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COLLEGE OF BUSINESS

School of Accountancy

**THE DETERMINANTS OF THE ACCOUNTING CLASSIFICATION OF  
CONVERTIBLE DEBT WHEN MANAGERS HAVE FREEDOM OF  
CHOICE**

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## **Abstract**

This study examines the accounting classification of convertible debt in an environment where there is the choice of debt, other capital funds or equity.

Contracting theory suggests possible determinants of accounting choice. These are leverage, as a proxy for closeness to debt covenants, the relative size of the convertible financial instrument issued and the contractual terms of the instrument. Two measures of leverage are used. One is debt to earnings before interest, tax, depreciation and amortisation (EBITDA). This variable has been included as it is the most commonly used ratio in debt covenants. The second measure is debt to net tangible assets as this ratio, or similar ratios, have been used in previous accounting studies to proxy for closeness to debt covenants. As leverage ratios tend to vary between industries I identify whether each firm is above or below their industry average. I find that the best predictor of the accounting classification choice is the contractual terms of the instrument. The two debt covenants derived hypotheses are not supported. The leverage of the issuer and the relative size of the issue have no significant influence on the choice of classification.

Key words:

Convertible debt, accounting choice, classification, debt covenants.

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## 1 Introduction

New Zealand issuers of convertible debt currently have considerable flexibility with respect to the accounting classification used for the convertible. While preference shares, whether convertible or redeemable, are included in equity, the classification of the various forms of convertible debt on issue varies. Classification may be in debt, between debt and equity in other capital funds or in equity. This is in spite of the fact that New Zealand generally accepted accounting practices include as authoritative sources Australian and International standards. IAS 32, released in 1995, and AASB 1033, released in 1996, both require a components approach to compound instruments.

New Zealand differs from most other jurisdictions as they mandate how such instruments will be classified. For financial accounting periods commencing in 2007 New Zealand entities will lose this flexibility. They will be required to comply with NZ International Financial Reporting Standards (NZ IFRS)<sup>1</sup>. The standards include NZ IAS 32 *Financial Instruments: Disclosure and Presentation*. This standard, which defines assets liabilities and equity, will also mandate how convertible debt is classified in the financial statements of issuers. Currently, however, New Zealand provides an environment that offers a unique opportunity to study the factors that may influence managers in their choice of classification of convertible debt.

This paper investigates the determinants of managerial choices in the classification of convertible debt. This differs from previous accounting research into financial instruments that have elements of debt and equity. Researchers have sought to determine the feasibility of various classification alternatives and normative studies have discussed the need for decision useful information about convertible debt. This study extends the research in this area by focusing on the motivations of managers when they choose a classification for convertibles without being constrained by accounting regulations.

The research also extends previous research into the determinants of accounting choice. Previous research has considered changes to accounting methods such as the use of accruals, the method of accounting for inventory, and changes due to changes in accounting standards. There is evidence that debt contracts frequently specify the methods that will be used by stipulating whether existing accounting methods can be changed. This study focuses on the classification of the convertibles in the first financial statements produced after the convertible is issued. The reason for doing this is to look at the effect on the classification of convertible instruments of debt covenants in contracts that were entered into prior to issuing the convertible in question. The advantage of examining a “first time” choice is that it is less

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<sup>1</sup> IFRS must be adopted for periods beginning on or after 1 January 2007 but preparers may opt to adopt for periods beginning on or after 1 January 2005.

likely that the accounting classification of convertible instruments has been subject to any restrictions in the issuer's pre-existing debt contract.

Section two of the paper discusses the environment in which the research is conducted. Section three provides a review of the literature on accounting choice and the development of hypotheses. Section four outlines the sample selection procedures and describes the sample. Section five describes the research design while section six presents the results. The final section concludes the paper.

## **2 The New Zealand environment**

While New Zealand issuers still have flexibility in the classification of hybrid instruments, this will soon change. New Zealand standard setters have committed to adoption of International Accounting Standards by 2007.

Bishop, Bradbury and van Zijl (2004) discuss the range of instruments on issue and the potential impact of NZ IAS 32 on New Zealand issuers. NZ IAS 32 will require that the debt and equity components of a hybrid financial instrument be shown separately in the financial reports. It was found that the restriction on choice of accounting classification for convertible instruments imposed by NZ IAS 32 has the effect of increasing leverage significantly, mainly through the elimination of a "mezzanine" category between equity and liabilities.

Reducing accounting choice has potential benefits for users. Where divergence in accounting methods exists inter firm comparisons may require adjustments to the financial statements to eliminate the effect of differing accounting methods. There are circumstances where reduction in accounting choice can also benefit the preparers of the statements. Beatty, Ramesh and Weber (2002) examined the debt covenants of 206 firms with variable rate debt based on the London Inter Bank Offer Rate (LIBOR). Of these 114 excluded both voluntary and mandatory changes. Regressing the spread of the borrowing rate over LIBOR on a dichotomous exclusion variable and control variables they find that the exclusion variables are negative and significant. This provides evidence that by accepting restrictions on changes, firms obtain lower interest rates.

This reduction likely comes with a cost. As Beatty et al. (2002) note there is a possibility that the firm may be required to produce two sets of accounts, one to comply with current GAAP, and the other using GAAP and accounting policies that were being applied at the inception of the debt contract. Alternatively if the lender requires current GAAP to be used, changes in GAAP may cause a technical breach of an accounting based covenant in the loan or a reduction in the amount of covenant slack between the ratio in question and the level at which the covenant will be breached.

