Commerce Commission that when considering adjusting the MRP for the GFC that he would "rely on a combination of data such as implied market volatility from index options, credit spreads and other macro economic indicators."¹⁰ Our approach does this in a formal and transparent way.

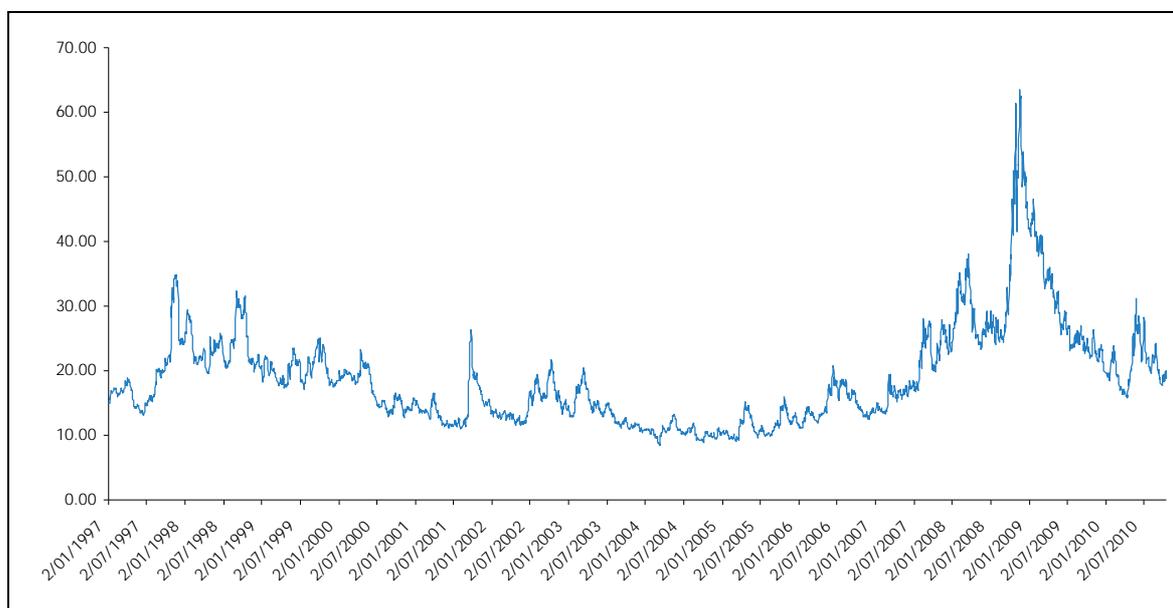
Figure 3 displays a time series of the implied volatility of a three month call option issued against the ASX 200 Index for the longest time period available to us i.e. from 1st January 1997 to 15 October 2010. The behaviour of implied volatility on longer dated options behaves similarly.

¹⁰ Franks J, M Lally and S Myers, "Recommendation to the New Zealand Commerce Commission on whether or not it should change its previous estimate of the tax adjusted market risk premium as a result of the recent global financial crisis," April 2010 ISBN:978-1-869450-98-2, p6



The impact of the global financial crisis (GFC) is clearly evident.

FIGURE 3: FORWARD VIEW OF VOLATILITY OF STOCK MARKET TO 15 OCTOBER 2010



Source: Bloomberg

We have found high correlation between the implied volatility and the annualised 30 (and 90) day moving average of the standard deviation of the ASX 200 Index.

As noted our forward estimates of the MRP are derived by applying a constant premium per unit risk to the forward view of risk (volatility). The premium per unit risk is derived from the ratio of long term historical MRP and a long term volatility estimate and we estimate this to be 0.5%. Ideally we would apply this to a forward estimate of volatility with a horizon equivalent to the regulatory period. However it is not available in Australia. Consequently we assume our implied volatility for a one year option (i.e. a one year forward view) regresses to the mean derived from historical data. The 'glide path' itself is derived from historical patterns in volatility and returns thereby assuming history can inform a view of the future.

Our glide path from the current one year view of MRP of 10% (found by applying the constant MRP per unit risk of 0.5 to the current estimate of risk of 20.4%) to the long run estimate of 7% provides a geometric average over the 5 year period to 2015 in the range 7.9% to 8.9% as presented in Table 5 below. We have taken a conservative view and recommended the lower end of the range of 8.0% be used in regulatory hearings. We are most uncomfortable with the use of 6% as the MRP over the next 5 year period.

We also point out that if the geometric average was calculated over a shorter period then the annual rate would be higher. For example the rates appropriate for a 3 year regulatory horizon would be 8.1%, 9.1% and 9.6% instead of the 5 year rates of 7.6%, 8.3% and 8.9% as shown in the last column of Table 5. A 9% MRP would be more appropriate for a 3 year horizon.



