

Final decision

Trailing average cost of debt

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We wish to acknowledge the contribution of the following staff to this report:

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EXECUTIVE SUMMARY

The Queensland Competition Authority (QCA) has various functions under the *Queensland Competition Authority Act 1997* (the QCA Act), including oversight of revenues and prices for certain services supplied by firms in the rail, ports, water and retail electricity sectors in Queensland. An important aspect of that oversight is to identify an appropriate return on capital to providers of equity and debt to the firm, which is an important component of a firm's allowed revenues for regulated services.

The decision in this report relates to the conceptual framework for establishing the cost of debt as part of the weighted average cost of capital for a firm. Specifically, and similar to most other Australian regulators, the QCA's framework for setting the regulatory cost of debt applies an 'on-the-day' approach. This approach involves setting the regulatory cost of debt over a relatively short period immediately preceding the start of a regulatory period.

The rationale for the on-the-day approach is that the allowed cost of debt at the beginning of a regulatory period should reflect prevailing market conditions and therefore known information at the time. The market rate provides the best estimate of the rate of return on debt that lenders require at that time.

In recent years, a trailing average cost of debt approach has been proposed. The trailing average estimates the regulatory cost of debt as an average of the total cost of debt over an historical period (i.e. the most recent 10 years) with annual updates of that average. There is more than one methodology for calculating the trailing average.

Supporters of the trailing average approach consider that the approach provides a better 'match' between the allowed (regulatory) cost of debt and the firm's cost of debt by better replicating the actual practice of many regulated firms in issuing long-term debt and staggering their debt to manage refinancing risk. Such firms may seek to match the regulatory cost of debt closely in order to reduce risk.

Proponents also claim that the trailing average approach provides more accurate signals for new investment and smooths final prices to consumers.

Assessment

The QCA has assessed the merits of the trailing average approach relative to its current, on-the-day approach and undertaken an extensive public consultation process. The QCA's view is that the trailing average approach has some advantages, comparatively, but they are not sufficient to merit a change in methodology at this time. Further, the disadvantages of the approach outweigh the advantages.

The QCA's conclusion is that the case for change at this time is not compelling. In particular, adopting a trailing average approach would mean compensating regulated firms at historical interest rates rather than at prevailing rates, unless the trailing average is modified to compensate the firm for new investment at the prevailing cost of debt. However, doing so involves additional complexity, and the QCA's analysis indicates that its approach already provides sufficiently accurate signals for new investment without such complexity.

In addition, the QCA is concerned that the 10-year trailing average is likely to materially overstate the cost of debt relative to the on-the-day approach. This is because efficient firms have an incentive to trade off risk and return to obtain a shorter term of debt. The 10-year risk-free rate in the trailing average total cost of debt is not necessarily the correct term for the regulator to benchmark. Stakeholders have not provided persuasive evidence to alleviate the QCA's concerns in this regard. An overstated cost of debt is not in the interest of consumers.

Moreover, the QCA's on-the-day approach is consistent with ensuring the revenue sufficiency of the firm, including meeting the firm's cost of debt financing, while preventing excess prices to customers. This approach also provides efficient signals for new investment and is relatively straight forward to implement. The QCA is confident that the on-the-day approach provides an appropriate and manageable benchmark to enable all of the regulated firms under its jurisdiction to manage their debt efficiently. Finally, the forward-looking aspect of the on-the-day approach is consistent with the QCA's broader cost of capital methodology, which focuses on current market conditions.

Implications for price monitoring

Under price monitoring, the QCA's role is to assess price and performance against regulatory benchmarks. More heavy-handed regulation may not occur unless the monitoring regime indicates, for example, that excessive profits are being earned. The QCA has also considered whether to use the trailing average approach to set cost of debt benchmarks for the firms subject to price monitoring, while maintaining the on-the-day approach for firms subject to price determination.

The QCA believes that applying its cost of capital methodology consistently across regulatory frameworks is important unless there are compelling reasons for different treatment for firms subject to price monitoring. For the reasons given previously, the QCA considers that the case for moving to a trailing average is not strong in the present circumstances.

The QCA recognises that the on-the-day approach could lead to larger price changes from one regulatory period to the next in certain circumstances. However, this concern is outweighed by the advantages of the on-the-day approach. In particular, this approach:

- better reflects prevailing financial market information at the time, which provides the best estimate of the cost of debt that lenders require at the time prices are determined
- is consistent with the approach that the QCA has consistently applied in its assessments — consistency in methodology is important for regulatory certainty.

Finally, with respect to concerns about price volatility under the on-the-day approach, the QCA notes that:

- the cost of debt is only one component of the WACC
- the return on capital component of revenues is only one component of the maximum allowable revenue (MAR), on which final prices are based.

THE ROLE OF THE QCA – TASK, TIMING AND CONTACTS

The Queensland Competition Authority (QCA) is an independent statutory authority to promote competition as the basis for enhancing efficiency and growth in the Queensland economy.

The QCA's primary role is to ensure that monopoly businesses operating in Queensland, particularly in the provision of key infrastructure, do not abuse their market power through unfair pricing or restrictive access arrangements.

In 2012, that role was expanded to allow the QCA to be directed to investigate, and report on, any matter relating to competition, industry, productivity or best practice regulation; and review and report on existing legislation.

Task, timing and contacts

This final decision paper considers the trailing average cost of debt in relation to the 'on-the-day' approach and establishes a preferred position for a regulatory cost of debt framework. The cost of debt is fundamental to the calculation of the weighted average cost of capital for regulated businesses.

This paper draws on submissions that were made in response to the QCA's March 2014 issues paper and to the August 2014 draft decision on the trailing average cost of debt. It also draws on submissions to the QCA that relate to the cost of debt in response to other QCA investigations and draws on independent, expert advice.

Key dates

20 March 2014	Release of Issues Paper
29 August 2014	Release of Draft Decision
10 October 2014	Closing date for submissions
24 April 2015	Release of Final Decision

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1 INTRODUCTION

The Queensland Competition Authority (QCA) determines or monitors prices for firms in the rail, ports, water and retail electricity sectors. In doing so, the QCA applies the 'building block' model. In each case, the QCA examines available evidence to establish the weighted average cost of capital (WACC) of the regulated firm.

The WACC is a weighted average of the cost of equity and the cost of debt. The respective weights represent the market value shares of equity and debt in the capital structure of the firm. The cost of equity and cost of debt components of the WACC are set at a level that generates expected revenue for a service that is at least enough to meet (and does not exceed) the efficient costs of providing access to the service, including a return on investment commensurate with the regulatory and commercial risks involved.

1.1 Cost of debt methodology review

The QCA has undertaken a comprehensive review of its cost of capital methodology. As part of this review, the QCA has assessed its approach to determining the cost of debt. This approach has two components:

- (a) a conceptual framework that serves as the basis of regulatory cost of debt estimation
- (b) an empirical methodology, including techniques and data sources, for estimating the benchmark cost of debt at a point in time.

The second component is presented in a separate QCA paper, *Cost of Debt Estimation Methodology* (QCA, 2014e), and in a related consultant report by PricewaterhouseCoopers (PwC, 2013). These two papers should be read in conjunction with this paper.

The QCA's current conceptual framework for setting the regulatory cost of debt applies the 'on-the-day' approach. This approach involves setting the regulatory (i.e. allowed) cost of debt over a short period immediately preceding the start of the regulatory cycle. The allowed cost of debt is subsequently reset before the start of the next regulatory cycle (e.g. after five years).

Supporters of this approach note that utilising the current rate of return, including the current cost of debt, at the time of a regulatory determination provides a forward-looking return and appropriate signals for new investment.

However, over the last several years, proposals have arisen at both the federal level and in several states to replace the on-the-day approach with a form of historical, 'trailing average' portfolio approach.

The trailing average cost of debt is an historical average of the cost of debt. The historical period corresponds to the benchmark efficient term of debt (e.g. 10 years). The trailing average cost of debt can be applied to the full cost of debt (i.e. to both the risk-free rate and the debt risk premium (DRP)) or to the DRP only (i.e. the 'hybrid' approach).¹

¹ The hybrid approach combines elements of both approaches. Under the hybrid approach, the total cost of debt is the sum of an on-the-day risk-free rate and a trailing average of the DRP (see section 3.2.3).

Supporters of the (full) trailing average approach argue that a properly weighted trailing average better reflects how regulated firms refinance their debt in practice, while providing superior signals for new investment and reducing output price volatility.²

1.2 Consultation

Issues paper

In March 2014, the QCA released an issues paper on the trailing average cost of debt, along with an expert report by Dr Martin Lally (QCA, 2014b; Lally, 2014a). The issues paper presented all three possible approaches to the cost debt (i.e. on-the-day, trailing average and hybrid) and discussed the advantages and disadvantages of each approach (QCA, 2014b).

The QCA received submissions in response to the issues paper from Queensland Treasury Corporation (QTC) and from two of the south east Queensland (SEQ) water distributor-retailers (i.e. water retailers), Queensland Urban Utilities (QUU) and Unitywater.³ These stakeholders supported adopting a trailing average approach that includes the following key features:

- (a) applying the trailing average to the total cost of debt (rather than to the DRP only)
- (b) updating the regulatory cost of debt estimate annually
- (c) applying weights to reflect changes in the regulated firm's debt balance as a result of new investment.

Draft decision

The QCA's position in the draft decision was that there is not a sufficiently compelling case to support a change from the on-the-day approach to the trailing average approach (QCA, 2014d). In particular, the QCA concluded that the current, on-the-day approach:

- (a) provides more efficient investment signals
- (b) will not overstate the allowed cost of debt
- (c) is simpler and less costly to implement
- (d) contributes to regulatory certainty (QCA, 2014d: iv, 16–17).

The QCA received submissions on its draft decision from QTC and Unitywater. These stakeholders maintained their support for the trailing average approach (QTC, 2014c; Unitywater, 2014).

The purpose of this report is to present the QCA's final position on its conceptual framework for the regulatory cost of debt. The report evaluates the trailing average and the on-the-day approaches. In doing so, it responds to stakeholder submissions and draws on an expert report by Dr Lally (Lally, 2015) and other relevant information.⁴

This report concludes the QCA's cost of capital methodology review.

² Unless stated otherwise, the term, 'trailing average', will be used to refer to the approach that averages over the total cost of debt, while the hybrid approach will be used to refer to the approach that averages over the DRP only.

³ The other retailers are Logan, Redland and Gold Coast City Councils (QCA, 2015b: 1).

⁴ Dr Lally's report is available for download from the QCA's website at www.qca.org.au.

2 REGULATORY OBJECTIVES

2.1 Objectives

The QCA investigates prices relevant to monopoly business activities (e.g. water) and determines access prices for essential monopoly services (e.g. ports and rail) under Parts 3 and 5 respectively of the QCA Act. The QCA Act sets out a number of economic objectives that must be considered in undertaking these functions.

The QCA Act does not prescribe the weights to attribute to each of these objectives, but the QCA considers that the primary objective should be economic efficiency (QCA, 2013: iv). This position is also consistent with the fact that each of the economic objectives specified in the QCA Act has an underlying efficiency driver.

A related and important objective in the context of regulation in natural monopoly markets is revenue sufficiency. Specifically, in the presence of large sunk costs, expected revenue for a service should be sufficient to enable the regulated firm to recover its efficient costs of providing the service, including a return on investment commensurate with the regulatory and commercial risks involved.

Additionally, the QCA Act does not limit the matters to which the QCA may have regard when undertaking a monopoly pricing investigation (s.26(3)) and permits the QCA to consider any other issues that the QCA considers relevant when deciding whether to approve (or refuse to approve) an access undertaking (138(2)(h)). The QCA considers that, in the present context, such relevant matters and issues include:

- (a) *Net Present Value (NPV) = 0 requirement* — the firm's future, expected net cash flows, when discounted at the risk-adjusted opportunity cost of capital, should equal the initial investment; this principle ensures revenue sufficiency and promotes allocative, productive and dynamic efficiency
- (b) *efficient signals for new investment* — appropriate signals for efficient investment promote dynamic efficiency
- (c) *price stability* — stable prices can allow firms and customers to improve their planning; however, there are circumstances under which price variability is desirable for efficiency reasons; stabilising prices (or not) also allocates risk
- (d) *practicality and implementation* — the regulatory process and arrangements should be practical, cost-effective and administratively feasible, taking into account reasonable constraints on complexity and cost.

2.1.1 Economic efficiency

Economic efficiency has several dimensions, including allocative, productive and dynamic efficiency. Allocative efficiency is achieved when the price charged reflects the opportunity cost of providing an incremental unit of the good or service. If the price is higher than opportunity cost, some customers who would be willing to purchase the good or service if it were priced at cost will not make the purchase. In this case, consumption will fall below the economically efficient level. On the other hand, if the good or service is priced below its opportunity cost, there will be some consumers who purchase the good or service even though they would be unwilling to pay the opportunity cost. As a result, consumption will exceed the economically efficient level.

Productive efficiency means that the cost of production is minimised. Spending more than necessary to acquire inputs or to operate a business is wasteful and results in higher prices paid by customers.

Dynamic efficiency involves firms innovating over time to increase productivity. For example, they might adopt technologies that reduce operating costs and allow new and better services to be provided. These activities, in turn, usually require new investment of capital. The return on capital, of which the return on debt is a significant component, is intended to ensure that a firm receives an economic return on this capital that is commensurate with the regulatory and commercial risks involved. In this way, a rational firm with access to such capital will make the necessary investments.