One area where borrowers may still have flexibility is where the specification of the accounting rules has not included unanticipated future transactions and has not specified how they are to be recorded. Since this research focuses on the choice of accounting classification for convertibles in the initial year of issue, covenants relating to pre-existing debt may not specify any rules for this. Research into the relationship between the classification of convertible debt in an environment where there is freedom of choice will provide information on the extent to which covenants affect accounting choices and the extent to which accounting choices influence real choices.

Both the feasibility and the potential effect of decomposing compound instruments into their separate components have been examined in the literature<sup>2</sup>. There has, however, been no research into the classification of convertible debt in an environment where the classification is not mandated. Information on the choices made regarding the classification of convertible instruments will assist in determining the potential impact of the change. This paper provides information on the factors that influence the choice of classification of convertible debt.

### **3 Literature review and hypothesis development**

There is evidence that companies will use financial instruments to manage balance sheet ratios. Engel, Erickson, and Maydew (1999) examine the use of trust preferred stock to achieve classification with equity for financial reporting purposes while maintaining tax deductibility of cash payments to holders. The use of trust preferred stock requires setting up a related entity that qualifies for tax treatment as a partnership or trust. This related entity then issues the preferred stock, loaning the proceeds to the company as deeply subordinated long-term debt. The company is able to record this debt as capital funds but the interest is deductible for tax purposes. Meanwhile the interest income the related entity receives is taxable only in the hands of the investors. Thus the company avoids recording the amount as debt but without the penalty of double taxation. The finding that firms will incur the additional cost of setting up a new entity in order to replace straight debt with a hybrid that can be reported as equity is interpreted as evidence that managers do use the classification of financial instruments to manage balance sheet ratios. This does not, however, provide any insights as to the motivation of managers who use the classification of hybrid financial instruments to manage balance sheet ratios.

There is a research tradition of examining the relationship between the accounting choices and the contracts a firm has in place to determine likely motivations behind accounting

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<sup>2</sup> For examples see Barth et al. (1998), Billingsley et al. (1986) Casson (1998) and Ma And Lambert (1998).

choice. One particular aspect within the contracts that the firm enters into is the presence of debt covenants.

Debt covenants have been seen as a means of reducing the cost of debt by ensuring that shareholders cannot transfer wealth from bondholders to themselves. Many covenants are written on accounting numbers and, since it is costly to violate covenants, managers have incentives to choose accounting methods that will be less likely to lead to default.

There are two factors that determine the influence of debt covenants. One is how close to the prescribed limits of debt covenants the issuers are and how the numbers used in the covenant will be affected. The other is the cost associated with technical default (Foster, 1980). Technical default, which is a violation of a debt contract other than a default on specified payments (Smith, 1993), may require the issuer to renegotiate or refinance unless the holder of the debt provides a waiver.

Renegotiation or refinancing has been found to result in significantly increased costs. Renegotiation typically results in increased interest rates and more covenants added. For those who are forced to refinance, the increase in interest and the number of extra covenants is greater than for renegotiation (Beneish and Press, 1993).

Accounting measures commonly used in debt-based covenants are leverage ratios such as the ratio of debt to equity and debt to total assets (Duke and Hunt, 1990; Press and Weintrop, 1990). Dichev and Skinner (2002) find that the most commonly used accounting based covenant in American private debt contracts is debt to cash flow. They note that there is variation in how this ratio is defined. Several measures of debt can be used and cash flow can be operating cash flow, earnings before interest and tax or earnings before interest, tax, depreciation and amortisation (EBITDA). With any definition of debt in the ratio the reclassification of hybrid instruments required by NZ IAS32 could conceivably cause the issuer to be in technical default of the debt contract or bring firms closer to violation. However, as Smith (1993) notes, technical default due to a mandated change in accounting method is relatively rare. Technical defaults are more likely to be caused by deterioration in the financial performance and position of the firm. The potential problem with a mandated change in accounting method is that the firm could lose some of its covenant slack<sup>3</sup>.

The loss of the covenant slack is likely to restrict future financing and investing. It is also likely to increase the risk of technical violation if losses are experienced in the future. The effect of mandated reclassification may also affect the likelihood of a waiver being granted in the future

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<sup>3</sup> Covenant slack refers to the difference between the required level of the ratio subject to the covenant and the current level of the ratio.



as creditors have been found to use the leverage ratios of the firm when deciding whether to grant a waiver in the event of a technical default (Chen and Wei, 1993).

The literature on accounting choice has been the subject of reviews by Holthausen and Leftwich (1983), Watts and Zimmerman (1990), Christie (1990) and Fields et al. (2001)<sup>4</sup>.

Holthausen and Leftwich (1983) reviewed 9 studies, published from 1979 to 1983, which examine the association between voluntary accounting choice and firm specific determinants. Size and leverage are the only variables consistently found to be significant. While this provides support for the thesis that debt covenants may be related to accounting choice Holthausen and Leftwich provide a caution that the robustness of the results is difficult to judge, in part due to the short time period and limited accounting issues.