TABLE 5: POSSIBLE 'GLIDE PATHS' FOR MARKET RISK PREMIUM

MRP profile						
Current Volatility	20.4 As at 15/10/2010					
Average MRP	7.0%					
Average volatility - stable periods	14.0%					
Risk per unit volatility	0.50					
One year forward looking MRP						
Begin of Year	1	2	3	4	5	Geo Average
	2011	2012	2013	2014	2015	
Decline after 1 year	10.2%	7.0%	7.0%	7.0%	7.0%	7.6%
Decline over 3 years	10.2%	9.1%	8.1%	7.0%	7.0%	8.3%
Decline over 5 years	10.2%	9.6%	8.9%	8.3%	7.6%	8.9%

The AER have recognised the current highly volatile market conditions have led to an increase in the required market risk premium by investors.

*"The AER agrees generally that estimates of the short-term MRP are likely to be above the long-run equilibrium MRP, . . . "*¹¹

The practical recognition has been an increase in the MRP from 6.0% to 6.5%. In our view this increase does not adequately reflect the current view of risk expected over the next 5 – 6 years and will not provide an adequate incentive for investment. We are unsure of the quantitative or analytical basis for the addition of the 50 basis points selected by the AER.

We point out, however, that our estimate of 8.0% over the next 5 years is 2 percentage points above the AER's view of the long term MRP of 6%. In our view, informed by our assessment of historical data and from including a component in the market return to reflect the yield from imputation tax benefits, 6% is conservative and 7% is preferred as the long term estimate.

Debt Spread

In our view, the cost of long term debt is the most appropriate input to the WACC for RLB. In addition, this is best estimated from yields arising from current market trades where available.

The ACCC settled on an AA rating as a suitable benchmark for debt that might be issued by the RLB business. It also used 7 year maturing debt as the benchmark.

Data on long term debt and on all debt rating categories is sporadic at best under current market conditions, for example there has been no summary data reported in Bloomberg on AA rated bonds since June 2005. Further, 10 year maturing corporate debt does not trade very frequently making aggregated data unreliable. The most recent data for 7 year AA rated corporate bonds provides a spread of 137 basis points over the yield on 10 year Commonwealth Bonds. This makes the task of using a general approach to estimating a cost of debt derived from credit ratings and 'typical' spreads for credit ratings challenging.

We obtained a recent rating for the comparables. There were only 3 with a rating available from Bloomberg. These are summarised in Table 6.

¹¹ AER, "Victorian electricity distribution network service Providers Distribution determination 2011–2015 June 2010



TABLE 6: DEBT RATINGS OF COMPARABLES

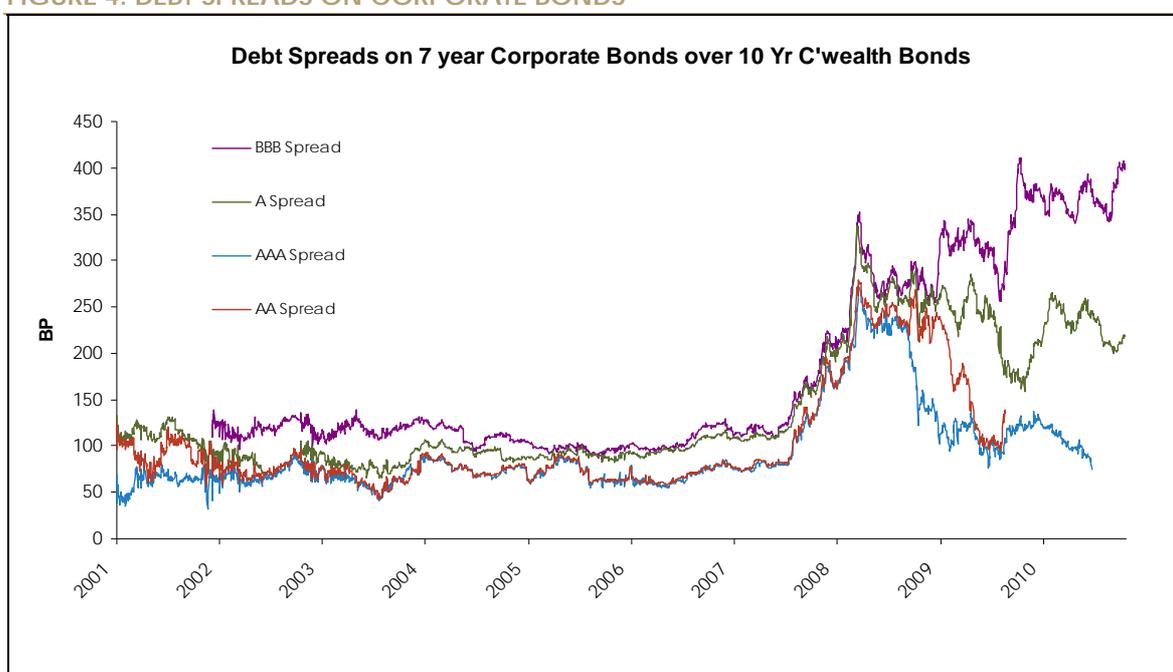
Company	S & P Rating
Singapore Post	AA-
TNT	BBB+
Deutsche Post	BBB+

