UNIVERSITY OF CAMBRIDGE
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CAMBRIDGE WORKING PAPERS IN ECONOMICS

# On dividends and market valuations of Australia's listed electricity utilities: regulated vs. merchant

Paul
Simshauser

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Restructuring of Australia's electricity supply industry during the 1990s and the string of M&A events that followed led to two clear lines of business emerging, i). regulated utilities (i.e. poles & wires), and ii). merchant utilities (i.e. competitive generation and retail). There are dozens of utility businesses in Australia but only four are listed on the Australian Stock Exchange – two regulated and two merchant. Operating in parallel for most of the past two decades, the two utility segments followed very different earnings trajectories over recent years. Unlike merchant firms, regulated utilities avoided the large swings in dividends which characterised merchant firms as Australia's climate change policy conditions began to tighten. In turn, the comparative stability of regulated utility dividends in the context of a low interest rate environment led to soaring valuations, culminating in simultaneous takeover events. Co-incident delisting of the regulated utilities marks the end of our ability to observe continuous market valuations, and real capital market reactions to changes in network regulation. In this article, the dividend policy and market valuations of the listed regulated utilities are analysed in the context of a falling interest rate environment. Results are consistent with Grullon & Michaely's lifecycle theory of dividend policy – it would seem the stability provided by Australia's regulatory framework made the network utilities, rightly or wrongly, a proxy for bond investors in a falling-rate environment. For merchant utilities, the pattern of dividends and earnings are consistent with information content theory. But their valuations have been adversely impacted by a tightening of Australian climate change policies –ironically, this also being the likely trigger of regulated utility takeover events.

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# On dividends and market valuations of Australia's listed electricity utilities: regulated vs. merchant

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April 2022

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*Restructuring of Australia's electricity supply industry during the 1990s and the string of M&A events that followed led to two clear lines of business emerging, i). regulated utilities (i.e. poles & wires), and ii). merchant utilities (i.e. competitive generation and retail). There are dozens of utility businesses in Australia but only four are listed on the Australian Stock Exchange – two regulated and two merchant. Operating in parallel for most of the past two decades, the two utility segments followed very different earnings trajectories over recent years. Unlike merchant firms, regulated utilities avoided the large swings in dividends which characterised merchant firms as Australia's climate change policy conditions began to tighten. In turn, the comparative stability of regulated utility dividends in the context of a low interest rate environment led to soaring valuations, culminating in simultaneous takeover events. Co-incident delisting of the regulated utilities marks the end of our ability to observe continuous market valuations, and real capital market reactions to changes in network regulation. In this article, the dividend policy and market valuations of the listed regulated utilities are analysed in the context of a falling interest rate environment. Results are consistent with Grullon & Michaely's lifecycle theory of dividend policy – it would seem the stability provided by Australia's regulatory framework made the network utilities, rightly or wrongly, a proxy for bond investors in a falling-rate environment. For merchant utilities, the pattern of dividends and earnings are consistent with information content theory. But their valuations have been adversely impacted by a tightening of Australian climate change policies – ironically, this also being the likely trigger of regulated utility takeover events.*

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## 1. Introduction

Australia's National Electricity Market (NEM) comprises a mix of regulated and merchant utilities set within an array of ownership structures. In all, there are ~15 regulated utilities, ~five major 'gentailers' and 20+ specialist generators, retailers and renewable developers of varying sizes. In 2021, only four major utilities were listed on the Australian Stock Exchange (ASX) with the balance either private or government owned. Intriguingly, two of the four ASX-listed firms were regulated utilities, and both were simultaneously the subject of takeover events at ~30% premiums to market closing prices. Regulated utility valuations have reached a peak while merchant valuations are at a 15-year nadir.

Although regulated and merchant segments form part of the electricity supply industry, they own and operate very different businesses. Regulated utilities can be thought of as the *poles and wires* segment – large *asset heavy* infrastructure firms with a Regulatory Asset Base or 'RAB' subject to a form of economic regulation. Annual revenues for regulated utilities are set in five-year cycles by the Australian Energy Regulator with the RAB and regulated rate of return forming crucial variables.

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Merchant utilities operate in the NEM's intensely competitive wholesale and retail markets and include generation and retail supply – with (re-)integration forming the dominant model.

Dividends and market valuations of the listed utilities ran broadly in parallel for much of the past two decades. But a noticeable divergence in trajectories occurred over the most recent few years. More importantly, regulated utility de-listing events mark the end of our ability to continuously observe market valuations in Australia, which has implications for policymakers. The purpose of this article is to make use of available public earnings data and identify drivers that led to the de-listing events of regulated utilities, and the sharp deterioration of merchant firms. Drawing on the 15-year window of directly-comparable half-yearly earnings data (2007-2021), this article sits within the literature on dividend policy and in particular, lifecycle theory.

Key findings are as follows. Both utility segments seek to maintain investment-grade credit metrics and an outworking of this is gearing levels (i.e. debt to debt+equity) of ~65% for regulated and ~30% for merchant firms. Regulated utilities distribute (on average) 100% of earnings to shareholders – a not unsurprising result given large depreciation charges and the overall maturity of such businesses. Merchant firms distribute (on average) 60% of earnings, the differential explained by a 3-fold increase in the volatility of operating cash flows.

For merchant utilities, a decision to change dividends is followed by symmetrical earnings results in future years. That is, a dividend increase (average=12%) telegraphs higher future earnings, higher future asset returns and higher market valuations over the ensuing two years of trade. Such results are consistent with an 'information content' theory of dividend policy (see John and Williams, 1985; Miller and Rock, 1985).

Regulated utilities results are completely *counterintuitive*. When regulated utilities increase dividends (average=9%), future earnings decrease, future asset returns deteriorate but stock prices experience a positive drift. Conversely, dividend cuts are followed by rebounding profits and rising asset returns. These results are consistent with a lifecycle theory of dividend policy (see especially Grullon and Michaely, 2002; Grullon, Michaely and Swaminathan, 2002; DeAngelo, DeAngelo and Stulz, 2006).

Finally, falling interest rates and a tightening of climate change policies in Australia has impacted the segments differently. Merchant fortunes deteriorated as an influx of low-cost renewables entered the market – and low interest rates has produced even lower entry costs – all of which adversely impacts legacy fossil generation fleets. These same forces appear to have triggered regulated utility takeover events – the prospect of rising renewable network connections and interconnectors (i.e. 'growth') inducing substantial takeover premiums.

From a policy perspective, while de-listing ends our ability to observe 'real' market reactions to changes in regulatory policy, the history is clear enough. Despite periodic objections to regulatory decisions regarding returns, the practical evidence confirms regulated utilities outperformed the broader ASX200 index.

This article is structured as follows. Section 2 provides a brief overview of industrial organization in Australia's electricity supply industry. Section 3 reviews the literature on dividend policy. Sections 4-6 analyse available market data. Policy implications and concluding remarks follow.

## 2. Brief background to industrial organization in Australia's NEM

When the electricity supply industry was first formed in the 1890's, what we now refer to as the four primary industry segments, viz. generation, transmission, distribution and retailing, were constituted as vertical monopolies for reasons of coordination and efficiency. For most of the 20th Century the vertically integrated electricity supply industry was one of the leading sectors of the economy vis-à-vis productivity – extracting economies of scale through technological development (Joskow, 1987). However by the 1980s, sectoral performance across many countries including the US, Great Britain and Australia was marked by capital misallocation, overcapacity and rising prices (Pierce, 1984; Hoecker, 1987; Joskow, 1987; Kellow, 1996; Newbery and Pollitt, 1997). A global wave of microeconomic reform would follow.

Disaggregation of vertical monopoly electricity utilities[1] and the introduction of competitive markets can be traced as far back as Weiss (1973). Limits to scale economies in power generation had been empirically documented as early as Christensen & Green (1976) and Huettner & Landon (1978). Moreover, technology changes with generation plant (e.g. Combined Cycle Gas Turbine) meant scale-efficient entry was contracting after more than 60 years of expansion (Joskow, 1987; Hunt and Shuttleworth, 1996; Meyer, 2012). With this backdrop, restructuring plans began to emerge in various jurisdictions. A wave of microeconomic reform swept through western economies during the 1990s, typically involving the vertical and horizontal restructuring of monopoly utilities and the creation of competitive wholesale power pools, often based on the British model (Newbery, 2005, 2006).

In the case of Australia, the pre-reform electricity supply industry structure was comprised of state-based vertically integrated monopoly utilities. During the 1990s, the four vertical monopoly utilities in Queensland, New South Wales, Victoria and South Australia were restructured into 16 portfolio generators, 5 transmission entities and 15 distribution/retail supply entities around state/NEM region boundaries.

Over the following decade, 14 out of 15 distribution network business divested their retail supply division – an observed pattern which also occurred in Great Britain where this business combination was initially derived.[2] Structural separations between network and retail supply were value-driven investor events – capital markets were consistently under-valuing combined distribution/retail supply entities. Sum-of-the-parts valuations revealed structural separation would result in better *Total Shareholder Returns*. Underpinning all of these motives is the distribution of future cash flows (i.e. dividends). Retail supply businesses were consolidated with three dominant firms emerging from a long line of M&A events, viz. AGL Energy, Origin Energy and EnergyAustralia. Each is vertically integrated with generation, two are listed on the ASX. And as noted in Section 1, two regulated utilities are also listed after various M&A events involving various transmission and distribution networks.

## 3. Review of literature: dividend policy

Few decisions made by firms receive more consistent annual attention by Boards of Directors than dividend policy. For more than 60 years, financial economists have sought to explain dividend policy but a united theory remains challenging (Coulton and Ruddock, 2011). The fact that a spectrum of dividend policies exists, ranging from low to high payout ratios, provides the practical evidence.

The origins of dividend policy research commences with Lintner (1956). In his seminal study, 15 variables[3] thought to be important vis-à-vis dividend policy were

[1] For an excellent discussion of the diversity of industrial organisation within the electricity industry prior to the reforms, see Schmalensee (2021).
[2] Evidently, a general lack of scope economies and vastly different risk profiles existed between regulated distribution networks and merchant retail businesses – the practical evidence being the comprehensive nature of this structural re-organisation pattern.
[3] Variables included dividends >70% of earnings, <40% of earnings; raised / did not raise external finance, firm scale, industry, earnings stability, liquidity, balance sheets structure and so on.

used to screen 600+ listed equities. 28 were selected for subsequent investigation with clear insights emerging:[4]

- Dividend payout ratio is considered an 'optimum problem' by Directors;
- Dividend policy changes are only undertaken if the decision would be viewed positively in the long run;
- Directors hold a *deep belief* that equity markets place a premium on dividend stability;
- Directors select dividend policies unlikely to be reversed within a two-year timeframe. Erratic changes are to be avoided; and
- No other Board decision was considered as *consistently important* as dividend policy.