In a natural monopoly situation, there are trade-offs among these efficiency objectives. In the absence of regulation, a natural monopoly has an incentive to reduce output and set a price higher than its average cost. This behaviour creates an allocative inefficiency, the standard rationale for natural monopoly regulation. However, setting price at marginal cost, the opportunity cost of producing an additional unit of the service, will not allow the firm's investors to recover their investment.⁵ This will deter dynamically efficient investment.

2.1.2 Revenue sufficiency

In natural monopoly regulation, revenue sufficiency is a key objective. The potential losses from a firm that does not participate in the market or fails to invest adequately in operations and maintenance due to inadequate revenues can be significant and exceed the potential allocative efficiency losses from prices that exceed marginal cost. Also, if the firm cannot recover its costs, it will also not have incentives to make new investments (QCA, 2013: 10).

The NPV = 0 principle is a mechanism for ensuring *ex ante* revenue sufficiency (QCA, 2013). This principle requires that the regulated firm's future, expected net cash flows, when discounted at the risk-adjusted opportunity cost of capital, equal the firm's initial investment (Marshall *et al.*, 1981). It is fundamental to regulation — lower revenues than those that satisfy the principle will fail to adequately compensate the firm, while higher revenues constitute the excess profit that regulation seeks to prevent (Lally, 2012: 5–6).

The revenue sufficiency requirement for regulated firms means that all prices cannot necessarily be set at marginal cost.⁶ In many circumstances, revenue sufficiency requires pricing at average, rather than marginal, cost. However, prices above average cost, or at average costs that are not as low as they could be, reduce allocative and productive efficiency respectively. As a result, the constrained regulatory objective is the maximum level of efficiency consistent with revenue sufficiency. Setting price as closely as possible to the efficient level of cost will reduce the monopoly distortion.

2.1.3 Price stability

Regulated businesses require stable revenues to provide investors with confidence that sunk investments will be protected. Businesses and consumers tend to prefer stable prices to assist them with planning, thereby reducing transactions costs (QCA, 2013: 31).

⁵ If such firms exhibit decreasing cost production then marginal cost pricing produces an allocatively efficient output. If there are barriers to entry in the industry, which is typically the case, the government/regulator can either subsidise the firm or permit prices to deviate from marginal cost pricing to recover the revenue deficit.

⁶ Alternatively, if they are, other cost recovery mechanisms must be applied (e.g., two-part tariffs).

However, stable prices can provide inefficient signals. For example, time-of-use prices are not stable by design but are reasonably predictable and desirable, as they provide efficient price signals (Bonbright *et al.*, 1988: 384–389).

Stabilising prices or investors' returns serves as a risk allocation mechanism. As a general rule, stabilising prices shifts risk from customers to investors. Alternatively, stabilising *returns* shifts risk from investors to customers.

The extent to which the regulator should stabilise prices depends on both investors' and customers' attitudes toward risk. Within the framework of the Capital Asset Pricing Model (CAPM) used to estimate the return on equity, investors are averse to risk in their returns. Whether or not customers are averse to volatile prices depends on their risk preferences.⁷ Customers might prefer some price volatility because they have the opportunity to consume more when the price is low (and *vice versa*).⁸

2.1.4 Practicality and implementation

All else equal, a methodological approach should be as practical as possible. This means that the approach should be understandable and feasible to implement under reasonable cost and time constraints.

An overly complex approach that improves the accuracy of the cost of capital estimation process, but only marginally, will not likely produce benefits that outweigh the costs. This is not to say that a methodology should ignore complexity. Rather, the point is to highlight that trade-offs are involved.

In addition, an approach should be implementable at a reasonable cost and in a reasonable amount of time. An approach that is costly to implement and/or requires substantial time to implement will not likely generate net benefits. Finally, methodological approaches should be assessed on a case-by-case basis.

2.2 Incentive regulation and benchmarking

The standard rationale for applying economic regulation to firms with natural monopoly characteristics is that these firms may deliver poor economic performance in a number of areas, and there are net benefits from implementing price, entry and supporting regulations in a way that improves performance (Joskow, 2005: 33).⁹

All forms of regulation are likely to impact on incentives, but the term, 'incentive regulation', has evolved to describe a form of regulation that attempts to address two key problems with economic regulation:

- (a) the incentive for, and ability of, a regulated firm to hide its true cost profile
- (b) the lack of incentives for the regulated firm to operate and invest efficiently.

⁷ For a discussion of risk allocation between investors in a regulated firm and its customers, see Cowan (2004).

⁸ Customers' preferences for price variation around its expectation depend on several factors, only one of them being the (uncompensated) price elasticity of demand. In order for customers to be averse to price risk (i.e. prefer price stability), their aversion to income risk must be sufficiently high and / or the income elasticity of demand for the good or service must be sufficiently low, all else equal. See the discussion in Turnovsky *et al.* (1980) and in Newbery and Stiglitz (1981).

⁹ The social benefits of regulation (i.e. benefits to society as a whole) must exceed the social costs.

The economic literature refers to these two problems as ‘adverse selection’ (or ‘hidden information’) and ‘moral hazard’ (or ‘hidden action’) respectively. These problems arise due to the fundamental asymmetry of information between the regulator and the regulated firm. Therefore, regulatory policies should seek to directly or indirectly provide incentives for more efficient outcomes. In the context of standard Australian regulatory design, a principal way in which such incentives are provided is by establishing a regulatory benchmark.

Benchmarks based on similar ‘comparator’ firms can be used to reduce the information asymmetry. In principle, if the regulated firm of interest is only allowed to recover costs based on the realised costs of other, regulated firms then the firms have the incentive to ‘compete’ against each other with respect to cost reduction.¹⁰ This ‘competition’ drives costs toward their efficient levels and promotes productive efficiency.

A key issue that arises with benchmarking is specifying the reference point or benchmark against which performance should be measured. As a general rule, comparators should be other firms that are:

- (a) *‘pure play’* — the firm provides only essential inputs or services in the input / service area of the regulated firm of interest, and does not engage in unrelated business activities, because similar firms will tend to have comparable, underlying risk characteristics^{11,12}
- (b) *regulated* — the firm should be subject to regulation because regulation affects the risks of the firm; these firms typically have more stable cash flows than unregulated firms due to the presence of regulation
- (c) *‘stand-alone’* — the firm is without parent ownership, or treated as such, for benchmarking purposes, as the presence of parental support can influence key metrics (e.g. credit rating) of the comparator and, therefore, make it less relevant to the regulated firm of interest.

The QCA notes that this characterisation is broadly consistent with the definition of the ‘benchmark firm’ adopted by the Australian Energy Regulator (AER), although the AER chose not to take a position on the last characteristic, ownership structure (AER, 2013c: 33–36).

¹⁰ For instance, if the firm of interest does not undertake effort to reduce its costs, but comparator firms do, then these other firms will profit because the prices they charge will be above their costs. However, the firm of interest could experience losses if it does not exert effort to reduce its costs. If firms are identical, it follows that the prices set using such an approach should never fall below the firms’ efficient costs. In equilibrium, the price will converge to a level as if the firms were competing directly with each other. The seminal article on this issue is by Shleifer (1985).

¹¹ In particular, the comparators should have underlying *systematic* risk similar to the regulated firm of interest for the purpose of estimating the beta. The beta of a firm is defined as the covariance between its return and the market portfolio’s return divided by the variance of the market portfolio’s return.

¹² If comparators are not ‘pure plays’, adjustments should be made to remove the effects of the unrelated information. This additional step, however, can make the estimation task more difficult.

3 COST OF DEBT CONCEPTUAL FRAMEWORK

3.1 Background

3.1.1 WACC and the cost of debt

The regulatory, or allowed, cost of debt is estimated using the promised yield on corporate debt with a credit rating that is consistent with the benchmark credit rating of the regulated firm.¹³ The cost of debt can be expressed as the sum of a risk-free rate (typically proxied by a government bond yield) and a premium for risk (i.e. the DRP).

In Australia, and consistent with the previous discussion, the cost of equity and the cost of debt are estimated with reference to benchmarks. Firm-specific parameters are benchmarked against those of comparable firms. The principal parameter that informs the cost of debt is the DRP.¹⁴ This input is, in turn, informed by benchmarks for the regulated firm's capital structure and credit rating.¹⁵

3.1.2 Economic efficiency concepts and debt financing

Selecting a conceptual framework to serve as the basis for a cost of debt approach must be informed by the QCA's regulatory objectives. As noted in Chapter 2, a primary objective of regulation is economic efficiency. However, this objective can be constrained by the need to ensure revenue sufficiency.

When setting a cost of debt for regulatory purposes, providing a benchmark allowance that exceeds the efficient cost of debt will lead to excessive prices for the service (i.e., allocative inefficiency).

Productive efficiency requires the regulated firm to minimise its expected debt costs for a given debt management strategy. This objective includes selecting the correct mix of debt instruments to achieve the debt financing objective. This task also involves choosing debt instruments with an appropriate maturity (given an assessment of risks) from lenders offering the best terms. Failure to follow such practices will result in reduced productive efficiency.

Dynamic efficiency requires appropriate signals for new investment over time. This signal will occur when the NPV of that investment is zero. If the expected return on debt differs from the return on debt allowance by the regulator in the period then inter-temporal funding of new investment might be distorted.

3.1.3 Financial risk management

Efficiency concepts applied to the cost of debt must be interpreted in a practical context, which includes considering real-world aspects of debt financing. The financial risks that a firm faces in managing and structuring its debt are relevant considerations.

¹³ The promised yield comprises the expected return that compensates for the time value of money, systematic risk, and the inferior liquidity of corporate bonds relative to government bonds. The expected return also includes an allowance for expected default losses. Using the promised yield is an empirical convenience given the difficulties that arise in identifying the systematic risk component of debt separately.

¹⁴ The underlying benchmark parameter that informs the cost of equity is the equity beta.

¹⁵ In contrast, 'market parameters' (i.e. parameters that are the same across regulated firms) include the risk-free rate, market risk premium (MRP) and 'gamma'.

Specifically, a primary role of the corporate treasury function is to manage a range of financial risks at minimum cost to the firm. Several different types of financial risks related to the cost of debt are relevant. Among others, these risks are interest rate risk, refinancing risk, and currency risk.^{16,17}

Interest rate risk reflects the potential mismatch between the return on debt allowed by the regulator and the actual return on debt due to the movement in interest rates over time. Regulated firms manage interest rate risk in a number of ways (SFG Consulting, 2012: 23–28).

For example, movements in the base rate component of the cost of debt (e.g. the risk-free rate) can be hedged using interest rate swap contracts.¹⁸ These contracts enable a firm to decouple the contractual borrowing term and associated refinancing risk from the effective borrowing term. In Australia, regulated firms' use of interest rate swap contracts for this purpose is widespread (AER, 2009: 150–154).

Refinancing risk arises from exposure to unusual conditions in credit markets at the time of rolling over debt, particularly the non-availability of credit at any price. Regulated firms manage refinancing risk by:

- (a) obtaining debt from multiple sources of finance (e.g. bank debt, domestic bonds and international bonds)¹⁹
- (b) issuing long-term debt
- (c) staggering debt.

PwC reports that the debt portfolios of Australian listed, regulated energy firms in 2012 comprised (on average across the firms): bank debt (27%), domestic bonds (50%), and international bonds (23%) (PwC, 2013: 19, Table 2.2).²⁰ Maintaining access to multiple sources of debt reduces refinancing risk in the event that changes in financial conditions reduce the availability of debt in a particular market at a particular time.

Refinancing risk can be amplified by increased debt refinancing frequency, which arises from using shorter-term debt. Therefore, firms tend to issue long-term debt to reduce the frequency with which debt requires refinancing. Empirical evidence indicates that Australian listed, regulated energy firms have a weighted average term of debt at issuance of 10.2 years for the three principal types of debt listed above (PwC, 2013: 20, Table 2.7).

Refinancing risk also arises from the borrower's potential exposure to the market power of lenders when a significant amount of debt (as a proportion of the entire debt portfolio) is refinanced over a very short period of time (Lally, 2010a: 9). As a result, regulated firms tend to

¹⁶ Currency risk is not considered further, as the QCA's cost of debt estimation methodology assumes a 'simple portfolio' of Australian bonds, and therefore it does not rely on international bond data. For a detailed discussion, see PwC (2013).

¹⁷ Basis risk is a related consideration. It is the risk that offsetting investments in a hedging strategy will not experience price changes in exactly opposite directions from each other. This imperfect correlation between the two investments creates the potential for residual risk (i.e. excess gains or losses for the particular hedging strategy implemented).

¹⁸ An interest rate swap is a contract between a borrower and a third party (typically a financial institution) under which the borrower 'swaps' the floating rate payments it is required to make on floating rate debt that it has issued, in exchange for fixed payments over the term of the debt.

¹⁹ Again, the QCA's estimation methodology excludes international placements of debt and, accordingly, the focus is on domestic bonds only.

²⁰ The firms are: APA Group, DUET, Envestra, Spark Infrastructure and SP AusNet.

stagger their debt such that there is not too high a proportion of existing debt that is maturing in any one year (QCA, 2014d: 14; QTC, 2014c: 6; Lally, 2015: 10–11). The specific debt staggering profile varies on a firm-specific basis (e.g. see QTC, 2014c: Appendix A).