This suggests the AA- rating used by the ACCC may be a little aggressive but we recognise that judgement is required here.

Figure 4 shows a history of credit spreads on 7 year maturing AAA, AA, A and BBB corporate bonds over the 10 year CGS.

Most noticeable is the recent divergent behaviour of the spread on AAA, and AA to some extent, and other bonds. The spread on AAA has reduced closer to historical levels whereas the spreads for A have remained higher.

FIGURE 4: DEBT SPREADS ON CORPORATE BONDS



From a recent rate sheets we observe only one 7 year AA- bond trading. It was trading at a spread of 377 basis points to the Commonwealth Treasury Bond Rate with a 10 year maturity. The average yield on bonds maturing in 10 years that were rated either AA-, AA or AA+ was 6.54% or a spread of 139 basis points over the 10 year CGS rate. One 5 year maturing bond was trading at a spread of 214 basis points while the average yields on AA, 3 year maturing bonds trading at 6.98% which is 190 basis points above the 3 year CGS yield. We observe that the average yield on all AA rated (i.e. AA-, AA & AA+), 3 maturing corporate bonds traded at 6.32% which is 124 basis points above the yield on 3 year CGS.

Ideally we would look for the spread on the longest maturing debt to closely match the life of the assets. On this basis the market based spread appears to be circa 140 basis points.



Imputation Tax

We are of the view that gamma is specific to the circumstances of a company. It depends upon how much tax it pays, how and when it distributes that tax to shareholders and how much, if any, of the distribution is claimed by shareholders. The cost of capital is a market rate affected by the risk (beta in the CAPM context) of the company, not its tax rate. However, to earn the cost of capital, it must cover its actual tax payments (the net tax that does not flow to shareholders). In the case of Australia Post, it has to cover its tax payments which will be at 30% because there is no recovery of this by shareholders from imputation tax claims: Australia Post does not pay franked dividends and the shareholder wouldn't claim them anyway.

The gamma that is relevant to the cost of capital is the 'market gamma' which is reflected in the expected return on the market used for the MRP estimate. This is a marginal construct that is fraught with measurement challenges.

We presented a view in our last assessment of the WACC for Australia Post that gamma used for defining the cash flow based revenue requirement should be zero. We are still of that view as noted above. The reasons were:

- Australia Post does not distribute franking tax benefits;
- Its shareholder does not claim franking tax benefits.

The ACCC is of the view that an average gamma for Australian companies, a term used to reflect the value of a dollar of imputation tax benefits, should be used for assessing the tax paid by Australia Post. Its estimate of this gamma was 0.65. The estimate is based on an assumed distribution ratio of 100% and an utilisation ratio of 0.65.

We are in strong disagreement with 0.65 being representative of gamma for an average Australian Company or investor. An assumed distribution rate of 100% does not accord with facts and is based on an incorrect premise.¹²

In our view, the empirical evidence points to an upper bound of 0.44 based on one set of data and more likely 0.30 (rounded) based on another set of data. If the gamma for an average Australian company was to be used for Australia Post then we recommend the use of a conservative 0.44 being the mid-point of the widest 'reasonable range' described above. We suspect 0.30 is more appropriate as we have doubts about the upper bound of 0.44 due to differences in the results of two studies.¹³

Table 7 summarises our view of the range or possible upper bounds of gamma based on the evidence available to us.

The first data column considers the case whereby all imputation tax benefits are distributed at the rate of 70% p.a. The distribution rate of 70% is a rounded estimate for 68% being the percentage of tax paid that has been distributed by way of imputation tax benefits.¹⁴ The net tax paid by companies to June 2008 since the introduction of the imputation tax system on 1 July 1987 is approximately \$539 billion. The FAB balance as at 30 June 2008 is reported as \$174 billion. This suggests that over the 21 year period, 32% of tax paid has not been distributed or conversely 68% have been distributed on average.

