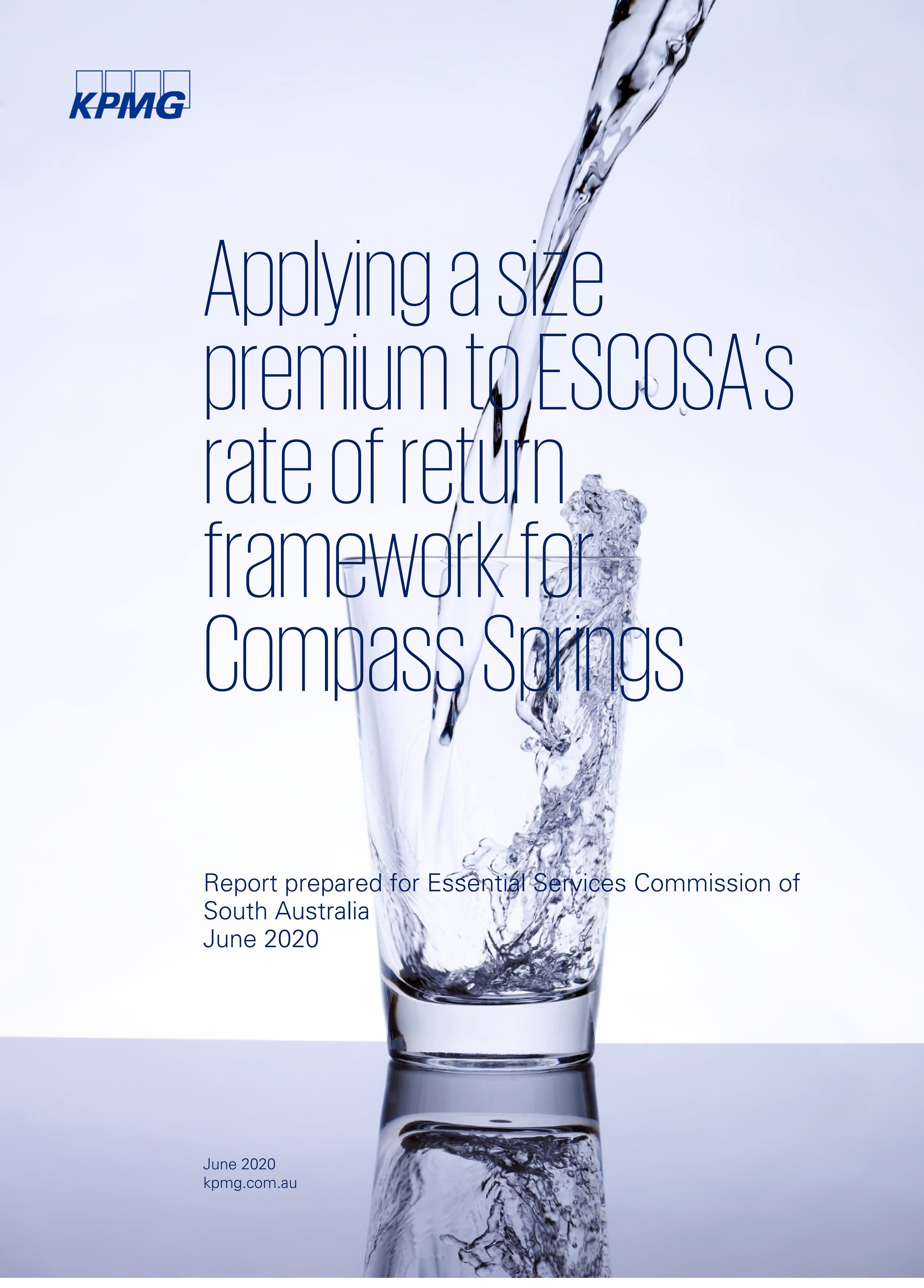

Applying a size premium to ESCOSA's rate of return framework for Compass Springs

Report prepared for Essential Services Commission of South Australia
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kpmg.com.au

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Contents

Glossary

AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
ACCC	Australian Competition and Consumer Commission
BEI	Breakeven inflation
CAPM	Capital Asset Pricing Model
CGS	Commonwealth Government Securities
CPI	Consumer Price Index
DGM	Dividend Growth Model
ERA	Economic Regulation Authority Western Australia
ESCOSA	Essential Services Commission of South Australia
IPART	Independent Pricing and Regulatory Tribunal of New South Wales
MRP	Market Risk Premium
OFGEM	Office of Gas and Electricity Markets UK
OFWAT	Office of Water Services UK
RBA	Reserve Bank of Australia
SAW RD	SA Water Regulatory Decision
SL-CAPM	Sharpe-Lintner Capital Asset Pricing Model
QCA	Queensland Competition Authority
WACC	Weighted Average Cost of Capital
SSP	Small Size Premium

1 Our findings and recommendations

The Essential Service Commission of South Australia (ESCOSA) determines the rate of return for Compass Springs by estimating a real post tax vanilla Weighted Average Cost of Capital (WACC) using the Sharp-Lintner Capital Asset Pricing Model. ESCOSA views this approach as the best way to set a rate of return that is commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as Compass Springs.

ESCOSA's regulatory framework adopts a Capital Asset Pricing Model (CAPM) approach to the calculation of rate of return. A core presumption of CAPM theory is that systematic risk is the only driver of differences in the returns that investors expect from different assets and that company size should not matter. However, there is some CAPM-based evidence that size might influence the cost of capital.

In considering an appropriate real post tax vanilla WACC for Compass Springs we have been requested to consider the issues arising from the size of the business relative to the large publicly owned water utilities that are typically regulated in Australia. We note that Compass Springs is significantly smaller than these businesses (having a RAB of less than $1million).

We have undertaken an extensive literature review that incorporated approximately 40 peer reviewed journal articles and public regulatory decisions that focused on the issue of size and the adoption of small size premiums. The rationale for size premiums identified in the literature included:

- **Ownership structures**. The potential impact of concentrated ownership structures on the ability of businesses to diversify risk.

- **Behavioural bias such as investor over reactions.** Information asymmetries associated with small businesses may be more severe than with large firms, leading investors to view small firms as more difficult to value and therefore more risky.

- **Exposure to fundamental risks.** Small businesses may not be as well-resourced to weather external economic shocks as well as large companies, which may make their returns inherently riskier. Small businesses may also have restricted access to capital sources when compared to larger businesses.

- **Illiquidity**. Illiquidity is the most common rationale for size premiums and reflects the sentiment that securities issued by small companies tend to be more illiquid than securities issued by large companies.

- **Data bias.** Commonly referred to in the literature as the January Effect. There are a number of empirical studies that focus on the potential impact of seasonal trends in stock market performance as an explanation of observable size premiums.

In relation to Compass Springs these drivers should be considered in the context of a strong reliance by the company on small commercial lenders to finance its activities. Given the scale of Compass Springs's activities we do not consider it is reasonable to expect it to be able to obtain a credit rating or raise debt in wholesale/institutional debt markets to the same extent as other larger regulated utilities.

Our review found that the evidence for a small size premium is mixed. While a number of papers found no supporting evidence, a number found small premiums and a number found significant premiums. Of those papers that found a premium the most recent (Winn et al 2018) undertaken for Chartered Accountants Australia and New Zealand found significantly positive premiums for small firms (categorised as Micro-Cap firms). In terms of regulatory precedent, we also noted that the UK water regulator Ofwat formally recognises small size premiums in its regulatory framework through the allowance for uplift factors in the cost of debt for regulated water only businesses.

On balance, our review of the international and Australian literature regarding small size premium supports the application of a premium to a business of Compass Springs scale and scope of activity.

In considering whether the premium should be applied to the cost of debt or equity (or both), we consider the most practical approach within Compass Spring's regulatory context is to apply a premium to the cost of equity. We note that a business of the scale and scope of activity similar to Compass Springs is significantly constrained in its ability to access capital markets and is not directly comparable to larger utilities. The debt raising issues associated with such small businesses make it impracticable to introduce a regulatory approach, such as that employed by the UK regulator Ofwat, which relies on observations from capital markets to determine an uplift in the cost of capital. Our recommendation is for a premium of 6.46% be applied to the cost of equity.

Set out below is a summary of the real post-tax vanilla WACC estimate adopted by ESCOSA as at 22 May 2020 (Base WACC), together with a low and high case for Compass Springs incorporating adjustments for size and levels of gearing. The low case scenario includes a small size premium adjustment to the cost of equity of 6.46%, holding all other inputs constant (including a gearing of 60%).

The high case scenario also considers the restricted access to debt capital markets for a business of the size and nature of Compass Springs, by setting the gearing to nil. In adjusting the level of gearing, consideration must also be given to the beta adopted, as the beta inherently reflects impact of financial leverage.