The next step in the pursuit of a general theory of dividends came from Miller and Modigliani (1961). The mathematical proof in their classic article demonstrated with perfect capital markets (i.e. no taxes, transaction costs, agency costs or asymmetric information), dividend policy is irrelevant to the value of the firm:

> *…Given a firm's investment policy, the dividend payout policy it chooses to follow will affect neither the current price of its shares nor the total return to its shareholders. Like many other propositions in economics, the irrelevance of dividend policy, given investment policy, is "obvious once you think of it". It is merely one more instance of the general principle that there are no financial illusions in a rational and perfect economic environment. Values are determined solely by real considerations – in this case the earning power of the firm's assets and its investment policy – not by how the earnings power are packaged for distribution… (Miller & Modigliani, 1961, p414).*

The central implication from MM's 1961 article, and their earlier article on the irrelevance of capital structure (i.e.Modigliani and Miller, 1958) is that investment policy alone determines the value of the firm. That is, in perfect capital markets neither the mix of debt/equity nor dividend payout selected will impact the value of the firm for a given investment program. Varying the capital structure or dividends merely re-packages the value generated by underlying investments in different formats. Of course, in practice we know dividend policy (and capital structure) is not irrelevant and by deduction relates to factors assumed away in perfect capital markets.

### 3.1 Taxation and franking credits

Of all the variables assumed away, MM suggested the most likely 'variable of relevance' was taxation. Under classical taxation systems, dividends are double-taxed – once at the firm level (company tax), and once at the shareholder level (income tax). Conversely, capital gains are usually tax free or at concessional rates.

Yet if taxation were the only determinant, we would observe a polarization of dividend policy into two groups, i). companies with zero dividends to avoid double taxation, and ii). companies paying 100% dividends to suit investors with low tax positions.[5]

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[4] See Lintner (1956), especially pp.98-101.

[5] As Miller and Scholes (1978, pp333-334) noted long ago in the case of the United States, "*in 1976 for example, corporations paid the Treasury 43% of their earnings of $111 billion in corporation income taxes. From the after-tax remainder, they then paid out $31 billion in dividends, thereby subjecting a substantial fraction of their stockholders to still another tax bite under the personal income tax. This seemingly masochistic dividend payout policy cannot convincingly be attributed to a dearth in opportunities to reinvest those dividends profitably within the corporate*

But no such polarization exists, implying taxation is not the exclusive determinant (Ball *et al.*, 1979).

In Australia, when the classical taxation system existed (i.e. up to 1987) the top 100 listed companies had an average payout of 44% (Nigols, 1992). A dividend imputation system[6] introduced in 1987 meant taxpaying resident shareholders would receive franking credits equivalent to corporate taxes paid (i.e. eliminating double taxation).[7] Shareholders thus receive a gross dividend ($GD$) comprising the cash distribution ($CD$) and a franking credit ($F$), the latter representing the value of corporate taxes paid ($\tau_c$) $w$ith $x$ representing the percentage of the cash dividends paid from post-tax profits (Beggs and Skeels, 2006; Gray and Hall, 2008; Fenech, Skully and Xuguang, 2014).

$$GD = CD + F \, \Big| \, F = CD \cdot \left(\frac{x\tau_c}{1-\tau_c}\right) \quad (1)$$

Under an imputation system, in theory investor preferences shift to high dividend payout ratios with tax credits delivered as soon as possible (Coulton and Ruddock, 2011). Various empirical studies observe demonstrable shifts in dividend policies following the 1987 change. Lowe and Shuetrim (1992) examined 224 Australian firms from 1973-1990 and found dividend payout ratios jumped from 47% to 76%[8] post-1987. Jun, Gallagher and Partington (2011) found institutional investors to be overweight stocks with full imputation credits (cf. partial or zero imputation credits). Because shareholders have a spectrum of tax positions, it is thought *dividend clienteles* exist which may drive dividend policy.

### 3.2 Dividend Clientele

If investor clienteles exist, firms will pursue stable dividend policies. Fluctuating dividends are unlikely to appeal to any class of investor given transactions costs of switching stocks. Miller and Modigliani (1961) noted one clientele is as good as another while Black and Scholes (1974) considered 'clienteles' based on demand and supply equilibrium concepts for the aggregate stock of low and high dividend firms.[9]

Pettit (1977) found significant dividend clientele effects with positive correlations between high dividend firms and older-aged investors, and negative correlations with the taxable income of investors. Lewellen *et al.*, (1978) also found investors influenced by taxation with an inverse relationship between marginal tax rates and dividend yields.[10] Bellamy (1994) examined dividend clientele effects by examining 2,200+ dividend events and found a tendency for franking to cluster at either 0% or 100%, with payout ratios consistently higher for Australian firms paying fully franked dividends. Jun et al. (2011) examined tax-induced dividend clienteles amongst Australian institutional investors and superannuation funds and found they were overweight stocks with franked dividends.[11]

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*sector… For at the same time that corporations were shovelling $31 billion of dividends out the front door, they were raking some $47 billion in through the back door in the form of new equity issues, new bond issues and new bank credit."*

[6] Other countries with dividend imputation include Canada, Chile, Malta, Mexico and New Zealand.

[7] Hamson and Zieegler (1990) observed individuals make use of tax credits to reduce personal income taxes (*imputation effect*) and payment of dividends now reduces capital gains taxes later (*CGT effect*).

[8] With dividends rising from 47-76% capital raisings would become more frequent. But Dividend Reinvestment Plans (DRP) return cash dividends to the firm. Bellamy (1994) examined DRPs pre- and post-1987 and found an increase from 25 to 120+ ASX-listed firms with DRPs. Abraham et al., (2015) found firms using DRP had higher dividend payout ratios and were larger in size.

[9] A dividend clientele is thought to be coarse and so only non-trivial changes to dividend yield would shift a company from a low or a high yielding asset class.

[10] Richardson et al. (1986) examined 192 firms announcing their first cash dividend and identified substantial increases in trading volume around announcement dates. However, their analysis also concluded the majority of volume related to the 'information content of future earnings' with 'clientele adjustments' being trivial.

[11] Interestingly, super funds did not seek highest dividend yields due to doubts over the sustainability of returns.

Various studies have attempted to value franking credits by focusing on drop-off ratios. In perfect capital markets with no transaction costs the expected share price drop on a firm's ex-dividend day should equal the cash dividend. With franking credits, this would extend to the gross dividend per Eq.1. Empirical tests have varied over time, initially exhibiting ~50% of franking values but falling to negligible levels as taxation and the source of investment flows changed (see Brown and Clarke, 1993; Bellamy, 1994; Walker and Partington, 1999; Hathaway and Officer, 2004; Swan, 2019). Beggs and Skeels (2006) examined 5500+ dividend events from 1986-2004 and found gross dividend $(GD)$ drop-off ratios were significantly less than unity (ie. marginal investors did not trade-up to the value of $F$). Unfranked dividends on the other hand were not significantly less than unity (i.e. investors extracted all $CD$ profit). The issue here is marginal investors clear stock prices (Miller and Scholes, 1982; Boyd and Jagannathan, 1994) and in Australia this is foreign (non-Australian taxpaying) investors who have no use of franking credits, $F$ (Cannavan et al, 2004).

### 3.3 Agency costs and dividends

Agency costs have long been a feature of economic theory and can be traced at least as far back as Berle and Means (1932), with the separation of management and ownership thought to induce firm scale at any cost, excessive salaries, perquisites and so on. Rozeff (1982, p.250) observed agency costs could be minimized through higher dividend payout ratios because raising equity on a regular basis is accompanied by provision of detailed corporate information to investors and underwriters, thus enabling low-cost monitoring of management performance. Combinations of high dividend payout ratios and subdued growth options were found in Rozeff (1982), Easterbrook (1984), Jensen (1986), Smith and Watts (1992), Lie (2000), and more recently in Australia by Yarram and Dollery (2015). Grullon et al., (2002), DeAngelo et al., (2006) and others find a similar relationship on payout ratios and growth options, although their explanation differs as Section 3.5 later explains.

### 3.4 Information Content of Dividends

A large body of research is dedicated to examining the *information content* of dividends, commencing with John and Williams (1985), Miller and Rock (1985) and Bhattacharya (1997). Since Directors hold valuable private/inside information, it is thought dividend decisions contain insight vis-à-vis future earnings. The reasoning follows Lintner (1956) – Directors select dividend policies unlikely to be reversed within a two-year timeframe. Grullon and Michaely (2004) identify three separate implications of this logic:[12]

1. *Unanticipated changes in dividend policy will be followed by changes in share price in the same direction.*

Brown et al.(1977) analysed the information content of company announcements in Australia. They found when earnings and dividends move in the same direction, share price movements are reinforced. Conversely, conflicting announcements (i.e. earnings in one direction, dividends in another) had adverse share price reactions – a result also found by Easton (1991).[13] Easton and Sinclair (1989) found Australian dividend announcements provided information over-and-above earnings announcements.

[12] Grullon and Michaely (2004) were specifically examining share repurchases. However the same principles logically follow vis-à-vis changes in dividend policy.

[13] Asquith and Mullins (1983) observed that firms making announcements on dividends for the first time or resuming after a ten-year period of no dividends tended to exceed market returns materially over a 2-day trading period. Healy and Palepu, (1988) also found significant market reaction to changes in dividend policies; they found that firms who initiated dividends also experienced a significant increase in earnings the following year. Conversely, they found that when firms cancelled their dividends, this was also accompanied by a material decrease in the earnings for at least one year after the change in dividend policy.

Unlike Australia, US dividends and earnings are announced separately. Asquith and Mullins (1983) found stock prices react well to dividend initiations, and to subsequent dividend increases. This led Miller and Rock (1985) to analyse whether firms increase dividends in order to run-up stock prices prior to capital raisings. Very short-term effects were identified but ultimately revert to underlying reported earnings. Loderer and Mauer (1992) found firms were *not* more likely to raise dividends prior to capital raisings, and evidence suggested capital raisings were not coordinated with dividend announcements.

Grullon, Michaely and Swaminathan (2002) studied 7600 announced dividend changes in the US over the period between 1967-1998. Average abnormal returns to share prices were found over the ensuing three trading days (+1.34%) for dividend increases, and -3.71% for dividend decreases. Healy and Palepu (1988) similarly found a +3.9% increase in share prices with dividend increases, whereas cutting dividends produced a -9.5% drop in share price.

In Australia, Balachandran et al., (2004) examined the information content of special dividends and the implications for rival firms. They found resource stocks tended to react in the same direction (*contagion*), while financial stocks reacted in the opposite direction (*competitive shift*). For industrial stocks, there was no equivalent reaction.

2. *Unexpected dividend changes will change market expectations of future earnings.*

The implication here is that when firms increase dividends, stock analysts will revise future earnings upwards. Here the evidence is conflicting. Ofer and Siegel (1987) found a positive relationship between the size of dividend changes and the forecast earnings of the firm reported by stock analysts. But Grullon and Michaely (2004) found US analysts revise profits downwards during a month in which increased distributions to shareholders were announced (and the greater the dividend, the greater the downward revision).