¹² An argument used to support a 100% distribution rate was that it was consistent with a paper written by Officer ("The cost of capital under an imputation system", Accounting and Finance May 1994). The paper made no such assumption and is agnostic to the distribution rate.

¹³ Hathaway N, "Imputation and Valuation" Capital Research Pty Ltd, June 2006 and Handley & K Maheswaran, "A Measure of the Efficacy of the Australian Imputation Tax System" The Economic Record, V84 No 264, March 2008, pp82-94

¹⁴ This was taken from ATO tax statistics.



The simple assumption is that there is a delay of one year between the tax being paid to the ATO this being subsequently claimed by individuals or Super Funds. Of \$1 of tax paid, \$0.70 is distributed as imputation benefits and it is assumed to be redeemed. With a discount rate of 12%, the value at the time the tax paid is circa \$0.63.

The second data row uses the average redemption rate from Handley and Maheswaran of 70% (ignoring any structural change assumption) while the last data row used a rounded mid point of the redemption rate found by Hathaway (2006).

TABLE 7: UPPER BOUND ESTIMATES OF GAMMA

	70% Distribution rate, 30% wasted	Source / Assumption
Present Value at Creation Date	\$0.63	12% average Cost of Equity
Redemption rate 70%	\$0.44	Handley and Maheswaran
Redemption rate 50%	\$0.31	Hathaway

Hathaway examines tax statistics and estimates that the redemption rate is between 45% and 53% (we choose 50% to represent this range) while Handley and Maheswaran estimate it to be 71% (we round this to 70%) over the entire period of their sample. At a 70% redemption rate, the upper bound for the average company gamma will therefore be in the order of \$0.44 in the dollar. At a 50% redemption rate from the Hathaway estimate, the upper bound of the 'average' gamma would be 31 cents.

In our opinion the combination of 70% distribution (30% wasting) and 70% redemption is a feasible upper bound thereby providing an upper bound in the range 31 - 44c for a value of gamma.

We understand that Hathaway may be revisiting his estimate of the redemption rate and in so doing has questioned some of the Handley and Maheswaran results. We await the outcome of this research which may lead us to view the upper bound as lower than 31 - 0.44c.

We also note that the lower bound for the value of a dollar of imputation benefits is zero. This is the case for overseas investors for example. However this should be factored into the estimated redemption rate we have used in our analysis.

We note that capital market evidence from a drop-off studies provide a range of values for theta. The latest research by SFG Consulting was cited in the Australian Competition Tribunal's "Reasons for Decision"¹⁶ document which found a value of 0.23 for the utilization rate. When applied to a distribution ratio of 0.7 the outcome is a gamma of 0.16. The Tribunal noted (p31) that caution must be placed on this empirical finding but it also noted that caution should be placed on the Beggs and Skeel empirical finding largely relied upon by the AER.

This additional data from the SFG drop off study is partially the reason why we have selected the lower end of our range of likely values as a point estimate however further research may change this.

Clearly the value of gamma for the 'average' Australian company is still subject to debate and uncertainty. We stress that this is applicable to assessing the MRP for the cost of capital and should be viewed as zero for the purpose of estimating how much tax the

¹⁶ Australian Competition Tribunal, Application by Energex Limited (No 2) [2010] ACompT 7



business has to recover in order to meet its shareholder cash flow needs defined by the opportunity cost of capital and the value of the investment.



Brief Survey of Recent Australian Material

"Provide a brief survey of recent Australian material (e.g. regulator's decisions) on item 2 issues."

The most recent AER / ACCC regulatory decision is a draft decision for Victorian Electricity Distribution companies presented in June 2010.

This is summarised in the Table below along with a recent decision for Queensland electricity distribution companies. These reflect current AER / ACCC decisions although we also understand that the Queensland decision is under challenge and is likely to be revised.