Watts and Zimmerman (1990) reviewed papers published during the 1980s. They note that the hypotheses most frequently tested are the bonus plan hypothesis, the debt/equity hypothesis and the political costs hypothesis. They find that there is only limited support for the bonus hypothesis and the support for the political cost hypothesis is “driven by the oil and gas industry”. They do conclude, however, that there is consistent support for the debt/equity hypothesis.

The approach adopted by Christie (1990) is to use three methods of aggregating and testing the results from previous studies. The first method used is an exact chi-square test. This test aggregates a transformation of the significance levels of variables from independent tests<sup>5</sup>. The null hypothesis is that none of the individual statistics is greater than zero. The second method used is an asymptotic test. This test, which relies on the central limit theorem, does not require the tests being aggregated to be independent. The null hypothesis for this test is that the mean of the statistics is not positive. Tests were conducted on seventeen studies published from 1978 to 1988. The variables tested were managerial compensation, interest cover, leverage, size, dividend constraint, and risk. The conclusion was that the variables have significant explanatory power. Thus, to the extent that variables such as leverage, interest cover and dividend constraints proxy for the debt covenant restrictions, this can be interpreted as providing support for the debt covenant hypothesis. As Christie notes however, different studies use the same variable as proxies for different incentives. The final test is a Bayesian test of regressions reported in the studies. The analysis required that tests use least squares analysis and include only contracting and size variables. This restricted the analysis to 5 studies with different events in returns studies tested separately. In this test the overall explanatory power was tested rather than the significance of individual variables.

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<sup>4</sup> There have been other reviews but these provide a comprehensive coverage of the literature with minimal duplication.

<sup>5</sup> The transformation used is minus twice the natural logarithm of the significance levels.

Thus, while the results support the contention that the data is consistent with contracting theory, this test provides no specific information about the debt covenants hypothesis.

In a comprehensive review of the literature on accounting choice Fields et al. (2001) reviewed two specific groups of literature associated with the debt covenant hypothesis. The first group looks at associations between accounting choice and closeness to covenants. The second focuses on firms that have reported debt covenant violations. While Fields et al. note that there has been progress in the use of specific covenants rather than using the debt/equity ratio as a proxy, the results overall were deemed to be inconclusive. They do, however, conclude that there is “a significant amount of data suggesting a relation between accounting choice and violation of debt covenants.”

Since Fields et al. (2001), Beatty and Weber (2003) have examined whether bank debt affects the likelihood of voluntary accounting changes. They also investigated the circumstances that make income-increasing changes likely. Using a sample of firms that had made material voluntary changes and had filed bank contracts with the Securities Exchange Commission (SEC) they found that borrowers whose debt contracts do not proscribe accounting changes are more likely to make income-increasing changes. The likelihood of income-increasing changes is higher for those that have performance-pricing agreements that allow the interest rate to adjust in line with an accounting ratio. Those that have lower expected costs of violation, due to the need to negotiate with only one lender, are significantly less likely to make income-increasing changes. Since most corporate borrowing in New Zealand is from consortiums of banks<sup>6</sup> it is expected that there will be an association between the accounting classification of convertible debt and the accounting ratios used in debt covenants.

Therefore, in investigating the accounting classification of convertible debt in the statement of financial position I use the debt covenants hypothesis. The focus is on the balance sheet classification of the instrument only. The rationale behind the decision not to investigate the accounting classification of distributions was that 73% of firms in the sample show the interest as an expense. The fact that only a minority of issuers charge the interest directly to equity suggests that interest cover ratios do not have a significant influence on the classification.

Rather than simply adopting the proxies used in previous research I follow the suggestion of Holthausen and Leftwich (1983) and investigate the actual terms used in debt covenants. In New Zealand most debt finance raised by listed companies is through private loans from bank consortiums and the actual terms are not publicly available. However the leverage covenant most often used in these loans is debt to earnings before depreciation and amortization

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<sup>6</sup> This information was received from David Blakey, Corporate Manager, BNZ, January 2004.

(EBITDA)<sup>7</sup>. This is consistent with the findings of Dichev and Skinner (2002) in their study of American covenants<sup>8</sup>.

Debt holders need to determine compliance with the covenants on debt contracts that were in place prior to issuance of the convertible debt. The information received from bankers is that, rather than accepting the classification at face value when determining debt levels, the contractual terms of convertible debt are considered. If necessary the debt holder will alter the classification of the convertible debt. This suggests that accounting measures used in debt covenant may be less likely to influence the manager's choice of accounting classification for convertible debt.

The effect of this may be that managers, knowing that lenders will restate the accounts if the classification of the convertible financial instrument seems inappropriate, simply choose to reflect the economic substance of the convertible. Since the classification decision is made when the instrument is issued and the likelihood of conversion is unobservable I use instead the likelihood that the issuer will be able to avoid or delay a cash outflow. I use the rights of each party, as set out in the contractual terms of the instrument, to determine this. If the holder has the right to determine whether the instrument is redeemed or converted the issuer will not be able to avoid or delay a cash outflow. If the terms of the instrument provide for the issuer to determine whether the convertible will be redeemed or converted then it is still possible that there may be a cash outflow but only if the issuer chooses. If the instrument is a mandatory convertible there will be no cash outflow. Thus when the terms allow conversion or redemption to be determined by the holders of the instrument this is categorized as being most like debt. If conversion is mandatory this is categorized as being most like equity. If the contractual terms allow the issuer to determine whether the instrument is converted or redeemed the economic substance is considered to be between debt and equity. If the contractual terms of the convertibles are the salient determinant there should be no relationship between the presence of covenants and the classification of the convertible instruments.