3. *Changes in dividends will be accompanied by changes in actual future profits in the same direction.*

This third implication by Grullon & Michaely (2004) is of central importance to the subsequent analysis presented in Sections 4-6. The statement presents as axiomatic – yet – there is an abundance of evidence within the literature which suggests the opposite. Lintner (1956) noted dividends would only be increased when Directors were confident any change could be sustained. Benartzi et al. (1997) found the relationship between unexpected changes in dividends and future earnings to be weak. Dividend changes either lagged, or were contemporaneous with, earnings movements. Furthermore, dividend cuts were commonly followed by a rebound in profits over the following two years.

Grullon, Michaely and Swaminathan (2002) found when firms cut dividends, abnormal stock returns of -3.71% immediately followed over 0-2 trading days, but in the years following, reported profits and asset returns increased. Conversely, Grullon et al. (2004) found when dividends were raised, immediate abnormal share price returns of +1.34% occurred in response, but in the years following profits and asset returns declined. Furthermore, firms that increased dividends the most experienced the greatest declines in profitability.

Using a 35 year dataset, Grullon *et al.*, (2005) found the relationship between dividend changes and future earnings disappears over time. Results indicated earning increases do not follow dividend increases in any systematic way, and that dividend changes are negatively correlated with future changes in profitability. This research produced useful insights on firms most likely to raise dividends:

- Firm raising dividends typically exhibit a build-up of cash;
- A reduction in capital expenditure would follow over the subsequent three years; and
- Asset returns declined, yet share prices experienced a *positive price drift*.

As Grullon and Michaely (2004) explain, the only economic variable capable of explaining the combination of raised dividends, falling profits, falling asset returns, and positive share price drift is a decline in systematic risk (i.e. β) of the firm. They found firms that raised dividends experienced a ~100bps *reduction* in WACC over the three years following a dividend increase (and conversely, a 200bps increase in WACC following a dividend cut). This reduction in WACC occurs aside from any change in leverage, with similar improvements in bond ratings and credit performance.[14] In Australia, Yarram and Dollery (2015) and Swan (2019) found similar reductions in the systematic risk of large firms characterised by low growth and high dividends.

Raising dividends with coincident moderating profits is likely when firms confront a decline in growth. When growth opportunities diminish, agency risk is thought to rise with heightened shareholder concern that management will make reckless investment decisions. By raising dividends to shareholders, such cash-burn is less likely and therefore rewarded by positive share price drift. To summarise, equity capital markets are reacting favourably to a set of forward cash flows that have become inherently *less risky*.[15] Grullon and Michaely (2004) explained this phenomenon as equivalent to a standard MBA Textbook on firm *lifecycle theory*:

> *Typically in a growth phase, a firm has many positive NPV projects available, high capital expenditures, low free cash flows, and high earnings growth. At some point, the firm's growth slows down (e.g. competitors enter the industry) and its economic profit declines. In this phase, capital expenditures decline and the firm generates a large amount of free cash flows… The potential for management to over-invest is very high when a firm is going through this change in its lifecycle, and hence the incentive for an increase in payout (Grullon and Michaely, 2004, p.656).*

This leads us to lifecycle theory.

### 3.5 On lifecycle theory of dividend policy

With lifecycle theory, the assets of mature firms reach a 'harvest' stage, generating cash well in excess of the investment requirements given a shrinking pool of opportunity, and are consequently better candidates to pay dividends (DeAngelo, DeAngelo and Stulz, 2006). Optimal dividend policy is therefore to retain earnings to meet any forward investment program and distribute excess cash to shareholders. Viewed in this light, firms which pay dividends have reached a level of maturity that enables stable dividends.

Conversely, emerging firms are in their early stages of profitability, face an abundant opportunity set for new growth and hold comparatively less income producing assets.

[14] They found WACC results to be "mean reverting" in that the WACC of dividend increasing firms moved closer to their rivals. This reduction in the WACC of dividend increasing firms explains positive share price drift in following years.

[15] A key body of closely related work from the US is that associated with 'share repurchases'. This was the topic of examination in Grullon and Michaely (2002), who examined whether or not firms were running down dividend payouts, and redistributing these earnings through share repurchases to enhance the form and tax efficiency of returns to shareholders. By examining a sample of 14,700 firms over the period between 1972-1998 they found it was logical to replace dividends with share repurchases on the grounds of taxation.

Given raising capital is costly, optimal dividend policy is dominated by 'retention of cash' in order to fund growth. Fama and French (2001) found US dividend-paying firms were significantly larger, more profitable, with fewer growth options than firms that did't pay dividends. Empirical results in DeAngelo et al. (2004) identified dividends are primarily the domain of large mature firms, which is *inconsistent* with theories of 'information content'[16]. They further found dividend paying firms could be stratified into two tiers, Tier 1 comprising a small number of large, mature, profitable firms dominating US dividends supply, and Tier 2 comprising a large number of firms with modest earnings, contributing little to aggregate supply.

In DeAngelo et al., (2006), firms from 1973-2002 were analysed and demonstrated a monotonic relationship between dividend payouts and the relationship with Retained Earnings (RE) as a percentage of Total Equity (TE). In other words, dividend payouts rise as RE/TE rises – this ratio being an indicator of firm lifecycle or 'maturity'. Similar results arose for RE as a percentage of Total Assets (TA). Conversely, no such relationship existed between TE/TA. The point here is that RE is 'earned capital' (cf. capital raised) and was a key variable vis-à-vis dividend decisions. Indeed, DeAngelo et al., (2006) found dividend payout ratios for firms with equity balances dominated by capital raisings falls to near zero.

Skinner and Soltes (2011) focused on whether a relationship exists between the quality of earnings and dividends. They found dividend-paying firms exhibited more persistent earnings and were less likely to report losses (excluding one-off significant items) – with this relationship remarkably stable over time. Conversely, firms reporting underlying losses were unlikely to pay dividends.[17] Coulton and Ruddock (2011) examined Australian firms in the context of lifecycle theory and found similar results. Dividend paying firms in Australia were dominated by large, profitable listed firms and identified similar relationships between dividends and RE/TA. Conversely, those firms with low RE were more likely to be in the growth and/or capital raising stage, with low or zero dividend policies.

Abraham et al., (2015) found Australian firms using DRPs had higher dividend payout ratios, were larger in size and had lower growth options. Swan (2019) found Australian firms paying franked dividends exhibited less systematic risk than stocks that did not pay franking credits, which is consistent with a maturity cycle.

Yarram and Dollery (2015) considered the quality of earnings in Australia and found dividend paying firms were on average larger, more profitable, characterised by lower growth prospects, had higher levels of free cash flows and lower systematic risk compared to non-dividend paying firms. Future growth as measured by the ratio of market value to book value was also found to have a significant negative influence on the size of dividend payouts. How these theories relate to listed electricity utilities in Australia is examined in Sections 4-6.

### 3.6 Applied dividend policy

To summarise the economics research, there are at least four plausible theories on why firms pay dividends, i). taxation and clientele effects (Miller and Modigliani, 1961; Pettit, 1977), ii). agency costs (Easterbrook,1984; Jensen, 1986), iii). information content (Miller and Rock, 1985; Bhattacharya, 1997) and iv). lifecycle theories (Grullon et al., 2002; DeAngelo et al., 2006). Each explain that payout policy, like investment policy, *does* have first-order value consequences and cannot be reduced to a *packaging exercise* as in MM (DeAngelo and DeAngelo, 2006).

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[16] That is, any demand for signalling should be highest among younger, growth firms with more volatile earnings.
[17] They also found firms that utilised share buybacks had less consistent earnings than dividend-paying firms, but greater earnings consistency than zero-dividend firms. In this sense, they considered dividends are informative with regards to *earnings quality*.

Among the more helpful explanations vis-à-vis the analysis which follows is lifecycle theory. Firms in a mature state will, on average, tend to pay higher dividends than firms in a growth phase because this is in the best interests of shareholders. Indeed as DeAngelo and DeAngelo (2006) and DeAngelo et al.,(2006) explain on dividend policy, if well-established, mature, profitable firms *did not* pay dividends, then i). cash balances would be enormous, ii). long-term debt would be trivial, iii). actual weighted average costs of capital would rise above efficient levels, iv). extreme discretion would be granted to managers, and most importantly, v). untold levels of shareholder wealth would be destroyed along the way.

DeAngelo's (2021) analysis of two of the most prominent firms in modern history revealed the following about dividends:

1. Firms do not set dividend policy in isolation to capital structure policy;

2. Dividends are not used to target an equity balance;

3. Reliable access to funding is *of paramount importance* and in fact forms the central financial policy concern of Boards and Executive Management.

4. Firms do not have a leverage target per se, but a credit rating target. Leverage is an outcome of this constraint[18].

5. In practice, firms will not exhaust a strict pecking order before issuing new equities – on the contrary they are likely to issue new equity capital prior to *exhausting* all debt-raising capacity within the constraints of #4 above because the option to borrow is valuable vis-à-vis #3 above.

## 4. On the dividend policy of ASX-listed utilities in the NEM

Economics research on dividend policy typically commences with a large dataset spanning the listed market over multiple decades, drawing on datasets from Compustat (US) or S&P Capital-IQ (Aust) – thereby comprising thousands of data points. The study of just two firms by DeAngelo (2021)[19] is a notable exception (and in my opinion, one of the more insightful articles in the field). The analysis which follows focuses on just three electricity utilities over the period 2007-2021. Recall the ASX has four listed electricity utilities. Two are regulated utilities and two are merchant – however – of the latter, one has substantial export LNG interests which overwhelm electricity results and has therefore been excluded[20]. The remaining three electricity utilities are:

1. Spark Infrastructure, the holding company of various regulated transmission and distribution network utilities, listed on the ASX in 2005 (ASX:SKI) and de-listed in December 2021 following a takeover event.

2. Ausnet Services, a large regulated network utility comprising transmission and distribution, dominated by electricity but with a gas network as well, also listed on the ASX in 2005 (ASX:AST) and de-listed in February 2022 following a takeover event.

[18] DeAngelo (2021) notes that some instability around achieving the target is to be expected over time, and the key tension that exists is access to reliable funding and using that access. For specific examples on this relating to vertical merchant utilities Australia's NEM, see Tian (2016) and Simshauser (2021a).

[19] Albeit the two firms were also the most significant industrial enterprises of the 20th century.

[20] Origin Energy is also a prominent energy utility although results are skewed by upstream gas interests (viz. LNG exports etc). Consequently, Origin Energy has been excluded in the comparative analysis. I should note including their results amplifies some headline findings (volatility of ordinary dividends) but mutes others (because LNG forward curves did not always coincide with wholesale electricity price curves).

