



Are New Zealand chief financial officers the 'country cousins' of their American counterparts?



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Financial management is no trivial matter with more than one trillion dollars a year spent on capital investments in the United States alone¹. Financial officers are confronted with a wide variety of financial management tools and techniques that influence their investment decisions. Generally, the theory and practice of financial management has emanated from North American research. Given that New Zealand managers operate in an open economy with international competitors, one would expect New Zealand managers to adopt such practices. However, differences in taxation, industry composition and economic conditions suggest that some of the techniques may not be suitable in New Zealand without modification.

In this article, we will seek to answer the following questions:

- Do New Zealand chief financial officers (CFOs) use similar sophisticated financial management practices for project evaluation and cost of capital determination as American CFOs?
- Are there sound reasons why the New Zealand and US financial management practices may differ, such as New Zealand's unique business environment?

In 1999, Graham and Harvey [hereafter G&H] (2001) surveyed American CFOs about financial management practices. The sample comprised 4440 American CFOs from the 1998 *Fortune 500* companies and members of the Financial Executives Institute. They report that the financial management practices of large firms tend to be those endorsed by the academic literature, including discounted cashflow techniques and the capital asset pricing model. In contrast, small firms are more likely to use 

¹ See Bruner, Eades, Harris and Higgins (1998).



less sophisticated techniques such as the payback criterion. When evaluating new overseas projects, both large and small firms are more likely to consider firm risk rather than project risk.

To ascertain to what extent New Zealand financial management practices follow those of the US, we adapted the G&H survey to suit New Zealand finance terminology. The following discussion outlines the details of our survey and our findings. We then draw some conclusions about the suitability of selected financial management practices in the New Zealand environment.

OUR SURVEY

In July 2000, we surveyed the CFOs of all 136 New Zealand-based companies listed on the New Zealand Stock Exchange (NZSE). Twenty-eight responses were received, of which two were omitted from further analysis to enhance comparability with the “small” company group of G&H. This yielded a favourable response

rate of 19 per cent for our survey, as opposed to nine per cent for the G&H study.

Survey comparability was enhanced by the following features:

- The survey document closely followed that of G&H.
- Only New Zealand responses fitting the small size category of G&H were used².
- The time elapsed between the two surveys was less than two years.

A comparison of usable responses from the two studies revealed some noticeable differences. Relative to the G&H results, our study is under-represented by manufacturing, technology, communications/media and mining/construction, and over-represented in retail/wholesale, transportation/energy and financial industries. This has probably arisen from historical differences in industrial development in the two countries. It was only

² We used the G&H classification of small firms, being those with sales of less than \$US1 billion, adjusted for the exchange rate.