The finding of a relationship between the covenants and the classification of the convertibles need not necessarily imply opportunism. It could be suggested that it is optimal for both parties to the debt contract to have some flexibility built into debt covenants. Assume that a firm has classified a convertible financial instrument in other capital funds or equity when, if it was classified as debt, it would lead to a breach of a debt covenant. The lender can take into account the presence or absence of other indicators that the firm will not be in compliance with other covenants and will not meet all obligations as they fall due. If there are no such

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<sup>7</sup> Information on debt covenants was received from David Blakey, Corporate Manager, BNZ and Stephen Guy, Corporate Manager, National Bank of NZ.

<sup>8</sup> While it is recognised that actual covenant data would be preferable this is not publicly available in New Zealand.

indicators the lender may accept the classification. Where other indicators suggest that there may be problems, lenders can take into account the fact that the convertible instrument is more like debt, and act on the failure to comply with other covenants. This is consistent with the suggestion that lenders use covenants as an option to intervene when desirable but do not find it optimal to act on all covenant breaches (Dichev and Skinner, 2002).

The final possible rationale to explain the classification of convertible instruments stems from evidence showing that managers act as if they believe investors and others are influenced by the reported financial figures without regard to the methods employed to arrive at those figures (Collison et al, 1996). While this appears inconsistent with the efficient markets hypothesis it may be a result of information asymmetry. Details of debt covenants are not always revealed in the financial statements and, where access to these details is available from other sources, it is costly in terms of both purchase price and time. For this reason fundamental analysis of the financial statements may use ratios such as the debt to tangible assets ratio, interest cover and dividend payout ratios as proxies for closeness to covenants (White et al. 1997). This provides a motivation for managers to choose a classification that will not increase the debt ratios if leverage is already high. If, however, leverage is not high the converse does not apply. In that circumstance the choice of classification may depend on managerial expectations with regard to the future capital funding needs and the future profitability of the firm. If this rationale holds, the more commonly used proxies such as debt to tangible assets should be significant.

Accounting ratios vary between industries (Foster, 1986) and this may influence managers' perceptions of their ratio. To control for this, industry adjusted variables are employed.

This leads to the following hypothesis:

*H1: When the ratio of EBITDA to debt, exclusive of the issue of the hybrid financial instrument, is below or equal to the industry average the classification of the instrument will be in equity or other capital funds.*

For all entities this uses the ratio that is employed in many New Zealand debt covenants as a proxy for closeness to covenants. To test whether the results are sensitive to different ratios the analysis will be repeated using a balance sheet leverage ratio as a proxy for closeness to covenants. Duke and Hunt (1990) note that covenants require intangible assets to be excluded from leverage ratios. Consistent with this, the analysis will be repeated with tangible assets (TA) to debt as the proxy.

While the leverage ratio is likely to be influential in determining the classification of the instrument, the potential impact of the convertible issue on the ratio is also likely to influence the classification. Hence the following hypothesis:

*H2: The higher the value of the hybrid financial instrument issue relative to the value of the tangible assets of the firm the more likely the classification of the instrument will be in equity.*

The most likely alternative to the debt covenants hypothesis is that the classification chosen is intended to reflect the manager's interpretation of the economic substance of the convertible. As discussed earlier the sample includes a wide range of convertibles from conventional convertible bonds to mandatory convertible notes. The proxy for the economic substance is whether the terms of the instrument allow for conversion/redemption at the option of the holder, at the option of the issuer or do not allow for redemption. This provides the final hypothesis:

*H3: The contractual terms of the convertible will influence the classification of the convertible financial instruments.*

#### **4 Sample selection and description**

The sample used is drawn from the same set of issuers used in Bishop, Bradbury and van Zijl (2004). However since the announcement of the impending move to NZ IFRS was made in late 2002 data for 2003/2004 has not been included due to possible bias. Other differences result from the fact that this analysis treats each issue as a separate case, while for Bishop et al. any company that made two issues in one year was treated as one case within the sample. In addition listed property trusts have been included although in Bishop et al. (2004) they were excluded due to the effects of NZ IAS on trusts and co-operatives.

The original financial statements for the year-end following issue were examined to determine the classification of the convertible and the conditions for conversion or redemption. Normally classification is decided in the year that the convertible is issued and is not altered in subsequent periods. There was, however, one instance of an entity altering the classification of a convertible some years after it was issued. This was treated as if it was a new issue in the sample as it is possible that a change in the firm's circumstances had led to the change in accounting classification.

Fifty-five listed New Zealand entities were identified as having convertible instruments on issue at some time during the period. This comprised fifty-two companies and three listed trusts. Several entities had raised funds by issuing convertible instruments on more than one occasion. For one company the convertible was, in substance, a funding facility that was drawn down over a period of years. In one other case an issue was not fully subscribed and was kept open over two accounting periods. To avoid biasing the sample with multiple entries of each funding arrangement or issue, only one year was included for each of these

companies. This provided a sample of sixty-five issues of convertible instruments. For two of these the issue and conversion of the convertible instruments was made prior to listing on the NZSE. A third was an issue of a convertible note in 1986, which is before the earliest date used in the study. In addition two issuers had stated that the convertible was classified in accordance with IAS 32. This provided a final sample of sixty issues made by fifty-three entities. Of these sixty observations 16 are classified in liabilities, 27 in capital funds and 17 in equity.

