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VALUING an SOE's EQUITY

Valuing a new security is always a difficult business. Historically, new firms' shares have been initially sold for far less than the price they subsequently trade at, as evidenced by the high profits accruing to participants in initial purchase offerings. While this first-day return is good news for the firm's initial shareholders, it's bad news for the firm because that money could have been accumulated as capital from their share sale. Toby Daglish notes that a government planning to sell a state-owned enterprise (SOE) is in a similar situation: pitch the price too low, and taxpayers will miss out on part of the windfall.

Comparing an SOE to a new company isn't entirely fair, however. First of all, the SOE has been around for a lot longer than a new firm, so more accounting information is available. Secondly, a new company may derive much of its value from potential future expansion – which is a tricky thing to value. And thirdly, the SOE may have debt.

Why is debt important? It serves two useful purposes. First, since a firm which issues debt has to convince the general public to be willing to lend it money, debt forces transparency on the SOE. This is because failing to produce readily interpretable annual reports will scare off would-be lenders. The second useful purpose for debt is that once we can see what the debt is worth, we can begin to guess what the value of the firm's assets are.

The value of debt

If a borrower takes on little debt relative to their assets, lenders can be sure that the debt will be repaid. So the debt will have a high credit rating, paying relatively little interest. By contrast, if a borrower has very little 'breathing room', lenders are less confident that they'll be repaid and so will give the borrower a lower credit rating – which requires more interest to make the loan.

By looking at the market's valuation of an SOE's debt, we can try to evaluate how much of a buffer they have over and above their debt, and hence find the value of the firm's assets. Once we know the firm's assets (because we know the value of the firm's debt), we can back out the value of the firm's equity. And once we know the value of the firm's equity, we'll be able to know how much the firm's shares should be worth.

As an example, consider Meridian Energy and Contact Energy – one an SOE and the other a private-sector firm. Table 1 on the following page contains some information gleaned from Meridian and Contact's annual reports, the NZDX (New Zealand's debt market), and the Datastream financial database.

We can see that Meridian owes about $1600 million. Of this, $200 million is represented by two bond issues: one matures in 2015 and the other in 2017. Contact, by contrast, owes about $1200 million, with $650 million of this being represented by two bond issues.

Figure 1 (on page three) plots, as of 6 January 2012, zero coupon yields for New Zealand Treasury securities, Meridian bonds and Contact bonds. We can use this information about

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Table 1: Meridian and Contact overall debt and information on two traded bond issues

	Meridian	Contact
Overall debt (book value)	$1623.02m	$1194.77m
16 March 2015 bonds, 7.15% coupon:		
Price (per $100)	$110.069	–
Face value	$125m	–
16 March 2017 bonds, 7.55% coupon:		
Price (per $100)	$112.931	–
Face value	$75m	–
15 May 2014 bonds, 8.00% coupon:		
Price (per $100)	–	$106.7
Face value:	–	$550m
16 March 2017 bonds, 7.855% coupon:		
Price (per $100)	–	$109.51
Face value	–	$100m

Table 2: A decrease in the portion of a firm's spread explained by credit risk leads to an increase in the implied value of its equity

Meridian (volatility=2.7%)		**Contact** (volatility=2.1%)	
Credit risk	Share price	Credit risk	Share price
34.5%	$1.89	24.5%	$1.95
34%	$2.39	24%	$2.58
33.5%	$3.15	23.5%	$3.61
33%	$4.38	23%	$5.46
32.5%	$6.54	22.5%	$9.38
32%	$10.94	22%	$20.17
31.5%	$22.02	21.5%	$69.78

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Meridian's and Contact's bond prices to attempt to back out a value for Meridian's and Contact's equity. Since Contact is a private company, we can use its actual share prices to guide us as to how well this approach works.

To illustrate the process, we use a very simple model: the Merton model of a firm's structure. This assumes that all of the firm's debt matures at the same time and pays no coupons. Clearly, this is an oversimplification. A more complex model which accounts for earlier default could yield more accurate results.

We assume that Meridian's debt consists of zero coupon bonds maturing in 3.445 years (the combined *duration* of Meridian's two bond issues – or when they pay off, on average) while Contact has a shorter maturity of 2.546 years.

Introducing volatility and liquidity

We need two further inputs in order to price Meridian's and Contact's debt.

The first is an idea of how volatile the firm's bonds are. If they have volatile returns, this would suggest that (all other things being equal) the firm's assets would be more volatile. More volatile assets would mean that bondholders would require the firm to have a larger portion of equity to achieve the same credit rating. From our point of view, higher volatility must mean the firm has a higher value of equity, holding the firm's credit spread constant. From examining Meridian's and Contact's yield curves, we can calculate a 2.7% volatility for the value of Meridian's tradable debt (again assuming that it all matures at once) and 2.1% for Contact's.

As well as being concerned about whether a borrower defaults or not, lenders may also be concerned about how easy it is to sell the borrower's debt if they change their mind about their purchase. So the second input is a measure of liquidity.

A small and closely-held bond issue may not be as attractive to investors, because they'll be unable to get out early. To reflect this, such an issue will have a lower price – which means that investors will get a higher return for their investment. If this effect is large for Meridian, we might believe that their bonds' prices are partially a function of liquidity as well as credit risk.

We can explore the effect of this liquidity by using a fraction of the bonds' observed spread in our calculations, so that Meridian and Contact's bonds have a higher price (which they might have if investors did not care about liquidity). As we increase the role of illiquidity for a given total spread, credit risk's role decreases. All other things being equal, this should imply a higher asset value relative to debt, and hence a higher share price.

Table 2 presents some possible scenarios for volatility and portion of spread which is explained by credit risk (as opposed to liquidity), for both Meridian and Contact. Contact's actual share price is $5.24. Macquarie Equities Research has valued Meridian's shares as having value of $4.08.[1] We can see that both of these valuations are quite conceivable. It is interesting that considerably different divisions of the two companies' bonds' spreads into credit risk and liquidity risk are necessary to achieve these valuations. The data suggest that about one-third of Meridian's credit spread could be due to credit risk; for Contact the figure is 23%. This suggests that, in both cases,

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Changes afoot at ISCR

Anton Nannestad

Rob Cameron

Toby Daglish

ISCR's deputy chair, Anton Nannestad, pays tribute to outgoing chair Rob Cameron and says that the principles Rob espoused will continue to inform ISCR and guide its recently expanded research capability.