3. AGL Energy, one of Australia's oldest companies having been formed in 1837 and the second company to list on the ASX (ASX:AGL). AGL underwent major structural changes in 2007 after divesting all regulated assets, subsequently becoming one of the three dominant 'gen-tailers' in the NEM (10,000MW of generating capacity, 4.5 million retail customers).

In practical terms, any analysis is bounded by the restructure of AGL in 2007 on the one hand, and regulated utility de-listing events during 2021 on the other. Consequently, the subsequent analysis focuses on comparative 6-monthly earnings data over the period 2007-2021.

A brief financial overview of the three utilities is provided in Table 1. Key segment differences include capital structure, with gearing for regulated utilities being 60-65%, and merchant ~30%. Additionally, regulated utility revenues are approximately 12% of the asset base whereas *gen-tailer* revenues are 1.5x enterprise value. Dividend policies vary, with regulated utility payout ratios averaging ~100% of net profit, and merchant averaging ~60%.

**Table 1: Utility financial statistics ($m)**

| 2021 | Spark Infra. | Ausnet | AGL Energy |
|---|---|---|---|
| ASX Ticker | SKI | AST | AGL |
| De-listed | Nov-21 | Feb-22 | |
| Utility Segments: | Regulated Networks | Regulated Networks | Merchant Gen & Retail |
| Sector | Elec & Gas | Elec & Gas | Elec & Gas |
| Enterprise Value | $10,362 | $17,166 | $7,191 |
| Market Cap. | $5,037 | $9,728 | $3,963 |
| Annual Revenues | $1,404 | $1,925 | $10,942 |
| EBITDA | $798 | $1,165 | $1,666 |
| EBIT | $411 | $691 | $959 |
| NPAT | $163 | $302 | $537 |
| Debt | $5,325 | $7,438 | $3,228 |
| Equity | $2,812 | $3,435 | $5,456 |
| Avg Gearing | 60% | 65% | 28% |
| Avg EBITDA Margin | 62.7% | 59.0% | 14.3% |
| Avg Return on Assets | 7.6% | 6.7% | 9.7% |
| Avg Dividend Payout | 89% | 111% | 62% |

Another difference worth noting, which in large part explains differentials in gearing, is the distribution of EBITDA Margins. Regulated utilities average ~60% with merchant just 14%. More interesting is the comparative volatility of EBITDA results over time, which is illustrated in Fig.1. Regulated utilities trades in a tight range (coefficient of variation= 0.12) while the merchant result (0.34) exhibits three times the level of pre-tax earnings volatility.

**Figure 1: EBITDA distribution (2007-2021)**

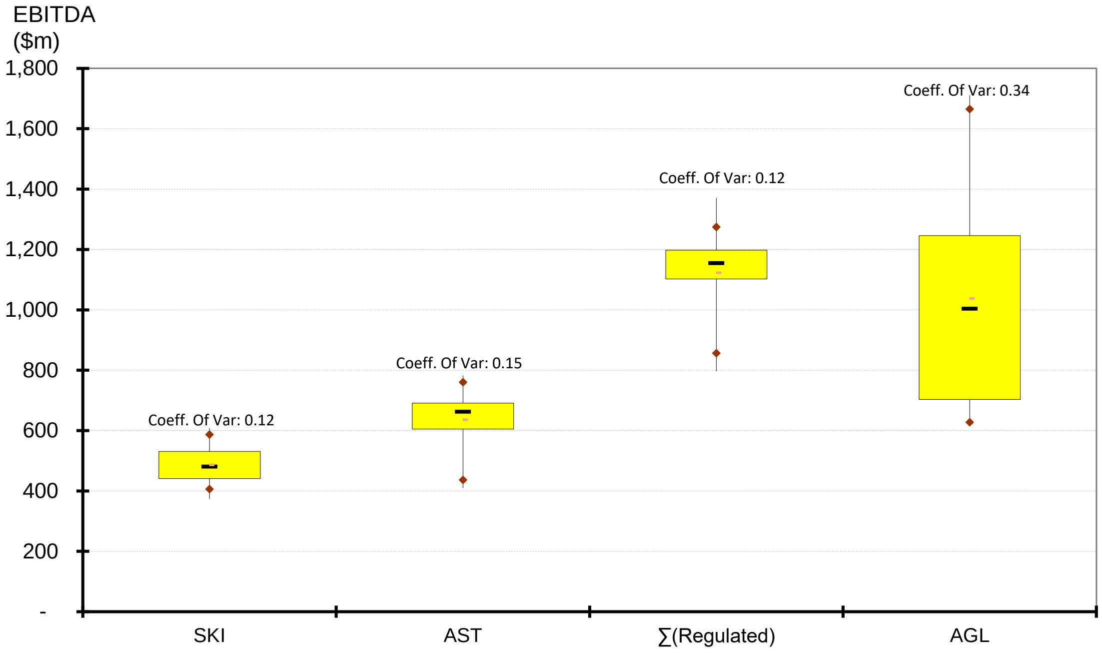



Table 2 provides a summary of dividends and shareholder returns over the analysis period. To summarise, merchant utility dividend payout ratios[21] average ~50-60% of earnings (see also Simshauser and Catt, 2012) whereas regulated utilities aim to distribute all surplus cash and therefore exhibit high payout ratios (~100%). For clarity, dividends of 100+% of accounting earnings is credible where accounting depreciation exceeds capital expenditures (i.e. mature firms). Australian Corporations Law generally limits dividends to profit, but certain cash-heavy entities can (and often are) structured as double-stapled securities (a common structure amongst real estate trusts) which enables ordinary distributions to shareholders to exceed accounting earnings through a combination of dividends and a 'return of capital' (nb. which provides tax offsets, thus exhibiting a form of dividend clientele effect). In the analysis which follows, the packaging of the distributions can be treated as ordinary dividends without any loss of generality.

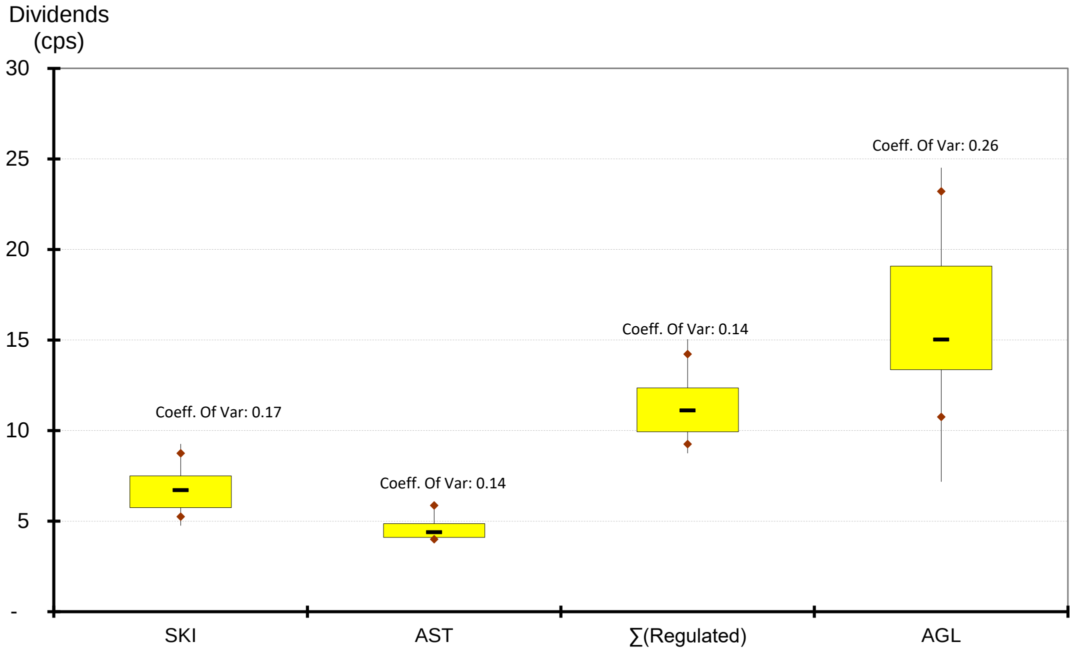
**Table 2: Regulated vs Merchant Dividends and Returns (2007-2021)**

| | SKI | AST | Regulated | AGL |
|---|---|---|---|---|
| Running Dividend Yield | 7.4% | 6.9% | 7.2% | 4.9% |
| Min Dividend Yield | 4.6% | 3.7% | 3.7% | 3.6% |
| Max Dividend Yield | 12.2% | 13.7% | 13.7% | 9.9% |
| Dividend Volatility | 0.17 | 0.14 | 0.15 | 0.26 |
| Stock Price 2007 | 1.95 | 1.16 | 3.11 | 14.33 |
| Stock Price 2021 | 2.73 | 2.58 | 5.31 | 7.18 |
| Total Shareholder Returns | 139% | 237% | 188% | 26% |
| Annualised TSR | 6.1% | 8.8% | 7.5% | 1.4% |
| Abnormal Returns | 46% | 144% | 95% | -68% |
| Annualised Abnormal Returns | 1.3% | 4.0% | 2.7% | -3.4% |

Notice in Tab.2 that the average yield of regulated utilities (7.2%) is materially higher than the merchant utility (4.9%), and also exhibit considerably less volatility (0.14 vs 0.26). This volatility is illustrated in Fig.2. Annualised Total Shareholder Returns (TSR) for regulated utilities equate to 7.5%, outperforming the ASX200 by ~2.7% while merchant utility TSR underperforms the market index by 3.4% pa.

[21] From 2007 through to ~2016 AGL had a 'progressive' dividend policy with dividends edging slightly higher each year. Dividend policy was changed to a 75% of NPAT as the business structure changed.

**Figure 2: Dividend distribution (2007/08-2021)**




## 5. Analysis of dividends: regulated vs. merchant

In aggregate, the three utilities made 87 earnings/dividend announcements over the analysis period 2007-2021. These announcements comprised 23 dividend 'raises', and 17 dividend 'cuts'. The purpose of this section is to analyse information content and market reaction. Recall from Lintner (1956) that Directors select dividend policies unlikely to be reversed within a two-year timeframe. And as Grullon and Michaely (2004) pointed out, one implication of this is that an increase in dividends signals increasing profits and asset returns.

### 5.1 Short run 'abnormal returns'

Market reactions following a dividend change are measured by abnormal returns.[22] Stock prices immediately before- and after- any dividend change during 2007-2021 were annexed into two buckets (raise/cut) and two segments (regulated/merchant). Final closing price on the day prior forms the base, announcement day (d+0) and the two subsequent trading days are then tested. Quantitative results are presented in Tab.3.