Parameter	Vic Distribution Companies June 2010	Qld Distribution Companies May 2010
Risk Free Rate	10 year rate (5.65%)	10 year rate (5.64%)
Market Risk Premium	6.5%	6.5%
Beta of Equity	0.8	0.8
Debt Risk Premium	3.25% (10 yr BBB+)	3.33% (10 yr BBB+)
Gearing	60%	60:40
Gamma	0.65	0.65

Some recent Australian Research of interest includes:

Paper	Brief Comments
Officer R.R. and S.R. Bishop "Market Risk Premium: Comments on the AER Draft Distribution Determination for Victorian Electricity Distribution Network Service Providers", July 2010	Argues for an 8% MRP over the next 5 years to reflect current economic uncertainty. MRP is derived by applying a constant MRP per unit risk to current estimates of market volatility and 'gliding' this to the long term average MRP
John Handley and Krishan Maheswaran "A Measure of the Efficacy of the Australian Imputation Tax System" The Economic Record, March 2008	Examines tax statistics to assess the amount of tax paid by corporations that is redeemed by individuals - 'is the imputation tax system working as planned' is the nature of the question they address. They argue that redemption has risen from an average of 67% over the period 1990 - 2000 to 81% over the period 2001-2004. This study was relied upon by the AER when selecting 0.65 as a value for gamma (along with a drop off study by Beggs and Skeels).
Hathaway, "Comment on: A Measure of the Efficacy of the Australian Imputation Tax System" by John Handley and Krishan Maheswaran, 2010.	Argues that some of Handley and Maheswaran's conclusions are an artefact of the assumptions they made in their data analysis and therefore their conclusions cannot be relied upon. This is very recent and there hasn't been a response to it by Handley and Maheswaran as yet.
Hathaway, "Imputation Credit Redemption: ATO data 1988-2008", July 2010	Another very recent paper that argued there is a \$43b gap in the ATO statistics around franking credits and therefore the data



	cannot be relied upon
Strategic Finance Group, "Issues relating to the estimation of gamma. A report prepared for Citipower, Jemena Electricity Networks, Powercor", 15th July 2010	Haven't been able to obtain a copy of this yet, Stephen Gray has advocated that gamma should be zero for a long time. His recent drop off research provides a theta of circa 22c which, when combined with a distribution rate of 70% leads to a gamma of circa 16%. We assume this paper makes this point and criticises the AER's choice of 65%
McKenzie and Partington, "Evidence and submissions on gamma", A report prepared for the AER, 25th March 2010	This is a paper prepared for the AER that argues that drop-off studies suffer from many econometric problems and are therefore quite unreliable. They argue that this requires examination of a broader set of information when forming a view of gamma. It scrutinises the SFG papers and drop-off studies reported since 2008 and listed on p 6-7 of their paper
Christopher L. Skeels, "Response to Australian Energy Regulator Draft Determination. A Report prepared for Gilbert and Tobin" by, Department of Economics, The University of Melbourne, 13th January 2010	The Beggs and Skeels drop off study has been heavily relied upon by the AER in establishing its gamma of 0.65, despite the conflicting findings of the subsequent SFG research. Skeels worked with SFG on its data and analysis and has endorsed this research as good and clean. The Beggs and Skeels data has not been made available to enable reconciliation with SFG but Skeels has embraced the SFG work! The AER appear to be downgrading the SFG work because they argue it hasn't been published.
Olan Henry, "Estimating β ", Submitted to AER April 2009 and Olan Henry, "Econometric advise and beta estimation," 2008; two papers prepared for the AER	Technical papers that deal with issues around beta estimation and that derive beta estimates for electricity distribution companies. Analysis included and examination of beta over time.



Appendix 1: Reconciliation of VAA and ACCC Estimated Betas

Introduction

VAA recently estimated betas for comparable companies on behalf of Australia Post ["AP"] for inclusion in AP's submission to the ACCC. The ACCC estimated betas using similar comparable companies however the estimates were much lower than those estimated by VAA.

The ACCC noted on page 149 of its Draft 2009 Price Notification when referring to AP's beta estimates:

"Whilst these estimates are different to the ACCC's estimates, this difference is due to the updated sample set used by the ACCC."

However the methods used to estimate betas by VAA and the ACCC differed. In particular, the ACCC used 10 years of weekly data while VAA used 5 years of monthly data. These differences alone can lead to different betas, even for the same sample of comparable companies.

This Appendix demonstrates this point by providing an explanation for a difference in betas using the same data source and comparables as the ACCC. Our investigation of the reasons for the difference finds that:

- The betas estimated using weekly data suffer from under-estimation errors arising from thin trading. Applying the technique recommended by Dimson¹⁷ (and supported by Henry¹⁸ to correct for this) leads to betas that are similar to those estimated using monthly data over the same time period;
- Betas have risen over the 10 year period and VAA's estimate was based on the most recent 5 year period. The ACCC betas include a longer period of time when the beta estimates were lower.

We also note that the ACCC betas were based on price data rather than total return data however the difference arising from this is very small.

In the material that follows we identify possible explanations for the difference in beta between VAA and ACCC. Our primary focus in this Appendix is on explanations that arise from differences in method rather than choice of comparables. Consequently we use a common comparable set for this investigation.

