

Agenda

Advancing economics in business

Up in flames, down the drain: accounting for risk in regulated networks

All companies face risk, and it is generally understood that increasing risk will increase a company's required returns. The third in our series of articles on the weighted average cost of capital (WACC) considers the risk faced by regulated utilities and how it is addressed by regulators. Ultimately, when it comes to quantifying risk, judgement is just as important as technical skills. In that spirit, put down your calculator and enjoy the read!

What is risk? All companies face risk, but risk means different things to different people. For companies, risks are diverse in nature, scale and form. What all definitions of risk have in common is the potential for an adverse event to occur. From an economic perspective, this generally means an event that results in a financial impact on the company.

In practice, the interpretation of risk depends on the audience:

- the board of a company will expect to see a risk register, which may highlight events, such as deflation or operational failures, that can be managed and mitigated;
- an investor may be interested primarily in the impact on dividends and credit ratios;
- the regulator will be concerned that the company remains able to finance its activities, and that the regulatory framework remains effective;
- in addition to prices, a customer may be primarily concerned security of supply—ie, that water comes out of the taps and the lights stay on.

In practice, the term 'risk' covers all these effects, but for most regulatory and financial purposes it is defined by its financial effect.

This article investigates how risk affects regulated companies and how it is translated into allowed rates of return for companies and prices for customers. Regulators seek to understand the impact of risk not just within the allowed rate of return, but also in terms of how risk is balanced between investors and customers more generally. The article reviews current thinking and the attempts by regulators (and legislators) to get that balance right.

Why does risk matter?

The level of risk faced by regulated utilities has two consequences for regulators and for the design of a regulatory regime:

- regulators (such as Ofgem—the energy regulator for Great Britain; or the Commission for Energy Regulation (CER)—the regulator for the electricity and natural gas sectors in Ireland) often have legal obligations to ensure that the risks faced by firms are manageable and allow access to capital (the 'financing duty');
- where risks are retained by regulated companies, the level of these risks will affect the required returns for investors in those companies.

Investors will require a risk premium when investing in risky assets. The size of this premium cannot be readily determined—ie, there is no directly observable 'market price' for risk. However, as discussed in February's *Agenda*,¹ there is a well-established approach to the calculation of the required return on capital for regulated companies used in regulatory precedent. This approach is to use a WACC that combines the cost of debt and the cost of equity, where the cost of debt is derived from market data, and the cost of equity is calculated using the capital asset pricing model (CAPM). According to the CAPM, the return required by equity investors is a direct function of a company's exposure to risk, which is represented by the 'equity beta' coefficient.² Specifically, the equity return covers systematic risk, which reflects the types of risk that are general to all equity investments, and which an equity investor cannot 'diversify away' through holding a wider portfolio of investments.

Beta is the only company-specific element required by the CAPM; the other parameters (the risk-free rate and the equity risk premium) are general to returns within the market more widely.

While the CAPM is well established, the calculation of the 'right' beta for a regulated company is not a simple exercise. In particular, the regulator does not generally have access to data from a range of comparable businesses that are traded on the market and that have similar operating and financial characteristics to the regulated business in question.

Market data shows that industry betas are broadly linked to the risks faced in those industries. However, the determination of beta involves a series of economic assessments, and there is a range of uncertainty around the beta, at both the industry level and, more generally, for the individual firm. This is illustrated in Figure 1 below.

The economic assessments include the following.

Identifying relevant comparators—the first step is to identify sufficient market comparators in order to perform an assessment of beta. This requires that a comparator's equity is traded on the stock market. In many cases it can prove difficult to gather a large sample of representative comparators. This is because many utilities are not listed: for example, in the UK there are more than 20 water companies, but only three are listed on stock markets, while in the Netherlands water networks are owned by municipal or regional authorities. At the same time, those companies that are listed rarely share the exact same risk characteristics that one is trying to assess (eg, the shares of EDF reflect the risk of the group's nuclear and overseas assets in addition to that of its energy networks).

Identifying the relevant dataset—there can be significant differences between one-, two- and five-year betas, and changes over time, due to market fluctuations or changes in economic fundamentals. For example, recent data published by Ofcom, the UK communications regulator, showed BT's asset beta

rising from 0.5 to 0.7 over a two-year period.³ Each of these could be valid, and the regulator would need to consider which set of market conditions is more comparable to the period of the particular price review under consideration.