EDITORIAL

As we roll over the calendar into the new year of 2012 (the Year of the Dragon for our Asian colleagues), so we are rolling through some changes at ISCR. At its last meeting of 2011, the board received with regret the resignation of chair Rob Cameron. Appointed in 2008, Rob has been a passionate advocate of the need for independent research applying analytical rigour and high levels of scholarship in order to inform companies' decisions, government policy, and the implementation of regulations. ISCR's board, staff, members and associates would like to thank Rob for his service and commitment to the organisation, and assure him (and all our other stakeholders) that the principles he espoused will be our guiding values as we work through the process of appointing a new chair.

These principles have also played an important role in shaping changes in the leadership team carrying out the research, communication and education activities that comprise ISCR's daily work. In October, we welcomed Dr Toby Daglish as Research Director, to work alongside General Manager Bronwyn Howell. The appointment of a dedicated research director substantially increases ISCR's research capability, underlining the importance that the members place on research, scholarship and analytical rigour as the foundation of all of our activities. Toby has a PhD in Finance from the University of Toronto, and was most recently a senior lecturer in the School of Economics and Finance at Victoria University of Wellington. He has been an ISCR research associate for the past three years, and is looking forward to having a much more active role at the institute.

The new year of 2012 promises to be a very interesting one. New Zealand, and indeed all of the world's economies, face new challenges and vexing problems. The need for independent research applying analytical rigour and high levels of scholarship in order to inform companies' decisions and government policy is as great, if not greater, than it has ever been. The new leadership team, supported by ISCR's research fellows, associates and assistants, is well placed to take us to a new level of contribution to that body of work.

Anton Nannestad is Head of Regulatory Economics and Modelling at Telecom New Zealand Ltd. He has more than 20 years of experience in applied microeconomics, tax, and public policy, much of it as a consultant in the Big Four advisory firms. As ISCR's deputy chair, Anton has supported Rob Cameron and he is presently acting chair, pending the appointment of a new chair for ISCR.

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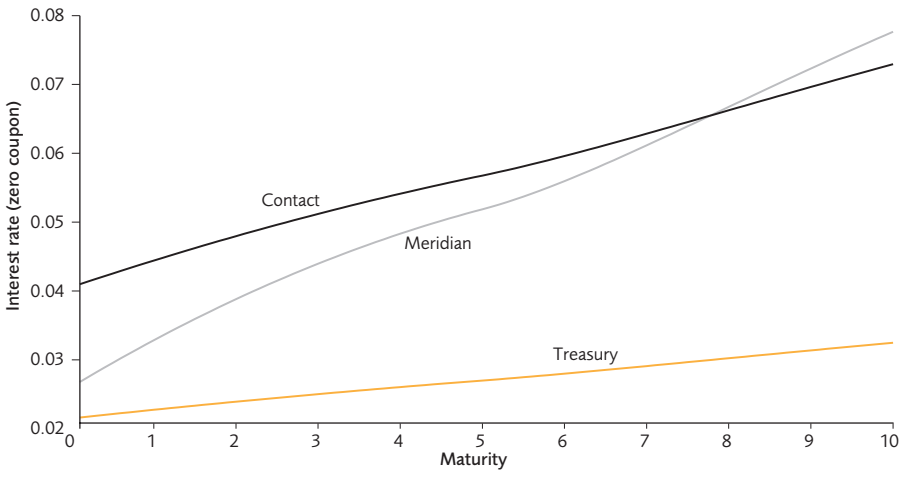
liquidity risk is far more important than credit risk in setting bond prices.

Allowing the information contained in SOE bond prices to inform pricing of SOE equity is potentially useful not only in the event of privatisation, but also for the 'marking to market' of government assets. Knowing market values of shares rather than their accounting values could be helpful for monitoring performance of SOEs, and also for evaluating the government's overall balance sheet. For once, owing a bit of money might not be such a bad thing after all.

1 Macquarie valued the firm's total equity at $6531m. Meridian has 1600m shares outstanding.

Toby Daglish is ISCR's Research Director.

Figure 1: Zerocoupon yield curves for Meridian Energy bonds, Contact Energy bonds and Treasury securities



Note: The spread between these rates can be explained as either a reward for bearing default risk or a premium for holding less-liquid securities.

CULTIVATING Cultural Wellbeing

New Zealand's political capital prides itself as also being the nation's 'Arts and Culture Capital'. But what returns do its ratepayers – and those of other New Zealand local authorities – get from financial support provided to libraries, museums, art galleries, heritage resources, visual and performing arts, festivals and other community and cultural activities? Lisa Marriott sees little evidence that local government spending on cultural activities in New Zealand is correlated with local economic growth – which tends to suggest that such spending occurs because the funders think that consuming culture is 'better for us' than we individually consider it to be.[1]

Since its passing in 2002, the Local Government Act has required New Zealand's local authorities to 'promote the social, economic, environmental, and cultural well-being of communities, in the present and for the future' (s.10). Data collected from the annual reports of eleven city councils – which are one type of local authority – show that over an eight-year period real per-capita spending on arts, culture and heritage activities has increased substantially in almost all cities.[2]

It's a reasonable expectation that such financial support should generate some form of return. But is the expected return social or economic? And how should the 'cultural wellbeing' returns be identified and measured?

Cultural wellbeing broadly encompasses values, customs, shared beliefs, behaviours and identity.[3] Nelson City Council, for example, describes cultural wellbeing as 'the vitality that communities and individuals enjoy through participation in recreation, creative and cultural activities' and as 'the freedom to retain, interpret and express their arts, history, heritage and traditions'.[4]

Arty justifications

A common justification for central and local government funding is the potential for externalities – where the benefits (or costs) of a good or service have a spillover effect to those not involved in the transaction. Other justifications include the creation of legacies for future generations, educational benefit, the enhancement of national identity, the value contributed to quality of life, and – in some cases – that the market cannot produce the welfare-maximising quantity of an activity at a price that the public is willing to pay. In all these circumstances, government funding is seen as improving the outcome.