**Table 3: Stock price drift (abnormal returns)**

| Dividend Raise | Dividend Chg d | d+0 | d+1 | d+2 |
|---|---|---|---|---|
| Regulated Utilities | 9% | 0% | 1% | 1% |
| AGL Energy / Merchant | 12% | -1% | -1% | -1% |
| | | | | |
| Dividend Cut | Dividend Chg d | | | |
| Regulated Utilities | -14% | 1% | 0% | 0% |
| AGL Energy / Merchant | -26% | -3% | -2% | -2% |

The first point to note is when utilities *raise* dividends, regulated increase by 9% (on average) and merchant by 12% (on average). When a regulated utility announces an increase in dividends, on the day of announcement abnormal returns are, on average, 0%. Stock prices then move +1% over the following two days of trade (i.e. d+1, d+2). Interestingly, market reaction to a dividend raise by merchant is negative abnormal returns, at -1% over the three-days of trade. The economic explanation behind such a result is that forward commodity prices will have increased in the period leading up to dividend announcement (forward markets being visible to all

[22] That is, returns of the $i^{th}$ utility stock price relative to market returns, $m$, such that any abnormal return = $r^i - r^m$.

investors), and investors either over-anticipated the flow-through to dividend increases, or executives have taken the opportunity to 'clean the books' (i.e. write-off lingering expenses) – either way – stock prices moderate on announcement of lower-than-expected dividend increase.

When utilities announce a dividend cut, the regulated segment averages -14% while merchant cuts are significantly larger at -26% (and as an aside, if the LNG/gas-heavy Origin Energy is included in the analysis, this result is further amplified). Section 6 will later shed light on why merchant cuts are higher than regulated.

Short run abnormal returns following a regulated cut to dividends is initially met favourably (+1%) before reverting to zero. For the merchant utility, market reactions reflect *a priori* intuition, abnormal returns falling by -3% on the day of announcement before moderating to -2% over the ensuing trading days. But perhaps more interestingly is earnings in future years following these dividend changes, in Section 5.2.

### 5.2 Information content of dividends: future earnings

Directors select dividend policies unlikely to be reversed within a two-year timeframe. Since Directors hold private information about firm performance and forecasts, logical reasoning dictates dividend increases occur only when higher distributions can be sustained through higher future profits. To test this, changes in dividends were matched with one- and two-year ahead underlying earnings. Results are presented in Tab.4 and reveal a striking set of contrasting outcomes.

When regulated utilities raise dividends, profits fall in years t+1 and t+2 by 4% and 10%, respectively. Conversely, when they cut dividends, profits rebound in years t+1 and t+2 by +7% and +4%, respectively. These results are counterintuitive, however, are entirely consistent with the literature on lifecycle theory (see Grullon et al., 2002; DeAngelo et al., 2006).

Merchant utility results move in the exact opposite direction – more consistent with information content theory. Any dividend raise is followed by flat to modest increases in earnings, while a cut is followed by sharp declines in profits.

**Table 4: Change in Dividends and Underlying Net Profit After Tax (NPAT)**

| Dividend Raise | Dividend Chg t | NPAT t+1 | NPAT t+2 |
|---|---|---|---|
| Regulated Utilities | 9% | -4% | -10% |
| AGL Energy / Merchant | 12% | 0% | 1% |
| | | | |
| **Dividend Cut** | **Dividend Chg t** | **NPAT t+1** | **NPAT t+2** |
| Regulated Utilities | -14% | 7% | 4% |
| AGL Energy / Merchant | -26% | -14% | -42% |
| | | | |

What could explain such results, and why do they conflict? First, regulated utility dividends are likely raised when growth options are moderating, and in turn likely associated with a 'tightening' five-year regulatory cycle. Tighter regulatory cycles are characterised by lower capital expenditure allowances and lower regulated returns. This combination produces (i) higher residual cash available for distributions, and (ii) lower Net Profit After Tax (NPAT), respectively.

Conversely, merchant utilities operate in volatile commodity markets with net incomes influenced heavily by forward prices (as Section 6 reveals). Such conditions elevate forward hedging, and the shape of the electricity forward curve (i.e. contango/backwardation) will lock-in profit results in a symmetrical direction. Put simply, a dividend cut reflects forward hedged positions.

### 5.3 Information content of dividends: return on assets

Equivalent asset returns are presented in Tab.5 and to generalise, they reinforce Section 5.2 earnings results. When regulated utility dividends are raised, return on assets moderate to 6.6% (nb. stock returns rise by 2%) over the following two-year window. With a dividend cut, asset returns rise to 7.3% (nb. stock returns fall by 2%). The year-on-year change following a dividend raise reflects consistent deterioration, while the cut is followed by a rebound in year t+2.

Merchant results are symmetrical. A dividend raise is followed by an improvement in assets returns to 10.7%. Conversely, a dividend cut is followed by a pronounced decline in returns (and stock prices, as Section 5.6 reveals).

**Table 5: Change in Dividend and Return on Assets**

| Dividend Raise | Dividend Chg t | RoA t+1 | RoA t+2 |
|---|---|---|---|
| Regulated Utilities | 9% | 6.8% | 6.6% |
| YoY Chg | | -0.3% | -0.2% |
| | | | |
| AGL Energy / Merchant | 12% | 10.6% | 10.7% |
| YoY Chg | | 0.4% | 0.2% |
| | | | |
| **Dividend Cut** | **Dividend Chg t** | **RoA t+1** | **RoA t+2** |
| Regulated Utilities | -14% | 7.1% | 7.3% |
| YoY Chg | | -0.3% | 0.2% |
| | | | |
| AGL Energy / Merchant | -26% | 8.9% | 6.5% |
| YoY Chg | | -1.1% | -2.4% |
| | | | |

### 5.4 Information content of dividends: gearing

Before examining debt levels (i.e. gearing), some background is appropriate. Both utility segments aim to sustain investment grade (BBB) credit ratings. Indeed, regulatory determinations are consistent with BBB metrics. In practical terms, for regulated utilities this means maintaining gearing ratios (i.e. debt/debt+equity) of c.60-65% over the cycle. Our two regulated utilities averaged ~64% over 2007-2021. Conversely, for merchant utilities to maintain a BBB credit rating gearing ratios will typically average 30-35% (Simshauser, 2021) and the merchant utility averaged 28%.

Tab.6 analyses the change to gearing as dividends change. It is evidently one of the few metrics that exhibit directional consistency between the utility segments. To summarise, when dividends are raised gearing experiences an upward drift – sending the regulated utility closer to its long run average of 64% and the merchant utility closer to its long run average of 28%. Conversely, a dividend cut is consistent with a de-leveraging cycle, with the regulated utilities trending towards 60% and the merchant utility below 20%.

**Table 6: Changes in Dividend and Gearing**

| Dividend Raise | | Gearing t+1 | Gearing t+2 |
|---|---|---|---|
| Regulated Utilities | 9% | 62.2% | 64.0% |
| YoY Chg | | 0.5% | 1.8% |
| | | | |
| Merchant Utilities | 12% | 26.4% | 27.7% |
| YoY Chg | | -0.5% | 1.3% |
| | | | |
| **Dividend Cut** | **Dividend Chg t** | **Gearing t+1** | **Gearing t+2** |
| Regulated Utilities | -14% | 61.8% | 60.6% |
| YoY Chg | | -0.4% | -1.2% |
| | | | |
| Merchant Utilities | -26% | 29.3% | 18.4% |
| YoY Chg | | 0.4% | -10.9% |

### 5.5 Information content of dividends: RE/TE

Recall from Section 3 that as Retained Earnings (RE) becomes a larger portion of Total Equity (TE), dividends are likely to be increased and vice versa. Tab.7 provides important insights vis-à-vis the stability of regulated utility earnings and the subsequent takeover analysis discussed in Section 6. Notice the RE/TE ratio is relatively sticky under all conditions, at ~30.3% +/- 1%. In contrast, the merchant result exhibits distinct trends – dividends are cut as RE/TE trends to 0% and are raised as RE/TE exceeds 20%

**Table 7: Changes in Dividend and the RE/TE Ratio**

| Dividend Cut | Dividend Chg t | RE/TE t+1 | RE/TE t+2 |
|---|---|---|---|
| Regulated Utilities | -14% | 31.3% | 30.6% |
| YoY Chg | | 4.7% | 3.9% |
| | | | |
| AGL Energy / Merchant | -26% | 4.3% | -0.9% |
| YoY Chg | | -9.5% | -14.7% |
| | | | |
| **Dividend Raise** | | **RE/TE t+1** | **RE/TE t+2** |
| Regulated Utilities | 9% | 29.3% | 30.2% |
| YoY Chg | | 1.8% | 2.8% |
| | | | |
| AGL Energy / Merchant | 12% | 26.2% | 24.8% |
| YoY Chg | | 1.8% | 0.4% |
| | | | |

### 5.6 Long run stock price drift

Section 5.1 examined short-run abnormal returns. How do capital markets respond over longer timeframes following a change in dividends? Longer-run stock price drift is illustrated in Tab.8. There are two results worth noting here.

1. The change in regulated utilities by year t+2 is largely symmetrical with the movement in dividends. As Grullon and Michaely (2004) explain, in economics only one variable can explain increased dividends, falling profits, falling asset returns and a rising share price – a lower ‘investor’ WACC (cf. regulated WACC) – and this is entirely consistent with lifecycle theory of dividend policy.

2. For merchant, there is no systematic pattern although what can be said is dividend cuts are met with an amplified symmetrical response – which requires further clarification in Section 6.

**Table 8: Long run share price drift following dividend changes[23]**

| Dividend Raise | Dividend Chg t | t+0 | t+1 | t+2 |
|---|---|---|---|---|
| Regulated Utilities | 9% | 0% | 7% | 2% |
| AGL Energy / Merchant | 12% | -1% | 5% | -2% |
| | | | | |
| Dividend Cut | Dividend Chg t | t+0 | t+1 | t+2 |
| Regulated Utilities | -14% | 1% | 3% | -2% |
| AGL Energy / Merchant | -26% | -3% | -39% | -53% |

## 6. Utility dividends and company valuations

Section 5 revealed regulated utilities exhibit dividend policy consistent with *lifecycle theory*, while merchant was consistent with an *information content*. Two primary matters require further explanation, i). why the difference in segment outcomes, and ii). why are regulated utility valuations at record highs while merchant valuations are at a 15-year nadirs?[24]

It is helpful to start with a visual of dividend flows (Fig.3). Note SKI and AST cut dividends following the global financial crisis but exhibit *relative stability* thereafter. AGL maintains stable dividends throughout the financial crisis to 2016, followed by a runup to 2019, with equally sharp cuts thereafter.