In order to compare a company geared at 60% to one without gearing, we have unlevered the regulatory equity beta of 0.65 adopting the formula outlined in section 5.2.6, to arrive at an asset (or unlevered) beta of 0.32.

The resulting WACC range is 5.11% to 6.78%. The midpoint in the range is 5.95%.

The estimation of a regulatory WACC for relatively small firms such as Compass Springs is a challenging exercise with limited regulatory precedent. We note that ultimately ESCOSA will need to exercise it judgment as to the determination of a WACC that is both compliant with its regulatory framework and consistent with the intent of adopting an appropriate benchmark WACC that is reflective of competitive outcomes for a business such as Compass Springs.

Table 1: Weighted Average Cost of Capital, Compass Springs (May 2020)

Input	Definition	Base WACC	Low	High
Rf	Risk free rate of return	0.91%	0.91%	0.91%
Ba	Unlevered asset beta	0.32	0.32	0.32
Be	Beta estimate	0.65	0.65	0.32
MRP	Equity market risk premium	6.0%	6.0%	6.0%
SSP	Small Size Premium	n/a	6.46%	6.46%
Ke	**Cost of equity (post tax, nominal)**	**4.81%**	**11.27%**	**9.27%**
Kd	Cost of debt (pre-tax)	5.09%	5.09%	5.09%
D/(D+E)	Proportion of debt in the capital mix	60%	60%	0%
E/(D+E)	Proportion of equity in the capital mix	40%	40%	100%
WACC	**Weighted average cost of capital (post tax vanilla, nominal)**	**4.98%**	**7.56%**	**9.27%**
i	Inflation	2.33%	2.33%	2.33%
WACC	**Weighted average cost of capital (post tax vanilla, real)**	**2.59%**	**5.11%**	**6.78%**

Source: KPMG

2 Introduction

2.1 Background

The Essential Services Commission of South Australia (ESCOSA) is currently reviewing prices proposed by Robusto Investments Pty Ltd (trading as Compass Springs) for the provision of drinking water services in Mount Compass.

ESCOSA's review of Compass Spring's prices is focused on:

- The proposed return on assets, which should reflect the efficient financing cost of the drinking water assets, based on the prevailing investment risks; and
- The amounts to be recovered as depreciation, which should reflect the efficient drinking water asset values and the remaining economic lives of those assets.

ESCOSA's determination process commenced February 2020 and the Commission expects to make a final determination in July 2020.

Compass Springs is a privately owned water business that exclusively services the Mount Compass community. Robusto Investments Pty Ltd was licensed by ESCOSA as a water retailer in August 2016.

We note that the scale and scope of activities undertaken by Compass Springs is significantly smaller than that typically undertaken by a regulated utility such as SA Water. Compass Springs supplies services to approximately 165 customers at Mount Compass, the majority of which are residential users. Compass Springs customer base is forecast to grow to 172 by 2023.

Compass Springs's assets are comprised of a water distribution network, water bores and water tanks. Drinking water is sourced from 3 bores on the Mount Compass Golf Course, and pumped to one of two holding tanks at the highest point of the land and then gravity fed to customers. In total the proposed value of the regulatory asset base is approximately $900,000 (June 2019)[1]. Compass Springs is also proposing new capital investment of approximately $1.5 million for network upgrades.

Compass Springs has proposed an accompanying expenditure of $1.1 million over five years to operate and maintain these assets. The total revenue requirement being sought by Compass Springs is approximately $2.6 million over a five year period (see table 2). In comparison, SA Water draft decision provides for $2.5 billion for water services and $1.1 billion for sewerage services (in present value terms) over a four year period. SA Waters regulatory opening asset base is valued in 2019-20 at $8.8 billion for water and $4.1 billion for sewerage.[2]

1 As outlined in correspondence between ESCOSA and Compass Springs dated 20 June 2019.

2 SA Water Regulatory Determination, Draft Determination: Statement of Reasons: https://www.escosa.sa.gov.au/ArticleDocuments/21462/20200304-Water-SAWRD20-DraftDecision-StatementOfReasons.pdf.aspx?Embed=Y

Table 2: ESCOSA revised pricing proposal (April 2019)

Compass Springs proposed revenue requirement	2019	2020	2021	2022	2023
Operating expenditure	258,860	253,513	205,968	206,351	212,541
Return on assets	157,500	157,500	157,500	157,500	157,500
Regulatory depreciation	88,000	88,000	88,000	88,000	88,000
Recovery of prior losses	42,436	43,709	45,020	46,371	47,762
Total Revenue Requirement	546,796	542,722	496,488	498,222	505,803

Source: ESCOSA documentation (April 2019), *20190416 – ESCOSA Pricing Submission Updated.pdf.* Table references immediate pricing proposal numbers.

2.2 Role of WACC in price determinations

The cost of capital is a core component of ESCOSA's assessment of the costs incurred by Compass Springs in providing water services. In order to determine a cost of capital, ESCOSA approve an appropriate rate of return based on a benchmarked weighted average cost of capital (WACC). The rate of return is the return expected by investors in capital markets for investments given a level of risk, and represents the opportunity cost to investors of expected returns on foregone investment opportunities - that is, the expected return from the next best alternative investment.

ESCOSA's WACC method is based on the presumption that capital is provided from two sources – debt and equity. It is calculated as the average return to each of these sources of finance, weighted to account for the relative proportions of debt and equity to total capital. This method requires estimates of the current market values of the business' debt and equity, a capital structure and market rates for both sources of funds. We note that the WACC calculation is separate to the determination of the value of the underlying asset base, referred to as the Regulatory Asset Base (RAB).

The scope of this engagement focuses on the appropriateness of the application of a size premium to Compass Springs WACC and the issue of the scope of activities captured by the WACC calculations. As directed by ESCOSA we have adopted a number of WACC parameter values as recently proposed by ESCOSA and outlined in the regulators draft decision for the 2020 SA Water price review.

2.3 Our objectives and scope

ESCOSA has engaged KPMG to assist with determining an appropriate rate of return to apply to a small privately owned drinking water operator. ESCOSA is seeking advice on the following:

- The appropriateness of adopting a size premium to account for the small scale of the Mt Compass operation.

- An appropriate separation or treatment in the rate of return of the current operators water activities from its other non-regulated commercial activities.

In addition to these issues KPMG has also been asked to calculate a rate of return appropriate for Compass Springs that is consistent with ESCOSA's existing regulatory approach and framework. ESCOSA's regulatory framework assumes a benchmark efficient business whose regulatory activities are ring-fenced, and who does not obtain credit support from its owner or other parties – i.e. a business that is ownership agnostic.

We note that the engagement terms require us to calculate a regulatory WACC based on an objective literature review of size premia and ESCOSA's recent regulatory determination of WACC parameters for SA Water draft price determination 2020 (SAW RD20), having regard to a benchmark efficient entity. Our work does not extend to a detailed review of each of the WACC parameters adopted in ESCOSA's SAW RD20. The resulting real post-tax vanilla WACC has been adjusted for issues related to size only, and does not represent our opinion of the appropriateness of the resulting WACC parameters as a whole. Our work relates to a benchmark efficient entity rate of return for regulatory purposes. We have not completed an audit or review of the background information of Compass Springs or information underlying Compass Springs draft pricing proposals.

2.4 Our approach

Our advice is premised on the assumption that, with the exception of the issue of size premiums and the exclusion of non-regulated activities, the methodology for determining the individual parameters of the WACC values are consistent with the methodology outlined in ESCOSA's guidance and regulatory precedent.

In preparing our advice, we have adopted the approach proposed by ESCOSA for the rate of return for the 2020 pricing determination in its Guidance Paper for SAW RD20[3] against the following:

- Principles of best practice regulation;
- Customer expectations for price stability; and
- Long term interests of customers.

Our advice has been informed by approaches employed by both Australian and UK regulators for estimating rate of returns and also by the current regulatory and operating environment facing Compass Springs.

The purpose of this paper is to assist ESCOSA in forming a view on the appropriateness and potential estimate (if deemed appropriate) of a small size premium for Compass Springs. In this regard we have not undertaken a detailed review of the methodology for other parameters such as cost of debt, risk free rate, debt margins, cost of equity, market risk premium for any matters unrelated to size. Based on ESCOSA's previous guidance and determinations the approaches adopted core individual WACC parameters including:

3 ESCOSA - SA Water Regulatory Determination 2020: Guidance Paper 5 – The cost of funding and using assets. November 2018.

- Nominal risk free rate;
- Market risk premium;
- Equity beta;
- Post-tax nominal cost of equity;
- Gearing; and
- Long term inflation expectations.