3.2 Debt strategy benchmarks

3.2.1 Overview

As discussed in Chapter 2, a principal objective of an incentive-based framework is to compensate the regulated firm for *ex ante* efficient costs. As stated by QTC:

An efficient debt management strategy results in a firm's equity providers being exposed to an acceptable level of interest rate risk and refinancing risk taking into account the firm's size, asset life, capital structure and the characteristics of its revenues. These considerations apply to all levered firms regardless of whether they are subject to economic regulation or price monitoring.

Compensating a regulated firm for efficiently incurred debt financing costs can be achieved by:

- *determining the characteristics of a prudent and efficient benchmark debt management strategy, and then*
- *making the best estimate of the benchmark costs that would be incurred to adopt and maintain this strategy over time (QTC, 2014c: 5–6).*

Specifying an efficient strategy is based on applying the relevant economic and regulatory concepts discussed above. However, while this exercise is principally conceptual in nature, it is also informed by examining real-world practice, subject to practical considerations and limitations that constrain the definition of the benchmark. When there are competing benchmarks, a set of criteria is necessary to evaluate them.

The remainder of this chapter provides an overview of the principal benchmarks under consideration. It then presents a discussion of key issues stakeholders have raised with respect to the conceptual definition of the appropriate benchmark and provides the QCA's responses. Chapter 4 assesses and compares the on-the-day and trailing average approaches. The QCA's views on the hybrid approach are discussed in section 4.2.

3.2.2 Incentive to adopt a 'matching' policy

Regardless of the benchmark implemented by the regulator (i.e. on-the-day, trailing average, or hybrid), a firm subject to revenue or price determination has a strong incentive to 'match' that regulatory benchmark. This incentive arises because the regulator sets allowed revenues, and any difference between the allowed (i.e. benchmark) cost of debt and the firm's cost of debt will effectively flow to (or from) the firm's equity holders.

If the benchmark firm is able to match the benchmark debt servicing costs relatively closely, it can substantially reduce this source of volatility to its equity holders (QCA, 2014d: 26). The regulator's specification of a benchmark, therefore, implies a corresponding debt management strategy for the regulated firm (Lally, 2014a: 8–9; SFG Consulting, 2012: 5).

A firm subject to a different form of regulation (e.g. price monitoring) might have different incentives to match the regulatory benchmark. This issue is discussed section 3.3.1 below.

3.2.3 Principal benchmarks

On-the-day benchmark

Overview

The on-the-day approach determines an allowed return on debt for the regulated firm as the sum of a prevailing risk-free rate and a prevailing DRP.²¹ As a result, both parameters are estimated over a short period (i.e. typically 20–40 days) closely preceding the start of the regulatory cycle to reflect current (i.e. on-the-day) rates.

In relation to the cost of debt, the choice of a term for the risk-free rate and the DRP are inherently part of the regulatory decision. The terms for these parameters should be selected to match the term of the regulatory period under consideration in order to satisfy the NPV = 0 principle.²²

Firms will have the incentive to match this benchmark, subject to managing various risks. As discussed in section 3.1.3, firms tend to manage refinancing risk by taking out long-term debt and by staggering that debt. The QCA's approach recognises the potential for refinancing risk and determines an efficient (i.e. benchmark) term of debt (QCA, 2014i: 217–218). To date, this term has been estimated at about 10 years (PwC, 2013: 19–20).

Implied debt management strategy

Given the use of long-term debt, an efficient firm would have the incentive to align its debt with the regulatory reset, consistent with the matching policy. The regulated firm can employ both interest rate swaps and credit default swap (CDS) contracts to achieve this objective.²³ In summary, the implied debt management strategy involves the regulated firm (e.g. for a five-year reset):

- (a) issuing an efficient term of debt (e.g. 10 years) to manage refinancing risk (with respect to frequency), where the rate is set over a short period (e.g. 20 days) immediately prior to the start of the regulatory cycle
- (b) using interest rate swap contracts to manage interest rate risk by converting the base rate of the 10-year cost of debt such that the term matches that of the regulatory cycle (e.g. five years)

²¹ Standard regulatory practice in Australia is to estimate the risk-free rate with reference to the yield on government bonds (where the term of the bond varies, depending on the regulator) and to estimate the DRP with respect to Australian corporate bonds with a term and credit rating consistent with the established regulatory benchmarks, typically 10 years and BBB+ respectively.

²² Schmalensee (1989) and Lally (2002) show this result for a firm financed with only equity, and the only source of risk is over future interest rates. Lally (2004) proves the same result in a more realistic situation, in which there are cost and demand risks and aggregate depreciation can deviate from the initial cost of the asset. Lally (2007) further extends this work to consider the implications of corporate debt and shows that the only scenario in which the NPV = 0 principle can be satisfied is where the regulator sets the terms of the risk-free rate and DRP to match the term of the regulatory period, while the regulated firm chooses its borrowing to match the term of the regulatory period. Davis (2014) extends this to allow for the DRP provided by the regulator to vary over time and to consider a greater variety of borrowing arrangements.

²³ A CDS contract is an agreement that transfers the credit risk of a reference entity from one party (i.e. the protection buyer) to another party (i.e. the protection seller) for the term of the contract. The protection buyer pays a periodic premium to the protection seller under the agreement. If the reference entity defaults, or another pre-specified credit event occurs, the protection seller is obligated to compensate the protection buyer for a specified face value of reference entity debt.

- (c) using CDS contracts to convert the 10-year DRP embedded in the average term of debt into a five-year DRP.²⁴

However, in practice, it is difficult to hedge the DRP using CDS contracts due to the lack of market liquidity in these instruments (PwC, 2013: 8). The QCA's approach recognises that the market for CDS contracts is illiquid, and accordingly assumes that firms do not use CDS contracts at this time. Therefore, the approach allows a 10-year DRP rather than a five-year DRP (QCA, 2014d: 3–6; Lally, 2010a: 11).²⁵

In practice, the mismatch between the benchmark DRP and the firm's DRP is managed in various ways, including by selecting the timing and market of debt issues.²⁶

Trailing average portfolio benchmark

Overview

The trailing average portfolio approach determines an allowed return on debt for the regulated firm as the sum of a risk-free rate and a DRP and computes both components on an historical average basis. The length of the historical averaging period is equal to the efficient term of debt (the benchmark is 10 years currently), and that period immediately precedes and includes the current year. Each year in the 10-year trailing average receives an equal weight (i.e. 10%). Therefore, at a point in time, the cost of debt is a 10-year trailing average of 10-year debt.

The allowed cost of debt estimated would be updated on an annual basis using the most recent 10 years. In other words, in each successive year of the regulatory cycle, an observation of the prevailing cost of debt is added (with a weight of 10%) to the trailing average and replaces the oldest observation; therefore, the trailing average is a 10-year moving average.

In addition, there are two variants of the trailing average, depending on the approach taken in compensating the firm for new investment incurred during the regulatory period. The 'simple', or 'unweighted', trailing average assumes that capital expenditure is funded at the historical, 10-year trailing average rate.²⁷

The 'weighted' trailing average compensates new investment at the prevailing rate and is the approach proposed by QTC.²⁸ Specifically, when there is intra-cycle investment, the approach assumes that the increase in the benchmark debt balance is equally funded by the 10 bonds in the benchmark portfolio (i.e. each bond funds 10% of the new investment) but at the prevailing benchmark debt yield (QTC, 2014c: 21).

Implied debt management strategy

The implied debt management strategy under the trailing average involves the firm:

- (a) holding a portfolio of long-term, fixed-rate debt with equally spaced maturities out to the efficient term (e.g. 10 years)

²⁴ Therefore, in this situation, the allowed cost of debt set by the regulator every five years would include: the five-year risk-free rate, the five-year DRP, the transactions costs of the interest rate and credit default swap contracts and the annualised debt issue costs arising from 10-yearly debt issues (Lally, 2010a: 10).

²⁵ Therefore, in this situation, the allowed cost of debt set by the regulator every five years would include: the five-year risk-free rate, the 10-year DRP, the transactions costs of the interest rate swap contracts and the annualised debt issue costs arising from 10-yearly debt issues (Lally, 2010a: 11). For a recent application, see QCA (2014i: 213–224).

²⁶ For example, see Jemena (2013: 36).

²⁷ This version is the approach adopted by the AER (see the discussion in section 4.3).

²⁸ Unless otherwise stated, references to the 'trailing average' from this point will mean the 'weighted' version.

- (b) refinancing 10% of the total debt each year as it matures with new 10-year, fixed-rate debt.²⁹

As with the other approaches, if the regulator sets the benchmark as the trailing average, the regulated firm has the incentive to match it. In this case, the benchmark is independent of the term of the regulatory period. Therefore, regulated firms do not require swap contracts (or comparable hedging arrangements) to hedge movements in rates related to the regulatory reset.

Hybrid portfolio benchmark

Overview

The hybrid portfolio approach combines elements from the on-the-day and the trailing average approaches. Consistent with the on-the-day approach, the regulator estimates the risk-free rate component of the total cost of debt at the rate prevailing immediately prior to the start of the regulatory cycle. The DRP component (only) is estimated using an historical trailing average (in the manner described previously).

Implied debt management strategy

The implied debt management strategy of the hybrid portfolio approach involves the firm:

- (a) holding a portfolio of long-term, floating-rate debt with maturities equally spaced out to 10 years
- (b) using interest rate swap contracts to convert the base rate of the 10-year cost of debt to match the term of the regulatory cycle.

In response to the regulator setting the on-the-day risk-free rate, the firm would have the incentive to enter into interest rate swap contracts (or implement a comparable financing structure) to hedge the movements in the risk-free rate.

3.3 Key issues

QTC and Unitywater raised two principal concerns with the QCA's on-the-day benchmark:

- (a) an efficient cost of debt strategy should not be circumscribed by the regulatory term (or the regulatory constraint more broadly), but should reflect the practice of comparable, unregulated firms or the practice of firms operating in competitive markets
- (b) the approach implies the use of a debt management strategy that is impossible to implement or to approximate in practice.

3.3.1 Perceived relevance of the regulatory term/constraint

Stakeholder submissions

QTC and Unitywater raised the over-arching concern that the regulated firm's choice of an efficient debt strategy should not be determined, or circumscribed, by the regulatory framework.

QTC argued that debt management strategies should not be driven by arbitrary factors such as the regulatory reset term:

²⁹ Over time, the average cost of such a debt portfolio would be a 10-year trailing average of 10-year, fixed-rate debt.

In QTC's view, efficient debt costs are not determined by arbitrary factors such as the term of the regulatory period. Rather, it is the observed practice of comparable firms and financial risk management principles that should determine the regulated cost of debt (QTC, 2014b: 1).

Unitywater argued that the trailing average better reflects the actual debt management strategy of firms operating in competitive markets and, therefore, is more likely to represent efficient financing practices (Unitywater, 2014: 2).

Unitywater also argued that, in the absence of regulation, an efficiently financed firm would be unlikely to employ debt financing practices that are used in the presence of regulation. For example, such a firm would not use interest rate swap contracts to reset the base interest rate on its debt portfolio (Unitywater, 2014: 2).

Similarly, in the context of price monitoring, Unitywater submitted that:

Retaining the 'on the day' approach or only applying the trailing average to the debt risk premium would incorrectly imply that efficient debt management practices are determined by arbitrary factors such as the term of the regulatory period which may not be relevant to SEQ water distributor-retailers under the long term regulatory framework under development by the Authority (Unitywater, 2014: 2).

QCA analysis

The QCA has considered QTC's and Unitywater's concerns relating to the constraint imposed by the regulatory framework. This section sets out QCA's responses to these concerns and gives the QCA's view on the implications of the regulatory framework for the allowed cost of capital and, in particular, the cost of debt.

The QCA notes that price determination and price monitoring are both types of economic regulation. Price determination is used to refer to the process by which the QCA has oversight of allowable revenues and prices. Relevant contexts for applying such a process include, for example, assessing an access undertaking under Part 5 of the QCA Act or assessing revenues and prices as the result of a price monitoring investigation under Part 3 (s.23A) of the QCA Act.

Price monitoring is used to refer to economic regulation where the QCA monitors prices and certain performance criteria for a period of time. Provided the regulated firm meets certain price and performance criteria, the regulator does not set revenues or prices. The QCA currently monitors prices for the SEQ water retailers and the Gladstone Area Water Board (GAWB) (QCA, 2015b; 2015a).

Price determination

As indicated previously, natural monopoly businesses that provide essential services are subject to regulation because, if left unregulated, they will have an incentive to reduce output and set a price higher than average cost. One purpose of regulation is to constrain such behaviour.

Investors in the firm and its customers require certain assurances, especially in a context where the parties make long-lived, sunk investment in relationship-specific assets and therefore commit to a long-term relationship. That arrangement should provide investors with a reasonable rate of return on their investment *ex ante*, and protect customers from excessive prices. When there is uncertainty about the future, the arrangement must be flexible enough to allow adaptation to changing market conditions over time (Biggar, 2011: 35–36).

Under revenue or price determination, regular resets provide such flexibility and ensure that revenues or prices reflect current market conditions.³⁰ This regulatory design serves to protect the long-term interests of both investors and customers with respect to the investment in, and use of, sunk assets (Biggar, 2011). Accordingly, the QCA disagrees with QTC and Unitywater that the regulatory term is an 'arbitrary' factor.

Importantly, revenue or price regulation changes the risk of the firm and its allowable revenue. Specifically, the presence of regulation reduces the variability of the firm's cash flows around their expected value. For example, the application of a revenue cap provides greater certainty that the firm's cash flows will be closer to their expected value than would be the case without the revenue cap. The regulator takes this impact on risk into account when setting allowable revenue and the final price. In other words, the firm's risk cannot be separated from the regulatory framework (Marshall *et al.*, 1981). This conclusion has two implications that are relevant to the present context.