**Figure 3: Dividends declared (cents per share)**

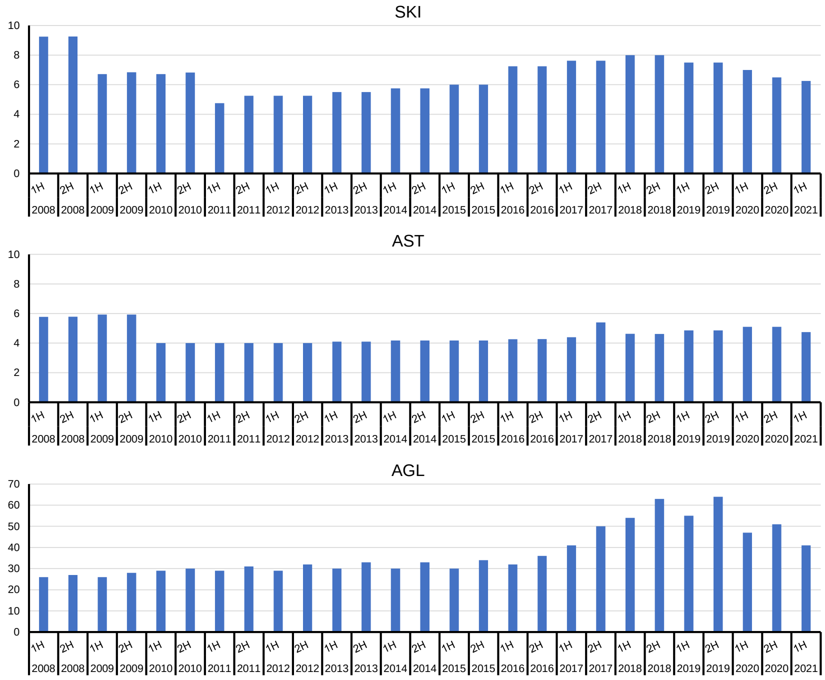
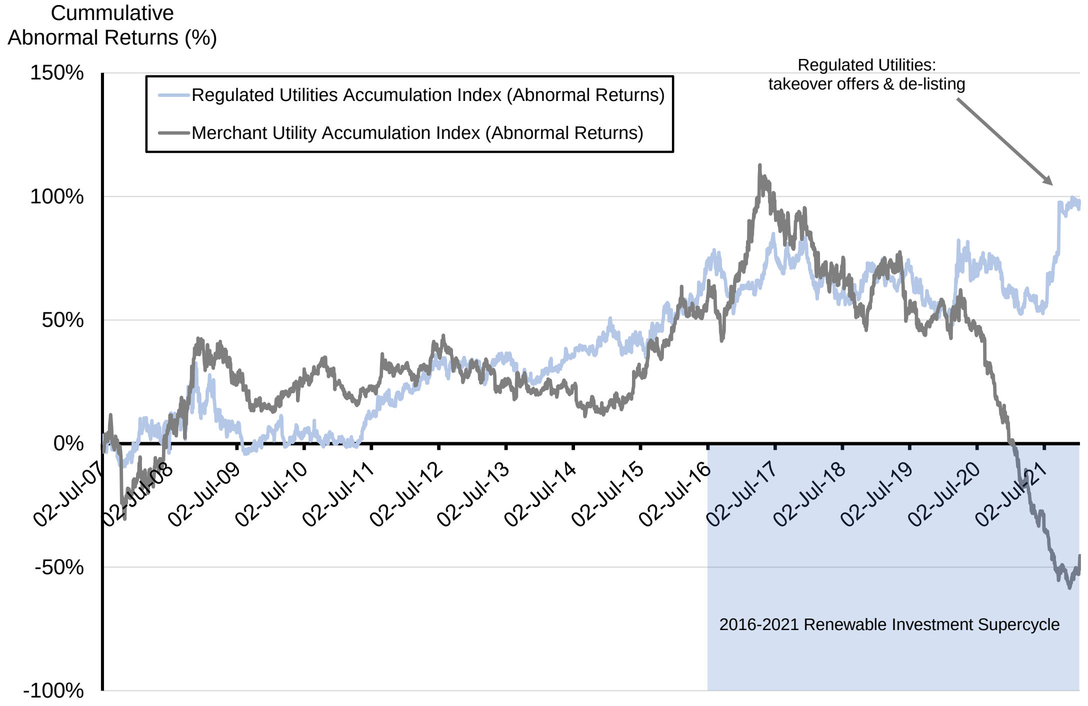



Fig.4 contrasts segment cumulative abnormal returns. The regulated stock price accumulation index consistently outperforms the broader market from the 2011/12 financial year onwards. Merchant outperforms from the start of the global financial crisis through to a peak in 2017, then declines over the ‘renewable investment supercycle’ period, with a notable (and rapid) deceleration from 2020. Changes in segment abnormal returns are being driven by very different forces as Sections 6.1 - 6.3 explain.

[23] The share price drift in Tab.8 presents the absolute change in share prices. When these are adjusted to a measure of abnormal returns relative to the ASX200, merchant results moderate and regulated utilities change sign, viz. 0% abnormal return following a dividend raise, and +7% change following a dividend cut (by year t+2).
[24] Both AGL and Origin Energy are at 15-20 year stock price lows.

**Figure 4: Regulated and Merchant Utilities - Abnormal Returns (2007/08-2021)**




### 6.1 Regulated utility dividends, market valuations and falling rates

When interest rates fall, holding all else constant, WACCs fall. And again, *ceteris paribus*, a falling WACC produces higher firm valuations.[25] But for a regulated utility, the assumption of *ceteris paribus* is not feasible because falling rates are automatically accompanied by a lower *regulated WACC*. Consequently, a lower regulated WACC automatically drives lower revenues, lower profits and lower asset returns for regulated entities.

To further explain this, for any regulated utility $i$, Annual Revenue ($AR_t^i$) in year $t$ is derived through a building block approach comprising allowances for Operating Expenses $\theta_t^i$, Return *of* Capital $\delta_t^i$, Taxation $\tau_t^i$ and Return *on* Capital $r_t^i$.

$$AR_t^i = \sum(\theta_t^i, \delta_t^i, \tau_t^i, r_t^i, \vartheta_t^i) \mid \delta_t^i = \left[\left(RAB_t^i / l_t^i\right) - \left(RAB_t^i \cdot \pi_t\right)\right] \wedge r_t^i = \left(RAB_t^i\right) \cdot WACC^u \quad (2)$$

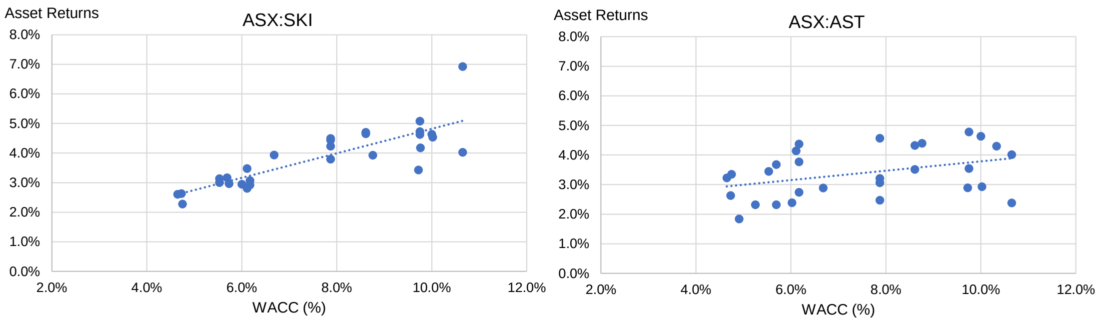
For clarity, $\delta_t^i$ is also known as Regulatory Depreciation with $l_t^i$ being the remaining useful life of Assets and $\pi_t$ being inflation. In practice $AR_t^i$ in Eq.(2) is dominated by values for Regulatory Asset Base $RAB_t^i$ and the regulated WACC as applies to all regulated utilities, $WACC^u$.

To summarise, a lower interest rate environment and correspondingly lower WACC allowance will produce lower revenues, lower profits and lower asset returns for regulated utilities. Consequently, all else equal, stockholders will be left *otherwise indifferent* to lower interest rates[26]. Fig.5 demonstrates this by plotting asset returns (half yearly data, 2007-2021) for the two regulated utilities against prevailing WACC decisions at reporting date. Note as WACC falls, asset returns fall per Eq.(2).

[25] That is, the constant growth free cash flow (FCF) valuation model = $(FCF \cdot (1+g))/(WACC - g) - D$, where g is constant growth and D is the value of debt.

[26] Provided the regulated utility's debt portfolio follows the regulator's benchmark debt portfolio, this result should hold.

**Figure 5: Return on Assets vs Regulated WACC**




Prima facie, the logic underpinning Eq.(2) and the data in Fig.5 otherwise suggests stock prices of regulated utilities would fall, or at best, drift sideways. Yet we know stock prices surged (Tab.7, Fig.2-3). What could explain such counterintuitive results?

The following linear regression model attempts to capture the historic dynamics associated with Australian regulated utility stock prices $s_t$:

$$s_t = \beta_0 + \beta_1 Dividend_t + \beta_2 WACC_t + \varepsilon_t, \quad (3)$$

where $Dividend_t$ is expressed in cents per share and $WACC_t$ is the regulator's most recent decision (nb. for any utility, thus setting forward expectations) at each dividend announcement date. Note that by incorporating $WACC_t$, estimates of equity Betas for regulated utilities are impounded along with 'BBB' rated corporate bonds and 10-year Commonwealth Government Securities (proxy for risk free rate $Rf$) through the Capital Asset Pricing Model derivation.

The intuition behind Eq.(3) is regulated utility stock prices are driven by changes in imputed returns of alternate low risk assets. Put simply, given the *comparative reliability and stability* of the NEM's regulatory framework, and by implication regulated utility dividends, when bonds become less profitable, regulated utility stock prices are bid up. Tab.9 summarises model variables with results presented in Tab.10.