ESCOSA's approach to each of these parameters and their associated values are discussed in section 5**.** In addition to each of these parameters we have separately addressed the issues of size premiums and scope of regulatory service based on a literature review of the regulatory precedent and empirical evidence supporting the inclusion of a size premium. In undertaking the review we have sourced peer reviewed articles and the decisions and determinations of economic regulators. We did not undertake a detailed critical review of the analytical method or design for each of the papers reviewed.

2.5 Structure of this report

This report is structured as follows:

- Section 3 discusses the appropriateness of adopting a size premium for Compass Springs.
- Section 4 discusses the issue of ring fencing and the scope of services referenced by the WACC calculation.
- Section 5 sets out the approach and values adopted for WACC parameters other than the size premium.

3 Size premiums

3.1 Introduction

Standard CAPM finance theory, makes no allowance for risks other than the market factor. From a purely theoretical perspective the concept of a size premium is not consistent with broadly accepted models for market behavior. However, size premiums are widely used in practice to estimate appropriate rates of return. As noted by Winn et al (2018 p6.)

> *many market participants employ an "x-factor" to their cost of capital for various reasons including for businesses of smaller size. Other reasons may include liquidity and transactions costs, political or sovereign risk, governance risks, other tail event risks, or accounting for estimation error. These reasons are not mutually exclusive and likely not independent. Some of these reasons relate to actual risks (the premise of our CAPM model) and others relate to market frictions (which are best dealt with explicitly in cashflow forecasts but may sometimes be handled as a short cut in the cost of capital).*

The issue of size premiums is relatively contentious and has been subject to extensive research in finance. The following discussion has been structured to review the drivers for the potential application of a size premium in the context of Compass Springs and examine the evidence supporting the application of a size premium at both an international and Australian level. The discussion also considers the available regulatory precedent

There are multiple issues to consider when determining the regulated rate of return, this is particularly important in the case of Compass Springs and the consideration of size premiums and their regulatory consequence. While Compass Springs is a relatively small utility, the potential adoption by ESCOSA of a size premium in its determination of the rate of return will set a regulatory precedent. While size premiums are a feature of other regulatory jurisdictions such as the UK they are not an established component of Australian economic regulation.

Size premiums are an attempt to account for the perceived impact of size on the CAPM calculations of return. They are an additional premium that take into account that smaller businesses are more risky than larger businesses. The size effect is the phenomenon in which small stocks (i.e., those with lower market capitalisations), on average, outperform large stocks (i.e., those with higher market caps) over time. The size premium is the return achieved by buying (being long in an absolute sense or overweight relative to a benchmark) small stocks and selling (shorting or underweighting) large ones. It is important to note that the type of premium calculated in excess of CAPM is one that has been adjusted for beta in order to isolate the return attributable solely to size.

It is worth noting that size premiums are not theoretically considered a component of the CAPM approach, the implication being that while their application may be common in practice there may be methodological issues associated with their application to a CAPM.

3.2 The rationale for size premiums

The literature on small size premiums identifies a number of potential rationales for the existence of small size premiums. These include:

- **Ownership structures**. Small companies tend to have more concentrated ownership structures, which may imply that the investors in these companies are themselves not well-diversified. In small firms with concentrated ownership structures, the investors may have much of their wealth invested in the business, and may therefore find little of the risk they are exposed to diversifiable. This inability to manage risk through diversification may lead to higher returns in small companies. This is analogous to the situation faced by owners of private, closely-held firms who might enjoy few diversification opportunities (Damodaran, 2001, p.233) (Frontier Economics 2013).

- **Behavioural bias such as investor over reactions** Barberis, Shleifer, and Vishny (1998), Daniel,Hirshleifer, and Subrahmanyam (1998), Hong and Stein (1999). This explanation of size premiums relates to exposure to cash flow news and variance news. Information asymmetries associated with small firms may be more severe than with large firms, leading investors to view small firms as more difficult to value and therefore more risky. Frontier (2013) note that this issue seems less relevant for regulated businesses since the regulatory process generally supporting size premiums facilitates reasonably good disclosure of information about firms, even relatively small ones. This observation may be less relevant for Compass Springs as the level of transparency associated with its regulatory oversight is significantly different from that typically accompanying much larger utilities such as SA Water.

- **Exposure to fundamental risks** Risk exposure can relate to both the ability of the company to respond to economic shocks and also to the nature of the activities being undertaken by small companies. Campbell, Giglio, Polk, and Turley (2017). Small companies may not be as well-resourced to weather external economic shocks as well as large companies, which may make their returns inherently riskier. Berk, Green, and Naik (1999) also noted that risk can be driven by the nature of small businesses activities on the basis that small stocks derive more of their values from growth options, which are riskier than assets in place, compared to big firms. Frontier Economics (2013) noted that, financeability and scenario testing of the sort undertaken by UK regulators, and some Australian state-level regulators, could be used to assess if regulated entities are sound financially over the regulatory period, and how risky the market may view the firms.

- **Illiquidity**. Illiquidity is the most common rationale for size premiums and reflects the sentiment that securities issued by small companies tend to be more illiquid than securities issued by large firms. The illiquidity of small stocks may arise in part if small companies find access to capital markets more costly than large companies. This could potentially be a relevant concern with respect to small regulated businesses. Studies such as Brennan and Subrahmanyam (1996), Amihud (2002), Hou and Moskowitz (2005), Sadka (2006), and P´astor and Stambaugh (2003) have provided empirical evidence for the relation between the illiquidity characteristic (or illiquidity risk) and the size premium.

- **Data bias** – commonly referred to in the literature as the January Effect. There are a number of empirical studies that focus on the potential impact of seasonal trends in stock market performance as an explanation of observable size premiums. Banz (1981) and Reinganum (1983) contend that the size premium is highly seasonal, and driven by small stock performance during January. Keim (1983) finds that half of the size premium over the 1963 to 1979 period occurs during January, whereas Blume and Stambaugh (1983) show that all of the size effect occurs in January after adjusting for the "bid-ask spread" bias. The potential explanations for these bias in the data relate to investor behaviour, where investors tend to sell stocks that have had bad performance, and this selling pressure depresses year-end stock prices, which rebound in January (Givoly and Ovadia (1983), Starks, Yong, and Zheng (2006) Musto (1997), and Ritter and Chopra (1989)).

We note that there are a number of operational risks associated with businesses of similar size and scope to Compass Springs can potentially impact on competitive outcomes for both cost of debt and the cost of equity. Such factors may include: less capacity to attract and retain key personnel; reliance on key executives; less geographic diversification and exposure to negative developments; limited market power; a larger ratio between project size and net worth; higher input costs and limited access to capital markets.

3.3 Evidence for a size premium

3.3.1 International evidence

There is no clear consensus in the literature as to the significance of the premium. While a number of studies find evidence of a positive premium other also find a negative premium, and some find no evidence to support the existence of a size premium.

One of the issues with the international literature is that it is based primarily on UK and European stocks. Small firms in these studies are typically defined by their level of market capitalisation.[4] The US definition of a firm with small capitalisation (small-cap) can vary, but it is generally a company with a market capitalization of between US$300 million and $2 billion.[5] A Micro-cap typically has a market capitalization between approximately US$50 million and US$300 million.[6] Companies with less than US$50 million in market capitalization are frequently referred to as nano-caps. In considering the international evidence for size premia, we need to be cognisant that Compass Springs capitalisation and cash flows are significantly smaller relative to a typical entity captured in these studies.

4 Market capitalization measures the market value of a company's outstanding shares, calculated by multiplying the stock's price by the total number of shares outstanding.

5 https://www.investopedia.com/terms/s/small-cap.asp

6 Micro-caps, low-caps and mid-caps and defined in Ibbotson, Duff and Phelps (2016) respectively as deciles 9-10, 6-9 and 3-5. These corresponded to market capitalisations as at 30 September 2015 of up to US$448m, US$2.08b and US$9.6b.

The most often cited compilation of US stock returns is provided by Ibbotson, Duff and Phelps (2016). This is an annually updated reference of US stock returns that dates back to 1926. This reference, whilst not a peer reviewed journal, is used by many valuation advisors and hence is worth noting given its prevalence and value as a summary data series. Ibbotson divides firms listed on the NYSE into size deciles, where size is measured by the aggregate market value of common equity. Table 3 presents Ibbotson premium estimates and threshold capitalisations, which are reproduced in Winn et al (2018).

Table 3: US evidence of size premiums

Size Group	Max threshold (USD)	Premium
Micro-Cap	$448m	3.6%
Low-Cap	$2.08b	1.7%
Mid-Cap	$9.6b	1.0%
Source: Winn et al (2018).		

Winn et al (2018) note that the Ibbotson (2016) study outlines three important qualifications:

- Since 1926, large firms beat small firms in almost half the years.
- Small firms have experienced far greater variability in returns.
- Smaller firms tend to have more market risk (market beta greater than one) than large firms.