We demonstrate that using a method that caters for infrequent trading leads to higher betas than the ACCC estimates. A subsequent section shows that the betas of the comparables have risen over time thus the choice of the 10 year period by ACCC provides a lower estimate than the VAA estimate over then most recent 5 years. The final section recommends a process for estimating comparable betas for AP that can then be applied to the same or a different comparable set. The main body of this report uses the recommended method on a wider comparable set than the set used in this Appendix.

¹⁷ Dimson E., "Risk Measurement When Shares Are Subject To Infrequent Trading," Journal of Financial Economics, Vol 7, (1979) 197-226

¹⁸ Henry O., "Econometric advice and beta estimation", November 2008, paper prepared for AER also Henry O., "Estimating β ," April 2009, paper prepared for AER



Possible Explanations for Differences in the Estimates of Beta for the Comparables

Potential explanations for the differences in the VAA and ACCC estimates of betas include:

- i. Differences in the comparable companies;
- ii. Differences in the estimation period;
- iii. Differences in the return measurement interval;
- iv. The impact of thin trading arising from using shorter return measurement intervals;
- v. Changes in the estimate over time combined with ii.;
- vi. Errors in the variables;
- vii. The relationship between R^2 and the OLS estimate of β .

To hone in on the explanation for the differences in the beta for Australia Post due to method rather than comparable company differences we have initially ruled out explanation i. & ii. by using the same companies and the same estimation period (10 years to October 2009) as the ACCC. Consequent upon our finding that most of the difference was due to thin trading and rising betas over time we have not focused on explanations vi. and vii.¹⁹

The important results are summarised in Table A1 below. The Table contains the comparable companies used by ACCC. We have used this set to enable comparisons of individual and average beta. Column (1) captures the betas for this set of comparables as initially estimated by VAA using 60 monthly observations to April 2009. The estimates have been updated to reflect the same end point as that used by ACCC viz. October 2009. These are presented in the column labeled (2). Differences are minimal. Column (3) reflects a re-estimate of the betas using price changes rather than total shareholder returns to make them comparable to the method followed by ACCC. Again the differences are small however they can now be directly compared with Column (4) which shows the estimates presented by ACCC.^{20,21} It is evident that the ACCC estimates are lower.

The ACCC described its estimates in the following way:

"These values were obtained from the Bloomberg data service These values represent an average of weekly beta estimates over the period 31 October 1999 to 31 October 2009." See their footnotes 577 and 578 on page 148.

We were a little unsure of how to interpret this statement however we were able to replicate the estimates using an OLS regression of weekly observations of price changes over the 10 year period against a market index of price changes. The replication gave us confidence that we had access to the same data as the ACCC.

We refer to the remaining columns in the next section.

¹⁹ Henry Op Cit examines vii in some detail for a different sample

²⁰ ACCC, "Australia Post's Draft 2009 Price Notification ACCC View," December 2009, p148

²¹ We also made a change to the way Bloomberg calculated returns when a stock doesn't trade in a period



TABLE A1: BETAS ESTIMATED USING DIFFERENT METHODS AND PERIODICITY

Company	(1) VAA Initial 5 Yr Monthly	(2) VAA Update 5 Yr Monthly	(3) VAA Price 5 Yr Monthly	(4) ACCC 10 Yr Weekly	(5) VAA Dimson 10 Yr Weekly	(6) VAA 10 Yr Monthly	(7) VAA Dimson 10 Yr Monthly
Global Comparables							
TNT NV	0.94	0.96	0.97	0.79	0.80	0.78	0.99
DEUTSCHE POST AG-REG	1.09	1.15	1.08	0.78	1.09	0.88	0.97
SINGAPORE POST LTD	0.57	0.48	0.48	0.34	0.45	0.46	0.55
OESTERREICHISCHE POST AG	0.17	0.14	0.11	0.17	0.16	0.11	0.05
Global Postal Average	0.69	0.68	0.66	0.52	0.62	0.56	0.64
Australian Logistics Comparables							
CTI LOGISTICS LTD	1.17	1.11	1.18	0.30	0.38	0.75	0.94
K & S CORP LTD	0.40	0.44	0.45	0.47	0.78	0.71	0.60
TOLL HOLDINGS LTD	0.65	0.70	0.69	0.93	0.74	0.81	1.11
WRIDGWAYS AUSTRALIA LTD	0.86	0.88	0.89	0.50	0.76	0.66	1.18
LINDSAY AUSTRALIA LTD		0.59	0.56	0.19	0.66	0.32	0.33
Australian Logistics Average	0.77	0.75	0.76	0.48	0.66	0.65	0.83
OVERALL AVERAGE	0.73	0.72	0.71	0.50	0.65	0.61	0.75

Adjusting for Infrequent (Thin) Trading

Infrequent trading in securities means that events that affect price may be reflected in returns for a period other than that in which the events occurred. This will happen if affected stocks do not trade in the period. For example an unanticipated change in interest rates may affect the price of all shares but it will only show up in the return if the shares traded in the period over which the return was measured. The impact of the change in interest rates on the infrequently traded shares will not appear in measured returns for the current period but will appear in a subsequent period (when a trade does occur).