It has been recognised by Bishop et al. (2004) that there is an inherent risk in using a time period that spans 1988 to 2002 inclusive. The risk is that attitudes of managers to the classification of convertible debt may have changed over time. In particular the introduction of IAS 32 in 1995 and AASB 33 in 1996 alter two relevant sources of New Zealand GAAP and could have influenced the classification choice. A chi-square test was used to compare classification of convertibles up to and including 1995 with those after 1995. The chi-square was not significant (3.8) indicating that the attitude to classification of convertibles has not changed significantly between these two periods.

Table 1 shows the classification of the convertible debts together with the features of each instrument. First the economic substance of the convertibles is represented by a three-way classification scheme based on the contractual provisions concerning conversion or redemption (TERMS) and how much scope they provide for the issuer to avoid disbursing cash. Firstly, where the holder is given control over the decision to convert or redeem the convertible the issuer has no control over whether the disbursement of the principal will be cash or shares. Secondly, if the issuer controls the decision the disbursement of the principal may be cash but this can be avoided by the issuing entity. Finally, if the convertible is a mandatory convertible the settlement of the principal amount will be in the form of shares disbursed to holders.

**Table 1 - Terms of the convertible debt**

Ability to avoid cash outflows <sup>▶</sup>	Convert or redeem at the option of the holder <sup>a</sup>	Convert or redeem at the option of the issuer <sup>b</sup>	Mandatory conversion <sup>c</sup>	Total
Classification <sup>▼</sup>				
Liability	9	5	2	16
Other capital funds	9	11	7	27
Equity	3	6	8	17
Total	21	22	17	60

<sup>a</sup> Where the holder has the right to decide whether to convert or redeem the issuing entity has no ability to avoid the outflow of cash.

<sup>b</sup> Where the issuing entity makes the decision to convert or redeem or has the right to override the holder's decision the majority of the cash outflows associated with the instrument can be avoided. If the issuer also has right to accrue interest and convert this to shares, all the cash outflows associated with the instrument can be avoided.

<sup>c</sup> Where conversion is mandatory the only cash flows are the interest payments. Again some convertible debt allows for this to be accrued and converted.

Table 2 shows the number of new issues in each year together with the total convertible instruments on issue in each year. The largest number of new issues was nine in 2002. The largest amount of funds was raised in 1993, when NZ\$1.09 billion was raised.

It is worth noting that the New Zealand Stock Market is very small with the number of listed New Zealand firms ranging from a minimum of 110 in 1992 to a maximum of 220 in 2002 (NZX Fact Book). In 1988 and 1989 it is possible that the number of firms with convertibles on issue is understated. This is due to the fact that no databases were available in New Zealand at that time. Identification of companies with publicly listed convertibles on offer was through the publications of the New Zealand Stock Exchange. Identification of privately issued convertibles relied on examining collections of Annual Reports although these were incomplete as smaller listed companies were rarely included. Over the remaining years the number of convertibles on issue averages more than ten percent of listed firms.

**Table 2 Issues of convertible debt**

Year	Number of new issues of convertible debt	Total value of new issues (\$000)	Entities with convertible debt on issue	Entities listed on the New Zealand Stock Exchange*	Percentage of Firms with convertible debt
2002	9	303167	16	220	7.3
2001	0	N/A	8	131	6.1
2000	3	196440	11	142	7.7
1999	4	103908	17	119	14.3
1998	4	1001978	16	126	12.7
1997	7	355892	17	123	13.8
1996	4	927390	14	121	11.5
1995	6	305392	15	132	11.4
1994	1	223000	13	137	9.5
1993	7	1088450	16	125	12.8
1992	3	622748	12	110	10.9
1991	4	115698	11	111	9.9
1990	4	130063	11	141	7.8
1989	2	201791	7**	267	
1988	2	153386	**	**	
<b>Total</b>	<b>60</b>	<b>\$5729303</b>			

\* Excluding overseas listings

\*\* It is possible that numbers are understated in these years due to the lack of a data base to identify privately issued convertibles.

Table 3 shows the issuers classified according to the sector classifications shown in the NZX Fact Book<sup>9</sup>. Due to the small size of the NZX these are very broad. The percentage of entities in each classification in the sample is given. As can be seen in Table 4 issuers of convertibles were found in fourteen industry classifications. Only two industry sectors were not represented. These were Ports, and Transport. Bishop et al (2004) noted that the representation of Property, Investment and Agriculture is disproportionately high while Intermediates and Durables and Mining are under represented.

<sup>9</sup> The NZX has since reduced the total number of classifications to 13.