In addition to Ibbotson (2016) there is a large body of literature that provides empirical evidence supporting size premiums. Brealey et al. (2013) conclude that over the long term there is an average annual difference in the cumulative returns of small-firm stocks and large-firm stocks in the US of 3.6%. Size premiums are also supported by Fama & French (1993) and Fama & French (2012) studies that concluded that returns to a size based factor were significant when added to a standard market model.

Size premia have also been observed outside of the USA. As cited in Frontier (2018), Damodaran (2013) notes, studies have found evidence of average small company premiums in the UK (7% between 1955 and 1984), France (8.8%), Germany (3.3%), and Japan (5.1% between 1971 and 1988).

In contrast to the empirical evidence supporting size premiums, studies over more recent periods have suggested that small company premia are much smaller or non-existent. As cited by Winn et al (2018):

"Many of the anomalous risk premia seem to be declining over time. The small-firm effect completely disappeared in 1980; you can date this as the publication of the first small-firm effect papers or the founding of small-firm mutual funds that made diversified portfolios of small stocks available to average investors (Cochrane 2005)."

Brealey et al. (2013) have suggested that the recent apparent disappearance of the size premium in some countries might be the result of researchers identifying and publicising its existence. This might have caused the premium to be arbitraged away (e.g. through the establishment of small cap funds to exploit these opportunities). Other studies cited in Winn et al (2018) that are consistent with no or low size premia include:

- Horowitz, Loughran, and Savin (2000) found no evidence of the size effect using three different methodologies during the period 1980-1996 across the NYSE, NASDAQ and Amex.
- Atanasov and Nitschka (2017) examine global data in addition to the US, Europe and Asia, and found a broadly pervasive value effect, and evidence of a size effect that turns negative for extreme growth stocks.
- Cakici and Tan (2014) examined the size, value and momentum factors in 23 developed international stock markets and didn't find size premia in any of the countries examined. Cakici, Tan and Yan (2016) likewise cannot find evidence of a size factor in emerging markets between 1990 and 2013 except in China.

3.3.2 Size premiums in Australia

A number of studies have tested for the existence of size premiums using Australian data. Table 4 summarises the evidence on the size premium from a selection of these studies.

According to these studies, the evidence for a size premium in Australia is mixed:

- Three studies report large positive size premiums. The largest premium Kassimatis (2008) was 11.5%. One study found a small positive premium.
- Four studies report negative size premiums; of these, two studies (both by Faff alone) did not present any evidence on the statistical robustness of the measured premium.
- Of all the studies, the one by Gaunt (2012), which could find no statistical evidence for a premium, was the most comprehensive in terms of data coverage (years canvassed).

The most recent study Winn et al (2018) allocated data into size buckets based on capitalisation and observed trends as companies get smaller, including:

- Market risk is significantly higher for the Micro-caps (the smallest quintile);
- Returns versus the biggest quintile increase monotonically;[7]
- Credit risk (measured as probability of default) versus the biggest quintile increase monotonically;
- Average profitability versus the biggest quintile is negative and decreases monotonically; and
- Asset growth is lowest for the micro-caps. Winn et al (2018) contended that the higher returns of the micro-caps is not due to normal growth but rather, their option-like qualities.

The studies vary both in terms of the size of the firms included and the time period over which the data is considered. The studies with longer time periods such as Brailsford, Gaunt and O'Brien (2012) and Gaunt (2015) tend to find no evidence or low premiums. Those studies that draw on shorter periods of approximately 10 years tend to find evidence of much higher premiums Kassimatis (2008), Winn et al (2018). This observation is consistent with the contention that the timing of the study influences the size of the premium and the general observation that size premiums may change materially over time.

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7 Having the property either of never increasing or of never decreasing as the values of the independent variable or the subscripts of the terms increase.

Table 4: Australian size premium studies

Study	Period	Premium	Observations
Winn et al (2018)	1991-2000	3.96% to 8.96% p.a.	Conclude that smaller firms have historically exhibited higher return performance than larger ones. The premium is indicative of the risks and difficulties of investing in smaller firms.
Ghaghori, Hamzah and Veeraraghavan (2010)	1991-2006	SMB average monthly 1.19%	The time-series averages of monthly returns are higher for the small size portfolios than for the big-size portfolios. The average monthly SMB (1.19%) premium is positive and statistically significant for the period 1991–2006.
Brailsford, Gaunt and O'Brien (2012)	1982-2006	No premium	Conclude there is an insignificant difference in returns between large and small portfolios after controlling for the book – to-market. Find that small-minus big (SMB) portfolios underperformed by – 0.22% per month
Dou, Gallagher and Schneider (2012)	1992-2010	Small negative premium.	The existence of size, anomalies is mostly attributable to micro-cap stocks
Gaunt (2015)	1974-2013	No premium	Average returns to both the smallest and largest decile portfolios are very similar, though the smallest decile portfolios still generate more volatile returns than the largest decile portfolios.
Durand, Limkriangkrai and Chai (2016)	1992-2010	No premium	Ran a four and five factor model and did not find significant explanation for the cross section of Australian returns.
Halliwell et al. (1999)	1980-1991	6% p.a.	Found that small companies have lower beta.
Faff (2001)	1991-1999	-3.7% p.a.	Found that the size premium is typically significantly negative.
Faff (2004)	1996-1999	-6.1% p.a.	In this paper the Fama and French three-factor model is tested using daily data drawn from the Australian stock market. In particular, a negative size premium is uncovered
Kassimatis (2008)	1993-2005	11.5% p.a.	Found that a year by year analysis of factor returns reveal that they produce positive statistically significant returns and that returns for SMB arbitrage portfolios are significant in explaining realised returns.

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One of the advantages of the Winn et al (2018) study is that it provides a relatively detailed breakdown of the impact of different premium drivers on micro-cap businesses. The study segments total returns and excess returns (Alphas) under four different size buckets (Q1, Q2, Q3 and Q4) versus financial risk (DTD), profitability (ROA) and growth. The results outlined in table 7 suggest that the size premium for micro-cap firms after accounting for risk, profit and growth rests within a range of 3.96% to 8.96%. The mid-point of this range is 6.46% (see table 5).

Table 5: Impact of size on Micro Cap businesses, by risk, profit and growth grouping (Winn et al 2018)

Measure	Q1 Highest Risk	Q2	Q3	Q4 Lowest risk
Alpha by size and financial risk	6.90%	7.75%	5.48%	3.96%
Alpha by size and ROA	7.01%	7.74%	6.58%	7.06%
Alpha by size and Growth	5.94%	6.91%	6.76%	8.96%

Source: Winn et al (2018).

Note: Businesses were sorted into four groups based on Distance-to-Default scores.

In addition to statistical data analysis Winn et al (2018) also drew on survey evidence, observing that just under a quarter of market practitioners in Australia employ a size premium as an adjustment to their standard CAPM formula. Winn et al (2018) noted that their sample size is limited but it did indicate some discrepancy in valuation methods employed. When practitioners do employ a size premium, the average premium is in the range of 1% to 5% for firms below $250m and $50m equity value respectively. The highest range is in the micro–cap group of between 1 and 20%.

Winn et al (2018) survey results are also broadly consistent with historical KPMG annual Valuation Practices Surveys which in 2013, 2015 and 2017 canvased the issue of the application of small stock premiums. These surveys found businesses typically perceived there to be a clear inverse relationship between the size of the small stock premium and the size of the entity (see figures 1 and 2 for 2015 and 2013 survey results, the 2017 survey found that the median and mode premium adopted was approximately 5%). The KPMG annual surveys indicate a premium ranging between 5 and 10% on average is adopted by small size firms. We note that this range represents practitioners practice, and is not directly comparable to the outcomes of peer reviewed empirical research papers, nevertheless it does indicate that it is common practice in the market for small size firms to apply a premium to their WACC calculations.