As a result, the estimated variance of returns on the market index will be biased downwards, the covariance and beta of infrequently traded shares with the market will also be under-estimated. The beta of frequently traded shares will be biased upwards essentially because the average of all betas must be one. However this impact is likely to be smaller as it is usually the larger firms that trade frequently and these dominate the index.

There are a number of methods of dealing with infrequent trading²² however the Dimson approach is the least data intensive and can be used with the Bloomberg data. The OLS regression equation is

$$r_t = \alpha + \sum_{k=-n}^n \beta_k M_{t+k} + \varepsilon_t$$

In this regression an estimate of the return for a stock in period t (r_t) is regressed against the contemporaneous return on the market index (M_t) in addition to leading and lagged market returns. The Dimson beta is then the sum of the coefficients (β_k) on each of these market index returns.

Our estimates using this technique were derived from 2 leading and 4 lagged market returns. The basis for the number of leading and lagged terms was simply that the lagged terms are more important for thinly traded stocks and with weekly data, four weeks captures at least a month's data. Using the UK data set Dimson found that "at least one leading term and four lagged terms would be required . . ."²³

²² See Dimson E, & P Marsh, "The Stability of UK Risk Measures and The Problem of Thin Trading," Journal of Finance, June 1983, pp 753 - 783

²³ See Dimson op cit p223



The results for the comparable set, using weekly data, are presented in Column (5) of Table A1. The betas estimated using the Dimson technique are generally, and on average, higher than those estimated using contemporaneous returns in Column (4).

This suggests the ACCC estimates using weekly data underestimate betas.

Moving to monthly return observations would be expected to mitigate the thin trading problem relative to weekly observations – there being a greater likelihood of a trade in a month than in a week. To this end, Column (6) displays the betas estimated using contemporaneous but monthly rather than weekly data over the same 10 year period. The betas are higher than the weekly estimates which is consistent with the ‘Dimson’ beta estimates. On these grounds we argue that the monthly estimates are less biased than the weekly and therefore more reflective of the actual beta than weekly estimates.

[Column (7) shows the application of the Dimson estimation to monthly data. We note that there is evidence of thin trading in the monthly data as well. All but one individual beta is higher. At this time we do not recommend adjusting the monthly estimates without a more detailed study of the most appropriate leads and lags to include. However we do note that the monthly estimates for beta that we have recommended may be too low.

Changes in Beta Over Time

The average estimate of beta arising from use of 10 years of monthly data (Column (6)) is still below that obtained by VAA using 5 years of data, Column (2). A possible explanation is that the beta has risen over the 10 years.

To assess whether this was the case, we divided the data set into two five year periods and re-estimated the betas using both weekly and monthly return data. The results are summarised in Table A2. The weekly data has not been adjusted for infrequent trading in this case.

It is evident that the average beta was higher in the second period regardless of whether weekly or monthly price change data is used. Consequently a further explanation for the difference between ACCC and VAA estimated betas arises because estimated betas have risen across the 10 year period used by ACCC.



TABLE A2: BETAS ESTIMATED IN FIVE YEAR INTERVALS

Company	(1) Weekly To 31/10/2004	(2) Weekly To 31/10/2009	(3) Monthly To 31/10/2004	(4) Monthly To 31/10/2009
Global Comparables				
TNT NV	0.63	0.96	0.64	0.97
DEUTSCHE POST AG-REG	0.69	0.88	0.78	1.08
SINGAPORE POST LTD	-0.11	0.40	0.01	0.48
OESTERREICHISCHE POST AG	#N/A N/A	0.17	#N/A N/A	0.11
Global Postal Average	0.40	0.60	0.47	0.66
<i>Average excl. Oesterreichisc</i>	<i>0.40</i>	<i>0.75</i>	<i>0.47</i>	<i>0.84</i>
Australian Logistics Comparables				
CTI LOGISTICS LTD	0.37	0.28	-0.12	1.18
K & S CORP LTD	0.39	0.49	1.22	0.45
TOLL HOLDINGS LTD	1.00	0.90	1.04	0.69
WRIDGWAYS AUSTRALIA LTD	0.31	0.56	0.19	0.89
LINDSAY AUSTRALIA LTD	-0.56	0.33	-0.29	0.56
Australian Logistics Average	0.30	0.51	0.41	0.76
<i>Average excl. Lindsay</i>	<i>0.52</i>	<i>0.56</i>	<i>0.58</i>	<i>0.80</i>
OVERALL AVERAGE	0.34	0.55	0.43	0.71

