The Maturity used to set Interest Rates in Regulation

Regulatory Period or Life of Assets?

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Summary

In this paper we assess the appropriate bond maturity to be used to set the risk free rate in regulated decisions. Our key conclusions are that:

- it is generally most efficient for a company to match the term of its debt to the economic life of its assets. When the debt term is shorter than the asset life it exposes the firm unnecessarily to interest rate risk. In a competitive market, such a firm will be placed at a competitive disadvantage to firms whose debt term is longer;
- it would only be efficient for a company to structure debt to match the length of the regulatory cycle under highly specific conditions which are generally only satisfied under a strict form of rate of return regulation: where *ex-ante* returns exactly match *ex-post* returns on capital. Even this conclusion may not hold where the transaction costs of refinancing debt are significant;
- these narrow conditions are not satisfied under incentive regulation, where *ex-post* returns are designed to deviate from *ex-ante* returns. Where the externalities imposed on the company by the regulatory environment are not significant – as is intended to be the case by incentive regulation – then it is more appropriate to structure debt based on normal commercial practices;
- as a result the ACCCs use of the 5-year bond for setting the risk free rate is likely to lead to inefficient pricing.

Optimal capital structure

Every company must choose a capital structure. An optimal capital structure is one that maximise the value of the firm. To a large degree, management of capital structure is a process of risk management for the company with an important component of the risk being related to interest rates.

Although discussions about gearing tend to focus upon the debt ratio, optimal capital structure is far more complex. It includes issues such as source, maturity, collateral, covenants, currency denomination, as well as whether to arrange fixed or floating interest rates. The company should be seeking its optimal configuration across all these dimensions. The decisions are complex, and optimality is not well defined. In a given situation there are a number of drivers that will affect the choices. These include the competitive environment, timing and variability of cash flows, asset structure and future expectations. It is thus not surprising that the empirical literature on capital structure identifies a very strong role for industry specific factors.

From the standpoint of optimal capital structure we now consider the appropriate structure of debt maturity for the company. We first consider the case of an unregulated company, before considering the case of a company subject to regulation.

Maturity decision in an unregulated environment

In a competitive environment, a company investing in long-lived assets would generally finance those assets with debt of similar maturities.[1] This allows the company to service its debt from the revenue generated by the assets without being exposed to interest rate risk. While both the assets and debt will generally have some potential to be liquidated before maturity, it is normally the intention of management to keep both in place through to the end of their lives. The firm may have short-term debt for a number of reasons including to provide flexibility, but this does not invalidate the observation that the maturity of the major part of debt generally approximates asset life.

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[1] Actually a company would match 'duration' of debt and assets, but this does not change the conclusions.

Mortgage financing typically provides this concordance of maturities. Financial leases also inherently follow this rule.

Brigham and Gapenski discuss the maturity issue and conclude as follows.[2]

> *For all these reasons, the best all-around financing strategy is to match debt maturities with asset maturities.* In recognition of this fact, firms generally do place great emphasis on maturity matching, and this factor often dominates the debt portion of the financing decision. (emphasis is in the original text)

Maturity decision under rate of return regulation

We can now consider the impact of regulation on a company's capital structure choice. Under what conditions is it the best risk management practice for a regulated company to align the life of its debt with the regulatory cycle? Notice that the question is framed as what is best practice for management.

We believe there are three conditions under which a company should align its debt maturities to the regulatory cycle:

- the firm is allowed a revenue stream that allows it to earn the regulator's rate of return (ROR) on assets;
- regulation drives the firm's revenues so as to match the pre-determined ROR; and
- the dominant factor in changes in prices, costs and ROR is changes in interest rates.

If these three conditions are all met, interest rates will be defined for the company over the regulatory cycle. This results in certainty over the regulatory period. The firm can then choose a debt structure that results in minimal revenue risk from market interest rate changes. Since this is likely to be consistent with value creation for the company, the best-practice capital structure for a company would be to have its debt mature with the regulatory cycle. Accordingly, when the regulator is estimating weighted average cost of

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[2] E. Brigham and L. Gapenski, *Intermediate Financial Management* (5th ed), 1996 (The Dryden Press, Fort Worth), p 544.

capital (WACC), it would be appropriate to have interest maturities set to the term of the regulatory cycle for all the pertinent factors in the WACC formulation.