**Table 9: Summary of model variables**

| Variable | **SKI Obs.** | Mean | Stdev | Min | Max |
|---|---|---|---|---|---|
| Dividend | 29 | 6.68 | 1.14 | 4.75 | 9.26 |
| WACC | 29 | 7.6% | 2.0% | 4.7% | 10.7% |
| Bond-Rf | 29 | 1.8% | 1.0% | 0.5% | 5.1% |
| | | | | | |
| | **AST Obs.** | | | | |
| Dividend | 29 | 4.62 | 0.63 | 4.00 | 5.93 |
| WACC | 29 | 7.5% | 2.0% | 4.7% | 10.7% |
| Bond-Rf | 29 | 1.9% | 1.5% | 0.3% | 13.2% |

**Table 10: Model results for SKI & AST**

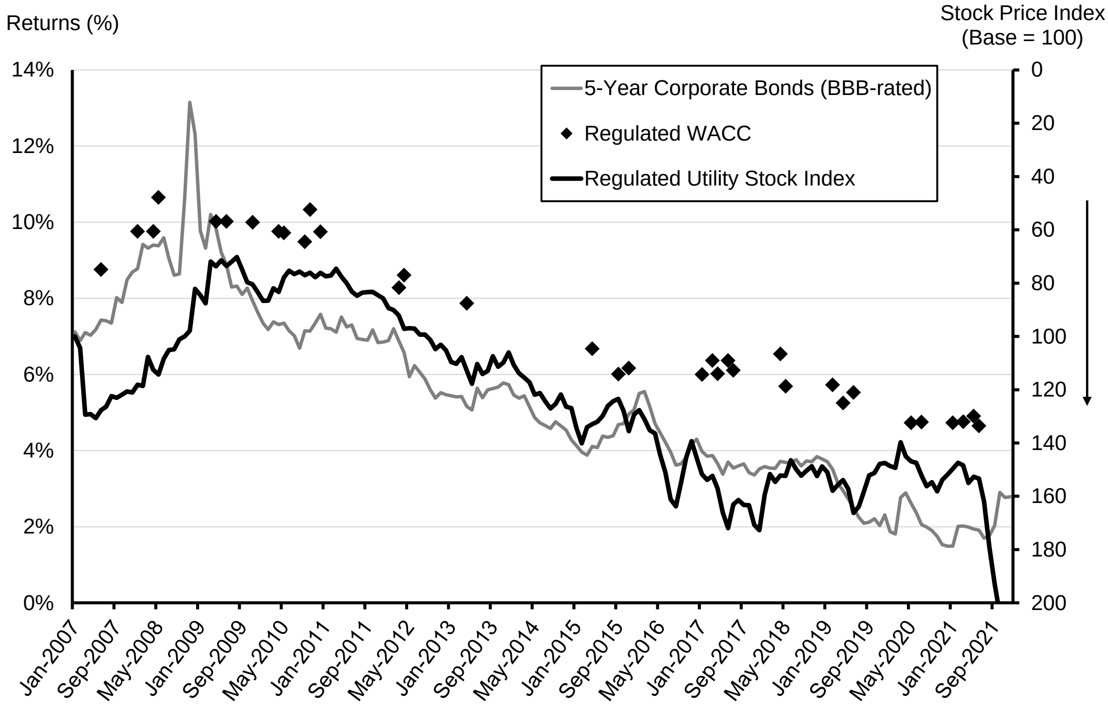
| | SKI | SKI | SKI | AST | AST | AST |
|---|---|---|---|---|---|---|
| Const. | 0.544 | 3.423 | 2.439 | 0.786 | 2.876 | 2.284 |
| | (0.46) | (0.185) | (0.306) | (0.598) | (0.131) | (0.26) |
| Dividend | 0.202*** | | 0.128*** | 0.140 | | 0.127** |
| | (0.068) | | (0.034) | (0.128) | | (0.049) |
| WACC | | -20.064*** | -18.344*** | | -19.319*** | -19.236*** |
| | | (0.128) | (1.992) | | (1.696) | (1.545) |
| R-sq. | 0.25 | 0.73 | 0.82 | 0.04 | 0.83 | 0.86 |
| Adj. R-sq | 0.22 | 0.72 | 0.81 | 0.01 | 0.82 | 0.85 |
| N | 29 | | | | | |
| Std Errors in parentheses. | | | DW=1.83 | | | DW=1.97 |

*, **, *** indicates significance at the 90%, 95% and 99% level, respectively.

Tab.10 shows a significant negative relationship exists (***) between half-yearly snapshots of the regulators prevailing WACC decisions, and stock prices of SKI and AST despite the positive relationship that exists between reported asset returns and WACC (Fig.5).

Fig.6 illustrates this dynamic over the period 2007-2021. In total, the regulator announced 33 separate WACC decisions (i.e. covering *all* regulated utilities) which are represented by the diamond markers (LHS axis). 5-year BBB corporate bond yields are represented by the light grey line series (LHS axis) while a composite index of SKI and AST stock prices are depicted by the black line series (RHS axis, and note ‘reverse’ y-axis). To summarise, despite falling regulated WACCs and asset returns, regulated utility company valuations increased. The most likely explanation for this occurring is low risk investors (i.e. bond investors) searching for higher yields as rates fell to zero. Regulated utilities, rightly or wrongly, became a *bond proxy*.

**Figure 6: Regulated WACC, Bonds and Stock Prices**

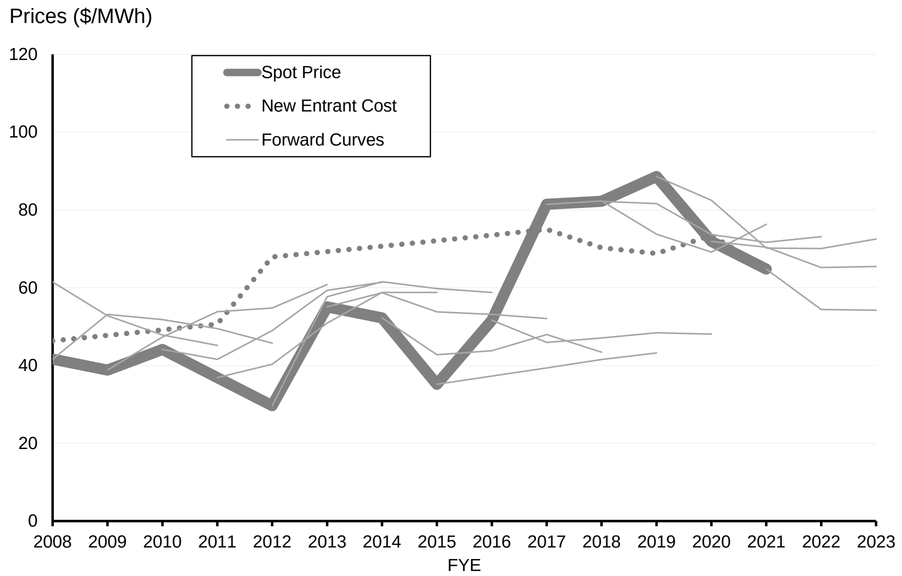



## 6.2 Merchant utility valuation

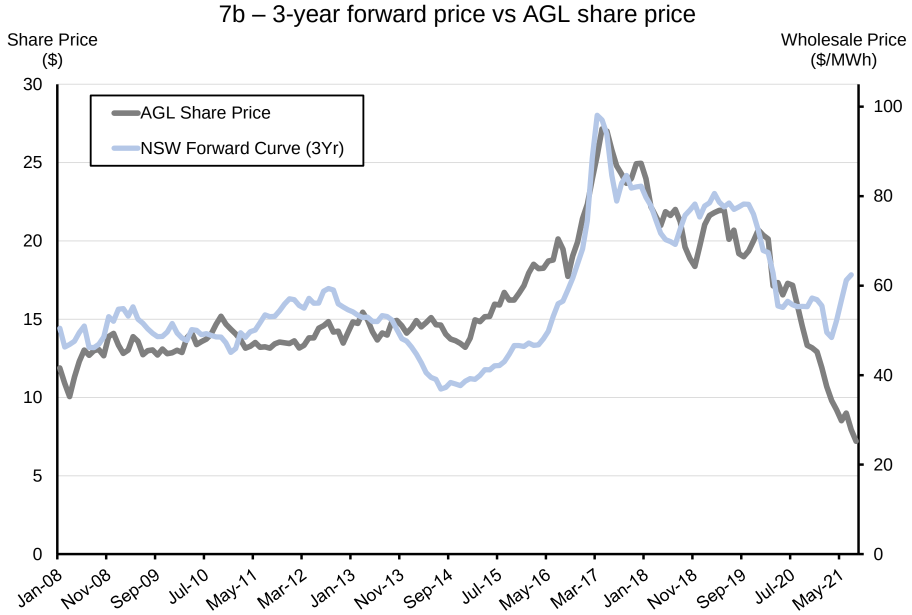
Recall merchant utility financial metrics persistently moved in a direction consistent with an information content theory of dividends. One element requiring further explanation was the profound drop in share price following dividend cuts. Unlike regulated utilities, merchant utility share prices have a tight relationship with movements in forward commodity markets – the reasons for which are axiomatic. Figure 7 illustrates this relationship. Fig.7a presents spot and forward wholesale electricity prices (annual resolution) while 7b extracts the forward prices into a composite 3-year-ahead continuous result in nominal dollars (RHS axis, daily resolution) plotted against the AGL stock price (LHS axis, daily resolution). The correlation between the two data series is +0.79.

**Figure 7: Merchant Utility Valuation**

7a – NSW spot and forward prices (2008-2023)




7b – 3-year forward price vs AGL share price




While professional stock analysts have long made the link between wholesale prices for electricity and the share price of AGL, a structural break is evident from ~2019/20. Analysing the full details would make for a research article in itself. However to provide a brief overview, retail prices have been the subject of political interference which has adversely impacted retail margins, and, AGL is 'long' baseload coal and $CO_2$ emissions in an environment of climate change policy tightening. The distinct change in investor risk appetite which logically follows has been amplified by severe bushfires in New South Wales (2019/20) and Australia's (belated 2021) commitment to net zero emissions by 2050, which occurred just prior to CoP26 and a looming Commonwealth election.

These policy events coincide with the start of the structural break between forward prices and the stock price. Furthermore, the 2016-2021 renewable investment supercycle saw more than $26bn in new entrant plant committed by various AGL rivals and it was the 2019/20 financial year that wholesale electricity prices began to moderate (see Simshauser and Gilmore, 2022). Compounding matters, falling renewable technology costs and falling market WACCs meant benchmark entry costs were also falling. If entry costs are falling due to technology costs and lower costs of capital, incumbent plant returns (including from AGL's 10,000MW generation fleet) will also fall placing pressure on merchant utility valuations.