**Table 3 - Industry sector weightings**

	<i>Frequency</i>	<i>Sample percentage</i>
Property	11	17
Investment	7	14
Agriculture	6	14
Forestry and Forest Products	5	7
Energy	4	7
Leisure and Tourism	4	7
Consumer	5	7
Food & Beverages	3	5
Media & Telecommunication	4	5
Intermediates and Durables	3	5
Construction and Building Materials	2	3
Mining	2	3
Textiles & Apparel	2	3
Finance & Other Services	2	3
Transport	0	0
Ports	0	0
Total	60	100.0

## **5 Research method**

### **5.1 Variables**

#### **5.1.1 Dependent variable**

In the absence of a standard governing the classification of convertible debt, New Zealand entities use any one of three possible classifications to report the instruments in the Statement of Financial Position. The classifications used are with the liabilities (16 observations), in other capital funds between debt and equity (27 observations), or with equity (17 observations).

While other capital funds is shown as a separate classification it is often shown as a subtotal on the statement of financial position. This is then added to equity and the sum is described as total equity and capital funds, total capital funds or some similar description. The reason for treating other capital funds as a separate category is that there is clearly an attempt to avoid recording the convertible in liabilities. The use of this classification does, however, distinguish the convertible from shareholders funds. Thus I use an ordinal independent variable with three levels that will be coded as follows:

Classification in liabilities = 1, as other capital funds = 2, in equity = 3.

### 5.1.2 Independent variables

The possible influences identified in the preceding section were: EBITDA to debt and the industry average for EBITDA to debt, the size of the issue relative to the size of the issuer, and the terms of the hybrid financial instrument offered.

EBITDA to debt is calculated as EBITDA divided by debt, exclusive of convertible instruments. Where EBITDA was negative a lower bound of zero was imposed. The industry-adjusted variables were calculated for each case in the sample by using financial information for all entities in the same industry in the year the convertible instrument was offered. Because the influence will vary depending on the relationship between the leverage variable and the industry average two additional variables have been created. The first is equal to the value of EBITDA/debt if the average is lower than or equal to the industry average and 0 if it is higher than the industry average. The second is equal to the value of EBITDA/debt if the average is higher than the industry average and 0 if it is lower than the industry average. The relative size of the issue was calculated as the value of the issue divided by the net tangible assets (NTA) of the issuer.

Finally the contractual terms of the convertible instruments proxy for the economic substance of the instrument. The likelihood of conversion can alter with changes in the share price and changes in interest rates. This makes the eventual outcome uncertain when issuers are determining the classification at the time of issue. Instead of probability of conversion I use ability of the issuer to avoid or delay outflows of cash as a proxy for economic substance. If the holder has the right to convert or redeem, the issuer is considered to have little or no control to avoid cash outflows. This is categorised as being more like debt. If the issuer has the right to decide, the control increases. In such cases the holder may still control the timing of conversion or redemption but the issuer can decide whether to redeem for cash or issue shares. This is categorised as falling between debt and equity. Where conversion is mandatory there are no cash outflows associated with the principal. This is categorised as being more like equity.

## 5.2 The models

The first model regresses the leverage variable and a separate dummy variable indicating whether the firm is above or below the industry average along with the relative size of the convertible instruments issue.

$$CLASS \approx \beta_1 LEV + \beta_2 AVLEV + \beta_3 ISS + \beta_4 TERMS1 + \beta_5 TERMS2 + e \quad (1)$$

Where:

CLASS is the classification of the convertible security 1 = liabilities, 2 = other capital funds and 3 = equity,

*LEV* is EBITDA divided by debt, exclusive of convertible notes,  
*AVLEV* is a dummy variable coded 0 if lower and 1 if higher than the industry average of EBITDA to debt,  
*ISS* is the issue value of the convertible notes/net tangible assets,  
*TERMS1* is a dummy variable coded 0 if the holder has the right to redeem or convert, otherwise 1,  
*TERMS2* is coded 0 if conversion is mandatory otherwise 1, and  
*e* is an error term.

This model provides a joint test of the three hypotheses.

The sign on *LEV* should be negative as the lower the ratio the more likely the chosen classification will be equity. A level of debt that is higher relative to other firms in the industry is hypothesized to influence the classification towards equity. Therefore the industry average variable is predicted to have a negative coefficient. It is expected that the *ISS* coefficient will be positive as the larger the relative size of the issue the larger the effect on the leverage ratios. This should increase the probability of classification in equity. *TERMS1* and *TERMS2* are dummy variables for the contractual terms. These enter the regression as factorial variables. In *TERMS1* the expected classification of convertibles that convert at the option of the holder is debt rather than equity or other capital funds. Thus the coefficient is expected to be negative. Mandatory debt is most likely to be classified as equity leading to the expectation that coefficient on *TERMS2* will be positive. The hypothesis suggests that convertibles that may be redeemed or converted at the option of the holder are much less likely to be classified in other capital funds or equity than mandatory debt. This is determined by subtracting the coefficient of *TERMS2* from that of *TERMS1*. The amount should be negative and larger than the results for *TERMS1* and *TERMS2*.

It is likely that there is an interaction between the dummy leverage variable and the leverage variable. The SPSS facility was used to model the interaction between these variables. When used with the ordinal regression facility this creates two variables, *LEVHI* and *LEVLO*. *LEVHI* equals *LEV* where EBITDA/debt is above the industry average and equals zero if below. *LEVLO* equals *LEV* where EBITDA/debt is below the industry average and zero where above. The model is tested with this in place of the *LEV* and *AVLEV* variables. This gives the following model:

$$CLASS \approx \beta_1 LEVHI + \beta_2 LEVLO + \beta_3 ISS + \beta_4 TERMS1 + \beta_5 TERMS2 + e \quad (2)$$

Where:

*LEVHI* = *LEV* where this is above the industry average otherwise 0

$$LEVLO = LEV \text{ where this is below the industry average otherwise } 0^{10}$$

Again the expected sign for *ISS* is positive and the coefficient should be positive for *LEVLO* indicating that, where *LEV* is below average, the likelihood of classification in equity increases.