The first implication is that, as regulation affects the firm's risk profile, relevant comparator firms will typically be other regulated firms (see section 2.2). Accordingly, competitive firms are not necessarily direct comparators when considering the riskiness of returns from investment in regulated firms (Lally, 2015: 27).

Likewise, debt management strategies of competitive firms will not necessarily be relevant to regulated firms for the purpose of designing a methodology for determining the cost of debt. Specifically, a debt policy of an unregulated firm in a competitive market might materially differ from the debt policy of a regulated firm subject to periodic regulatory resets.³¹

The second implication is that a firm subject to revenue or price determination has a strong incentive to take the regulator's policies into account in order to manage its risk optimally. Therefore, if the regulator employs an on-the-day approach, the firm has a strong incentive to adjust its debt strategy to match that approach (as discussed previously).

Consistent with this point, Unitywater submitted that, in the absence of regulation, an efficiently financed firm would be unlikely to employ a debt management strategy used in the presence of regulation. The QCA agrees with Unitywater — if the firm is subject to no regulation whatsoever then the firm would not necessarily have an incentive to adopt a debt benchmark used under regulation.

Price/performance monitoring

Under price/performance monitoring, a firm's revenues or prices are monitored by the regulator against a relevant benchmark, such as the consumer price index less the x-factor (CPI-X). Provided the regulated firm meets certain price and performance criteria, the regulator does not set revenues or prices. Given this context, Unitywater is concerned that the regulatory term might not be relevant to the SEQ water retailers, as they operate under a price/performance monitoring framework rather than a price determination framework.³²

However, while price/performance monitoring is a relatively 'light-handed' form of economic regulation, it can invoke a full, determinative price review should a firm fail to meet certain

³⁰ The length of time between resets is also a function of stakeholders' relative tolerances for risk, the need to improve incentives for cost reductions and a function of administrative costs. Resets also involve revising and, in some cases, renegotiating other conditions (e.g. non-price conditions of access).

³¹ The QCA notes that this conclusion holds even if aspects of those strategies, such as debt staggering, are common to both classes of firms.

³² See QCA (2015b) for a description of the price monitoring framework.

price or performance criteria. Therefore, the regulator must establish relevant benchmarks for monitoring prices and performance, and apply a test to detect 'excess' profits (i.e. an abuse of monopoly power). The integrity of the regulatory framework therefore requires that consistent benchmark concepts (including for the cost of debt) be applied across both price determination and price monitoring.

In the SEQ retail water context, the businesses reset their prices on an annual basis. As a result, the firms' prices can only be monitored if the regulatory benchmark prices are assessed with respect to a WACC that is set on an annual basis. However, the QCA only monitors final prices. Therefore, the SEQ businesses are *ex ante* free to implement any prices that they choose.

Finally, the QCA notes that, as the regulator does not set revenues or prices (unless there is evidence of an abuse of market power), a firm under price monitoring would have weaker incentives to match regulatory benchmarks than a firm subject to price determination. However, it does not follow that the regulator should adopt the firm's debt strategy as the benchmark. Rather, the regulator should adopt a benchmark strategy based on considering a range of relevant factors (as discussed in Chapter 4).

3.3.2 Assumptions and realism of benchmarks

QTC raised two related arguments against the on-the-day approach, namely that it:

- (a) makes several incorrect assumptions about refinancing practices
- (b) cannot be approximated in practice and, by implication, is not realistic (QTC, 2014c: 1).

Assumptions about refinancing practices

QTC argued that it is not feasible for a regulated firm to have its entire debt balance maturing over a short period of time (i.e. the 20–40-day averaging period immediately preceding a regulatory reset) and that doing so creates the potential for large mismatches between the allowed cost of debt and the firm's (efficient) cost of debt (QTC, 2014c: 1, 9).³³

In particular, QTC considered that the QCA has incorrectly assumed that it is a lack of availability that makes CDS contracts unsuitable for hedging the DRP. Rather, QTC argued that the primary problem is the structure of CDS contracts. Specifically, regulated firms cannot buy or sell protection on themselves (QTC, 2014c: 9).

Further, QTC argued that the QCA's benchmark incorrectly assumes that refinancing risk is managed by compensating the firm with an allowance rather than by assuming a strategy of maintaining staggered debt (QTC, 2014c: 1)

The QCA has considered these concerns. The QCA notes that any approach to setting a regulatory benchmark cost of debt is likely to create some mismatch for regulated firms (as no benchmark is perfect). The extent and implications of these mismatches under the on-the-day and the trailing average approaches are considered in detail in the next chapter.

The QCA maintains the view that it is a lack of liquidity in CDS markets, rather than the structure of CDS contracts, that is the principal problem. Specifically, while firms cannot transact in contracts on themselves, CDS prices for firms in the same industry and with the same credit rating will be highly correlated and, therefore, similar benefits can be achieved by constructing a portfolio of contracts on firms of this type.

³³ QTC also noted that, even if the firm could arrange for its entire debt portfolio to mature in this way, it could not be assumed that the firm would be able to refinance its outstanding (floating-rate) 10-year bond five years prior to maturity at the original issue level (QTC, 2014c: 7).

Given illiquidity is the primary problem, further development of the CDS market over time suggests that movements in the DRP could be hedged in this way.³⁴ Lally (2015) and other consultants have reached the same conclusion (Lally, 2015: 18–20; Chairmont Consulting, 2013a: 4).

The QCA also disagrees with QTC that the on-the-day approach assumes refinancing risk is managed with an allowance. The QCA recognises that refinancing risk is managed with a strategy, and that strategy may involve both issuing long-term debt and staggering that debt. As discussed, the QCA's approach recognises the potential for refinancing risk by benchmarking the efficient term of debt. The approach compensates the firm for the transactions costs of implementing a strategy to hedge the risk-free rate component of the cost of debt to the term of the regulatory period.

Realism of the benchmark

QTC and Unitywater submitted that the on-the-day benchmark cannot be implemented or approximated in practice. By implication, their view is that the benchmark is unrealistic.

QTC argued that, as a prudent and efficient debt management strategy involves both issuing long-term debt and staggering debt, it is therefore essential that the benchmark strategy reflects *both* of these practices to manage refinancing risk:

As a reasonable estimate of a firm's refinancing risk exposure is the percentage of total debt that matures each year, an efficiently financed firm will manage refinancing risk by:

- *staggering the maturity dates of its borrowings out to a sufficiently long maximum tenor to reduce the size of the annual refinancing task, and*
- *refinancing maturing debt with long-term debt (QTC, 2014c: 6).*

The QCA understands that important aspects of prudent debt management involve both issuing long-term debt and staggering debt to smooth the refinancing task, such that only a proportion of debt matures each year. Such practices are also acknowledged by Lally (2015: 40–41).

However, it does not necessarily follow that a benchmark should reflect *all* features of real-world practice. The QCA emphasises that the design of an appropriate regulatory benchmark involves a wider range of considerations that balance trade-offs between realism, complexity and other factors.

For example, real-world practice typically involves obtaining debt from multiple types of finance, spanning different debt instruments and markets (e.g. bank debt, domestic bonds and international bonds). The regulatory benchmark, however, does not attempt to determine and replicate an efficient 'funding mix' that reflects real-world practice. Doing so would involve additional costs and complexity that are not outweighed by the associated benefits.³⁵

Rather, regulators employ simplifying assumptions about benchmarks for valid reasons. While the QCA acknowledges that its benchmark uses simplifying assumptions, the QCA notes that QTC's trailing average benchmark also uses simplifying assumptions.

In the Australian Energy Market Commission's (AEMC's) review of electricity and gas network service rule changes and the AER's Rate of Return Guideline consultation process not all firms supported the trailing average. Some firms stated that they would not be able to approximate

³⁴ QTC also argued that CDS contracts only hedge default risk, which is a minority element of the DRP (QTC, 2014c: 9). While the CDS contracts do not fully hedge the DRP, hedging transactions are necessarily imperfect. However, this does not imply that they should not be used.

³⁵ For a detailed discussion, see PwC (2013).

it in practice, or if so, only at significant cost (e.g., Jemena, 2013: 23–26; Appendix A). Further, a number of firms supported the current, on-the-day approach (APIA, 2012: 2; APA Group, 2012: 1).

The QCA's view is that limitations should not exclude a benchmark from proper consideration. Rather, competing benchmarks should be evaluated on an appropriate basis using relevant criteria. This assessment is undertaken in Chapter 4.

4 ASSESSMENT OF COST OF DEBT APPROACHES

This chapter assesses the trailing average relative to the on-the-day approach. In doing so, the comparison involves the *weighted* trailing average, as QTC's proposal reflects this approach (discussed in section 3.2.3). The following criteria are applied:

- (a) NPV = 0 requirements
- (b) Efficient signals for new investment
- (c) Price stability
- (d) Practicality and implementation

Section 4.2 considers the hybrid approach. Section 4.3 examines regulatory practice.

4.1 Application of criteria

4.1.1 NPV = 0 requirements

This section examines violations of the NPV = 0 principle in the context of the regulated firm but without taking into account new investment incurred during the regulatory period. Incentives for new investment are examined in section 4.1.2.³⁶ A related issue, the potential overstatement of the cost of debt, is discussed in section 4.1.3.

Stakeholders argued that mismatches between the benchmark (i.e. allowed) cost of debt and the firm's cost of debt resulting from the on-the-day approach are significant and have implications for:³⁷

- (a) volatility in returns
- (b) violations of the NPV = 0 principle
- (c) the potential for financial distress³⁸
- (d) the potential to trigger a review under price monitoring.

Volatility in returns

All else equal, the larger (smaller) a deviation between the firm's cost of debt and the allowed cost of debt, the higher (lower) the volatility in cash flows to equity holders. This effect raises potential implications for the allowed cost of equity.

³⁶ Correct signals for new investment during the regulatory period are a NPV-related issue. However, given the significance of the issue in its own right, it is treated separately.

³⁷ Analysis in this section focuses primarily on the DRP component of the total cost of debt. This is because the regulator's use of an on-the-day or trailing average benchmark would not be expected to affect the risk of equity holders with respect to the risk-free rate. Again, this is because firms act to 'match' the regulator's benchmark. Therefore, if the benchmark is the on-the-day approach, the firm uses interest rate swap contracts, while if the benchmark is the trailing average, the firm does not. As a result, the relevant mismatch is with respect to the DRP only.

³⁸ Financial distress is a NPV = 0 issue as it relates to the potential for revenue inadequacy. However, expected bankruptcy costs are difficult to quantify. Therefore, financial distress is discussed separately.

Stakeholder submissions

QTC submitted that the on-the-day approach results in large cost of debt mismatches for a regulated firm implementing an efficient debt financing strategy (i.e. the trailing average strategy):

The average DRP paid by an efficiently financed firm will be approximately equal to the 10-year trailing average of the 10-year DRP. On a year-by-year basis the average DRP is likely to differ significantly from the prevailing DRP at the start of each regulatory period, especially if the regulatory period is short (eg, 1 year) (QTC, 2014c: 8).

QTC simulated random changes in the DRP in the market over 200 years based on an underlying time series model.^{39,40} QTC estimated the standard deviation of the DRP mismatch arising from using the on-the-day approach for both five-year and one-year regulatory cycles.⁴¹ The average standard deviations of annual mismatches over the simulation period were 0.73% and 0.87% (73 and 87 basis points (bps)) respectively (QTC, 2014c: 39, Table 2).

QTC concluded that the on-the-day approach therefore results in substantial volatility due to cost of debt mismatches (QTC, 2014c: 40).

QCA analysis

The QCA notes that any regulatory approach to the cost of debt is likely to create some mismatch between the regulatory benchmark cost of debt and the firm's cost of debt, as a firm might not be able to exactly match the benchmark. However, the QCA considers that the principal problems arising from any resulting volatility relate to the extent to which volatility causes violations of the NPV = 0 principle and increases the potential for financial distress of the firm. In addition, volatility in the cost of debt might also affect the volatility of final prices. (These issues are discussed later in this section.)

Notwithstanding these issues, it is important to recognise that any *systematic* volatility arising from cost of debt mismatches will already be impounded in the regulated firm's equity beta.⁴² Again, this is because beta measures systematic risk, including any systematic volatility flowing to equity holders arising from cost of debt mismatches. However, consistent with the discussion in Chapter 2, the allowed beta determined by the regulator is not estimated from the regulated firm's actual returns but is benchmarked using the returns of comparable, regulated firms. Therefore, applying a benchmarked beta estimated in this way will compensate investors in the regulated firm of interest for volatility arising from cost of debt mismatches to the extent that the comparator firms' beta estimates also reflect similar mismatches.

³⁹ The exercise assumes that the regulated firm is financed with floating rate bonds with annually spaced maturities of one to 10 years, and the business uses interest rate swaps to lock in the base interest rate for the term of the regulatory period. The debt balance is assumed constant (QTC, 2014c: 39).

⁴⁰ Given the lack of historical data for long-term Australian corporate bond yields, QTC used monthly data for both the risk-free rate and DRP for the United States from the Federal Reserve Bank of St Louis over the period 1953–2014. QTC used the data to parameterise an underlying time series model. Given this model, QTC then simulated monthly outcomes over a 200-year period and determined the standard deviation of the mismatch for both five-year and one-year regulatory resets for each simulation. QTC undertook 20,000 simulations of this type, and the average standard deviation reported for each reset is the average over all of the simulations (QTC, 2014c: 36–39).