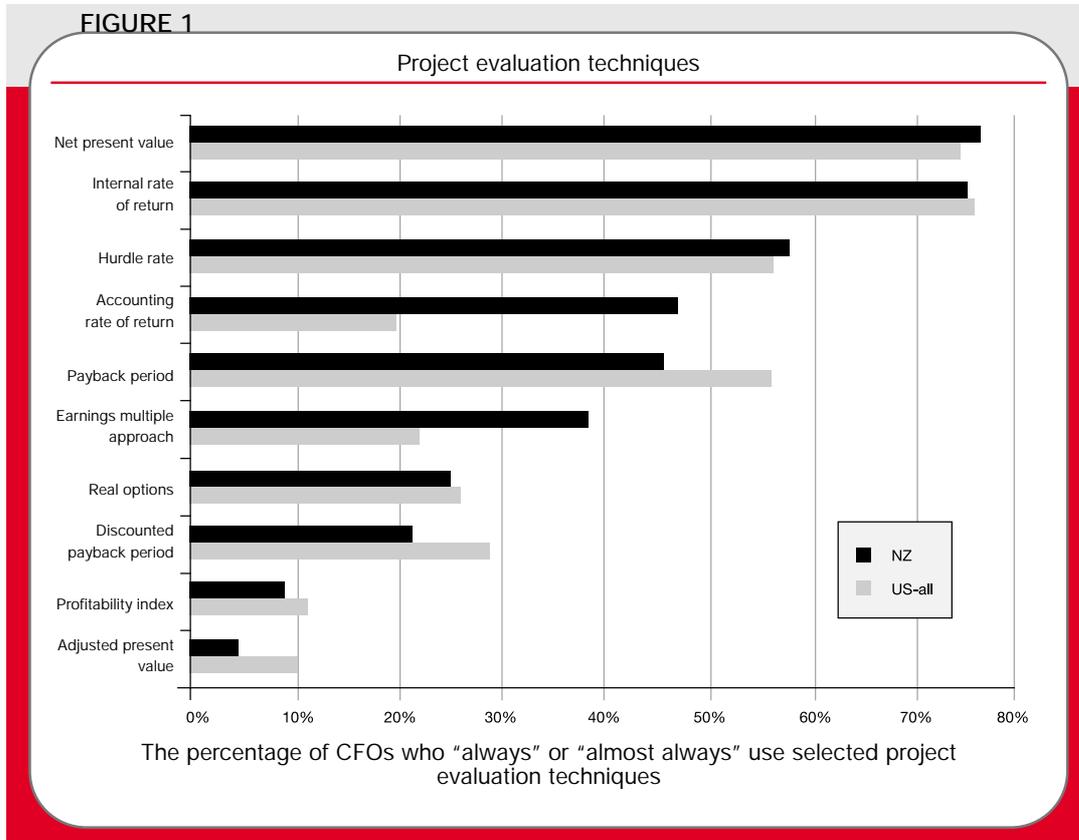


TABLE 1

Project evaluation techniques

Project evaluation technique	NZ average	US average – small firms	US average – large firms
Net present value	3.23	2.83	3.42
Internal rate of return	3.21	2.87	3.41
Hurdle rate	2.75	2.13	2.95
Payback period	2.31	2.72	2.25
Accounting rate of return	1.95	1.41	1.25
Earnings multiple approach	1.36	1.79	2.01
Discounted payback period	1.26	1.58	1.55
Real options	1.20	1.40	1.57
Profitability index	0.48	0.88	0.75
Adjusted present value	0.38	0.93	0.72

Average usage on a scale of 0-4, ranked in descending order of New Zealand results

in the 1970s and 1980s that New Zealand began to change from a commodity-based economy highly dependent upon one export market to a more diversified industrialised nation³. Nevertheless, the comparison is of interest as our sample is representative of industry groups in the New Zealand market.

As pointed out by G&H, some caution should be used when interpreting survey results as the respondents may not be representative of the population, or some questions could be misunderstood. In this study, we found the distribution of respondent firms' sales to be fairly uniform over our small-firm sales range.

Given the small number of responses to some questions, the results reported here represent only part of the total survey. We will examine the procedures and policies that New Zealand CFOs adopt for project evaluation and cost of capital estimation and compare them first to the entire G&H sample and then to the G&H small-firm sub-sample. A definition of techniques discussed can be found in the glossary.

PROJECT EVALUATION TECHNIQUES

Recent surveys have shown that US CFOs are increasingly using sophisticated analytical techniques to evaluate project profitability and risk⁴. We were curious to see whether this was

also the case in New Zealand. First we investigate which techniques are currently used in this country. In our survey, New Zealand CFOs were asked to rank on a five-point scale (0 = never, 4 = always) how frequently they use a variety of techniques when evaluating new projects. The results presented in **Figure 1** consider only the highest usage scores of 3 and 4 for all CFOs surveyed and reveal surprisingly little difference between the techniques used in both countries.