A further justification is that the activities funded to enhance cultural wellbeing are 'merit goods'. These are goods (such as education and health care) imposed on one group (such as the community) as a result of the preferences of another group (such as the government), usually because the donor believes that the recipient lacks information to accurately assess the full benefits of consumption. Because merit goods are better for a person than the person consuming them realises, they'll tend to be undersupplied unless subsidised. Furthermore, as merit goods are viewed as socially desirable in their own right, their production is typically maximised within a given budget constraint (that is, the subsidy).

Acceptance of cultural activities as merit goods assists with justifying financial support because 'merit goods are provided in pursuit of 'non-economic' objectives of public policy'.[5] However, such classification begs an assessment of the opportunity cost of funds applied to artistic and cultural activities. Furthermore, government support may reduce private philanthropy for the arts – or it may lead to government control over the forms of cultural and artistic activities that are supported.

Hunting the elusive benefit

A number of writers have suggested that a 'creative class' of individuals is an important driver of regional economic growth. One such writer is Richard Florida, whose 'creative class' is where 'members engage in work whose function is to create meaningful new forms' and who suggests that 'places that succeed in attracting and retaining creative class people prosper; those that fail don't'.[6] While not without its critics, Florida's work has attracted widespread attention. Its influence is visible in New Zealand – although only two of the eleven city councils explicitly associated cultural activities with economic benefit. One of these was the Auckland City Council, which in 2005 reported that creative industries 'have an important role to play in helping New Zealand to address its economic challenges'.[7]

So, what do the data show? Table 1 outlines New Zealand city council expenditure on arts, culture and heritage activities for every second year over an eight-year period. Table 1a shows this on a *per-capita* basis; Table 1b shows it *as a percentage of total operating expenditure*.

All cities show increasing per-capita expenditure on arts, culture and heritage activities over the eight years, with Auckland illustrating the highest levels of both yearly expenditure and growth over the eight-year period. However, when this expenditure is considered as a percentage of total expenditure, five of the eleven cities show it decreasing – Dunedin markedly so. Auckland again consistently exhibits the highest levels of yearly expenditure, although not for growth over the period.

Analysis of relationships between regional spending on cultural wellbeing and economic growth is hampered by limited data on regional economic growth. However, using labour force participation as a proxy for economic growth indicated that no relationship exists between spending on cultural activities and local economic growth.

Similarly, no relationship was found in the reverse direction of causality: increases in regional economic growth did not result in greater spending on cultural activities in the following years.

The absence of any evident correlation may be the result of – for example – government spending on cultural activity at the national level, other macroeconomic factors that impact more strongly on economic growth, the proxy adopted for economic growth, or the small sample size.

The small population size of New Zealand cities may itself be a limiting factor. Richard Florida's research is undertaken in large- or medium-sized cities (populations over one million or between 500,000 and one million respectively). The majority of New Zealand's cities are small in comparison.

Table 1: Expenditure[#] by city councils on arts, culture and heritage 2001/02 to 2009/10

(a) per capita

	2001/02	2003/04	2005/06	2007/08	2009/10	% change[*]
Auckland	$139.56	$150.14	$178.48	$188.66	$232.74[†]	67.7%
Hamilton	$99.84	$102.85	$99.16	$100.84	$120.79	16.5%
Napier	$57.33	$61.66	$59.89	$67.73	$69.41	21.2%
Palmerston North	n/a[§]	$120.27	$125.40	$143.48	$160.52	54.1%
Porirua	$68.23	$74.17	$82.85	$82.94	$103.30	47.5%
Upper Hutt	$46.23	$53.44	$69.92	$78.42	$73.62	66.0%
Hutt City	$76.94	$83.35	$65.33	$74.39	$99.21	19.6%
Wellington	n/a[§]	$130.43	$156.04	$172.30	$164.07	37.1%
Christchurch	$85.49	$92.00	$113.62	$111.47	$105.23	26.3%
Dunedin	$143.10	$158.76	$147.11	$152.59	$152.29	3.3%
Invercargill	$82.42	$89.55	$108.69	$109.46	$106.40	31.7%

(b) as a percentage of total operating expenditure

	2001/02	2003/04	2005/06	2007/08	2009/10	% change[*]
Auckland	11.39%	11.88%	10.61%	12.37%	13.19%[†]	14.8%
Hamilton	9.57%	9.15%	8.98%	9.33%	8.88%	-5.1%
Napier	5.51%	5.58%	5.01%	5.18%	5.45%	-3.7%
Palmerston North	n/a[§]	12.05%	10.94%	11.45%	12.35%	4.9%
Porirua	7.25%	7.24%	7.44%	6.75%	8.02%	6.0%
Upper Hutt	6.46%	6.79%	7.42%	7.96%	6.87%	11.9%
Hutt City	7.62%	7.23%	5.94%	6.71%	7.29%	-6.6%
Wellington	n/a[§]	7.40%	8.65%	9.34%	8.71%	25.0%
Christchurch	9.43%	9.84%	11.80%	10.37%	8.89%	-2.2%
Dunedin	11.59%	11.57%	10.44%	9.89%	9.99%	-16.7%
Invercargill	7.86%	8.00%	8.15%	8.67%	8.09%	5.7%

Source: Data collected from city council annual reports. Analysis was based on net figures; where activities were revenue generating, revenue was deducted from the overall expenditure for that activity.

Note: [#] Figures were inflation-adjusted to 2010 equivalents.

[*] A linear trend using least squares was fitted to the inflation-adjusted data and the percentage change (2001/02 to 2009/10) was determined from this.

[†] Reported data was for a 16-month period (to 31 October 2010) and has been adjusted to a 12-month equivalent.

[§] Data not available (analysis for Palmerston North and Wellington starts from 2003/04).