Figure 1: Survey 2015 – What is the benchmark SSP applied given the size of the entity

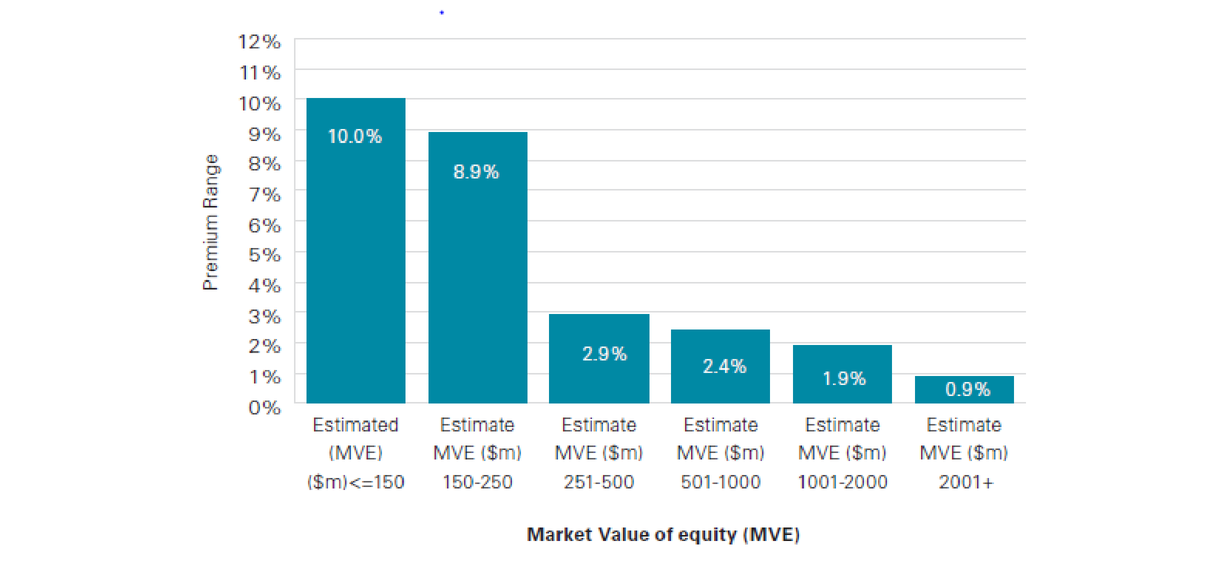

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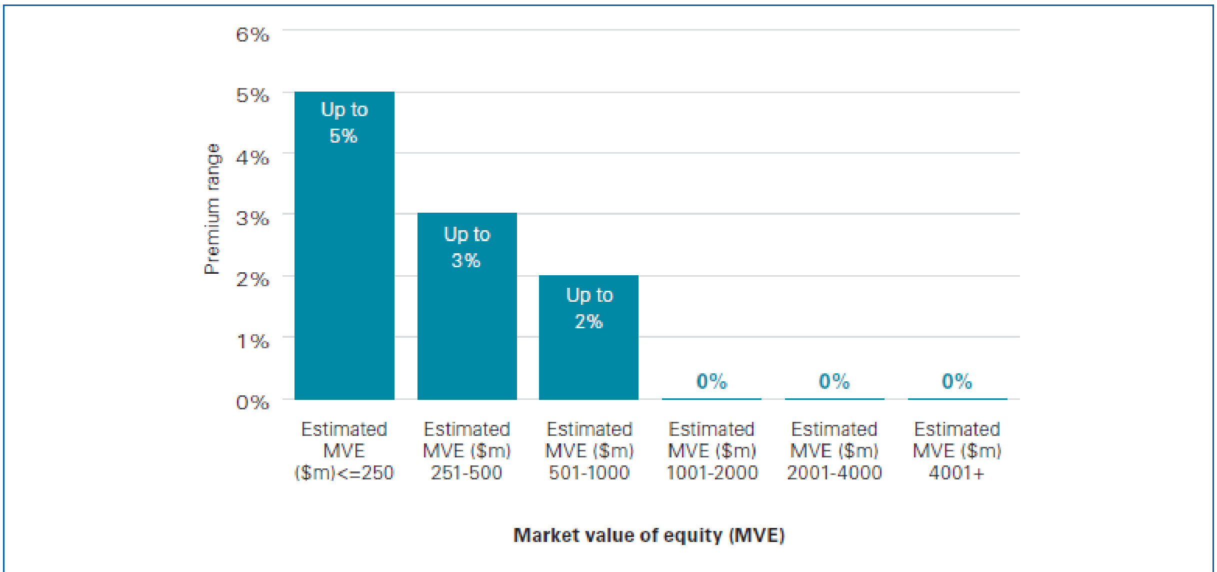
Figure 2: Survey 2013 – What is the benchmark SSP applied given the size of the entity



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While the literature on small size premiums may be mixed there are on balance a number of observations that can be made that support the application of a small size premium:

- There is both international and Australian evidence that smaller firms exhibit greater returns than larger ones. However this is not an absolute and there are instances where no or negative return premia are observed.
- There is evidence smaller firms are riskier than larger ones based on the variability of stock prices.
- Observed outperformance may reflect other return factors such as value, profitability and price momentum or risk factors such as credit risk or illiquidity.

Winn et al (2018) noted that a small firm cost of capital premium is still consistent with the standard CAPM to the extent it is a reward for some risk factor (such as illiquidity).

3.4 Regulatory treatment of size premiums

Size premiums are not a common feature of Australian regulatory regimes. However, they are a feature of UK regulatory frameworks, particularly those applied to water businesses and overseen by the UK regulator Ofwat (see Table 6).

Ofwat take the position that there is some evidence that smaller water-only companies have historically had, and may continue to have, more limited access to the more cost-effective financing options available to larger companies, leading to a relatively higher notional cost of debt. To address this issue Ofwat allow an uplift to the cost of debt allowance to reflect these costs, conditional on satisfying criteria on customer benefits and customer support.

In its PR19 final methodology, Ofwat set out a three-stage approach to assessing requests for a company-specific adjustment to the cost of capital, asking:

1. Is there compelling evidence that the level of the requested adjustment is appropriate?
2. Is there compelling evidence that there are benefits that adequately compensate customers for the increased cost?
3. Is there compelling evidence of customer support for the proposed adjustment?

As noted by Frontier (2013), small company premiums have been allowed only very rarely in relation to regulated energy networks because, on the whole, these networks are much larger than some of the regulated water companies. When Ofgem did make such an allowance, it did so only if there were barriers imposed by regulation (i.e. ring-fencing provisions) on the business benefitting from the benefits of being funded through a parent.

The key reasons that UK regulators have given for differentiating the cost of capital between small companies and large companies have been:

- The relative illiquidity of capital in small firms, which might be the result of high transaction costs; and
- An acceptance that the small companies in question happened to have higher operational gearing than larger counterparts.

While Ofwat recognises that there is a compelling case for including a premium in a small businesses cost of debt it has taken the position that that there is insufficient evidence that company size affects the cost of equity for companies in the UK water sector. Ofwat's rationale is that water only companies benefit from the same risk sharing mechanisms that are inherent in the regulatory regime, as for the larger companies (Ofwat 2017).

Table 6: Regulatory precident for size premiums

Regulatory decision	Size premium	Basis for decision
Ofwat 2019 Bristol Water Portsmouth Water SES Water	Premium for a company due to its small size is likely to lie in a range of 25 to 40 basis points over an efficient benchmark driven by large company borrowing costs.	• Higher costs of debt for small companies • Considered evidence of small company premia on both embedded debt and new debt.
Competition Commission 2010 Bristol Water	Increased asset beta by 18% to reflect the higher operational gearing of Bristol Water (a water only company) than larger, water and sewerage companies.	• Small water companies tend to have higher operational gearing than large water companies, and therefore higher systematic risk. • Small water companies may be more illiquid than large water companies
Ofwat 2009 Water only companies	0.1% to 0.4% premium on the cost of debt, over and above allowances for debt raising costs (assumed to be 0.2%)	• Access to debt finance is more limited for small water companies
Ofwat 2004 Water only companies	0.3% - 0.9% premium on the post-tax WACC	• The equity of small (water only) companies is relatively illiquid • Small water companies pay a premium to access debt markets • Transaction costs associated with raising debt and equity
Ofgem 2002 Independent gas transporters	0.8% premium on post-tax cost of equity	• Higher transaction costs from dealing in the shares of smaller companies, where market liquidity tends to be relatively low • Where a small company is financially and operationally ring-fenced from a parent company a small company premium could apply to the cost of equity.
Competition Commission 2000 Water inquiries	1% premium on post-tax cost of equity	• Impact of lower trading liquidity on cost of equity
Ofwat 1999	0.4% - 0.75% premium on post-tax WACC	• More limited access to capital markets

3.5 Size premium findings and recommendations

There is mixed evidence in the literature regarding the appropriateness of small size premiums. However, we note that:

- Recent studies, including Winn et al (2018) support the application of size premiums for micro-cap sized firms to the cost of equity.
- It is common practice for small and micro firms to adopt small size premiums in determining their own WACCs.

- There is regulatory precedent for the application of a size premium by Ofwat over the course of multiple price reviews.

On the basis of these observations we believe there is merit in considering the application of a small size premium to Compass Springs.

We recognise the regulatory precedent in the UK for the application of a size premium to the cost of debt. However, we note that there are a number of issues associated with determining the premium for Compass Springs from a debt perspective that make an uplift to the cost of debt consistent with Ofwat's approach impracticable.