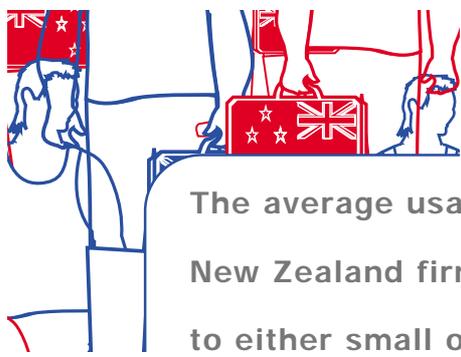
New Zealand and US CFOs most frequently use the more sophisticated techniques of net present value (NPV) and internal rate of return (IRR) – generally about 75 per cent in both countries. Most other results were comparable between the countries, with the exception of the accounting rate of return, which is more frequently favoured by New Zealand CFOs than their US counterparts (48 per cent versus 20 per cent). Given that finance textbooks have long argued the dangers of using unsophisticated techniques such as the accounting rate of return, its relative popularity in New Zealand could be viewed as worrisome⁵.

Finance theory asserts that the techniques of NPV and IRR are the best all-round methods for evaluating capital investment projects. Nevertheless, G&H (page 7) point to evidence that simple techniques such as the payback

³ For a brief historical overview of economic development in New Zealand, see Colgate & Stroombergen (February 1993).

⁴ For example, see Trahan & Gilman (1995).

⁵ The accounting rate of return is deficient as a project evaluation technique as it uses accounting profits rather than cashflows, it fails to consider the time value of money and is not consistent with shareholder wealth maximisation.



The average usage of real options by New Zealand firms is lower when compared to either small or large US firms

period and hurdle rates may implicitly account for the presence of option-like features and that the successful application of these techniques in a small-firm setting may encourage their continued use.

Table 1 reports the “average usage” of each project evaluation technique, with a high average indicating higher overall usage of a particular technique. Comparing the averages of the most frequently used techniques (average greater than 2.0), in all cases the New Zealand results fell between the large- and small-firm US results. The more sophisticated techniques of NPV and IRR were most frequently used by large US firms, followed closely by New Zealand firms and lastly by small US firms. In contrast, the less technical payback period was used most frequently by small US firms, less so by New Zealand firms and least of all by large US firms. This suggests that New Zealand CFOs are reasonably “up with the play” with respect to their usage of “technically

correct” techniques when compared to their counterparts in similar-sized US firms.

Interestingly, real options are often or always incorporated into the analysis for 25 per cent of New Zealand firms and 27 per cent of US firms. This reveals a high degree of sophistication in analyses given the practical difficulties of valuing real options. However, when all responses are considered (0 = never, 4 = always), the average usage of real options by New Zealand firms is lower when compared to either small or large US firms.

RISK AND PROJECT EVALUATION

Finance theory suggests that firms should make an adjustment for project risk when evaluating projects. This can be accomplished either by adjusting the rate used to discount the cashflows or by altering the cashflows themselves.

We asked CFOs how they consider risk in project evaluation. As shown in **Figure 2**, in