The models are analysed using logit ordinal regression. Ordinal regression allows the user to model multiple levels of ordinal dependent variables where the choice of response categories can be quite variable and the independent variables can be discrete and/or continuous (McCullagh, 1980).

## 6 Results

Descriptive statistics of the variables are shown in Table 4. The minimum and maximum values of EBITDA to debt (*LEV*) ranges from zero to 2.86<sup>11</sup>. The convertible instruments issue divided by tangible assets (*ISS*) range from .19% to 485% of TA. The means for *LEV* and *ISS* are lower than the median indicating that the variables are skewed.

**Table 4** Descriptive data

	<b>CLASS</b>	<b>LEV</b>	<b>AVLEV</b>	<b>ISS</b>	<b>TERMS1</b>	<b>TERMS2</b>	<b>LEVHI</b>	<b>LEVLO</b>
Mean	2.017	.319	.433	.252	.650	.720	.230	.089
Median	2.000	.205	.000	.138	1.000	1.000	.000	.000
Std Deviation	.748	.430	.499	.633	.481	.454	.459	.128
Minimum	1.000	.000	.000	.002	.000	.000	.000	.000
Maximum	3.000	2.865	1.000	4.85	1.000	1.000	2.866	.606
n =	60	60	60	60	60	60	60	60

The correlation matrix for the variables is shown in Table 5. The expectation in hypothesis one, which is based on the debt covenants hypothesis, is that *LEV* would be negatively correlated with *CLASS*. The correlation, however, is positive but not significant. *ISS* is, as expected, positively correlated with *CLASS* although it is significant only at 10%. The correlation between *TERMS1*, which is not related to the debt covenant hypothesis, and *CLASS* is positive and significant at 5%. The implication is that convertibles, which provide the holder with the option of converting or redeeming, are more likely to be classified in liabilities. *TERMS2* is negatively correlated with *CLASS*, significant at 5%. This is as expected since mandatory convertibles that may be expected to be classified as equity are assigned a value of 0, while those that convert at the option of the holder or issuer are grouped together as 1. This is consistent with the result for *TERMS1*. The negative

<sup>10</sup> It should be remembered that because debt is the denominator those above the industry average have lower relative debt levels.

<sup>11</sup> Negative values of EBITDA to debt have been set to zero. This is because an increase in debt when EBITDA is negative moves the ratio up towards zero.

correlations between *LEVLO* and *LEV*, *AVELEV* and *LEVHI* are unexpected. This may be due to the use of the dummy 0 for variables that are above average. On the whole the correlation matrix is not consistent with the debt covenants hypothesis although it provides support for the third hypothesis.

**Table 5 - Kendall's tau-b Correlation Statistics (level of significance, 2 tailed)<sup>a</sup>**

	<b>LEV</b>	<b>AVLEV</b>	<b>ISS</b>	<b>TERMS1</b>	<b>TERMS2</b>	<b>LEVHI</b>	<b>LEVLO</b>
CLASS	.114 (.263)	.024 (.848)	.186* (.067)	.283** (.022)	-.270** (.028)	.048 (.665)	.106 (.339)
LEV		.496*** (.000)	.091 (.307)	.192* (.076)	-.193* (.074)	.647*** (.000)	.071 (.466)
AVLEV			.032 (.756)	.148 (.255)	-.197 (.131)	.855*** (.000)	-.671*** (.000)
ISS				.258** (.016)	-.117 (.275)	.090 (.351)	-.057 (.557)
TERMS 1					-.461*** (.000)	.190 (.105)	-.082 (.253)
TERMS 2						-.236** (.044)	.153 (.597)
LEVHI							-.574*** (.000)

<sup>a</sup> Nonparametric correlations have been used as some of the variables are ordinal and the scalar variables do not conform to a normal distribution.

\*\*\* Significant at 1 percent

\*\* Significant at 5 percent

\* Significant at 10 percent

Model 1 regresses the independent variable *CLASS* on *LEV*, *AVLEV*, *ISS*, *TERMS1* and *TERMS2*. Table 6 reveals that the Chi-Square of model 1 is significant at the 5% level. The pseudo  $R^2$  values range from .103 to .217 suggesting that much of the variation in the classification remains unexplained.

The coefficients on the variables that are suggested by the debt covenant hypothesis are not significant. The coefficients for *LEV* and *AVLEV* are not significant and have the wrong sign. This clearly does not support hypothesis one. The evidence also fails to support hypothesis two. The coefficient on *ISS* is not significant. Overall the classification of convertible financial instruments is not explained by the debt covenants hypothesis.