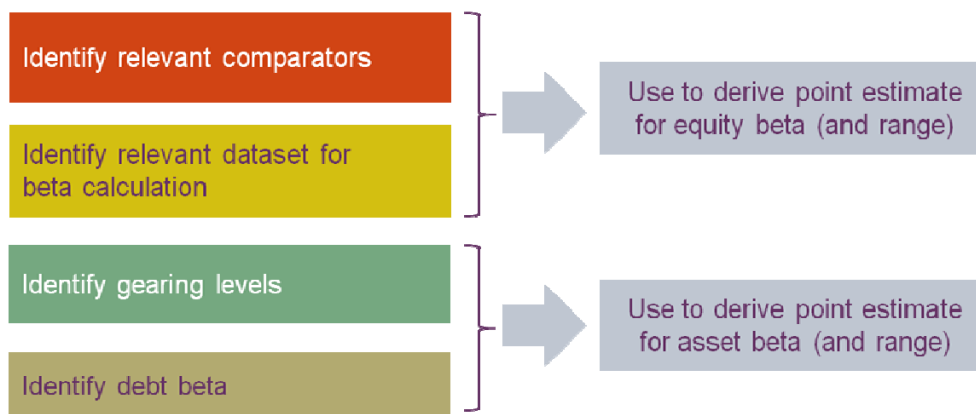
Identifying the relevant gearing—in theory, the level of gearing (debt/RAB) should be fairly transparent, as it reflects actual debt; however, the use of market values (which may not be immediately apparent) or book values for gearing, and the appropriate measures where gearing is changing, can be open to interpretation.

Identifying the debt beta—for a company funded by a combination of debt and equity, the 'asset beta' (ie, the concept of beta applied to the company's assets as a whole) is made up of a weighted average of an equity beta and a 'debt beta'.⁴ The debt beta is calculated by reference to the rate of change in market prices of debt (which are generally less observable than market prices of equity), and therefore debt betas are even more difficult to assess reliably than equity betas. There is evidence that they are likely to be non-zero, especially at high levels of gearing.⁵

What does this all mean in coming to a single view for the equity beta? Generally, regulators have taken a consistent approach, with simplifying assumptions used to resolve the majority of these issues. The regulatory precedent therefore suggests that, while there is a transparent process for calculating the asset beta and the return on equity under the CAPM, the outputs of this analysis are open to interpretation, and regulators employ judgement as well as financial analysis in reaching their results.

Below we consider how regulators address risk within the regulatory and financial framework, before investigating how the regulatory framework and the choice of beta interact.

Figure 1 Process for calculating the equity beta



Note: As shown in the figure, the equity beta (and, where relevant, the debt beta) are derived directly from stock prices, while the asset beta is a theoretical calculation based on a combination of observed market data and gearing.
Source: Oxera.

Regulation and the treatment of risk

Companies in regulated network industries are, by nature, low-risk relative to other companies. They tend to own long-lived assets that are likely to continue to maintain considerable value long into the future. However, this underlying low-risk profile is balanced by the nature of price regulation. Unlike other markets, the prices of regulated businesses are limited by legislation and regulation. Regulated businesses are often required to work within a fixed pricing contract⁶ over a number of years. Unlike in the case of other companies that can adjust prices on a daily basis to reflect changes in industry input costs or external market prices, this element of regulation increases risk.

As a result, it is important for the regulator to balance the level of risk retained by the companies, to mitigate the risk of companies being unable to provide services. The RPI – X regulatory framework takes risk into consideration through the use of one or more of the following:

- the equity element of the allowed return (ie, the main focus of this article);
- the financing duty and the financeability test;
- additional regulatory mechanisms that affect the balance of risks between regulated companies and their customers, generally through adjustments to prices.

Each point is discussed in turn below.

How does risk directly affect prices?

The calculation of beta described above can be directly translated into the equity return through the CAPM formula. Investors in infrastructure assets expect to receive such an equity return. The implication is that the investors (rather than customers) should face some risk, and generally this will include incentives for outperformance to improve the efficiency of the network. As a result, and taking into consideration the calculation of the equity beta above, the risk taken will result in a requirement for a reasonable rate of return for investors, including a profit for equity investors.

However, regulators will also seek to reduce the level of risk where appropriate, as higher risk directly results in higher returns, and therefore higher prices for customers. Therefore, the level of risk retained should be proportionate. This will be reflected in either the regulatory framework more generally (such as in the frequency of regulatory reviews, and the treatment of over- and underspend relative to regulatory allowances), or in specific regulatory mechanisms, as described below.

What does the ‘financing duty’ mean?