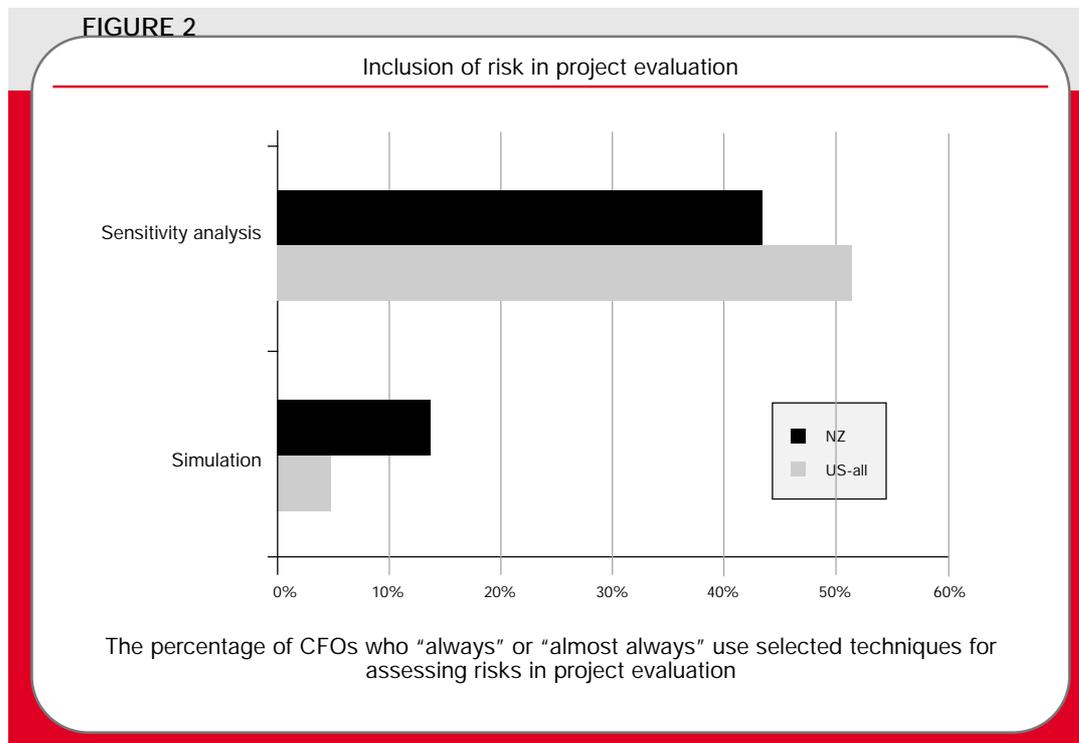


TABLE 2

Risk assessment techniques in project evaluation

Risk assessment techniques	NZ average	US average – small firms	US average – large firms
Sensitivity analysis	2.26	2.13	2.56
Simulation	0.81	0.76	1.22

Average usage on a scale of 0-4, ranked in descending order of New Zealand results

TABLE 3

Risk factors considered in project evaluation

Risk factors	NZ average	US average – small firms	US average – large firms
Interest rate risk	72%	54%	41%
Term structure risk	46%	28%	20%
GDP or business cycle risk	42%	40%	51%
Risk of unexpected inflation	40%	38%	38%
Size	38%	39%	27%
Commodity price risk	33%	25%	43%
Foreign exchange risk	32%	33%	62%
Market-to-book ratio	18%	15%	11%
Momentum	14%	19%	8%
Distress risk	9%	18%	19%

The percentage of CFOs who consider each risk factor, ranked in descending order of New Zealand results

both countries the most favoured risk assessment technique is sensitivity analysis, used always or almost always by 44 per cent of New Zealand firms and 52 per cent of all US firms. Simulation is less popular in both countries.

Examining **Table 2** averages for inclusion of risk in project evaluation, the New Zealand averages fall between those of large and small US averages, indicating that New Zealand CFOs use risk analyses as sophisticated as those used by their US counterparts. This is in line with a 1999 survey by Kester et al, who found sensitivity analysis to be one of the most important techniques for assessing risk in the Asia-Pacific.

There are many types of risk that impact on a project's evaluation. Therefore, respondents were next asked which risk factors other than market risk they considered when valuing a project. **Table 3** reveals that the most important risk factors for New Zealand firms were interest rate risk, term structure risk, business cycle risk and inflation risk. The New Zealand results are very similar to the US small-firm results, with the

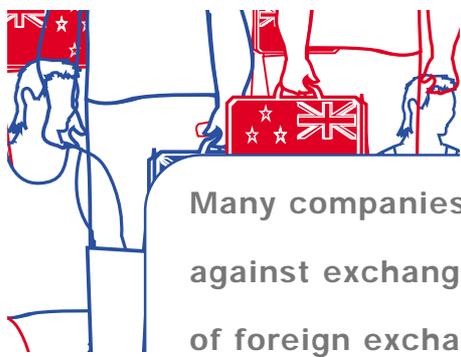
most notable differences being that both interest rate and term structure risks are considered more by New Zealand than US firms.

Given New Zealand's high volatility in interest rates, CFOs' concerns about interest rate risk are well founded. Sellon and Weiner (1997) document that on average over the period 1990 to 1996, New Zealand's interest rate volatility was higher than the US.