The Ofwat approach is premised on the ability of businesses to evidence debt premiums based on market data for comparable companies. The businesses in question (such as Bristol Water and Portsmouth Water) are a magnitude of order far larger than Compass Springs. As Compass Springs is of a size where issuing bonds would be infeasible obtaining data for debt consistent with Compass Springs' size would require either a survey of small commercial lenders or alternatively, benchmarking of businesses of comparable scale and scope, neither activity is practicable given both the regulatory costs it would impose on Compass Springs and ultimately on Compass Springs' customers along with the likelihood that neither lenders or comparable businesses would be prepared to participate in such a study.

An alternative to basing the debt size premium on observable market outcomes would be to determine a small size premium based on Compass Springs' actual cost of debt, however we have not recommended such an approach as it would undermine the efficient benchmark nature of the regulatory WACC.

We recommend that a size premium be applied to the WACC and in recognition of the impracticality of applying such a premium to the cost of debt we recommend ESCOSA adopt a premium on the cost of equity that reflects the most recent data as identified in Winn et al of 6.46% p.a.

We recognise that the Winn et al study does not canvas as greater a study time period as those studies that found lower premiums, however it does provide a more granular examination of the individual drivers of premiums for Micro businesses in the Australian context.

KPMG size parameter recomendation

A size premium of 6.46% be applied to Compass Springs cost of equity.

4 Scope of activities

In addition to the issue of size premiums ESCOSA is seeking advice on the scope of activities referenced by the cost of capital. Specifically, the issue of Compass Springs costs of debt being effected by the activities associated with its parent company Robusto. The issue of scope of activities is typically referenced in a regulatory context as the requirement - to ring fence cost of debt from a business's non-regulated activity.

The concern with scope of activities is that risk associated with Robusto's activities such as land development may adversely affect Compass Springs debt raising costs.

We note that ring fencing typically becomes an issue in situations in which a regulated entity relies on a parent or the wider group to raise its capital because that is more cost efficient than raising the capital itself. For instance:

- There may be scale economies associated with the costs of issuing debt centrally. If these issuance costs are largely fixed, they may be spread over a number of divisions/subsidiaries. In the case of Compass Springs this would translate to Compass Springs being able to access debt more cheaply if its debt costs are partially allocated to Robusto Ltd.
- A group or large parent may be able to access certain capital markets with minimum issuance size requirements, which might otherwise be out of reach of a small individual subsidiary. This would allow the subsidiary to access a wider investor base than it would on its own. This is likely not to be an issue with Compass Springs as Robusto would most likely not be able to access capital markets.
- Pooling its risks across a number of subsidiaries and projects, a group may be able to achieve some internal diversification, thus lowering its default risk and reducing its cost of borrowing.

We note that UK regulators such as Ofgem and Ofwat have countenanced higher funding costs for subsidiaries that are effectively made standalone, in a financial and operational sense, through ring-fencing provisions. However, such allowances have not been permitted when the absence of ring-fencing provisions has meant that subsidiaries might reap funding benefits that arise through group ownership.

One of the issues that the size of Compass Springs raises is that because of its scale it is financing is confined to small scale businesses loans which are likely to require securitisation against non-regulatory assets. Such requirements will make it impractical to implement robust ring fencing arrangements.

However, we note that the application of the regulatory benchmark WACC as opposed to actual cost of debt incurred negates the requirement to ring fence cost of debt.

4.1 Our findings and recommendations

We recommend that ESCOSA adopt a size premium for Compass Springs cost of equity. The application of a size premium to the benchmark regulatory WACC will provide for an efficient rate of return and negate the need to impose ring fencing arrangements.

5 Rate of Return

This chapter discusses ESCOSA's regulatory approach and each of these parameters and their values within the context of their application to Compass Springs.

5.1.1 ESCOSA's rate of return principles

ESCOSA's regulatory framework incorporates a number of regulatory principles that guide its processes and procedures including the calculation of regulatory rate of return. Our advice is consistent with these principles as follows:

- **General Principle:** The rate of return should reflect the prudent and efficient financing strategy of an incumbent large water utility, which minimises expected costs in the long term, on a risk-adjusted basis;
- **Supporting principle 1:** The rate of return should reflect a long-term obligation on the utility to provide reliable and secure water and sewerage services to consumers. It should not solely reflect the new entrant cost of capital;
- **Supporting principle 2:** The rate of return should provide an incentive for SA Water to incur prudent and efficient investment in regulated assets and financing costs;
- **Supporting principle 3:** The rate of return should be based on consistent principles over time and should be predictable. It should change only to reflect material changes in evidence or regulatory practice; and
- **Supporting principle 4:** The assumed prudent financing strategy should not depend on the ownership of the regulated business (that is, the approach is indifferent to whether the entity is in Government or private ownership).

While these principles are explicitly formulated for large water utilities that provide both water and sewerage services, the underlying principles of efficient financing, long term obligations and incentivising the pursuit of efficiency, consistency and indifference to ownerships constitute regulatory good practice and are applicable to Compass Springs.

5.1.2 ESCOSA's WACC calculation

Compass Springs's WACC recognises that its capital is provided from two sources, namely lenders and equity investors (owners or shareholders). It is calculated by adding the cost of debt, weighted by the proportion of debt to total assets, to the cost of equity, weighted by the proportion of equity funds to total assets.

The most recent articulation by ESCOSA's of its approach to calculating the WACC and its components is set out in *SA Water Regulatory Determination 2020: Guidance Paper 5, the cost of funding and using assets*. The Pre-tax Real WACC is calculated as follows:

$$WACC_{real}^{post\ tax} = \frac{1 + (k_e \frac{E}{V} + k_d \frac{D}{V}\}}{(1 + i_{exp})}$$

Where:

k_e	is the cost of equity

k_d	is the cost of debt
i_{texp}	is an adjustment for expected inflation
E	market value of equity
D	is the market value of debt
V	is the market value of the firm (V=E+D)

The cost of equity is calculated using the Capital Asset Pricing Model (CAPM). Under ESCOSA's regulatory framework the use of the CAPM model is a requirement of the National Water Initiative (NWI) Pricing Principles.[8]

Although ESCOSA must use CAPM for calculating the cost of equity, it may choose which CAPM model to apply. The options include Sharpe-Lintner, Black, and Fama French. Previous SA Water determinations have used the Sharpe-Lintner CAPM,

5.1.3 Sharpe-Lintner CAPM

The central concept of CAPM is that of undiversifiable risk (known as beta). In essence, the total risk of a business activity can be separated into two distinct classes of risk, being undiversifiable and diversifiable risk. Undiversifiable risk refers to the riskiness of an entity compared to the market as a whole. It is calculated by a linear regression based on historic data.

The remaining risk is known as diversifiable risk. This risk can be removed by holding the security as part of a well-diversified portfolio of investments. CAPM assumes that investors will not be compensated for the risk they can cost-effectively avoid. That is, it assumes that investors will only be compensated through the rate of return for risk that cannot be avoided through diversification (QCA 2002).

It is also worth acknowledging the concept of total risk for a small investor. Small investors may have a large percentage of their wealth tied up into the business – in which case they do care about total risk as they cannot diversify.

> *Betas measure the risk added by an investment to a diversified portfolio. Consequently, they are best suited for firms where the marginal investor is diversified. With private firms, the owner is often the only investor and thus can be viewed as the marginal investor. Furthermore, in most private firms, the owner tends to have much of his or her wealth invested in the private business and does not have an opportunity to diversify. Consequently, it can be argued that betas will understate the exposure to market risk in these firms.*
> http://pages.stern.nyu.edu/~adamodar/New_Home_Page/valquestions/totalbeta.htm

The three most common asset pricing models include:

- Sharpe-Lintner CAPM;
- Black CAPM; and

8 Water Industry Act 2012 (Section 35) Pricing Order for the Regulatory Period 1 July 2013 – 30 June 2016, available at https://www.escosa.sa.gov.au/ArticleDocuments/482/120930-WaterIndustryAct-FirstPricin.pdf.aspx?Embed=Y

- Fama-French three-factor model.

Most regulators in Australia and overseas use the Sharpe-Lintner CAPM (SL-CAPM). The Sharpe–Lintner CAPM requires the estimation of three parameters—the risk free rate, the market risk premium (or the return on the market portfolio over the risk free rate) and the equity beta. The estimation of these parameters is considered less complex than the estimation of parameter inputs for most other return on equity models, and is supported by robust and replicable analysis.

In the SL CAPM, risk-averse investors:

(i) choose between portfolios on the basis of the mean and variance of each portfolio's return measured over a single period;

(ii) share the same investment horizon and beliefs about the distribution of returns;

(iii) face no taxes (or the same rate of tax on all forms of income) and there are no transaction costs; and (iv) can borrow or lend freely at a single risk-free rate (NERA 2015).