Recommended Approach to Estimating Beta for Australia Post using Comparables

Selecting the time period over which to estimate betas is a trade off between reducing the standard error of the estimate by increasing the number of observations on the one hand and concern about structural change on the other. Typically 4 – 5 years of monthly observations is used in practice as a balance between these trade-offs. We are unsure of why the ACCC used 10 years of weekly data.

Moving to weekly rather than monthly observations increases the number of data points for a given time period however it also generally adds both increased variance and thin trading issues. As a consequence use of weekly data does not necessarily improve the beta estimates. This is the case for the sample examined in this Appendix.

The analysis presented supports the use of beta estimates derived using monthly observations (this minimises the likelihood of under-estimation due to thin trading) and use of the most recent 5 year period mitigates concern that the beta might not reflect current economic conditions.



Appendix 2: Descriptions of Comparable Companies

NAME	Description
TNT NV	TNT NV collects, transports, stores, sorts, and distributes letters, printed matter, parcels, documents, and freight items. The Company provides mail and logistics services domestically and internationally.
DEUTSCHE POST AG-REG	Deutsche Post AG provides mail delivery and other services to the public and businesses. The Company offers domestic mail delivery, international parcel and mail delivery services, and freight delivery and logistics services. Deutsche Post also provides a variety of financial services including standard banking services, retail and commercial lending, and brokerage services.
SINGAPORE POST LTD	Singapore Post Limited provides domestic and international postal services. The Company is also involved in logistic business and has a retail distribution network in Singapore.
OESTERREICHISCHE POST AG	Oesterreichische Post AG offers mail delivery services. The Company delivers mail and parcels and operates post offices.
CTI LOGISTICS LTD	CTI Logistics Limited provides courier services, freight forwarding, parcel, warehousing, logistic and customs broking services. The Company also designs, produces and installs security systems in Western Australia along with plastic services such as manufacturing plumbing fittings.
K & S CORP LTD	K & S Corporation Limited provides transportation, warehousing, logistics, fuel distribution and various services to companies throughout Australia. K & S provides road, rail and sea forwarding services, warehousing and storage, fuel distribution to fishing, farming and retail customers in certain regions of Australia. K & S also provides bulk distribution throughout New Zealand.
TOLL HOLDINGS LTD	Toll Holdings Limited provides express freight transport by road, rail and sea and provides integrated logistics and distribution systems, including specialized warehousing, port operations, vehicle transport and distribution, and rail passenger operations. The Company also provides coastal shipping, refrigerated freight services, bulk liquid transportation and wharf services.
WRIDGWAYS AUSTRALIA LTD	Wridgways Australia Limited provides specialized logistic services to international and national customers, including government bodies, the corporate sector and private individuals. The Company's services provided include furniture removal, packaging, high value/fragile product transportation, storage and import and export services.
LINDSAY AUSTRALIA LTD	Lindsay Australia Limited is an integrated transport, logistics and rural supply company. The Company primarily services customers in the food processing, food services, fresh produce, rural and horticultural industries.
CHALMERS LTD	Chalmers Limited provides various bulk transportation and storage services in Australia and New Zealand. The Company operates storage facilities, drop deck equipment to move equipment and bottom dumpers to carry bulk malt and grain. Chalmers also provides private companies and government agencies with the maintenance and servicing of storage facilities.
SALMAT LTD	Salmat Limited is involved in business process outsourcing and customer contact solutions. The Company provides data management and processing services such as printing and mailing services, document design, barcode addressing, data formatting and database development. Salmat also provides delivery services via teleservices operations or letterbox delivery network.



PMP LTD

PMP Limited provides commercial printing services throughout Australia and New Zealand for magazines, newspapers, books, retail catalogues, directories and promotional materials. The Company also provides letterbox distribution services, digital graphic arts services, magazine distribution and micromarketing.

COMPUTERSHARE LTD

Computershare Limited operates share registries and computer bureaus which includes the administration of employee share and option plans and the provision of software that specializes in share registry, financial and stock markets. The Company also provides corporate trust services and acts as a trustee for clients' debt offerings in certain markets.