With respect to term structure risk, Reserve Bank of New Zealand interest rate data reveals considerable shifts in the relative position of the term structure from 1989 onward. As is consistent with normal expectations, short-term interest rates were at times lower than the long-term rates. However, in many periods the reverse was true when short-term rates exceeded long-term rates. Such a circumstance penalises short-term projects through increased financing costs and can dampen economic activity.

Consequently, the management of interest rate and term structure risks may well be more important in New Zealand than in the US due





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to unique market factors and economic downturns in the early and late 1990s that were not evident in the US.

In contrast, large US firms considered foreign exchange risk to be most important, followed by business cycle risk, commodity price risk and interest rate risk. This is consistent with the greater emphasis among large US firms on risks relating to international trade, whereas small firms suffer more from exposure to risks relative to domestic economic conditions. In a small open economy like New Zealand's, one would expect most firms to have some exposure to exchange rate risk. Also, given New Zealand's fluctuating dollar value, it could be expected that exchange rate risk represents an important risk factor for New Zealand firms. Yet only 32 per cent of New Zealand CFOs surveyed consider foreign exchange risk when evaluating projects.

One possible explanation is provided by Atherfold (1999), who performed in-depth interviews with six large New Zealand companies that undertake substantial foreign direct investment. None of the interviewees considered foreign exchange risk, as most of them attempt to maintain a fully hedged balance sheet. Other research evidence has revealed that many New Zealand companies have in the recent past tended to fully hedge actual transactions against exchange rate risk, thereby reducing the impact of foreign exchange movements on known future cashflows⁶.

Many New Zealand companies, such as The Warehouse, have expanded their operations offshore. To evaluate a new project in an

⁶ See Prevost, Rose & Miller (2000), who examine the use of derivatives in New Zealand companies for the management of risk factors including exchange rate risk.