Consistent with our analytical approach we have adopted the SL-CAPM approach to calculate Compass Springs's WACC.

5.2 ESCOSA's WACC parameters

In November 2018, ESCOSA released a guidance explaining how ESCOSA would determine the efficient cost of funding investment in SA Water's regulated assets. ESCOSA has stated that the guidance is intended to provide information to all stakeholders of ESCOSA's initial positions on principles, requirements and methodology on matters relevant to the determination. ESCOSA also noted that that initial guidance is intended to inform the SAW RD20. Our WACC calculations are consistent with this guidance.

The individual parameters proposed by ESCOSA in its draft decision for SAW RD20 are outlined in the table below.

Table 7: SA Water 2020 WACC parameters

WACC Parameter	SAW20
Nominal risk free rate (%)	0.91
Market risk premium (%)	6.0
Equity beta	0.65
Nominal cost of debt (%)	5.09
Gearing (%)	60
Post Tax nominal WACC (%)	5.10
Long term inflation expectations (%)	2.33
Post tax real WACC (%)	2.66

Source: ESCOSA SA Water parameters (subject to a final decision by our Commission) provided by correspondence 12 May 2020.

5.2.1 Cost of Debt

ESCOSA has adopted a 10 year trailing average approach to the determination of cost of debt. The proposed draft decision cost of debt for SA Water is 5.09% (nominal for 2020).

ESCOSA's approach to calculating cost of debt assumes that a benchmark efficient entity will issue debt with a maturity of 10 years and, that 10% of its total debt is refinanced every year. Under this approach, the regulated entity can manage the risk of interest rates being high at any point in time. ESCOSA's guidance is that it will continue to use the cost of debt methodology that was adopted in its previous regulatory determination as it reflects the way a benchmark efficient entity would be likely to finance itself.

Theoretically, the discount rate for valuing debt (the cost of debt) in the CAPM model is the return expected by the providers of debt capital to reward them for bearing the systematic risk of investing in the entity. However, it is common regulatory practice in Australia to express the cost of debt as the promised yield of benchmarked debt with a credit rating consistent with the risk profile of the regulated entity. The credit spread (promised yield minus risk-free rate) is used to estimate the debt risk premium (rather than the debt margin as defined by the CAPM) because of the difficulties associated with estimating the component of the promised yield that rewards systematic risk.

In order to estimate the benchmark debt risk premium, a number of assumptions need to be made including the benchmark term of the debt, benchmark credit rating of the issuing entity, type of debt and location of issuance of debt.

The cost of debt is calculated as a 10 year trailing average based on BBB rated bonds (as opposed to the previously 'on the day' based approach). ESCOSA considers that this approach avoids over reliance on prevailing market rates, whereby the resultant cost of debt could be significantly different to the efficient costs that would form part of an ongoing business debt portfolio. Further, ESCOSA notes that this approach is in the best long-term interests of consumers as it replicates the likely debt financing strategy of a benchmark incumbent water utility, absent regulation, where long-term assets are financed by long-term debt.

We note that the cost of debt is based on a 10 year trailing average and that Compass Springs began trading in 2016. Compass Springs was acquired by Robusto Investments Pty Ltd from Hillrise Investments Pty Ltd in June 2016 and has only been operating as a business entity for four years. Due to its size Compass Springs is unlikely to obtain a fixed rate for 10 years as it will not be able to issue bonds itself. ESCOSA has indicated that it accepts the adoption of the SA Water benchmark cost of debt as it is expected to be higher than one calculated on a shorter term (such as the four years that Compass Springs has been trading) and therefore not likely to disadvantage the businesses.

5.2.2 Market risk premium

The Market Risk Premium (MRP) is the total return to shareholders, less the Risk-Free Rate. In the SL-CAPM it is described as the expected return, yet it can only be observed retrospectively.

ESCOSA is proposing to adopt a MRP of 6.0% for its recent SA Water draft decision. A MRP of 6% is consistent with majority of regulatory decisions over the past 10 years (see appendix A), market surveys of academics and market practitioners and sits within the range provided by historic estimates.

5.2.3 Gearing

ESCOSA has previously adopted a gearing assumption of 60% debt and 40% percent equity. This was considered to be representative of the Benchmark Efficient Entity, consistent with general regulatory practice in Australia and other parameters of WACC were set in that context.

We note that while the gearing assumption is consistent with regulatory precedent the majority of this precedent references large utilities with capital values that may not be directly comparable to Compass Springs.

There is some evidence that gearing may have a positive relationship to size. For example Brierely and Bunn in a 2013 Bank of England study noted:

> *Analysis of company accounts data suggests that gearing levels are persistent, positively related to company size and negatively correlated with growth opportunities and the importance of intangible assets (Brierley and Bunn 2005).*

There is also regulatory precedent for applying a gearing rate less than 60%. IPART in its 2018 decision for maximum fares for rural and regional bus services approved a gearing of 50% which was the midpoint in a range between 60% and 40%. The IPART decision was based on both current market data and long term averages. IPART undertook a benchmarking exercise based on the gearing levels of 23 transport companies (IPART 2018). We note that while IPART's benchmarking resulted in minimum gearing of 40% it did include a number of large business with market capitalisations in excess of USD$500 million. Gearing for those companies of comparable size to Compass Springs was much lower than the bottom bound of the IPART range. Six of the IPART benchmark companies had market capitalisations of USD$10 million or less. The average gearing for these companies was 24.9%. Undertaking a separate benchmarking study based on firms carrying out similar activities at a similar scale to Compass Springs is outside the scope of this engagement.

In addition to regulatory precedent we also note that businesses undertaking activities of a scale and scope similar to Compass springs are unlikely to:

- Be able to obtain a formal credit rating from a rating agency such as S&P or Moody's
- Issue corporate bonds in global, institutional / wholesale credit markets (such as USPP, 144A and EMTN markets.

- Enter into fixed for floating swaps to hedge for 10 year tenors / terms at a fixed rate.[9]

Such businesses are likely to gain short term debt from a local bank as opposed to global bond markets. This constraint may create issues where a local lender might potentially not accept the RAB as security, as the assets are very specialised in nature and cannot be removed or repurposed in the event of default. It is reasonable to expect Compass Springs to be relatively constrained in its ability to access credit in the absence of credit support from another party. Given the benchmark nature of the regulatory WACC rests on the assumption that it is reflective of Compass Springs water services and not securitised by non-regulated assets, we believe it is reasonable to consider a scenario where the businesses relies purely on equity funding.

In the absence of gearing benchmarking study we recommend ESCSOA adopt a potential range of gearing. The top of the range being 60% commensurate with the SAW RD20 and the bottom of the range being a zero gearing in recognition of the potential difficulties of firms such as Compass Springs obtaining debt.

We note that a lower level of gearing may impact on the cost of debt calculation. There is a generally accepted inverse relationship between a business's gearing and its credit rating. The implication being that a lower gearing level will result in a higher credit rating and lower cost of debt (all things being equal). However the strength of this relationship is difficult to quantify (see Hird and Wilton 2013). In the absence of benchmarking study for gearing levels (as outlined above) we have not estimated Compass Springs cost of debt to accommodate a lower gearing noting that for the lower bound of the range recommend no cost of debt will be incurred as a gearing of zero implies no debt.

5.2.4 Risk-free interest rate

ESCOSA have proposed a risk free rate of 0.91% in its draft determination for SA Water. The rate is based on observed yields from 10-year Commonwealth Government Securities (CGS) averaged over 20 business days. Observations taken close as possible to the draft determination.

The adoption of a 20 day averaging period is consistent with other regulators and with the fundamentals of the CAPM approach. The purpose of the averaging period is to shield against the risk that short-term volatility in the Risk Free Rate will determine the outcome of the Risk Free Rate at the time of the determination. ESCOSA notes that an average of the observations from the previous 20 days is consistent with its past practice and some other regulators. ESCOSA states that no regulator adopts a period shorter than 20 business days, but 40 or 60 days is sometimes used (ESCOSA 2019). The 10 year bond term adopted by ESCOSA is also consistent with the approaches of other regulators.

The risk free rate is exogenous to Compass Springs and the method and estimates proposed by ESCOSA for the SA Water 2020 price review are appropriate. We note that the

9 See https://assets.kpmg/content/dam/kpmg/au/pdf/2018/debt-market-update-au-q1-2018.pdf and https://www.business.hsbc.com.au/en-au/australian-nz-debt-capital-markets for examples of Australian regulated entities raising debt offshore.

adoption of these rates does mean that Compass Springs WACC is not based on a risk free rate that represents the most recent 20 day averaging period. However, ESCOSA has indicated that this is appropriate with the context of this report and that it will consider updating the risk free rate as a when it makes a decision.