⁴¹ The one-year reset corresponds to the one-year frequency with which the SEQ water retailers adjust their prices.

⁴² As explained previously in footnote 37, these mismatches relate to the DRP component of the total cost of debt.

This observation raises the issue of whether an adjustment to the benchmarked beta is required if the comparable, regulated firm is subject to a *different* cost of debt approach than the regulated firm of interest.⁴³ However, while it might be desirable to estimate such an effect, it would not be possible at present to estimate it. This is because available returns data for estimating beta is drawn from regulated firms that are subject to the on-the-day approach.⁴⁴ Further, any differential effect on beta would likely be difficult to detect empirically.

Importantly, the on-the-day approach has an advantage over the trailing average approach with respect to hedging volatility. Mismatches in the DRP are (at least) partially offset by MRP estimation errors (Lally, 2015: 12–13). Under the on-the-day approach, DRP mismatches are most severe for firms when the prevailing rate is low relative to the trailing average cost of debt (i.e. the benchmark allowance received from the regulator is less than the trailing average cost of debt paid by the firm). Prevailing rates on debt tend to be low in favourable economic conditions. However, in these same conditions, the true MRP is likely to be less than the allowed MRP in the cost of equity; that is, the true MRP will be less than the MRP determined by the regulator.⁴⁵ As a result, the current approach provides a partial hedge for equity holders in the firm.

Aside from volatility concerns *per se*, the principal issue is whether mismatches have a material impact on the firm's revenue sufficiency. If revenues are not sufficient then the NPV = 0 principle will be violated.

NPV = 0 violations

As discussed previously, if the regulated firm implements a debt strategy that does not match the regulatory benchmark then mismatches between the firm's debt costs and the (benchmark) allowed costs can arise. Lally (2010a) provides a useful example:

...with five yearly resetting of the ten year debt margin, the resulting process would violate the NPV = 0 test because the allowed premium would sometimes diverge from that actually incurred by a firm. For example, suppose the firm is established now and partially funds itself with ten year debt involving a current debt premium of 1.5%. The regulator will set prices for the first five years using the same ten year debt premium, and therefore no difference arises in the first five years. However, in five years time, the regulator will reset prices using the ten year debt premium prevailing at that time and this may differ from the current debt premium. In that event, the price allowed by the regulator for that second five year period will diverge from the costs incurred by the regulated firm. Nevertheless, the divergence could be in either direction (Lally, 2010a: 11).

The QCA's draft decision indicated that the mismatches under the on-the-day approach result in only a minor violation of the NPV = 0 principle for an extreme event (i.e. a severe mismatch between the firm's DRP and the benchmark) (QCA, 2014d: 15; Lally, 2010a: Appendix 1). The violation corresponds to a WACC understatement of 0.036% (3.6 bps). However, the mismatch could also be in the other direction, resulting in a WACC overstatement of 0.036% (Lally, 2010a: 41).⁴⁶

⁴³ Note that this does not mean that, if a comparable firm is subject to a different cost of debt benchmark, the regulator should adopt that (other) benchmark. See section 4.3.

⁴⁴ The AER only implemented the trailing average approach in 2014, and beta estimates are typically estimated using five years of returns data. Therefore, such data are not yet available.

⁴⁵ The reverse holds in unfavourable economic conditions.

⁴⁶ For the analysis, the term of the regulatory period is five years (Lally, 2010: 36).

Stakeholder submissions

QTC disputed the QCA's draft position that the NPV violations are minor. QTC simulated random departures from NPV = 0 over a 200-year period. The standard deviation of the WACC is 0.09% (9.0 bps). However, QTC contended that a departure from NPV = 0 due to an extreme event (which QTC defines as three standard deviations) corresponds to a WACC understatement of 0.27% (27 bps). QTC noted that this estimate is substantially greater than Lally's estimate of 0.036% (3.6 bps):

...results suggest that the 3.6 basis point estimate in Lally's example is conservative. A more realistic estimate of an extreme outcome would be a violation of NPV = 0 that is equivalent to mis-estimating the WACC by ± 27 basis points in perpetuity (ie, a 3 standard deviation event) (QTC, 2014c: 41).

QTC noted that the trailing average and the hybrid strategies do not produce NPV = 0 violations (QTC, 2014c: 41).⁴⁷

QCA analysis

The QCA assessed QTC's claim that NPV violations are substantial with respect to the on-the-day approach. The QCA notes that QTC's simulation shows that the violation corresponds to a WACC understatement of 0.27% (QTC, 2014c: 41).

Lally (2015) has undertaken additional analysis of this issue and demonstrated that QTC's estimate of 0.27% is materially too large for three reasons.⁴⁸ The first and most significant reason is that QTC's estimate is based on *actual* changes in the DRP, while Lally's estimate of a 0.036% WACC understatement is based on *expected* changes. When the analysis takes this point into account, the WACC understatement becomes 0.15% (Lally, 2015: 13–14).

The second issue is that QTC defines an 'extreme' outcome on the basis of three standard deviations (i.e. the 99th percentile). However, the QCA agrees with Lally that a more reasonable definition of an extreme outcome is two standard deviations (i.e. the 95th percentile). Taking this point into account reduces the understatement from 0.15% to only 0.08%, which is not significant (Lally, 2015: 14).

These conclusions are based on the implicit assumption that the regulated firm makes a single, 10-year borrowing (and then rolls it over after 10 years). However, a more realistic strategy for the firm is to stagger its debt to some extent. For example, Lally demonstrates that, if the regulator sets the cost of debt using an on-the-day approach and firms stagger their debt evenly over 10 years, then the potential WACC understatement is reduced further, from 0.08% to 0.02% (Lally, 2015: 15).^{49,50}

⁴⁷ If the regulator implements a trailing average or a hybrid benchmark, the presumption is that the regulated firm can exactly match it. If so, there is no NPV = 0 difference.

⁴⁸ Lally used the United States data directly for the analysis, as he expressed reservations with relying on the simulation results. This is because the simulation assumes that random shocks to the DRP are normally distributed when the underlying data on which the time series model is based indicate that upward shocks to the DRP are more pronounced than downward shocks. The simulation also assumes that the same model of reversion of the DRP to its long-run average applies at all times when the speed of reversion is likely to be higher after a very significant shock to the DRP (Lally, 2015: 12).

⁴⁹ In other words, the firm undertakes 10% of the borrowing for a one-year term, then rolls it over for 10 years, undertakes a further 10% of the borrowing for a two-year term, then rolls it over for 10 years, etc. After 10 years, the firm will have attained the desired profile of debt (i.e. consistent with firms using debt with an average term of 10 years and staggering that debt evenly).

The estimates of 0.08% and 0.02% are significantly lower than QTC's estimate of 0.27%; moreover, they are not substantial. Further, these NPV violations could equally result in an overstatement and, in any event, are outcomes from extreme scenarios.

Given the analyses undertaken by QTC and Lally on this matter, the QCA is satisfied that any potential violations of the NPV = 0 principle would not be substantial.

Financial distress

Financial distress refers to the circumstance where a firm cannot meet, or has difficulty meeting, its financial obligations to creditors.

Under the on-the-day approach, allowed revenues are based on the cost of debt prevailing at the commencement of the regulatory cycle. In practice, if the firm is paying the trailing average cost of debt, then divergence from the regulatory allowance could increase the risk of the firm being unable to meet its debt repayments.⁵¹

Stakeholder submissions

QTC submitted that to reduce the probability of financial distress a business would seek to implement a total cost of debt that responds slowly over time to changes in market interest rates. QTC considered that such an approach is consistent with a trailing average that applies to the total cost of debt (QTC, 2014b: 6).

QCA analysis

The QCA notes that most regulated natural monopolies provide services with low income elasticities of demand. They also operate in a well-defined regulatory environment that provides a number of protections, including substantial revenue certainty. Given this environment, the QCA considers that financial distress is likely to be relevant in only the most extreme market conditions.

In examining the implications of the on-the-day approach for financial distress, Lally (2014a) assessed the net cash flows of a hypothetical firm over the period 2007–2013 and concluded that applying the on-the-day approach did not contribute to material bankruptcy risk (Lally, 2014a: 20–23). This outcome is particularly relevant, as this period reflected considerable market turbulence, encompassing both the Global Financial Crisis (GFC) and the onset of the European sovereign debt crisis.

On this basis, the QCA concludes that the risk of financial distress is very low under the on-the-day approach.

Potential to trigger a review under price monitoring

A fourth concern is that mismatches arising between the cost of debt benchmark allowance and the firm's (efficient) cost of debt are incorrectly interpreted by the regulator as an abuse of market power and, as a result, trigger a review.

⁵⁰ For a one-year regulatory period, the understatement is 0.06% (rather than 0.02%), but this figure is also not significant.

⁵¹ This issue does not arise with respect to the risk-free rate component of the cost of debt. Under the on-the-day approach, the risk-free rate determined by the regulator is the rate prevailing at the start of the regulatory cycle, and it is effectively the same rate paid by the firms that use interest rate swap contracts in order to align their borrowing terms to the regulatory cycle. Under the trailing average approach, the risk-free rate is a trailing average. Once the regulator sets the trailing average risk-free rate, regulated firms will have an incentive to match the regulator's benchmark.

Stakeholder submissions

Specifically, QTC noted that Unitywater, QUU and GAWB will be subject to performance monitoring by the QCA from 1 July 2015. QTC further noted that these entities support a trailing average cost of debt and that, if the QCA retains the on-the-day approach or adopts the hybrid approach, differences between the businesses' cost of debt and the QCA's benchmark will arise.

QTC submitted that, if the QCA's estimate of the cost of debt is below the firms' trailing average, it would not be reasonable for the QCA to conclude that the businesses have abused their monopoly power. In reaching this conclusion, QTC submitted that the broad consistency between the businesses' trailing average approach and the AER's approach should be a relevant consideration (QTC, 2014c: 31).

QCA analysis

The QCA understands and has considered this concern. It accepts that, if the businesses adopt a trailing average cost of debt approach, differences with the QCA benchmark might occur over time. The QCA's view is that differences between DRPs in the trailing average and the on-the-day approaches should not, by themselves, trigger a cost of service review.

The QCA notes that, based on simulation analysis, QTC estimates the standard deviation of annual mismatches between the trailing average DRP and the on-the-day DRP at 0.87% (QTC, 2014c: 39). Using Bloomberg data for 2002–2014, the longest period over which data is available for Australia, the QCA estimates the standard deviation of the differences at 0.97%, which is similar to QTC's estimate. These differences imply WACC differentials of 0.52% and 0.58% respectively (given benchmark leverage of 60%).

From 2013–2015, Unitywater applied a WACC of 7.62%, which is 1.05% higher than the QCA benchmark WACC of 6.57%. For comparison purposes, this WACC differential implies a cost of debt differential of 1.75%. This figure is about three times the QCA's estimated WACC differential of 0.58%, based on the standard deviation of the differences in the DRPs of 0.97%. The QCA notes that, in its review of Unitywater's 2013–2015 prices, the QCA commented on Unitywater's WACC difference of 1.05% but found that there was no evidence that Unitywater was exercising market power (QCA, 2014c: 80).

More generally, and consistent with the discussion in section 4.1.4, any year-to-year change in the WACC will be less than the change in the cost of debt because the cost of debt is only one component of the WACC. In turn, any year-to-year change in final prices will be even less, all else equal, because the return on capital component of revenues is only one component of the maximum allowable revenue (MAR), on which final prices are based.

Further, a breach of CPI-X does not necessarily trigger a cost of service review. Rather, in considering whether a review is warranted, the QCA considers a combination of price and performance criteria (QCA, 2015b).

4.1.2 Efficient signals for new investment

Background

The prevailing cost of debt at the time of investment is considered to be the best indicator of future borrowing costs. As such, it provides appropriate signals for efficient new investment to promote dynamic efficiency.

The on-the-day approach involves setting the allowed cost of debt set at the start of the regulatory period. This rate will apply to new capital expenditure that occurs during that period until it is reset at the start of the next period.

If the prevailing cost of debt materially diverges from the allowed cost of debt during the period, there could be implications for capital expenditure incentives. However, this risk can be managed in various ways.⁵²

Using an *unweighted* trailing average to set the allowed cost of debt implies that the firm can issue new debt at a 10-year average, historical rate, which is not possible (unless the cost of debt has not changed). Moreover, the unweighted trailing average can exacerbate capital expenditure incentive issues identified above because the (unweighted) trailing average cost of debt reflects less relevant market information.⁵³ This approach produces a bias toward over-(under-)investment when the prevailing rate is below (above) the unweighted trailing average.

QTC's (weighted) trailing average seeks to address these concerns. As discussed in section 3.2.3, new debt arising from intra-cycle capital expenditure is compensated at the prevailing cost of debt.⁵⁴ In subsequent years, this cost of debt converges to the trailing average (QTC, 2014b: 20–21).

Stakeholder submissions

QTC argued that the (weighted) trailing average approach will provide superior signals for new investment relative to the on-the-day approach (QTC, 2014c: 11).

QTC's analysis indicates that, for a five-year regulatory period, applying the on-the-day approach creates a mismatch between the allowed DRP set at the start of the period and the DRP prevailing during the period of 0.61%. By comparison, using the trailing average results in a mismatch of 0.38% (QTC, 2014c: 40).⁵⁵ By implication, it is claimed that the on-the-day approach will provide inefficient signals for new investment:

Under the on-the-day approach, the DRP on a new borrowing is only correctly compensated for the first 5 years (assuming a 5-year regulatory period). The compensation received for the last 5 years will depend on the prevailing DRP at the start of the next regulatory period. Larger mismatches will occur on new borrowings made during the regulatory period (QTC, 2014c: 22).