It's good for you

With no apparent evidence of economic growth from funding cultural activity, what else would account for the expenditure on cultural wellbeing? Commentaries in the annual reports indicate that the primary motivation for funding cultural and artistic activities is the social benefit. Their focus was on intangible benefits such as reflecting the diverse communities of the city, fostering a sense of identity and pride, celebrating the city, making the city an attractive and exciting place, creating a sense of energy and vibrancy, offering residents and visitors entertainment and cultural experiences, raising the profile of the city, encouraging local creativity, maintaining quality of life, and valuing history and heritage.

A desire for economic benefits from investment in cultural wellbeing may exist, but this is not readily apparent from the annual reports investigated. Instead, it would appear that the intended return from investment in cultural wellbeing is almost entirely social. The most likely explanation for expenditure on cultural wellbeing is that these activities are viewed as merit goods which generate politically desirable social benefits.

1 This article is based on L Marriott (forthcoming) 'Accounting for Cultural Well-being: An exploratory study of New Zealand regions'.

2 The aim of the research was to analyse data from all 16 city councils. However, as some changed their expenditure classifications over the weight-year time period, they were excluded from the analysis.

3 Ministry for Culture and Heritage (2011) *Cultural Well-being: What is it?* (available at www.culturalwellbeing.govt.nz).

4 Nelson City Council *Annual Report for the year ended 30 June 2009* (retrieved from www.nelsoncitycouncil.co.nz).

5 CD Throsby & GA Withers (1979) *The Economics of the Performing Arts* Edward Arnold (Australia) Pty Ltd Melbourne p197.

6 op. cit. p4.

7 Auckland City Council (2005) *Snapshot: Auckland's Creative Industries Report* (retrieved from www.aucklandcity.govt.nz).

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separating the *facts* from the *fury*

It happened just one week before Christmas last year: Christchurch City Council's announcement that its CEO Tony Marryatt would receive a 12.3% pay rise (worth $59,037) backdated to 1 July 2011. Ratepayer reaction was fast, furious, and public. Glenn Boyle takes a look at the facts, to see whether all the fuss was justified.

Perhaps the proximity to Christmas encouraged the Christchurch City Council (CCC) to believe that such a move[1] would slip through largely unnoticed. But Christchurch residents, having had to endure 15 months of earthquakes and the even more damaging after-effects inflicted by government behemoths EQC and CERA, proved in no mood to be forgiving. Every single letter to the editor of local newspaper *The Press* in the 20 and 21 December editions was critical of the move – most vehemently so. Two weeks later it was still easily the dominant topic of correspondence, both in print and online. *The Press* itself was quick out of the blocks, offering up a 20 December editorial view that the pay rise was 'excessive' and giving prominent space on two separate pages to the critical views of a local churchman.[2] Shortly thereafter, an activist group called No Payrise For Tony Marryatt announced that a protest march would be held on 1 February 2012; about 1500 people ultimately turned up.

But was all this outrage really justified? After all, Marryatt had received no pay rise at all in the previous year, so there was potentially an element of catch-up in the announced increase. Virtually none of the newspaper correspondents provided any figures to back up their opinions that it was 'indecent', 'inappropriate', 'evil', 'selfish', 'disgusting', 'exorbitant', or 'obscene' (to list just a few of the adjectives that were trotted out). Those who did tended to rely on very limited – and sometimes irrelevant – data. Political critics were, if anything, even more incoherent. Councillor Sally Buck, for example, provided the helpful explanation that she had voted against Marryatt's pay increase 'because it is a huge amount, almost obscene, much more than the average wage'.[3] Others claimed that it was unwarranted because of the hardships being faced by many post-quake citizens of Christchurch, although the link between the two was never explained.

Pointing the finger

An early revelation was that the Council had relied on information provided by consulting firm StrategicPay. Although initially described as confidential, this report was eventually released on 30 January 2012. It revealed that StrategicPay had followed a two-step procedure. First, Marryatt was given a points score based on his qualifications, experience, and various measures of the authority and responsibilities associated with his position. Second, median and upper- and lower-quartile remuneration were provided for similar positions in both the public and general (including private) sectors of New Zealand. Quite how the jump was made from the first step to the second is not explained, but unless the sample size was very small (that is, the statistics were obtained from a sample of positions having *exactly* the same number of points as Marryatt's) the potential for mixing apples and oranges is obvious.

Conflating private- and public-sector remuneration is also problematical. Public-sector senior management (in government departments, SOEs and universities, as well as in local authorities) face few of the risks and responsibilities of their private-sector counterparts. They're not subject to the discipline of financial markets, they can't go bankrupt, they don't have to worry about not being able to pay their employees, they don't create wealth or knowledge, they don't operate in globalised markets, and few of them participate in an international labour market. Basically they're bureaucrats, and are necessarily rewarded differently from private-sector executives and entrepreneurs.

The official CCC announcement of the decision claimed that '[t]his increase aligns Mr Marryatt's remuneration to the market rate for comparable chief executive roles'. The

most obvious examples of comparable roles are other New Zealand local authority CEOs. A summary of the 2006-2010 pay distribution for the 73 holders of such positions appears in Table 1.[4] As can be seen, considerable variation exists across local authority areas; but the mean and median figures do not seem excessive for this kind of role.

Table 1: Summary Statistics for local authority CEO remuneration (New Zealand)

Year	Mean	Median	Maximum	Minimum	Christchurch
2006	$204,557	$188,423	$385,259	$111,140	$350,965
2007	$220,079	$209,520	$403,357	$105,108	$370,000#
2008	$231,947	$216,469	$447,600	$137,217	$373,542#
2009	$243,494	$230,043	$453,000	$145,217	$452,945#
2010*	$242,650	$236,000	$479,492	$135,907	$479,492#

Note: # Tony Marryatt.
* Auckland not included because of the switch to the single 'super-city'.

Show me the money

The question of interest is whether the $535,529 package offered to Tony Marryatt for 2011/12 is out of line with those appearing in Table 1. In other words, is that package consistent with the outcomes that prevail elsewhere in the local authority sector, given the particular scale and responsibilities of the Christchurch role?