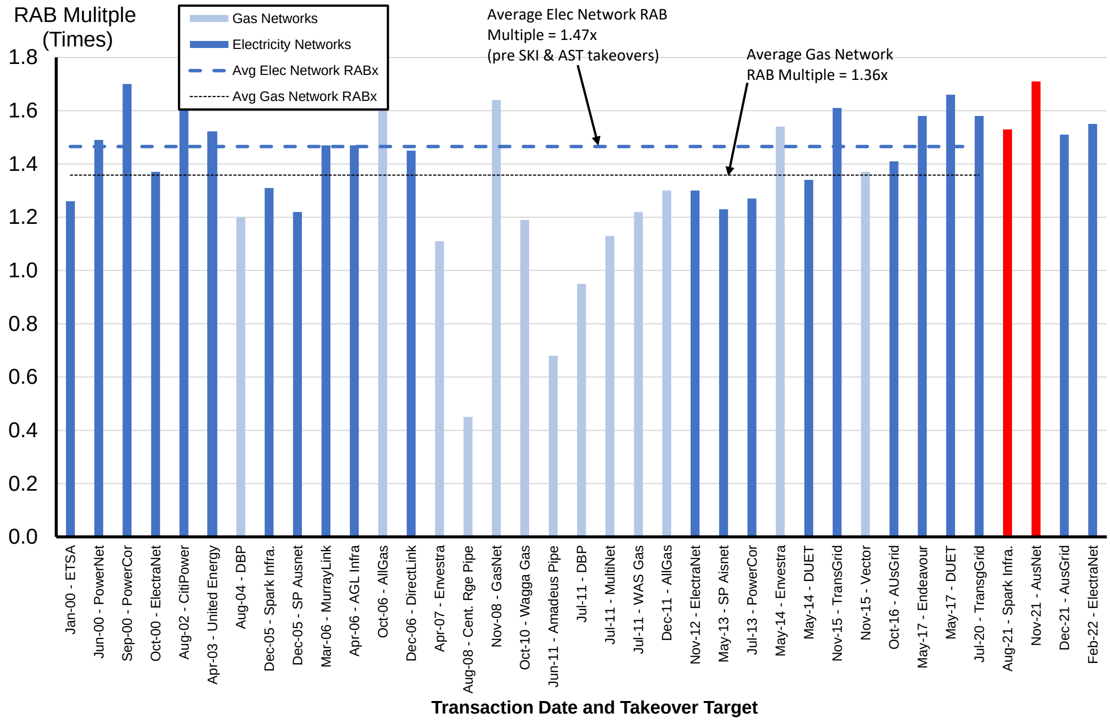
### 6.3 Regulated utility takeovers: drivers and metrics

Why was it that both regulated utilities were takeover subjects while merchant utility valuations were at record lows? Section 6.1 explained the relative stability of dividends and the low interest rate environment over the past 10 years has favoured the regulated segment. Conversely, the rapidly changing plant stock vis-à-vis renewable investments is adversely impacting current and future profits of merchant plant.

The same renewable investment supercycle damaging merchant utility plant valuations presents an opportunity for regulated utilities through renewable connections and network reinforcements (i.e. growth). Combined with stable dividends, the prospect of re-emerging network growth may explain the sudden interest and associated M&A premiums, which are outlined Fig.8 and in Tab.11.

Between 2000-2021 there have been a total of 37 regulated energy utility Merger & Acquisition (M&A) events in Australia with a cumulative transaction value of $97.9 billion (real 2022$). One metric constantly monitored are transaction 'RAB Multiples' – i.e acquisition price relative to the Regulatory Asset Base from which regulated revenues are determined. These 37 transactions are illustrated in Fig.8. The dark blue bars are electricity networks, light blue are gas networks, red bars represent SKI and AST takeover events, and the horizontal line series depict average RAB Multiples for electricity and gas, respectively.

**Figure 8: Regulated energy utility transaction metrics in Australia (2000-2022)**



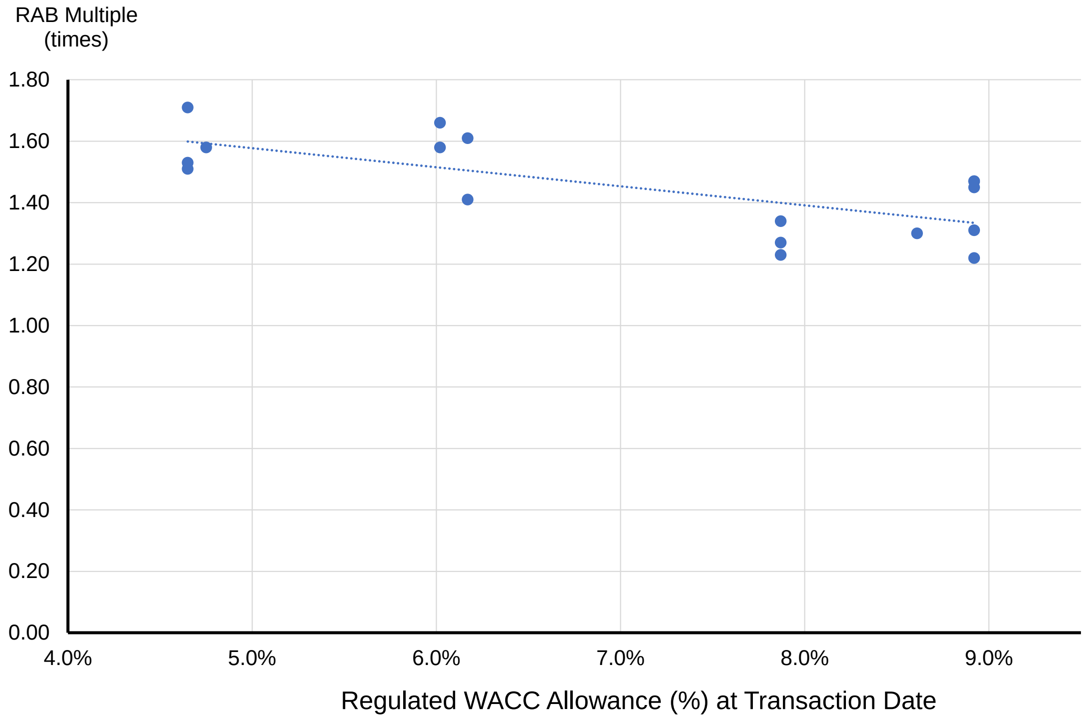

The historic average 'RAB multiple' for electricity networks is 1.47x (value-weighted basis). SKI's M&A multiple was *1.53x* and AST's was *1.71x*. Tab.11 sets out a statistical summary of the two M&A events and highlights the 30-day Volume Weighted Average Price (VWAP) and associated market capitalisations of the two utilities prior to offers being announced, market capitalisation post-offer and the M&A premiums paid. Note the SKI premium is 28%, and 32% for AST (i.e. reflecting the investment bankers rule-of-thumb takeover premium of 30%).

**Table 11: Statistical overview of the regulated network M&A events**

| Analysis of M&A Events | SKI | AST |
|---|---|---|
| M&A Offer Date (initial) | 15-Jul-21 | 21-Sep-21 |
| De-listing Date | 29-Nov-21 | 04-Feb-22 |
| Shares on Offer (millions) | 1,755 | 3,830 |
| 30 day VWAP *Pre Offer* ($) | 2.23 | 1.97 |
| Market Cap Pre Offer ($m) | 3,920 | 7,532 |
| Debt on Issue ($m) | 5,325 | 7,438 |
| Enterprise Value ($m) | 9,245 | 14,969 |
| Closing Share Price ($) | 2.87 | 2.59 |
| Market Cap Post Offer ($m) | 5,037 | 9,920 |
| M&A Premium ($m) | 1,116 | 2,388 |
| M&A Premium (%) | 28% | 32% |
| RAB Multiple (Times) | 1.53 | 1.71 |
| Historic Avg RAB Multiple (Times) | 1.47 | 1.47 |
| RAB Multiple 'Premium' (Times) | 0.06 | 0.24 |
| RAB Premium ($) | 423 | 2,834 |

Imputed RAB premiums of $423m and $2,834m given 1.53x and 1.71x multiples (vs. 1.47x historic average) appear high. There is, as Fig.9 demonstrates, a relationship between RAB Multiples and the regulated WACC. Furthermore, Busuttil et al., (2021) highlight, equivalent transaction metrics in the US are currently averaging ~1.76x.

**Figure 9: RAB Multiple vs Regulated WACC**




## 7. Policy implications

Australia's regulated utility de-listing events mark the end of our ability to observe continual-market valuations. There is no policy problem to solve per se, but it is nonetheless an unfortunate development for Australian policymakers because de-listings also mark the end of our ability to observe 'real' investor reactions to regulatory change. What can we deduce from 15 years of history? For policymakers, evidently, capital markets valued the stability and predictability associated with the NEM's regulatory framework, including the regulatory determinations made in a falling rate environment.

Such an observation is *not immediately obvious* when examining regulatory submissions and announcements to capital markets:

- On regulatory submissions, private owners of NEM regulated utilities (Network Shareholder Group[27]) submitted a detailed document to the Australian Energy Regulator in 2021 highlighting a lack of invest-ability given the prevailing WACC allowance. Less than two months later, $23 billion in M&As were executed as outlined in Tab.11, which tends to suggest otherwise.

- On announcements, a quick search on the terms "Spark, AER" on the *Australian Financial Review* website reveals 43 articles in Australia's top financial newspaper, and on at least 12 occasions, management raise concerns vis-à-vis regulatory decisions. Real investor reactions were mixed. On four occasions, there was no change in share price, on two occasions prices rallied (+1.6%) and on six occasions prices decreased (-1.4%) with an overall net result of -0.5%. On balance, this presents as noise.

Enduring regulated utility valuations (Fig.6, Tab.11) suggest the regulatory framework is credible – one in which investors have confidence – at least in a low inflationary,

[27] Submission to the AER on 1 September 2021. Available at https://www.aer.gov.au/system/files/NSG%20-%20Submission%20-%20Overall%20rate%20of%20return%2C%20Equity%20and%20Debt%20-%203%20September%202021.pdf. Accessed January 2022.

falling interest rate environment. Whether such conditions hold as inflationary pressures take hold, interest rates rise and the so-called 'energy transition' accelerates demanding sizeable new capital commitments[28], is of course an open question.

## 8. Concluding remarks

Following the 1990s reform era, two distinct lines of business emerged in Australia's electricity supply industry, viz. regulated and merchant utilities – industrial reorganisation was driven by government restructuring and capital markets in two distinct phases. Given the NEM's regulatory framework, regulated utilities exhibited *relative stability* in dividends over time. In a declining interest rate environment, this stability led to rising valuations. Dividend increases were met with moderating profits and asset returns (and vice-versa), and ironically, positive stock price drift. As Grullon & Michaely (2004) explain, only lower (investor) WACCs can explain such a combination of outcomes, all of which is consistent with lifecycle theory of dividends. The tightening of Australian climate change policy and the prospect of a return to network 'growth capex' through renewable connections has culminated in a sudden surge in valuations and takeover events at 1.53-1.71x RAB. The irony here is that the explanation of soaring valuations and M&A premiums (i.e. return to growth) collides with the explanation of regulated utility dividends and earnings performance (i.e. lifecycle theory). Perhaps 2022 marks the start of a transitioning point for regulated utility dividend policy.

As regulated valuations surged, merchant fortunes deteriorated and most likely for the same reason – the influx of renewables is designed to squeeze out legacy fossil plants. Unlike the lifecycle characteristics of regulated utility dividends, merchant outcomes were consistent with information content theory, viz. any change in dividends was reflected in forward earnings data and followed the very visible trend of forward electricity price curves.

For dividend policy, it would be difficult to originate a theory based on the data presented because of limitations vis-à-vis sample size. But result alignment with existing theory provides useful insights. The falling interest rate environment has been favourable for shareholders of Australia's listed regulated utilities. Unfortunately, with both regulated utilities now de-listed we will be unable to observe their real-time fortunes in a rising rate environment with an accelerating *'energy transition'* – the conditions which now confront the sector.

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[28] One critical issue which I am aware of is the impact of large marginal investments on the credit rating of network utilities given the revenue structure in Eq.(2). In New Zealand, the approach was modified with RAB indexation on large marginal investments removed.

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