QTC further argued that the mismatch between the benchmark DRP under the on-the-day approach and the incurred DRP is even larger (i.e. the standard deviation increases from 0.61% to 0.88%) if the regulatory cycle is one year. QTC noted that this outcome is relevant as the QCA intends to estimate the cost of debt benchmark for the SEQ water retailers on an annual basis (QTC, 2014c: 22, 40).

⁵² If the timing of the capital expenditure is known, the risk-free rate component can be hedged with a forward-starting swap contract.

⁵³ The DRP allowed under the unweighted trailing average will be farther from the prevailing DRP under the on-the-day approach at any point in time, as the former reflects a DRP that is five years out-of-date on average, while the latter reflects a DRP that is 2.5 years out-of-date (i.e. the average time from the start of the regulatory cycle until the incurrence of capital expenditure for a five-year regulatory cycle).

⁵⁴ Again, when there is intra-cycle investment, QTC's approach assumes that the increase in the benchmark debt balance is equally funded by the 10 bonds in the benchmark portfolio (i.e. each bond funds 10% of the new investment at the prevailing benchmark debt yield (QTC, 2014c: 21)).

⁵⁵ These are standard deviations (in basis points) based on the QTC simulation results for mismatches in the DRP (QTC, 2014c: 39–40).

QCA analysis

The QCA accepts that mismatches in the cost of debt can occur. However, the QCA's view is that the relevant consideration for the efficient signalling of new investment is the NPV of that investment. The QCA notes that QTC has not undertaken a NPV analysis of new investment.

However, Lally (2015) has undertaken a NPV analysis of new investment under the on-the-day approach for both five-yearly and one-yearly updating of the cost of debt.⁵⁶ The greatest incentive problems for new investment are likely to occur approximately half-way through the regulatory period (e.g. at 2.5 years through a five-year cycle).⁵⁷ Accordingly, Lally's analysis focuses on the difference between the allowed DRP (set 2.5 years before) and the prevailing DRP at the midpoint of a five-year cycle.

Lally (2015) focuses on the cases in which the allowed DRP is *lower* than the prevailing DRP because economic investment does not occur in this situation. Further, he analyses the worst-case set of differences for the period 1955–2014, specifically the 95th percentile of the entire distribution of these differences. Lally then estimates both the NPV and corresponding WACC understatements resulting from these worst-case DRP differences (Lally, 2015: 15–17).

The analysis for a five-year cost of debt update (i.e. a five-year reset) indicates an understatement equal to 1.7% of the initial value of the firm's regulatory asset base (RAB), which is equivalent to a WACC understatement in perpetuity of 0.15%. For comparison, the trailing average gives a WACC understatement of 0.09%. Therefore, the difference from the trailing average in a five-year setting is only 0.06%.

The QCA notes that, for a one-year reset, the on-the-day approach only results in a WACC understatement of 0.06%, and therefore provides (marginally) *superior* signals for new investment relative to the weighted trailing average approach (0.09%). This is because, while both methods involve annual updating, the on-the-day cost of debt reflects the most relevant information. In contrast, the trailing average retains older and less relevant information for a long period of time (Lally, 2015: 22).

As a result, the QCA considers that the claim that the trailing average provides superior signals for new investment is overstated, particularly in the context of a one-year reset. These results are summarised in Table 1.

Table 1: On-the-day approach—effect of DRP mismatches on new investment (95th percentile)

<i>Approach</i>	<i>NPV Effect (% RAB)</i>	<i>WACC Effect (%)</i>
Five-year updating — On-the-day	–1.7	–0.15
One-year updating — On-the-day	–0.7	–0.06
One-year updating — Trailing average	–1.0	–0.09

Source: Lally (2015: 17-22).

⁵⁶ The analysis again utilises the same historical United States data utilised by QTC and is based on DRP mismatches.

⁵⁷ Mismatches between the allowed DRP and the prevailing DRP will persist for the longest time (i.e. until the allowed rate is reset at the start of the next regulatory cycle), but are likely to be smallest, near the start of the regulatory cycle. Mismatches between the allowed DRP and the prevailing DRP are likely to be largest toward the end of the cycle, but will not persist for long because the allowed DRP will soon be reset. These points suggest that the most likely investment distortions will relate to mid-cycle capital investment decisions.

In summary, while investment signals are slightly better with the weighted trailing average in the context of a five-year reset, the difference is only 0.06%. In contrast, the on-the-day approach in the context of a one-year reset (i.e. annual updates) provides marginally better signals for investment than the trailing average. This result is relevant as the SEQ water retailers have a one-year price monitoring period.

Finally, it should be noted that these differences relate to outcomes from extreme events and could equally reflect WACC overstatements.

4.1.3 Potential overstatement of the cost of debt

A key concern highlighted in the QCA's draft decision is that implementation of the trailing average cost of debt is likely to result in an overstatement of the cost of debt (QCA, 2014d: 15–17).

Under the on-the-day and hybrid approaches, the regulated firm has a strong incentive to hedge the risk-free rate component of its debt to align it with the regulatory reset. Under the trailing average approach, the incentive to align the term of the risk-free rate with the term of the regulatory cycle is, in theory, not present. This is because, unlike the other two approaches, the trailing average does not apply an on-the-day risk-free rate that is set immediately prior to the reset. Rather, it applies a trailing average, which is independent of that reset.

However, it does not follow that the appropriate term for the risk-free rate for the regulator to set when implementing the trailing average is the 10-year term. Rather, the relevant benchmark term should be set with reference to the behaviour of efficient and otherwise comparable, *unregulated* firms. This is because regulated firms are not suitable comparators as their swap contract behaviour is influenced by the regulatory constraint.⁵⁸

Efficient, unregulated firms would have the incentive to enter into interest rate swap contracts in order to shorten the effective term of their debt because debt is progressively more expensive as its term increases. Specifically, it is more likely that such a firm would choose its debt term and interest rate swap contracts to optimally trade off the:

- (a) reduced refinancing risk from longer term debt
- (b) increase in the effective risk-free rate with the effective debt term
- (c) transactions costs of the interest rate swap contracts
- (d) increased interest rate volatility due to a shorter effective debt term (Lally, 2014: 43).

Therefore, if the regulator seeks to implement a 10-year trailing average cost of debt then the correct term to set for the trailing average risk-free rate should be its *effective* term (i.e. the reduced term, adjusted for the interest rate swaps). An example that illustrates the situation confronting the regulator is the following:

...suppose that otherwise similar unregulated firms have ten-year debt, use interest rate swap contracts to convert the risk free rate component of their cost of debt to the three-year rate, the average ten-year DRP is 2%, the average ten-year risk-free rate is 6%, the average three-year risk-free rate is 5%, and the transactions costs of the swap contracts are 0.20%. The average

⁵⁸ For example, if a firm is subject to the on-the-day approach and the regulatory period is five years then it would be expected that the firm would match the regulatory policy and convert the risk-free rate component of the cost of debt into five years. However, this fact is not useful in determining how the firm would behave if unregulated. The fact that the relevant comparators in this case are unregulated firms is an exception to the rule that typical comparators are similar, regulated firms.

cost of debt of these firms is then 7.2%, comprising the average three-year risk-free rate of 5%, the ten-year DRP of 2%, and the transactions costs of the swap contracts. However, a regulator who merely observed their average debt term of ten years and ignored their interest-rate swap contracts would allow a ten-year cost of debt, with an average rate of 8%. The allowed cost of debt would then be too high by 0.8% (Lally, 2014a: 44).

As a result, the allowed cost of debt would be set too high by the difference between the 10-year risk-free rate and the effective (i.e. reduced) risk-free rate.⁵⁹ Therefore, if the trailing average is implemented, the correct term for the risk-free component is the effective term, not the 10-year term.⁶⁰

The regulator's problem is that, in order to implement the 'correct' trailing average cost of debt, the regulator must be able to observe (i.e. benchmark) the average *reduction* in term resulting from using the interest rate swap contracts. However, this effective term is unobservable because the relevant firms to observe for this purpose are comparable firms *not* subject to regulation, as regulation changes the nature of the firm's behaviour.

These firms are not likely to exist — if they did, they would likely be subject to regulation by virtue of being comparable, as they would be firms that provide essential monopoly services (Lally, 2014a: 44; Lally, 2015: 22–24).

As a result, the QCA expressed the concern that the trailing average is likely to overstate the benchmark cost of debt and cause a violation of the NPV = 0 principle (QCA, 2014d: 15–17).

Key issues

QTC disagreed with the QCA's draft position and advanced several arguments against it.

First, QTC submitted that the QCA's approach to evaluating risk management strategies is simplistic as it focuses only on the average cost of debt associated with different terms of debt, rather than on minimising risk (QTC, 2014c: 14–15).

However, the QCA does not agree that its approach focuses on the long-run average cost of debt. The QCA's on-the-day approach recognises refinancing risk, specifically the potential for the efficient term of debt to exceed the term of the regulatory period. The QCA's approach further recognises that firms will have a strong incentive to manage their cost of debt to reduce this risk and provides firms with an allowance to implement a strategy (i.e. using the relevant swap contracts) to hedge the base rate of the cost of debt in this way. Actual practice supports the idea that the firms hedge in the way described by the QCA.⁶¹ Therefore, the QCA's approach recognises risk-adjusted costs are important to firms.

Further, the QCA does not agree with QTC that firms seek to minimise risk. Reducing risk has a cost, and firms trade off risk reduction with the cost of risk reduction — the efficient level of risk-bearing is generally not zero (Gollier, 2004).

⁵⁹ This situation assumes that the term structure of swap yield curves is upward-sloping, which is typically the case and is not a controversial issue.

⁶⁰ It should be noted that once the regulator implements the trailing average, the firm has an incentive to match the regulatory benchmark, consistent with the matching policy. Whether or not comparable, unregulated firms use interest rate swaps to shorten the effective risk-free rate term is an independent issue relating to what effective term the regulator should set when implementing the trailing average benchmark — once that effective term is set, the regulated firm has an incentive to match it.

⁶¹ See the summary of corporate treasury views by the AER (AER, 2009: 150–154). In its submission to the AER's Rate of Return Guideline, Jemena indicated that such hedging is standard practice among network businesses (Jemena, 2013: 19).

Second, QTC argued that Lally (2014a) and the QCA (2014d) have not accurately characterised how a comparable, unregulated firm with stable cash flows and relatively high leverage would manage its interest rate risk. Citing Martellini and Milhau (2011), QTC challenged the view that the benchmark firm would use interest rate swap contracts to reduce the term of the risk-free rate, on the basis that prudent debt management involves reducing risk in *net* cash flows rather than reducing risk in debt costs only (QTC, 2014c: 12–14).

However, while QTC cite Martellini and Milhau (2011) in support of this claim, these authors do not recognise either refinancing risk or the availability of interest rate swap contracts. As such, their analysis is not helpful in assessing this issue (Lally, 2015: 23–24).

QTC also contended that applying the trailing average approach would not violate the NPV = 0 principle. QTC noted that Lally (2014a) considers a strategy to be consistent with the NPV = 0 principle if, among other criteria, it is feasible for the firm to implement it. As the trailing average is a feasible strategy, QTC contended that there is no violation (QTC, 2014c: 15–16).⁶²

The QCA has considered QTC's view that an overstatement of the cost of debt will not lead to a violation of the NPV = 0 principle and notes QTC's citation of Lally on this point. However, the QCA also notes that Lally views the NPV = 0 principle in the context of an action by the firm that is feasible. Lally's definition states nothing about whether or not a firm's choice of debt management strategy is efficient (Lally, 2014a: 8–9). As noted in the draft decision, and given the regulatory context, the QCA defines the NPV = 0 principle with respect to efficient costs (QCA, 2014d: 14).

Regardless of the definition applied, the QCA considers that the overstatement issue is a potential efficiency concern. In the example at the start of this section, the cost of debt allowed is 8.0%, while the benchmark cost of debt achievable using the swaps (but unobservable by the regulator) is 7.2%. Therefore, the allowed cost of debt is 0.8% too high. As the cost of debt is an input into producing the final essential service, if the regulated price is set 'too high' (i.e. again, due to the excessive input cost), there will be an allocative efficiency problem that a regulator should be concerned with.

Finally, QTC noted that the AER concluded that a trailing average reflects efficient financing costs. QTC argued that the AER's conclusion therefore does not support the QCA's claim that cost of debt will be overstated under the trailing average approach (QTC, 2014c: 17–18).

The QCA acknowledges that the AER concluded that the trailing average is consistent with efficient debt costs. In doing so, the AER's discussion refers to the 'benchmark efficient entity' minimising the expected NPV of its financing costs (AER, 2013c: 141). The QCA notes that the AER defines the 'benchmark efficient entity', among other criteria, as 'regulated' (AER, 2013c: 34–35). However, as explained previously, the relevant comparators in this context should be comparable, unregulated firms. The AER does not specifically address why comparable, unregulated firms would not use swaps under the trailing average approach to shorten the risk-free rate term (AER, 2013c: 140–141).

⁶² As discussed, a regulator's debt policy might induce a regulated firm to change its behaviour. Lally therefore considers that, in the context of debt policy, the NPV = 0 principle should be viewed not only as a regulatory policy that satisfies NPV = 0 but also as a compatible combination of regulatory policy and firm action that satisfies the NPV = 0 principle. This compatible combination must involve a course of action by the firm that is feasible and a regulatory policy whose imposition would not cause the firm to change its behaviour (Lally, 2014a: 12–13).