In this case it is the interest rate certainty over the period that drives the optimal decision on maturity of debt for the company, not how the rate is set. Given that in this case the optimal decision for the firm is to fix maturity at the regulatory period, the regulator should set the interest rate using the regulatory cycle.

It is important to note that the reasoning runs from the economically rational behaviour of the firm to the regulator's decision – ie the company's decision to have debt mature in line with the regulatory period is derived from the revenue certainty over the regulatory period – not the rate chosen by the regulator.

Maturity decision under incentive regulation

We have discussed two opposite circumstances; no regulation and stringent ROR regulation. Actual circumstances will fall between these two cases. This raises the issue of how to handle a case where there is regulation, but it is less definitive than described by the three conditions above.

The question to be considered is whether the regulatory cycle imposes such a significant externality on the income producing flow of the assets that the regulatory cycle should become the maturity for a company's debt. Will the *ex ante* ROR closely approximate the *ex post* ROR on a consistent and predictable basis?

For a company operating under incentive regulation the interest sensitivity of the company's cash flows will not be matched by the interest sensitivity imbedded in the debt. Furthermore, under incentive regulation, it is not intended to be the case. A central feature of this form of regulation is that unanticipated events and the firm's actions can cause the realised ROR to be different from the ROR set by the regulator. This difference can be significant, given that incentive regulation is designed to encourage an efficient company to achieve efficiency gains that result in the realised ROR being above the regulated ROR for the duration of the regulatory period[3].

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[3] Furthermore, there is no reason for a company to expect that regulatory reviews will significantly mitigate the difference over time.

Therefore, the force of regulation on companies such as an electricity transmission network will not ensure that the companies will (*ex post*) earn the regulator's WACC to within a small margin of error, let alone exactly.

Transactions costs of reissuing debt

It should be noted that these cases considered above do not take into account the transactions costs associated with reissuing debt[4]. Where these are significant – as may be the case in a market where debt is thinly traded - and where a significant reissue can result in an increase in market price, then the costs associated with the refinancing of debt may make it efficient for a company to finance its debt with longer-dated maturities, even under strict ROR regulation. In practice, these transaction costs may be significant - we note that the ACCC estimated in its Victorian gas decision that 'bank costs' related to debt issuance added 0.5% on the cost of debt.

Regulatory precedent

It is worth noting that the ACCCs practice is at odds with that of other regulators in Australia and overseas. Regulators have tended to set the bond maturity in line with the longest liquid bond, as is seen in table 1 below.

Table 1: Bond maturity in regulated electricity decisions

Regulator	Decision	Date	Sector	Bond rate
ACCC	SMHEA	2001	Transmission	5-year Commonwealth
ACCC	Transgrid	2000	Tranmission	10-year Commonwealth
QCA	Qld DBs	2001	Distribution	10-year Commonwealth
ORG	Vic DBs	2000	Distribution	10-year indexed Commonwealth
IPART	NSW DBs	1999	Distribution	10-year Commonwealth
OTTER	Aurora / Transend	1999	Dist / Trans	10-year Commonwealth
ICRC	Actew / AGL	1999	Distrbution	10-year Commonwealth
OFGEM	UK PES	1999	Distribution	Range including 10 and 20-year Gilt

[4] There will also be transactions costs associated with existing debt that cannot be changed immediately to reflect changed regulatory circumstances

Concluding thoughts

It is important to note that the company has economic incentives to maintain an optimal capital structure. Although regulators may have strongly held and informed views about capital structure for a firm, they never have to face the economic consequences of their views. Therefore, where it is efficient for a firm to issue debt with longer-term maturities, it is inappropriate for the regulator to base its financing decisions on a parameter that does not reflect business decision-making.

It seems presumptuous for a regulator to set policy based on an assumption that the management of a company does not know how to make capital structure decisions that are in the best interests of the company. While it may sometimes be the case that management are not acting wisely, we believe the burden of proof should be on the regulator, not the company.

As a result, we recommend that the maturities for the risk free rate and debt premium be set at a rate that best approximates asset life.