The second source of protection against risk is the financing duty: many, but not all, regulators have a financing duty set out in legislation. Such a duty

generally requires the regulator to ensure that companies that are subject to regulation are able to finance their activities.⁷ These duties provide a fundamental level of protection set out in legislation. At the same time, the duty is not always clearly defined, and its level of application has tended to come from precedent and experience, rather than from a clear definition within the legislation. The financing duty is applied in two ways:

- through a ‘financeability test’, applied when setting charges. In theory, the equity return must be high enough to give equity investors the incentive to invest in the assets, and therefore to cover the risks from holding the asset. However, as described above, estimating an equity return is difficult and open to debate. In this context, the financeability test is largely a cross-check of whether the equity return is high enough to cover the companies against a reasonable level of risk, and is normally applied through assessment against credit ratios;
- through exceptional reviews of the regulatory framework, should regulated companies face financial difficulties. There are several precedents in the UK of companies being allowed exceptional price rises to offset potential financial difficulties (examples include Royal Mail and air traffic services provider, NATS).⁸

RPI – X + A – B + C * D ^ E?

The third mechanism applied by regulators is a sharing mechanism to transfer individual risks to customers where appropriate. Regulators seek to reduce the level of risk retained by companies, through often complex mechanisms within the price formula. There is generally a good argument for risk transfer from companies to customers where the following conditions are met:

- the risk is **not controllable** by the regulated companies—ie, there is no (or very limited) ability for the companies to control the risk;
- the risk is **material**—ie, leaving the risk with the company may have an effect on the risk premium required;
- the risk is **measurable**—ie, the risk can be quantified with respect to a measurable external parameter, such as market volumes or taxes, and therefore a reliable mechanism can be designed which will offset the risk through adjustments to prices (eg, actual allowed price changes follow RPI – X + C).

How does the regulator balance risk and return?

The discussion above shows that regulated utilities, while being naturally low-risk relative to other sectors, face a certain level of risk over price control periods

and that, as a result, investors will be exposed to fluctuations in the returns on their investments. Equity investors will therefore require a risk premium to compensate them for that risk.

The following main conclusions emerge from this discussion.

- In quantifying the risk exposure of a regulated business and beta coefficient, analysis should always be complemented by a careful assessment of qualitative factors. In other words, judgement is at least as important as technical analysis when assessing risk.
- Modelling techniques dictated by finance theory to quantify risk inevitably rely on historical data. History may not always be a useful guide to the future, especially when a regulatory regime changes such that more (or less) risk is allocated to regulated companies going forward.

- In addition, a regulator's own decisions, and the perceived risk that arises from them, are central to the level of that risk premium. Regulated businesses are generally protected from some of the wider market pressures faced by other companies, but are exposed to others by the fixed nature of the regulatory contract.

It will be critical to address these questions as regulatory regimes evolve and companies' exposure to risk is altered. For instance, Ofwat has consulted extensively on the balance between risk and reward, and its recently published methodology for the water price control review in 2014 indicates a desire to further reduce the level of risk funded by customers, with a lower cost of equity and higher gearing.⁹ However, is this the right balance, given the regulator's wider aims, and given that its own decision is central to the level of risk? Should the answer be more risk and stronger incentives, rather than lower reward? The jury is still out.

¹ Oxera (2013), 'What WACC for a Crisis?', *Agenda*, February.

² In this formula, the beta is calculated as the covariance between the returns on an individual asset and the return on the market portfolio—ie, the more a share price changes with wider market conditions, the higher the beta.

³ Ofcom (2013), 'Fixed Access Market Reviews: LLU and WLR Charge Controls', June, Annexes, p. 134.

⁴ The debt beta reflects a comparable analysis of the cost of market risk within the price of debt. Given that debt prices can appear stable relative to equity prices, a common assumption has been that the debt beta is zero, although a small debt beta is increasingly used in regulators' determinations.

⁵ In particular, the more debt that a company holds, and the smaller the amount of true equity, the more 'equity-like' the risks associated with the debt will become. This will apply to the debt as a whole, and in particular to the more subordinated debt. The beta of such debt will then increase towards the asset beta.

⁶ Prices or revenues are generally capped using a fixed formula, although the formula will include inputs, such as inflation, which change over time.

⁷ For example, under the Communications Act 2003, Ofcom does not have a financing duty in respect of telecoms operators (eg, BT), although since 2011 it has had a financing duty in respect of the universal service provider of postal services (Royal Mail).

⁸ Royal Mail applied successfully for a 15% price rise for business mail to offset financeability concerns, and NATS applied for a re-opener of its price control from the CAA in 2002, which was accepted in return for certain commitments by NATS to adjust its financing structure. See Postcomm (2011), 'Postcomm's Final Decision, 2011-12 Regulatory Framework', February; and CAA (2003), 'NATS' Application to Re-open the Eurocontrol Price Control', March.

⁹ See Ofwat (2013), 'Setting Price Controls for 2015-20 – Final Methodology and Expectations for Companies' Business Plans', July, covered in this issue in 'Ofwat's Final Methodology: Now for Implementation'.

If you have any questions regarding the issues raised in this article, please contact the editor, Dr Leonardo Mautino: tel +44 (0) 1865 253 000 or email l_mautino@oxera.com

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