Summary

QTC argued that a comparable, unregulated firm would not use interest rate swaps. As discussed above, such comparators are highly unlikely to exist for benchmarking purposes. Therefore, it is not possible to state that such firms would *not* use interest rate swaps.

However, the QCA's view is that it is highly improbable that (unregulated) natural monopoly firms would *never* use such contracts. Such contracts allow the firms to reduce their expected cost of debt at the price of higher volatility, as described previously. While firms with stable revenues incur higher volatility in net cash flows if they shorten the maturity of their debt (and increase the volatility of their debt costs), they might still choose to adopt such a strategy. These considerations are all part of optimising the trade-offs between risk and return.

For these reasons, the QCA maintains its draft position that the trailing average approach to the total cost of debt is likely to materially overstate the cost of debt. This is a significant drawback of the trailing average approach.

4.1.4 Price stability

Australian regulators periodically determine the firm's allowed revenue and price for a fixed period. The length of the period varies, depending on the regulatory and statutory context.

For firms subject to access pricing in the QCA's jurisdiction, the length of the period has varied from four to 5.5 years.⁶³ For firms subject to price monitoring, the period depends on the Ministerial direction.⁶⁴

A principal issue that arises is that prices can experience substantial variability, or 'step changes', between regulatory resets due to time-varying changes in components of the allowed revenue, such as the return on capital.⁶⁵

Stakeholder submissions

QTC and some of the SEQ water retailers have expressed the view that adopting a trailing average approach to estimating the cost of debt is preferable to the current, on-the-day approach in order to smooth short-term changes in the cost of debt and, therefore, output prices. They contended that the trailing average cost of debt is consistent with the long-term nature of water infrastructure and provides greater price certainty to customers. As stated by Unitywater:

...one of the most important goals is to achieve greater regulatory certainty to enable the development of forward looking price paths that avoid customer price shocks whilst guiding participant's expectations (Unitywater, 2014: 1).

Similarly, QUU stated:

⁶³ The first access undertaking for the Dalrymple Bay Coal Terminal (DBCT) had a term of 4.5 years, while Aurizon Network's proposed access undertaking (UT4) has a term of four years. In its 2012 draft access undertaking (DAU), Queensland Rail proposed a term of between four to five years. However, in its June 2013 DAU, Queensland Rail proposed a term of less than four years, commencing on the undertaking's approval date and terminating on 30 June 2017 (QCA, 2014j: 10).

⁶⁴ GAWB and the SEQ water retailers are subject to price monitoring. The effective regulatory period depends on the length of the price monitoring period. The price monitoring period for GAWB is five years and the price monitoring period for the SEQ water retailers is one year.

⁶⁵ Price 'variability' is a better term in this context as volatility typically refers to the unanticipated dispersion of output prices from their expected value over a very short period.

A secondary benefit of adopting the trailing average approach is a reduction to the saw-tooth like volatility that can occur at the end of regulatory periods. This results in a more stable cost of debt allowance over time and a reduction in potentially significant price volatility for customers (QUU, 2014: 2).

QCA analysis

General

The QCA accepts that the on-the-day approach can create the potential for step changes in the cost of debt. At the same time, the QCA considers it important for the cost of capital, including the cost of debt, to reflect current market conditions.

However, the QCA notes that this price variability is likely to be less substantial when the regulatory period is shorter rather than longer. The QCA further notes that, where it makes price determinations for longer periods (e.g. four years or more), neither the regulated firms nor their customers have argued that step changes in price are a problem for them.

Finally, any variability in the cost of debt will have considerably less impact on final prices to customers. This is because the cost of debt is only part of the cost of capital, and the regulated firm's allowed return to its capital providers is only one component of its allowed revenues, on which final prices are based.

SEQ price monitoring

The QCA understands and has considered the water retailers' concerns regarding obtaining a more stable cost of debt and lower output price variability. However, and consistent with the points above, the QCA considers that the potential for large step changes between regulatory periods is reduced under the proposed long-term regulatory framework.

Performance assessments are undertaken on an annual basis. In effect, the regulatory period is one year in duration. Therefore, the annual change in the cost of debt would have to be very significant, all else equal, to substantially affect final prices.

As discussed above, regulated firms can take mitigating actions to reduce the impact of time-varying changes in their costs. Under price monitoring, regulation is less constraining, and firms have more flexibility to adapt to changes over time. In addition, there are a number of ways to 'smooth' prices, and these are discussed in a QCA information paper (QCA, 2014a).

The concern that a more variable cost of debt triggers a breach of the CPI-X benchmark is addressed in section 4.1.1.

The QCA also notes that smoothing the cost of debt using a trailing average approach can result in higher prices to customers relative to the QCA's current on-the-day approach. QCA analysis indicates that, had a trailing average cost of debt operated from 2002–2014, the cost of debt would have been about 0.30% (30 bps) higher. This impact corresponds to an increase in the WACC of 0.18%. If this increase was applied to the MAR for 2014–2015, the MAR would have been higher by 1.1% or \$26.1 million in total across all five retailers.⁶⁶

Further, while businesses might be prepared to pay a higher price to smooth price variability (i.e. for planning and costing purposes), it is not apparent that residential household customers would be. Residential households might prefer higher variability in prices in exchange for a

⁶⁶ The impact on the individual retailers is relatively uniform.

lower *average* price.⁶⁷ The QCA considers that this observation could be relevant for the SEQ water retailers, as the businesses receive most of their revenue from residential customers.⁶⁸

If price variability is a particular concern, other mechanisms are available to regulated businesses to smooth prices year-to-year, including utilising alternative depreciation profiles. While the QCA referred to such options in its trailing average cost of debt draft decision, stakeholders have not provided any comments in response (QCA, 2014d: 25–26).

4.1.5 Practicality and implementation

The trailing average cost of debt approach purports to more closely align the allowed cost of debt with the cost of debt incurred by the (benchmark) efficient firm. However, the greater precision achievable should be considered against the additional complexity and implementation issues raised.

In its draft decision, the QCA raised three principal concerns with the implementation of the trailing average:

- (a) More frequent (i.e. annual) updating of the benchmark cost of debt is required (as compared with a single measurement at the start of each regulatory period under the present approach), thus adding to administration costs (QCA, 2014d: 27).
- (b) Methodological issues related to determining weights for new investment add to the complexity of the approach, specifically:
 - (i) the approach will result in different WACC benchmarks for each regulated business even if all other WACC benchmark parameters remain the same (QCA, 2014d: 21)
 - (ii) the weighting mechanism for capital expenditure is not readily intuitive (QCA, 2014d: 20).
- (c) Transitional arrangements required from the current approach to the trailing average add to the complexity of the cost of debt approach (QCA, 2014d: 33).⁶⁹

More frequent updating

While noting that annual updating of the trailing average requires additional steps, QTC argued that those additional steps simply involve more frequent calculations and do not make the approach more complex (QTC, 2014c: 26). Further, QTC noted that the annual updating of the trailing average will not require additional steps in the SEQ price monitoring context, as the QCA intends to update the cost of debt annually for the businesses in any case (QTC, 2014c: 26).

QTC noted that publicly available data from the Reserve Bank of Australia (RBA) could be used at no cost for these updates (QTC, 2014c: 26).⁷⁰

⁶⁷ See the discussion in section 2.1.3.

⁶⁸ For example, for 2012–2013, the estimates are: Redland – 92%, Unitywater – 83%, Gold Coast Water – 78%, and QUU – 64%. The data are publicly available from the 2013–2015 SEQ price monitoring submissions at: <http://www.qca.org.au/Water/Urban-retail-water/SEQwater-price-monitoring/Final-Report/Price-monitoring-2013-15/File-List?cat=Submissions&num=22&sort=NodeOrder>.

⁶⁹ Transitional arrangements are necessary to ensure that firms have time to adapt their risk management practices to the new approach and to prevent firms from incurring windfall gains or losses (and *vice versa* for their customers).

⁷⁰ Since December 2013, the RBA has published Australian corporate DRPs for the BBB and A credit rating bands. These premiums are available on a monthly basis, and the data series provided commences with January 2005. The methodology for determining the DRPs is described in Arsov *et al.* (2013).

The QCA accepts that implementing an *unweighted* trailing average is no more complex than the current approach and might be implemented at a reasonable cost. The QCA also accepts that the same frequency of updating will be required for the SEQ price monitoring benchmarks. However, the QCA notes that the frequency of updating required relative to the current approach will be greater when applying the trailing average to regulated firms with regulatory periods greater than one year.

The QCA has previously expressed reservations about using the RBA data (QCA, 2014e: 8). The QCA continues to have concerns with this data source. The frequency of the observations is only monthly, and the lack of consecutive, daily estimates means the monthly estimates are susceptible to the influence of very short-term market anomalies. In addition, there are also indications that the RBA methodology can be inaccurate for estimating the cost of debt at longer terms to maturity (e.g. 10 years) (Incenta Economic Consulting, 2015: 28–29).

Different WACC benchmarks

QTC disagreed that different WACC benchmarks for different firms are necessarily a problem. QTC contended that there is no need to equate the benchmark cost of debt for all regulated firms. In particular, if the timing and size of new investment of two otherwise comparable, regulated firms differ, the difference should be reflected in their respective cost of debt allowances (QTC, 2014c: 22–23).

The QCA agrees that there is no need to establish identical WACCs for all firms and recognises that differences in their cost of debt profiles can arise due to different investment profiles. However, the QCA's point was that allowing different benchmarks consistent with this approach might not be justified if the additional complexity is material. The QCA considers that, in any case, other regulatory mechanisms can be applied to deal with changes in interest rates in the context of major investments (e.g. network expansions) (QCA, 2014d: 18).

Weighting mechanism

QTC also disputed the QCA's claim that the adjustments for new debt issues were complex and not readily intuitive. QTC noted that its weighted trailing average was developed in response to the AER's adoption of an unweighted trailing average. As the unweighted trailing average applies an historical average cost of debt to new investment rather than the current rate, QTC considered using an unweighted trailing average to be flawed (QTC, 2014c: 21–22).

The QCA understands QTC's weighting method for new investment and the associated spreadsheet model. While the QCA considers that implementing the weighting mechanism is feasible, it does add to the complexity of the approach.

In addition, the QCA considers that the gradual convergence from the prevailing cost of debt for new investment to the trailing average is not readily intuitive.

The QCA notes that the AER rejected the weighted trailing average approach. Among other reasons, the AER expressed concern with the incentives provided by alternative weighting methods (AER, 2013c: 115–118).

Transitional arrangements

Finally, designing an appropriate set of transitional arrangements for switching from the on-the-day approach to a trailing average raises additional issues. While QTC has not commented further on transitional arrangements, the QCA notes that a number of firms regulated by the AER have raised objections to the proposed structure of the transitional arrangements, and

these objections have been substantial.⁷¹ Designing appropriate transitional arrangements clearly would add to the complexity and cost of implementing the trailing average approach.

4.2 The hybrid approach

In its draft decision, the QCA considered that there are some advantages to moving from the on-the-day approach to a trailing average type approach. In this respect, the QCA preferred the hybrid approach relative to the (full) trailing average on the basis that, among other considerations, the hybrid approach:

- (a) provides a regulatory allowance that more closely aligns with the preferred debt management strategy under regulation
- (b) maintains consistency with the term of the risk-free rate in the cost of equity and in the cost of debt (QCA, 2014d: v).

The QCA also emphasised that the hybrid approach does not have the potential to materially overstate the cost of debt (QCA, 2014d: 31).

Stakeholder submissions

QTC disagreed with the QCA's draft position on the relative merits of the two trailing average approaches and submitted that:

- (a) there is no reason to expect a comparable, unregulated firm to fully reset the base rate on its entire debt portfolio every five years and therefore, a trailing average type approach should not incorporate any distortions associated with the on-the-day approach
- (b) consistency between the terms of the risk-free rate in the cost of equity and the cost of debt is not required, consistent with Lally's advice (QTC, 2014c: 19–20).

QCA analysis

The QCA does not agree with QTC's view that the hybrid approach incorporates a 'distortion' associated with the on-the-day benchmark (i.e. by providing the incentive for the firm to match the regulator's on-the-day risk-free rate by hedging). Rather, the hybrid approach has certain advantages over the trailing average approach. In particular, it addresses concerns with respect to the potential overstatement of the cost of debt.

The QCA does not agree with QTC's interpretation of the QCA's position on consistency of the risk-free rate terms. The QCA seeks to clarify this issue. In particular, setting the term of the risk-free rate in the cost of debt to be the same as the term in the cost of equity is not *required* to satisfy the NPV = 0 principle (Lally, 2010b: 10).

With respect to the cost of debt, the QCA notes that the same risk-free rate will also satisfy the NPV = 0 principle because the regulated firm can use interest rate swap contracts to match the base rate component of its cost of debt to the regulatory benchmark allowance (QCA, 2014d: 24). The QCA recognises that another choice for the risk-free rate in the cost of debt would also satisfy the NPV = 0 principle.

Given these considerations, the QCA maintains its draft position on the relative merits of the hybrid approach compared to the trailing average approach.

⁷¹ These are documented in Lally (2014b).

4.3 Regulatory practice

The QCA has also examined current practice by other Australian regulators.

State-level regulators

Australian state-level regulators vary in their approaches to the cost of debt.