Answering this question proceeds in two steps. First, the remuneration data above is combined with additional data on what could roughly be described as the 'fundamental features' of each CEO position – the local authority's population base and land area, the scope of the job, the economic health of the region, the regional cost of living, the CEO's experience – and then the relationship between the two is estimated. Second, this relationship is used to come up with a value for the 'normal' remuneration for the Christchurch CEO position, given its fundamental features as of 30 June 2011.[5]

Loosely speaking, what this exercise does is estimate the remuneration Marryatt would expect to receive in 2012 if he were paid the 'normal' sector rate for these fundamental features. As a result, any positive (or negative) difference between his actual pay and the estimated 'normal' pay would indicate that he is being compensated more (or less) generously than the typical New Zealand local authority CEO, after taking into account the fundamental features of the Christchurch position.

Table 2 shows that estimated 'normal' remuneration for the Christchurch CEO role in 2012 is $458,243 with an upper bound (allowing for the margin of error) of $477,016. The difference between these numbers and the $535,529 actually awarded is sufficiently great that the latter figure would almost certainly make Marryatt the highest-paid local authority CEO in New Zealand relative to the demands of his position. Nor is this just a 2012 phenomenon: between 2007 and 2010 Marryatt received (on average) $38,022 more a year than the 'normal' pay for his position.

Such numbers could indicate that the CCC has systematically overpaid Marryatt relative to his peers, with this coming to a head in December 2011. Or it could just be that the Christchurch CEO position has 'above-normal' responsibilities not captured in the data. Mayor Parker's revelation[6] that Marryatt's remuneration was benchmarked in part to the private sector – on the grounds that 'it's a very large job' – suggests the former explanation is more likely. Marryatt himself has argued[7] that his job has 'grown immensely' since the February 2011 earthquake. But this seems spurious. Like an insurance company, a CEO receives a regular premium during good times as compensation for the extra effort that needs to put in when the going gets tough. To then claim that higher pay is justified by the going having got tougher seems like an attempt to retain one's cake after having already eaten it.

On 25 January 2012, Marryatt indicated that he might refuse the pay rise. Were he to do so, his remaining remuneration of $479,492 would be very close to the upper-limit value in Table 2, suggesting that any departure from normal local authority practice would then be small.

Less noise, more light

Even after taking into account the significant scale of Marryatt's position, the initial award of $535,529 does seem to be very generous relative to standard practice in the local authority sector. In this sense at least, the public's unhappiness would seem to be justified. However, refusing the increase would leave Marryatt's remuneration at a level that is not obviously out of kilter with that of other local authority CEOs. The eventual outcome may, therefore, end up being about right – albeit by accident.

How might such 'accidents' be avoided in future? Given the difficulties in establishing the true value of any position, there is no easy solution. But downgrading the role of compensation consultants would be a good start. Such companies typically seek to provide other services to councils and thus have a strong incentive to put the CEO's position in the most favourable light when it comes to remuneration reviews. While it might be necessary to retain consultants to provide data (a task at which they excel), employment of an independent labour economist to analyse this data and make pay recommendations would eliminate conflicts of interest and provide a better set of analytical skills.

Table 2: 2012 Christchurch City Council CEO remuneration

	Mid-point	Upper limit	Lower limit
'Normal'	$458,243	$477,016	$439,469

	Awarded	After 'refusal'	Average annual excess#
Actual	$535,529	$479,492	$38,022

Note: #Four-year average 2007-2010.

1 The exact magnitude of the pay source is a matter of some confusion. On 18 December, the CCC announced that Marryatt's remuneration would rise from $474,000 to $538,529, an increase of $64,529 (13.6%). However, when this was reported in *The Press* the next day, the first figure was mis-stated as $470,400 – which incorrectly yields the popularly-quoted increase of $68,129 (14.5%). Finally, the CCC's 2011 annual report lists Marryatt's pay for the year ending 30 June 2011 as being $479,492, which I've assumed to be the correct figure.

2 Quite why *The Press* would consider a man of the cloth to have expertise in the area of executive compensation remains, at the time of writing, unexplained.

3 *The Star* 21 December 2011. Councillor Buck apparently saw nothing wrong with her own 2010/11 remuneration of $107,626 being much more than the average wage.

4 Scott Rademaker collected most of this data.

5 For the mathematically-inclined, these two steps are simply equations. The first is a regression of pay on fundamental features. The second substitutes data on 2011 Christchurch fundamental features into the estimated regression in order to back out the level of 2012 pay consistent with those features.

6 *The Press* 31 January 2012.

7 *The Press* 5 January 2012.

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Mates rates? What CEOs get paid

Can CEOs manipulate their pay through involvement in the pay-setting process? Contrary to what we intuitively assume, they may not. A study of New Zealand firms[1] discovered that CEOs with the most direct involvement in the setting of their own remuneration are, on average, rewarded *less* generously than those who are kept at arm's length. Helen Roberts explains.

The design of executive remuneration packages, typically overseen by a compensation committee of the firm's board, is fraught with conflicts of interest between the shareholders and managers. A chief executive officer (CEO) who sits on the board and is also a member of his firm's compensation committee seems to be in an ideal position to negotiate a pay package that maximises self-interest, at the expense of shareholders' interests. Even when a CEO is excluded from discussions on their own contract, being on the compensation committee can still yield personal benefits. This is because, with contracts being negotiated relative to one another, a CEO's support for generous packages for subordinate executives will result in higher compensation for the CEO. In contrast, a CEO who is not a member of the board has little influence over the pay-setting process. One would anticipate that, all else being equal, CEOs who are not on the board would be the lowest paid and have the least influence over pay increases.

Down at the coal face

Glenn Boyle and I used a sample of 699 observations taken from 149 NZX-listed firms between 1997 and 2005 to investigate the effect of CEO influence on pay-setting.

Growth in CEO pay could be determined for 447 of the 699 observations. More than three-quarters of the surveyed firms had the CEO on their board; one-third appointed the CEO to the compensation committee. This contrasts with US data: there, CEO appointment to the compensation committee is rare (although the CEO is almost always on the board).

Summary statistics of CEO pay as well as firm performance are shown in Table 1. Data for pay focus on the cash component of compensation, which consists of salary, bonus and allowances. This figure is disclosed directly in the annual report, for CEOs who are members of the board of directors. Compensation for non-director CEOs is estimated using the midpoint of the highest $10,000 band of declared salaries of employees earning more than $100,000 per year.