5.2.5 Inflation

ESCOSA have proposed an inflation parameter of 2.33% in SAW RD20. The inflation rate reflects ESCOSA's long term expectations and is based on a geometric mean of inflation over 10-year period using RBA inflation forecast for the first year and midpoint of RBA inflation target band for other years.

5.2.6 Equity Beta

ESCOSA have adopted an equity beta of 0.65 for SAW RD20. The equity beta is consistent with recent decisions by other regulators which tend to range between 0.6 and 0.7 (see appendix A). We note that the equity beta for SAW RD20 represents a decline on previous betas SAW RD16 at 0.7 and SAW RD12 at 0.8. ESCOSA has stated that the reduced beta reflects declining systematic risk faced by SA Water due to trailing average cost of debt, and the introduction of revenue caps, rather than price caps.

The beta factor is a measure of the risk of an investment or business operation, relative to a well-diversified portfolio of investments. In theory, the only risks that are captured by beta are those risks that cannot be eliminated by the investor through diversification. Such risks are referred to as systematic, undiversifiable or market risk. Equity betas can be statistically measured by regressing the returns on an equity market index against the share price returns of the relevant stock. By definition, the market portfolio has an equity beta of 1.0. A beta greater than 1.0 implies that the returns on a stock are, on average, more volatile, and hence the stock is more risky than the market, whilst a beta of less than 1.0 implies the reverse. The regulatory beta of 0.65 represents an equity beta commensurate with a company with a gearing ratio of 60%.

We have adopted the SAW RD20 equity beta as directed by ESCOSA and note that the beta represents non-diversifiable risk and as such should be applicable to Compass Springs. While we have adopted the SAW RD20 beta, we have had to adjust the beta to ensure that it is consistent with the zero gearing scenario.

Betas derived from stock market observations represent equity betas, which reflect the degree of financial gearing of the company. Consequently, it is not possible to compare the equity betas of different companies without having regard to difference in their gearing levels. In theory, a more valid analysis of betas can be obtained by "ungearing" the equity beta to derive an unlevered asset beta, by applying the following formula:

$$\beta_a = \frac{\beta_e}{1 + \left[\frac{D}{E} \times (1 - t)\right]}$$

Where:

D/E	is the debt and equity values of the relevant equity security
t	is the corporate tax rate

The adjustment involves stripping out the impact of financial gearing from the equity beta to obtain an ungeared asset beta (denoted by βa). The asset beta removes the impact of debt to measure the systemic risk due to the company's assets.

In order to compare an investment geared at 60% to one without gearing, we have unlevered the regulatory equity beta of 0.65 adopting the formula above, to arrive at an asset beta of 0.32.

5.3 Findings and recommendations

Based on the parameters approved for SAW RD20 Draft Determination and our recommended adjustments to gearing and beta we have adopted the following parameter values.

Table 8: WACC parameters

Input	Definition	Value
Rf	Risk free rate of return	0.91%
Ba	Unlevered asset beta	0.32
Be	Beta estimate	0.65 to 0.32
MRP	Equity market risk premium	6.0%
SSP	Small Size Premium	6.46%
Kd	Cost of debt (pre-tax)	5.09%
D/(D+E)	Proportion of debt in the capital mix	60% to 0%
E/(D+E)	Proportion of equity in the capital mix	40%
i	Expected inflation	2.33%

Source: KPMG Corporate Finance Analysis

Based on these parameter values, and the application of the the Sharpe-Lintner CAPM consistent with ESCOSA's regulatory guidance, we estimate a real post-tax vanilla WACC range of 5.11% to 6.78%. The midpoint in the range is 5.95%.

Set out below is a summary of the real post-tax vanilla WACC estimate adopted by ESCOSA as at 22 May 2020 (Base WACC), together with a low and high case for Compass Springs incorporating adjustments for size. The low case scenario includes a small size premium adjustment to the cost of equity of 6.46%, holding all other inputs constant (including a gearing of 60%).

The high case scenario also considers the restricted access to debt capital markets for a business of the size and nature of Compass Springs, by setting the gearing to nil. In adjusting the level of gearing, consideration was also given to the beta adopted. In order to compare an investment geared at 60% to one without gearing, we have unlevered the regulatory equity beta of 0.65 adopting the formula outlined in section 5.2.6, to arrive at an asset beta of 0.32.

Table 9: Weighted Average Cost of Capital, Compass Springs (May 2020)

Input	Definition	Base WACC	Low	High
Rf	Risk free rate of return	0.91%	0.91%	0.91%
Ba	Unlevered asset beta	0.32	0.32	0.32
Be	Beta estimate	0.65	0.65	0.32
MRP	Equity market risk premium	6.0%	6.0%	6.0%
SSP	Small Size Premium	n/a	6.46%	6.46%
Ke	**Cost of equity (post tax, nominal)**	**4.81%**	**11.27%**	**9.27%**
Kd	Cost of debt (pre-tax)	5.09%	5.09%	5.09%
D/(D+E)	Proportion of debt in the capital mix	60%	60%	0%
E/(D+E)	Proportion of equity in the capital mix	40%	40%	100%
WACC	**Weighted average cost of capital (post tax vanilla, nominal)**	**4.98%**	**7.56%**	**9.27%**
i	Expected inflation	2.33%	2.33%	2.33%
WACC	**Weighted average cost of capital (post tax vanilla, real)**	**2.59%**	**5.11%**	**6.78%**
Source: KPMG Corporate Finance Analysis				

Appendix A: Regulatory WACC precedent

Regulator	Entity	Risk free rate	Averaging period	Inflation	Debt margin	Market risk premium	Gearing	Gamma	Equity beta	Cost of equity	Cost of debt	Post tax nominal vanilla WACC	Classic WACC
AER (2012)	Powerlink	4.17%	20 days	2.60%	3.93%	6.50%	60%	0.65	0.8	9.37%	8.10%	8.61%	7.18%
AER (2013)	Envestra	3.53%	20 days	2.50%	3.23%	6%	60%	0.25	0.8	8.33%	6.76%	7.39%	6.14%
AER (2016)	Australian Gas Networks	2.57%	20 days	2.39%	-	6.50%	60%	0.4	0.7	7.10%	5.51%	6.15%	5.18%
AER (2016)	United Energy	2.94%	20 days	2.32%		6.50%	60%	0.4	0.7	7.50%	5.62%	6.37%	5.34%
AER (2017)	AusNet Services	2.93%	20 days	2.32%		6.50%	60%	0.4		-	-	6.31%	n/a
QCA (2018)	SeqWater	1.84%	20 days	2.25%	-	7.00%	60%	0.46	0.77	7.05%	5.55%	6.33%	5.22%
AER (2018)	Transgrid	2.68%	20-60 days	2.45%	-	6.50%	60%	0.4	0.7	7.20%	5.97%	6.54%	5.40%
IPART (2018)	Rural and Regional Buses	2.80%	40 days	2.50%	1.80%	7.60%	50%	0.25	0.85	-	-	7.60%	n/a
QCA (2018)	Aurizon Network	1.90%	20 days	2.37%	-	7%	55%	0.484	0.73	4.17%	-	5.70%	n/a
AER (2019)	Ausgrid	2.04%	20-60 days	2.42%	-	6.1	60%	0.585	0.6	6.30%	5.74%	5.72%	4.68%
AER Draft (2019)	SA Power Networks	1.32%	20-60 days	2.45%	-	6.10%	60%	0.585	0.6	4.98%	4.93%	4.95%	4.10%
AER Draft (2019)	Ergon Energy	1.32%	20-60 days	2.45%	-	6.10%	60%	0.585	0.6	4.98%	4.79%	4.87%	4.04%
AER Draft (2019)	Energex	1.32%	20-60 days	2.45%	-	6.10%	60%	0.585	0.6	4.98%	4.79%	4.87%	4.04%
AER Draft (2019)	Jemena	0.94%	20-60 days	2.45%	-	6.10%	60%	0.585	0.6	4.60%	4.36%	4.46%	3.70%
IPART (2019)	Central Coast	2.00%	40 days	2.30%	2.30%	7.30%	-	0.25	0.7	8.10%	4.40%	5.50%	n/a
IPART Draft (2020)	Hunter Water	1.20%	40 days	2.30%	1.80%	6.00%	60%	0.25	0.7	7.40%	3.00%	6.40%	4.96%
ESCOSA Draft (2020)	Water	1.16%	20-60 days	2.33		6.00%	60%		0.65%			5.10%	n/a
QCA (2020)	SunWater	1.16%	20 days	-	2.09%	6.50%	60%	0.48	0.755	6.06%	3.24%	4.37%	3.82%

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