The Economic Regulation Authority of Western Australia (ERA) currently applies an on-the-day approach with annual updates of the DRP (ERA, 2014: 187).⁷² The ERA is presently considering whether to retain this approach or to adopt the hybrid approach (ERA, 2015).

The Independent Pricing and Regulatory Tribunal of New South Wales (IPART) rejected the use of a trailing average in June 2013 (IPART, 2013a: 196–197). In its most recent WACC methodology review, it decided to estimate the cost of debt by constructing a range based on both current market data (i.e. recent 40-day averages) and on long-term, 10-year averages. IPART does not specify the methodology by which the short- and long-term data are combined and weighted to obtain a point estimate (IPART, 2013b: 10).

The Victorian Essential Services Commission's (ESC) used an on-the-day approach with a 10-year risk-free rate and DRP in its 2013–2018 price review for Greater Metropolitan Water (June 2013) (ESC, 2013b: 108; 2013a: 132). The ESC's proposed approach for its 2016 water price reviews appears to be based on the approach in its 2013 decisions (e.g., ESC, 2015: 38).

The Essential Services Commission of South Australia (ESCOSA), in its March 2015 final report to the Treasurer on the regulatory rate of return for the South Australian Water Corporation (SAWC), stated its preference to apply a trailing average approach to estimating the allowed cost of debt for SAWC. ESCOSA has stated that it is presently considering implementation options (ESCOSA, 2015: 42–48).

Australian Energy Regulator

In its Rate of Return Guideline Explanatory Statement (December 2013), the AER adopted a trailing average cost of debt approach (i.e. applied to the total cost of debt), with the following key features:

- (a) using a benchmark debt term consistent with the efficient term of debt (e.g. 10 years)
- (b) annual updating of the cost of debt, consistent with a moving average
- (c) applying historical rates to new borrowings for capital expenditure (AER, 2013c: 115–119).

These features correspond to QTC's proposed version with one important exception — the AER's version applies historical rates for new investment (i.e. the unweighted trailing average), rather than the prevailing rate (i.e. the weighted trailing average).

Under the unweighted trailing average, new investment will not be compensated at the correct cost of debt if there is a divergence between the (unweighted) trailing average and the prevailing rate. There will be a bias toward over-(under-)investment when the prevailing rate is below (above) the trailing average.

The AER considered that the unweighted trailing average could produce acceptable outcomes if the growth rate of the firm's RAB is relatively low (AER, 2013c: 118). The QCA also notes that

⁷² It should be noted that these annual changes are based on an update of the DRP using only the prevailing rate and do not involve applying a trailing average.

the unweighted trailing average might produce reasonable outcomes if market rates are near their long-term averages.

However, the approach will be problematic in circumstances where interest rates are persistently higher or lower than the (unweighted) trailing average value. At the present time, global capital markets are characterised by rates below long-term averages.

Stakeholder submissions

QTC contended that the QCA's approach is 'out of step' with the broad support that the trailing average cost of debt has received at the national level from regulated firms and consumers (QTC, 2014c: 1).

Unitywater noted that the AER has now adopted the trailing average approach (Unitywater, 2014: 2). QTC suggested that, as the QCA uses firms regulated by the AER as comparators, and these firms are now subject to the trailing average, the QCA should therefore adopt the trailing average (QTC, 2014c: 24–25).

Finally, QTC noted that IPART has recently moved away from a pure on-the-day approach and now gives weight to the 10-year average of the 10-year debt yield, which is effectively a trailing average without annual updates (QTC, 2014c: 24).

QCA analysis

The QCA acknowledges that the trailing average has received support at the national level. However, the QCA notes that both the on-the-day and hybrid approaches have also received support from various stakeholders at the national level. For example, ETSA Utilities, Citipower, Powercor Australia and Jemena supported the hybrid approach (ETSA *et al.*, 2012: 10; Jemena, 2013: 1). The Australian Pipeline Industry Association (APIA) and APA Group both supported retaining the on-the-day approach on the basis that it is 'forward-looking' (APIA, 2012: 2; APA Group, 2012: 1).

The QCA notes that the AER has adopted the trailing average. However, the QCA does not agree with QTC that comparator analysis implies that the QCA should also adopt the trailing average. Rather, relevant comparators will be other regulated firms that match the characteristics of the regulated firm of interest as closely as possible. It does not follow that the QCA should adopt the same cost of debt benchmark.⁷³

Finally, the QCA does not accept that there is clear regulatory precedent for the trailing average. At present, there is no Australian regulator that uses a trailing average in the form proposed by QTC. The unweighted trailing average used by the AER has a potential flaw with respect to investment signalling, and QTC acknowledges this weakness (QTC, 2013: 1).

ESCOSA has proposed a trailing average cost of debt to apply to SAWC and is currently considering the form of such a trailing average and implementation options.

IPART has regard to the 10-year average of the 10-year cost of debt, but it does not provide details on how it uses the historical information to determine a point estimate for the cost of debt. Therefore, it is questionable whether IPART's approach can be characterised as a trailing average.

⁷³ As discussed in section 4.1.1, applying the trailing average is likely to reduce volatility to equity holders, but the effect is unlikely to be substantial. Therefore, the fact that firms regulated by the AER use the trailing average is unlikely to have a substantial impact on the firms' estimated betas. As a result, these firms are still likely to be appropriate comparators for estimating beta. Nothing in this comparator analysis process implies that the QCA should adopt the cost of debt methodology to which these firms are subject (Lally, 2015: 27).

The ESC uses the on-the-day approach, and the ERA uses an on-the-day approach with annual updates.

In Queensland, only firms subject to price monitoring have advocated the trailing average. As they are subject to price monitoring, these firms have the flexibility to set their cost of debt in any manner they choose, including using a trailing average approach. While concerns have been raised that adopting this approach could trigger a potential review under the price monitoring framework, these concerns have been addressed in section 4.1.1.

4.4 Summary of assessment

The (weighted) trailing average has been proposed as an alternative, and preferable, cost of debt approach to the on-the-day approach. This chapter has assessed these approaches against four relevant criteria.

A key contention by proponents of the trailing average is that it results in a better match to the firm's cost of debt than the on-the-day approach. Further, the resulting cost of debt mismatches under the on-the-day approach are substantial and result in violations of the NPV = 0 principle. Such violations have implications for both the revenue sufficiency of the firm and economic efficiency.

However, the analysis in this chapter demonstrates that the NPV violations for the regulated firm using the on-the-day approach are not material. The QCA also considered that any mismatches could have implications for financial distress but found the probability of financial distress to be very low.

A key issue is that the trailing average will likely overstate the efficient cost of debt. This potential overstatement arises because the reduced term for the risk-free rate in the trailing average is unobservable by the regulator. Therefore, if the regulator applies a 10-year risk-free rate, but the effective (and unobservable) term is four years, for example, then the trailing average cost of debt will be overstated by the difference between the 10-year and four-year risk-free rates. This is a significant weakness of the trailing average approach.

The QCA also examined implications for new investment. For a five-year revenue or price determination process, the trailing average provides slightly improved signals for new investment, but the difference is not substantial. However, in the context of a one-year reset, the trailing average provides marginally inferior signals for new investment. In the latter case, this outcome occurs because the trailing average approach uses less relevant information than the on-the-day approach.

With respect to price variability, the trailing average produces a cost of debt that is less variable than the on-the-day approach. Proponents of the trailing average cost of debt consider this feature to be a major advantage of the approach.

Finally, implementing the trailing average involves greater complexity and additional cost, although the latter is unlikely to be substantial. Also, even though the weighting mechanism adds to the complexity of the approach, the resulting differences in terms of investment signalling are not substantial (as described previously).

5 OTHER ISSUES

5.1 Single or multiple benchmarks

In considering the conceptual approach to the cost of debt, the QCA also analysed submissions and analysis presented to, and considered by, both the AEMC and the AER in the context of the development of the network regulation rule changes and the rate of return guideline, respectively.

The QCA considered whether it should adopt a 'menu approach', allowing a regulated firm subject to economic regulation to choose an approach that best matches its efficient debt management strategy (i.e. on-the-day, trailing average or hybrid approach).

The QCA considers that a 'menu approach' has several drawbacks.

First, the approach would involve considerably more complexity. The QCA would need to specify upfront details with respect to how it would estimate the cost of debt under each approach and also specify a process by which regulated firms would propose a methodology. While adding these additional features is not insurmountable, this approach would involve substantial complexity and additional cost.

Second, the QCA expressed the concern in its draft decision that such an approach is susceptible to gaming. Depending on the market circumstances, a firm might have an incentive to choose one approach at one review but then nominate an alternative approach at a subsequent review on the basis of revenue maximisation. For example, at the start of a regulatory cycle, if the prevailing cost of debt is higher than the historical, trailing average, a firm might seek to switch regimes (QCA, 2014d: 28).

While a mechanism could potentially be designed to address such issues, it also would involve considerable complexity and implementation costs. The QCA notes that the AER reached the same conclusion (AER, 2013c: 100).

For these reasons, the QCA does not consider it to be prudent regulatory policy to allow firms to select their preferred regulatory benchmark.

Finally, the QCA notes that it has assessed the water businesses in Queensland using the on-the-day approach for a number of years.

5.2 Indirect costs of early debt issuance

Like most Australian regulators, the QCA provides an allowance for the direct costs of debt issuance. These are the debt-raising transaction costs incurred to refinance the firm's debt portfolio.⁷⁴ Recently, the QCA updated its allowance from 0.125% (12.5 bps) to 0.108% (10.8 bps) for these transaction costs.⁷⁵

⁷⁴ These direct costs include arrangement fees, which are paid to an arranger (i.e. typically an investment bank) to compensate it for managing the capital-raising process and other costs associated with the debt-raising, such as credit rating and legal fees.

⁷⁵ For a full discussion, see PwC (2013: 73–86).

Stakeholder submissions

QTC submitted that it is efficient debt practice to issue new 10-year debt three months in advance to ensure that funds are available to repay a soon-to-mature borrowing.⁷⁶ Early issuance imposes a cost on the regulated firm; that is, the borrowing rate less the rate at which the funds would be deposited. QTC contended that, since early issuance is efficient, the regulator should compensate the firm for the costs of this practice.

QTC further submitted that the funds raised should be invested in a short-term, risk-free asset that does not change the credit risk exposure of the borrower. QTC therefore suggested that such an asset is a three-month bank bill, with the bank bill swap rate being a proxy for the risk-free rate (QTC, 2014a: 5–6, Appendix A; QTC, 2014c: 32).

QCA analysis

In its final decision on the cost of debt estimation methodology, the QCA did not accept this proposal on the basis that it would require additional assumptions to be made about the length of the early issue period and the characteristics of the short-term investment of the new funds raised (QCA, 2014e: 12–13).

The QCA maintains its position for these reasons and for those set out below.

The QCA disagrees that, in order to maintain the same credit risk exposure, the investment should be in a risk-free asset. Rather, the investment should be made in bonds with the same credit risk as the firm's own debt in order to maintain the firm's borrowing rate. Further, the QCA would require empirical evidence that relevant comparators (i.e. those firms used for benchmarking the allowed DRP) undertake this type of activity and invest in the way described by QTC (Lally, 2015: 34–35).

However, the QCA notes that the allowed cost of debt is, in any case, overstated. Regulatory application of the promised yield on debt over-compensates the regulated firm because it includes an allowance for the value of the default option possessed by equity holders. This allowance is simply a transfer between equity and debt holders and, therefore, does not affect the true, underlying WACC.⁷⁷

Importantly, the overstatement from defining the regulated firm's cost of debt as the promised rate applies not just to the temporary borrowing immediately prior to the debt refinancing but to the firm's entire stock of debt (Lally, 2015: 35).

⁷⁶ QTC raised the issue initially in responding to PwC's cost of debt estimation methodology discussion paper (QTC, 2014a: 5–6). While the QCA did not accept this proposal in its final decision on the cost of debt estimation methodology (August 2014), QTC has raised this issue again in the context of the trailing average review.

⁷⁷ The default option simply reflects the limited liability option that equity holders possess. Specifically, equity holders hold an option to 'walk away' from the firm when the firm is worth less than the promised payment to debt holders. In return for this option, debt holders require a higher promised rate. However, the limited liability protection is simply a zero-sum contract between equity and debt holders. As a result, it should have no impact on the cost of capital. As this element is impounded in the promised rate of interest that debt holders receive, the promised yield overstates the 'true' cost of debt.

GLOSSARY

A

AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
APIA	Australian Pipeline Industry Association

B

Bps	basis points
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C

CAPM	Capital Asset Pricing Model
CDS	credit default swap
CPI-X	consumer price index less the x-factor

D

DAU	draft access undertaking
DBCT	Dalrymple Bay Coal Terminal
DRP	debt risk premium

E

ERA	Economic Regulation Authority of Western Australia
ESC	Essential Services Commission (Victoria)
ESCOSA	Essential Services Commission of South Australia

G

GAWB	Gladstone Area Water Board
GFC	Global Financial Crisis

I

IPART	Independent Pricing and Regulatory Tribunal (New South Wales)
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M

MAR	maximum allowable revenue
MRP	market risk premium

N

NPV	net present value
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P

PwC	PricewaterhouseCoopers
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Q

QCA	Queensland Competition Authority
QTC	Queensland Treasury Corporation
QUU	Queensland Urban Utilities

R

RAB regulatory asset base

RBA Reserve Bank of Australia

S

SAWC South Australian Water Corporation

SEQ south east Queensland

W

WACC weighted average cost of capital

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