Interestingly, those CEOs who sit on their own compensation committee received the lowest annual growth in compensation, but the firms they managed also performed less well. Conversely, CEOs who were not on the board led the best-performing firms but received little recognition in terms of compensation for doing so.

Digging deeper

Although the descriptive statistics tell an interesting (albeit counter-intuitive) story, they may mask effects attributable to other factors such as governance variables, risk-return trade-off considerations, and self-selection bias.

A first step is to use a simple model controlling for differences in firm performance across the three levels of CEO involvement in the pay-setting process. This is shown in *Equation 1* (see panel).

Two striking results emerge from using the New Zealand data in Equation 1. First, variation in firm performance explains very little of the variation in pay growth for New Zealand CEOs. This suggests CEO pay, on average, is relatively well insulated from changes in firm performance. Second, annual pay growth for those CEOs who sit on their own compensation committee is approximately four percentage points lower than the pay growth for CEOs who sit only on the board. Even more surprising is the fact that this change in pay is almost identical to that achieved by CEOs who are not on the board at all.

Using the average observed performance (5.85%) from Table 1, Equation 1 gives 13.5% as the estimated growth in pay for a CEO who

sits on the board. This falls to 9.5% if the CEO is not on the board or to 9.6% if the CEO is a member of the compensation committee. The difference is even greater when the definition of CEO involvement on the committee is extended to include those CEOs who have an 'ex-officio' role. These CEOs are defined as attending the committee meeting but not being one of its official members.[2] The simple model thus reinforces the conundrum that first surfaced in the descriptive statistics.

Table 1: Firm performance and mean CEO pay 1997-2005

	All firms	CEO on board	CEO on compensation committee	CEO not on board
	(n = 447)	(n = 186)	(n = 157)	(n = 104)
Firm performance				
Raw stock return*	16.71%	19.03%	10.89%	21.33%
Market-adjusted return#	5.85%	7.47%	1.17%	10.01%
Mean CEO pay§				
Annual	$439,230	$534,980	$388,810	$344,100
Annual change	11.34%	14.72%	8.60%	9.42%

Source: Data from 699 observations across 149 NZX-listed New Zealand firms.

Note: *Raw stock return is the annual percentage change in firm value.
#Market-adjusted return is raw stock return minus the return on the market index.
§CEO pay is the sum of salary, bonus superannuation, health insurance, and vehicle allowance.

Dirt pay or pay dirt?

It is possible that the simple model may omit important governance variables, thereby contributing to a spurious relationship between pay growth and a CEO's inclusion on the compensation committee. Re-estimating Equation 1 to take account of board size (number of directors), independent director representation (proportion of independent directors), and whether the CEO is chair of the board produces *Equation 2* (see panel).

Although larger boards are weakly associated with higher pay growth, the main result is unchanged. In fact, including the governance variables exacerbates the puzzle. CEOs who are on their boards' compensation committees achieve even lower pay increases than CEOs who are excluded from the board altogether.

It may be that a CEO who sits on the board's compensation committee uses that position to negotiate a low-risk low-return pay package. So in this instance the CEO accepts a lower pay package, the pay difference being the price of reduced compensation risk. This behaviour could possibly explain the unusually lower pay. This is captured by adding variables RD_H and RD_L to the model, which takes us to *Equation 3* (see panel).

Unfortunately, adding these extra variables does not resolve the conundrum.

Some CEOs may choose to participate in the pay-setting process in order to minimise the personal cost of any change in their compensation package. Running the data through Equation 3 produced coefficients that are counter-intuitive, which would be consistent with such CEO 'self-selection'. However, when Equation 3 was further re-estimated to control for self-selection bias, this made the puzzle worse.

It's possible that, by considering only cash payments to CEOs, the models somehow excluded other relevant information. For example if CEOs who sit on the compensation committee receive stock options and give up some cash in exchange for these, one may observe the type of relationship documented from this sample. Yet a closer examination of the sample reveals that CEOs who are not members of the compensation committee receive option grants at more than twice the rate of CEOs who are members.

Out on a limb?

CEO involvement in pay setting has been widely ignored in the work on executive compensation. The New Zealand data, which covers a range of CEO involvement in the pay-setting process, has identified a unique and somewhat puzzling result: greater involvement by CEOs (through membership of the board's compensation committee) is associated with lower CEO pay increases. This effect warrants further investigation elsewhere. If the result holds more widely, then it enhances the case for self-regulation of CEOs' involvement on their boards. If the result is a uniquely New Zealand phenomenon, we are left with a further puzzle of why New Zealand – or New Zealand CEOs and boards – may genuinely differ from their counterparts in other countries.

Equation 1

$$\Delta Pay = \alpha_0 + \alpha_1 R + \alpha_2 D_H + \alpha_3 D_L + \varepsilon$$

where

ΔPay = annual change in the natural log of CEO pay
R = annual firm performance, measured as excess stockmarket return
D_H = 1 if the CEO sits on the compensation committee and 0 otherwise
D_L = 1 if the CEO does not sit on the board of directors and 0 otherwise.

Equation 2

$$\Delta Pay = \alpha_0 + \alpha_1 R + \alpha_2 D_H + \alpha_3 D_L + \alpha_4 Board + \alpha_5 ID + \alpha_6 CCH + \varepsilon$$

where

$Board$ = the number of directors
ID = the portion of independent directors
CCH = 1 if the CEO is the chair of the board and 0 otherwise.

Equation 3

$$\Delta Pay = \alpha_0 + \alpha_1 R + \alpha_2 D_H + \alpha_3 D_L + \alpha_4 Board + \alpha_5 ID + \alpha_6 CCH + \alpha_7 RD_H + \alpha_8 RD_L + \varepsilon$$

where

RD_H = the return-related increment in pay for those CEOs who are on the compensation committee
RD_L = the return-related increment in pay for those CEOs who are not on the board.

1 G Boyle & H Roberts (2009) 'Go along to get along? Pay-performance sensitivity and CEO membership of the compensation committee' *Proceedings of the 13th New Zealand Finance Colloquium* (available at www.nzfc.ac.nz/archives/2009/papers/NZpps01c.pdf). This paper is a past winner of the ISCR prize for best paper in financial regulation at the New Zealand Finance Colloquium.