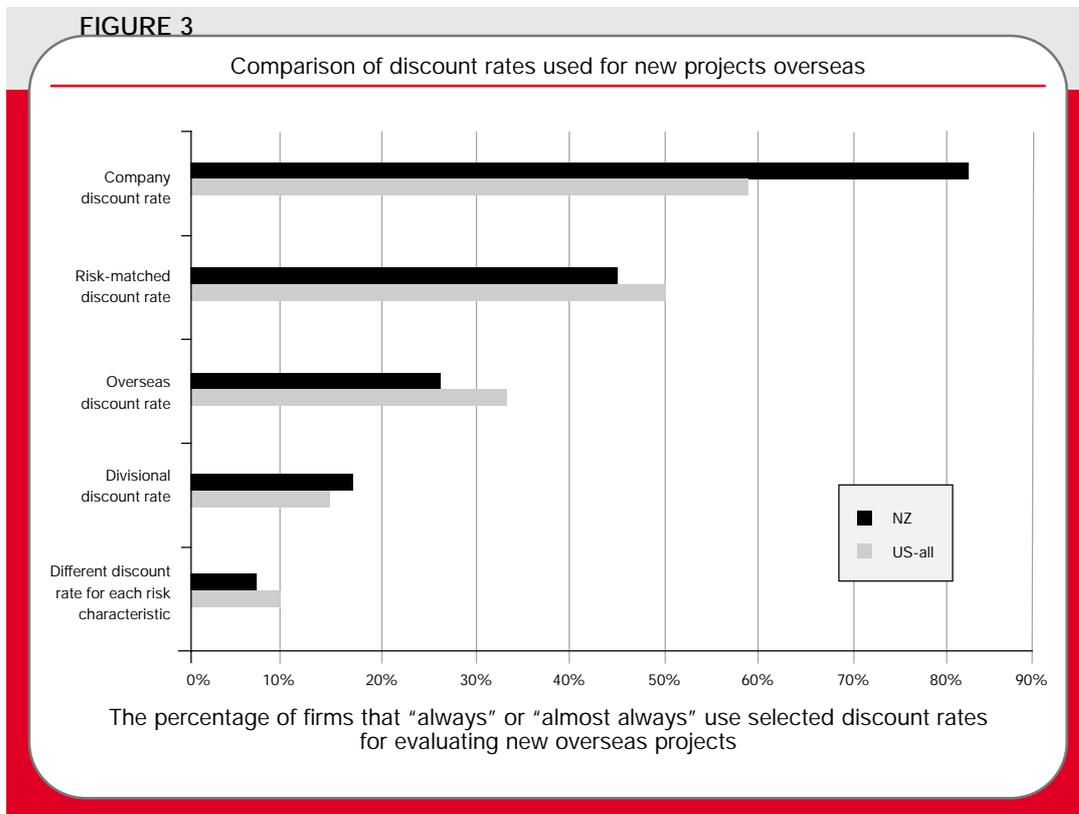


TABLE 4

Comparison of discount rates used for new projects overseas

Discount rates	NZ average	US average – small firms	US average – large firms
Company discount rate	3.25	2.50	2.50
Risk-matched discount rate	2.00	1.86	2.36
Overseas discount rate	1.27	1.49	1.84
Divisional discount rate	1.27	0.82	1.09
Different discount rate for each risk characteristic	0.62	0.68	0.64

Average usage on a scale of 0-4, ranked in descending order of New Zealand results

TABLE 5

Method of estimating the cost of equity capital

Estimation method	NZ average	US average – small firms	US average – large firms
CAPM	3.40	2.49	3.27
Equity average historical returns	1.31	1.80	1.65
CAPM plus additional risk factors	0.12	1.39	1.70
Discounted dividend/ earnings model	0.05	0.96	0.87
What investors require	0.04	1.22	0.54
Other	0.00	0.37	0.50

Average usage on a scale of 0-4, ranked in descending order of New Zealand results

overseas market, finance theory suggests that firms should use a risk-adjusted discount rate. So we asked New Zealand CFOs how frequently their companies use particular discount rates when evaluating new overseas projects.

Of the 26 New Zealand firms sampled, only 16 (62 per cent) invest in overseas projects. As shown in **Figure 3**, 81 per cent of these companies always or almost always use a company-wide discount rate. A risk-matched discount rate was the second most popular choice at 46 per cent, followed by an overseas country discount rate at 27 per cent. These findings support those of Atherfold (1999), but are rather surprising, as a company-wide rate is appropriate only when the project financing and risk levels are identical to those of the firm overall.

Unreported results reveal that most New Zealand firms prepare a sensitivity analysis, analysing each project using more than one discount rate, while others adjust for risk through project cashflows. These tendencies perhaps highlight the difficulties that firms experience in determining the “correct” discount rate to employ.

Comparing internationally, although the ranking of preferences was identical, New Zealand CFOs were more likely to use a company-wide discount rate as compared with US CFOs. The US results include both large and small firms, yet large firms are likely to have more overseas investments and, therefore, be more motivated to devote resources to the rather complex task of determining appropriate risk-matched discount rates. Yet this would not explain why in the matched sample reported in **Table 4**, the average usage of company-wide discount rates was higher among New Zealand CFOs compared to their counterparts in US small firms (rating of 3.25 versus 2.50).

COST OF CAPITAL

Cost of capital is the average cost of financing a firm’s investments and it forms a key component of project evaluation. Interestingly, we found that 80 per cent of New Zealand CFOs estimate their firm’s cost of equity compared to only 64 per cent of their US peers. This demonstrates a high level of financial acumen among New Zealand CFOs. As shown in **Table 5**, the capital asset pricing model



(CAPM) is by far the most popular technique for estimating cost of equity in both New Zealand and the US. In fact, it is used more by New Zealand firms than by either small or large US firms. This is unexpected as the CAPM is notoriously difficult to apply correctly, especially in a small market like New Zealand with a dividend imputation tax system⁷.

Notwithstanding the criticisms of the CAPM and its variants, finance theory has been unable to offer a more robust, workable alternative. CFOs are left with the choice of adopting the less-than-ideal modified CAPMs or employing alternative models such as those that consider firm size or the book/market ratio⁸.