2 This information is typically disclosed in a footnote statement.

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do CURRENT power and FUTURE risk cause FUTURE power and CURRENT risk?

Little is known about the relationship between risk and market power in electricity markets. It's widely agreed that the expansion of forward markets decreases market power in concentrated electricity industries, and that this increases social welfare. However, such one-way causality tells only half the story. Gabriel Fiuza de Bragança finds that market-power indicators such as the Lerner Index may be telling us something different from what we thought they were.[1]

Hedging (that is, entering into forward contracts in order to offset the risk associated with trading) is not the simple elegant solution it's often assumed to be. In fact, hedge markets are also affected by spot markets. This leads to two important practical implications. First, forward prices are affected by spot market power. Second, a robust measure of market power must take risk – a primary determinant of hedging decisions – into account.

Re-thinking the link

Regular forward (or futures) commodity pricing is based on the presumption that a cash-and-carry trade doesn't offer arbitrage opportunities: that is, traders can't profit without risk by buying a commodity and using a forward (or futures) contract to sell it in the future.

The beauty of pure arbitrage methods is that they are general and rely on very few economic hypotheses about the underlying market. However, electricity is a rather unusual asset. Electricity can't be stored, which makes cash-and-carry trade strategies impossible to follow. This means that without using a forward contract, one cannot lock in a future price for electricity. Furthermore, since electricity markets typically have a limited array of derivatives (and those that exist are often illiquid), it may be pretty difficult to lock in a price at all. Figuring out an electricity forward price relies on tailor-made approaches.

So, what happens when both the microeconomics of the New Zealand electricity market and financial theory are incorporated in a theoretical formula for forward prices?

Circuit-breaking theory

Besides fitting observed data quite well, this hybrid model presents a particularly innovative feature: it relates market power in the spot market to forward (futures) prices and allows for interesting counter-factual exercises. In particular, it shows that a reduction in the number of generators in the New Zealand market could result in a significant increase not only in spot prices but also in forward prices.

The general consensus is that an increase in the amount of forward contracts decreases market power. In addition, it can be argued that a decrease in generators' market power would decrease forward prices. We know that with lower forward prices, generators will be less inclined to sell their electricity in forward markets. That is, decreases in market power could result in decreases in the amount of forward contracts. So, what is the net result of these two opposite effects put together? Since market power and hedging are impossible to separate, the answer depends on a comprehensive approach.

Corporate hedging decisions are driven by risk management. In practice and theory, firms try to maximise their value by maximising their expected profits – and to do this, firms often seek to reduce the volatility of their cashflows.

There are several reasons for this. A risky firm has a higher probability of bearing legal, transactional and managerial costs associated with bankruptcy. Cashflow problems due to illiquidity are also more likely when revenue and costs are uncertain. In incomplete markets, the notion of value is subjective and may depend on shareholder preferences and risk aversion. Oligopolistic markets present an additional catch: hedging also affects the generators' profit margin through its impact on the spot price. In other words, generators face a tradeoff between reducing risk and increasing business profits.

As in any theory, simplifying hypotheses are necessary to better understand the complex reality. The model's framework explicitly assumes that generators and retailers maximise their expected profit (subject to some penalty for bearing risk). Electricity firms decide their forward contracts and clear the forward market. Close to the delivery date, generators decide how much to produce. At the delivery date, the electricity spot market is cleared by a single price auction, such as occurs in the New Zealand electricity market (NZEM).

The appeal of this approach is that prices and quantities of both spot and forward markets are determined within the model. That is, the model allows for hedging and market power interacting in both directions.

Tangled wires

Demand- and supply-side volatility can have different effects on hedging decisions. The model shows that generators' and retailers' optimal hedge positions are ultimately driven by their risk exposure and their risk aversion.

While risk aversion is positively correlated with hedging, the ways in which demand-side and supply-side volatility affect risk exposure are ambiguous and depend on the parameters of each market. In particular, an illustrative exercise based on actual NZEM numbers shows that increases in cost-side volatility can even have a negative effect on generators' hedge ratios. More importantly, the most common market-power measure, given by the difference between expected spot prices and marginal costs (the Lerner index), is also driven by risk exposure. In other words, this measure could be flawed because it captures the risk environment instead of completely reflecting the generators' market power. For example, expected spot prices equal to expected marginal costs (Lerner index equal to zero) could be erroneously interpreted as a sign of competitive conduct when it could equally be a symptom of the existence of a particular risk exposure at the point in time when forward contracts were transacted.

The bottom line

In spite of the fact that forward contracts reduce market power, their quantities and prices cannot be controlled by policymakers. In a free market, both the quantity and price of these contracts are determined by the market participants' decisions *and also* respond to and affect market power. Electricity generators sacrifice market power to protect themselves against risk. Given that it's socially beneficial to manage risk, a reasonable question is whether there's a trade-off between risk and market power in terms of social welfare. If the answer is yes, then concern about increases in electricity market power should be put in perspective. Indicators of increasing market power could simply be reflecting a risk-return tradeoff, compensating market participants for the risks they must bear.

1 This article is based on aspects of the author's PhD thesis in economics, which was supervised by Lew Evans and Toby Daglish. It is available at http://researcharchive.vuw.ac.nz/bitstream/handle/10063/2008/thesis.pdf?sequence=2. ISCR provided Gabriel with scholarship support to undertake his research.

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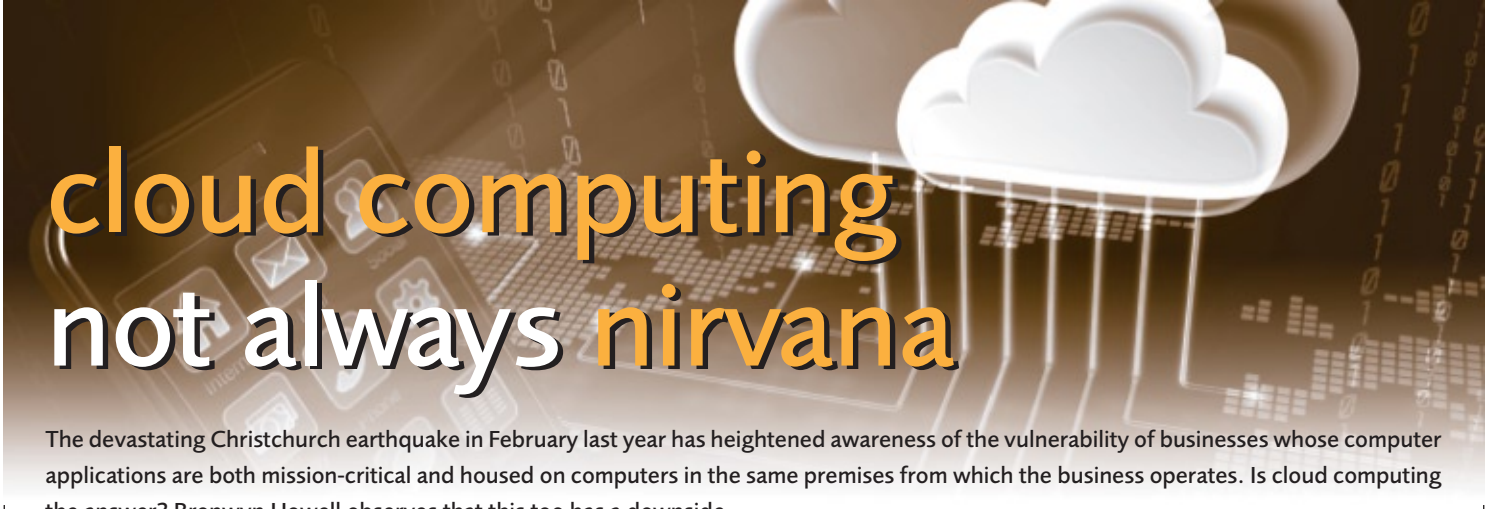

cloud computing not always nirvana

The devastating Christchurch earthquake in February last year has heightened awareness of the vulnerability of businesses whose computer applications are both mission-critical and housed on computers in the same premises from which the business operates. Is cloud computing the answer? Bronwyn Howell observes that this too has a downside.

As the earthquake dust settled, horror stories emerged of a data devastation 'double-whammy'. Some firms have had their computers and servers – along with the software and data on them – physically destroyed. Others have lost access to their data and applications as a result of not being allowed back into quake-stricken buildings. The 'lucky' ones might have been able to 'snatch a crucial USB upon escape'[1] but for many the loss of access to data and applications has been crippling.

However, adversity often begets opportunity – in this case, for providers of 'cloud computing' services.

Up in the clouds

Cloud computing is a relatively new IT system model enabling 'convenient, on-demand network access to a shared pool of configurable computing resources (for example, networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction'.[2] In other words, cloud computing involves storing one's data at a mass data-storage location provided through the internet and also (in many cases) processing that data using software which is downloaded from the cloud.

Many individuals and businesses already use cloud-computing applications, perhaps even without realising it. When you upload your photos to Facebook, post your videos on YouTube, deposit your iTunes purchases in your iCloud account or share documents using Dropbox, you're using a cloud service. The data (and often the software required to use it) is lodged remotely, which lets you access it at any time from any place and using any device supported by the specific cloud provider.

There may be many benefits (and costs) associated with the use of such services. However (and unsurprisingly), commercial cloud-service providers have been quick to use examples of their clients whose business was not disrupted by data disasters during the Christchurch earthquakes as a key means of convincing potential clients of the value of their services in the event of natural or other physical disasters (such as fire or equipment failure).

The storm clouds gather

Whilst undoubtedly cloud applications do reduce exposure to risks of data loss from physical causes, potential users must also consider the new risks that moving to cloud-computing platforms invokes. Indeed, these may actually be greater than the risks of physical events such as earthquakes – as was illustrated recently when the FBI succeeded in closing down the operations of service provider Megaupload, operated by the larger-than-life internet entrepreneur Kim Dotcom.

Leaving questions of the legality of some of Megaupload's media-streaming activities to one side, the firm was also engaged in the provision of data storage and other cloud-computing services on a commercial basis to businesses around the world. Although Megaupload owned some servers itself, the storage of most of the data belonging to its cloud-computing clients was subcontracted to third parties. When Mr Dotcom was arrested and the FBI seized the assets of Megaupload, payments to the third-party providers ceased. These providers now had no incentive to continue providing storage of (and access to) the data that firms had contracted Megaupload to manage. As the third parties had no way of knowing whose data they were storing, and the legitimate users of the data could not know where their data were physically located, there was no way to broker alternative arrangements for either access or payment. Large amounts of commercially significant data were either physically destroyed or access by legitimate users prevented – just as surely as during the Christchurch earthquakes.

The Megaupload case serves as a reminder that, appealing though the cloud-computing model may be, when data is posted into the cloud its users become exposed to risk of its loss – not just from physical events (which are easily mitigated by duplicate storage) but also from the possibility that any one of the parties in the complex contractual chain may fail, as a consequence of financial or other causes. Arguably, this is far more likely to occur than a physical disaster.

Safeguarding the silver lining

As the Megaupload case illustrates, the operators of cloud-computing platforms may be engaged in many other businesses which expose the cloud 'data banking' business to risks if these other activities fail. As many cloud operators act simply as brokers of contracts between their clients and the owners of the servers, their businesses often have few assets to act as a buffer against financial stresses – which exacerbates the risks of failure. This begs the question of whether it is prudent to commit mission-critical business data to their care without some credible safeguards in place.

But what might those safeguards be? As cloud operators act in the manner of 'bankers' of 'data capital', it could be argued that at the very least they should be required to meet some standards of prudential competence or perhaps even, like banks, be made subject to some forms of registration and independent monitoring (via industry self-regulation, for example) before they are trusted with responsibility for any firm's information-lifeblood.

1 http://my.lawsociety.org.nz/in_practice/practice_management/technology_for_lawyers/everything_you_need_to_know_about_cloud_computing

2 UK Institute of Standards and Technology definition of cloud computing (v15).

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