IMPLICATIONS FOR MANAGERS

So what insights can managers draw from the above? Our results reveal that New Zealand CFOs use relatively sophisticated techniques for project evaluation and cost of capital determination. Structural changes in the New Zealand economy have led firms to adopt a market-led orientation and it is reasonable to assume that such a competitive environment requires that New Zealand financial managers adopt the latest and best financial management practices. Our recommendations for project evaluation and determination of cost of capital are:

- *Use the best project evaluation techniques.* Managers should review their project evaluation practices to ensure that sound techniques such as NPV and IRR are routinely employed. Consideration should also be given to the presence of real options and how they may affect the value of projects⁹.
- *Assess project risk.* The risk inherent in new projects needs to be assessed both qualitatively and quantitatively. The latter may be incorporated by adjusting cashflows or project discount rates.
- *Consider the method used for determining the firm's cost of capital.* Firms need a theoretically sound method for determining the cost of equity capital. The most widely used approach is the CAPM, but it is difficult to use and can easily yield misleading results if applied incorrectly. Modern research has been unable



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⁷ New Zealand and other research have indicated that in thinly traded markets like New Zealand, where many shares do not trade daily, the basic CAPM model requires modification (see Dimson & Marsh 1983, Ibbotson, Kaplan, & Peterson 1997, and Bartholdy & Riding 1994). This problem for many of the NZSE listed companies is further compounded by the dominance of Telecom in many of the major indices. For example, as Telecom represents approximately a quarter of the NZSE40 index, the index is greatly manipulated by changes in Telecom's share price, thereby biasing the betas used in the CAPM. Furthermore, the conventional CAPM model was developed assuming a classical system of dividend taxation that operates in the US. Modifications are needed in order to apply it correctly in New Zealand where a dividend imputation system operates. For a useful summary of the research on the cost of capital in a dividend imputation environment see Bowman & Marsden (1996). Lally (1996) points out that estimates using a domestic CAPM model can be biased by up to 60 per cent in the circumstance of when an international version is more appropriate.

⁸ For modifications to the CAPM, see Bartholdy, et al (1996), Brooks, Faff, & Slade (1997), Lally (2000), and Bryant & Eleswarapu (1997). For alternative models, see Vos & Pepper (1997) and Bryant & Eleswarapu (1997).

⁹ Real options include the option to abandon a project, the opportunity for further follow-on investments, the choice to delay a new investment and the chance to vary production levels. The inclusion of real options in project evaluation is discussed in Brealey, et al (2000).



to provide any robust, workable alternatives, although factors such as firm size and the book/market ratio may hold some promise.

The differences in the financial management practices as investigated in this article between New Zealand and American CFOs tend to reflect differences in firm size and environment. Small listed firms tend to adopt less sophisticated financial management practices than large listed firms, perhaps because CFOs in smaller firms benefit from closer involvement in day-to-day operations. Given the distinctive features of the New Zealand market, including the dividend imputation taxation system and the absence of a capital gains tax, it is particularly important for New Zealand managers to consider the relevance and applicability of the financial techniques they employ.

GLOSSARY

A brief non-technical definition of each of the key techniques mentioned in this article:

Accounting rate of return (ARR) – a technique for measuring project return by dividing the annual accounting profit by the initial investment.

Capital asset pricing model (CAPM) – estimates the expected return for an investment. The model assumes investors will demand the risk-free rate (e.g. interest yield on government stock) plus a premium to compensate them for the risk of the investment. The risk premium is measured using beta.

Internal rate of return (IRR) – a similar technique to NPV, but gives a percentage return on a project rather than measuring change of firm wealth.

Net present value (NPV) – the value in today's dollars of all cashflows generated by a project. This technique measures the change in firm wealth as a result of implementing a project.

Payback period – measures the length of time it takes for a project to recover its initial investment.

Sensitivity analysis – technique that helps to assess project risk. The technique manipulates one or two variables (e.g. a project's expected sales) at a time to determine the effect on an outcome (e.g. a project's NPV).

Simulation – assesses project risk by generating a probability distribution that indicates the most likely outcomes of a project. A computer is typically used to simulate the probable outcomes.

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REFERENCES

- Atherfold, N. (1999). Foreign direct investment: how should the complexities of foreign direct investment be treated when estimating value? *Unpublished Research Report*, Massey University.
- Bartholdy, J., & Riding, A. (1994). Thin trading and the estimation of betas: the efficacy of alternative techniques. *The Journal of Financial Research*, 17(2), 241-254.
- Bartholdy, J., Fox, K., Gilbert, C., Hibbard, R., McNoe, W., Potter, M., Shi, J., & Watt, K. (1996). Estimating beta for New Zealand companies. *New Zealand Investment Analyst*, 17, 14-22.
- Bowman, R.G., & Marsden, A. (1996). Cost of capital under imputation: an analysis of comparative models. *New Zealand Investment Analyst*, 17, 27-32.
- Brealey, R., Myers, S., Partington, G., & Robinson, D. (2000). *Principles of Corporate Finance*. Sydney: Irwin/McGraw-Hill.
- Brooks, R.D., Faff, R.W., & Slade, P.L. (1997). An investigation of the level and stability of beta risk across New Zealand industries. *Pacific Accounting Review*, 9(2), 37-58.
- Bruner, R.F., Eades, K.M., Harris, R.S. & Higgins, R.C. (1998) Best Practices in Estimating the Cost of Capital: Survey and Synthesis. *Financial Practice and Education*, 8(1), 13-28.
- Bryant, P.S., & Eleswarapu, V.R. (1997). Determinants of the cost of equity in New Zealand. *New Zealand Investment Analyst*, 18, 5-13.
- Colgate, P., & Stroombergen, J. (February 1993). A promise to pay: New Zealand's overseas debt and country risk. *Research Monograph 58*, New Zealand Institute of Economic Research.
- Dimson, E., & Marsh, P. (1983). The stability of UK risk measures and the problem of thin trading. *Journal of Finance*, 38, 753-783.
- Graham, J.R., & Harvey, C.R. (2001). The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics*, 60(2/3), 187-243.
- Ibbotson, R.G., Kaplan, P.D., and Peterson, J.D. (1997). Estimates of small-stock betas are much too low. *The Journal of Portfolio Management*, 23(4), 104-111.
- Kester, G. W., Chang, R. P., Echanis, E.S., Haikal, S., Isa, Md, M., Skully, M. T., Tsui, K.-C., & Wang, C.-J. (1999). Capital budgeting practices in the Asia-Pacific Region: Australia, Hong Kong, Indonesia, Malaysia, Philippines, and Singapore. *Financial Practice in Education*, 9(Spring/Summer), 25-33.
- Lally, M. (1996). The CAPM under dividend imputation and international portfolio selection. *Pacific Accounting Review*, 8(1), 48-65.
- Lally, M. (2000). Valuation of companies and projects under differential personal taxation. *Pacific-Basin Finance Journal*, 8, 115-133.
- Prevost, A., Rose, L., & Miller, G. (July, 2000). Derivatives usage and financial risk management in large and small economies: A comparative analysis. *Journal of Business Finance and Accounting*, 27(5/6), 733-760.
- Reserve Bank of New Zealand. (February 2001). *Financial Statistics*, 4 (1), Wellington: 18.
- Reserve Bank of New Zealand. (February 2000). *Financial Statistics*, 5 (1), Wellington: 18.
- Sellon, Jr, G.A., and Weiner, S.E. (Second Quarter 1997). Monetary policy without reserve requirements: Case studies and options for the United States. *Federal Reserve Bank of Kansas City*, 82(2), 17-18.
- Trahan, E. A., & Gitman, L. J. (1995). Bridging the theory-practice gap in corporate finance: a survey of Chief Financial Officers. *The Quarterly Review of Economics and Finance*, 35(1, Spring), 73-87.
- Vos, E., & Pepper B. (1997). The size and book to market effects in New Zealand. *The New Zealand Investment Analyst*. 18(1), 35-45.