The coefficient on *TERMS1* is negative but not significant suggesting that, when the comparing the classification of convertibles where the holder has the right to make the choice to redeem or convert with those where the choice lies with the issuer, the instrument is not significantly more likely to be classified as debt. When the comparison is between mandatory debt and the reference category the sign is positive but again not significant. When the comparison between convertibles where the holder has the right to make the choice to redeem or convert and mandatory debt is calculated the coefficient is negative and, at -

1.477<sup>12</sup>, is high enough to be significant at the 5% level<sup>13</sup>. These results support the hypothesis that the classification chosen is based on the contractual terms of the instrument. This may be due to the fact that managers know that lenders will scrutinise the terms of the instrument and draw their own conclusions about the nature of the convertible. This would negate the results of any attempt to avoid increasing ratios used in debt covenants. Alternatively managers may choose the classification to provide information to the market about their ability to delay or avoid cash outflows associated with redemption of convertible instruments.

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<sup>12</sup>  $\beta_5 - \beta_4 = -.806 - .671 = -1.477$

<sup>13</sup> Wald statistic = 4.57

**Table 6**

Test of the relationship between classification of the convertible financial instrument and the relative size of the issue, the debt to EBITDA, the industry average for debt to EBITDA and the contractual terms of the instrument. (Link function: Logit)

Parameter Estimates

Variables	Chi-Square	LEV (EBITDA/Debt)	AVLEV = 0 (Industry Ave EBITDA/Debt)	ISS	TERMS1	TERMS2	LEVLO	LEVHI	Pseudo R2		
Expected Sign		(-)	(-)	(+)	(-)	(-)	(+)	(-)	Cox and Snell	Nagelkerke	McFadden
Model 1 (Wald Statistic)	9.978*	.445 (.160)	.332 (.315)	1.060 (.589)	-.806 (1.781)	.671 (1.078)	N/A	N/A	.153	.174	.078
Model 2 (Wald Statistic)	10.445*	N/A	N/A	1.167 (.726)	-.805 (1.779)	.680 (1.113)	2.100 (.900)	.191 (.040)	.160	.181	.081

\*\*\* Significant at 1 percent

\*\* Significant at 5 percent

\* Significant at 10 percent

Model 2 replaces *LEV* and *AVLEV* with the interaction variables *LEVHI* and *LEVLO*. The results of this test, shown in Panel B of Table 6, are very similar to model 1. The -2 Log Likelihood Chi-Square is significant at 5% and the Pseudo  $R^2$  range from .104 to .219. Again the signs for *TERMS1* and *TERMS2* are in the right direction but not significant. The comparison between convertibles that redeem or convert at the option of the holder and mandatory convertibles when calculated is significant. The results support hypothesis three but not hypotheses one and two.

To test the model for sensitivity to different measures of leverage I repeated the analysis substituting TA to debt for EBITDA to debt in the *LEV* variable. The results in Table 7 are consistent with the previous results with the contractual terms of the convertibles being the only significant predictor of the classification.



**Table 7**

Test of the relationship between classification of the convertible financial instrument and the relative size of the issue, debt to tangible assets, the industry average for debt to tangible assets and the contractual terms of the instrument. (Link function: Logit)  
Parameter Estimates

Variables	Chi-Square	LEV (NTA/Debt)	AVLEV (Ave NTA/Debt)	ISS	TERMS1	TERMS2	LEVLO	LEVHI	Pseudo R2		
Expected Sign		(-)	(-)	(+)	(-)	(-)	(+)	(-)	Cox and Snell	Nagelker ke	McFadde n
Model 1 (Wald Statistic)	10.196*	.077 (.514)	.280 (.239)	.927 (.818)	-.819 (1.864)	.701 (1.116)	N/A	N/A	.156	.177	.079
Model 2 (Wald Statistic)	10.005*	N/A	N/A	1.041 (.758)	-.868 (2.175)	.578 (.816)	.033 (.053)	.064 (.325)	.154	.174	.078

\*\*\* Significant at 1 percent

\*\* Significant at 5 percent

\* Significant at 10 percent

## **7 Summary and conclusion**

The objective of the study is to obtain information about the factors that influence a manager's choice of classification for convertible instruments. Using contracting theory I identify possible determinants of the classification. These are the EBITDA to debt as a proxy for closeness to debt covenants and the relative size of the convertible financial instrument issued as an indication of the size of the effect on debt covenants. It is expected that, if the debt covenants hypothesis holds, the higher the debt ratio and the larger the relative issue size the more likely it is that the classification chosen will be equity.

I also include the contractual terms of the convertible. These are included as proxies for the degree of control managers have over the timing of conversion or redemption and whether they can avoid cash outflows.

The first two hypotheses are derived from the debt covenants hypothesis. Hypothesis one is that the debt to EBITDA ratio most commonly used in debt covenants will influence the classification. The results fail to provide any support for this hypothesis. A model utilising an alternative ratio that has been used as a proxy for debt covenants in early studies also fails to provide support for the theory. The second hypothesis is that the size of the issue will influence the classification. While this is weakly correlated with the classification, the variable is not significant in the regression. There is not sufficient evidence to suggest that this hypothesis is supported.

The analysis provides no evidence that managers use the classification of convertible instruments to avoid an increase in the ratio that is used in debt contracts. While this evidence is not consistent with the debt covenants hypothesis it may be due to the fact that lenders will scrutinise the contractual terms of a convertible when determining compliance with pre-existing debt covenants.

The third hypothesis is that a variable representing the contractual terms of the convertible instrument influences the choice of classification. This variable is found to have predictive power in the regression. It is also the only variable that is correlated with the classification chosen for the convertibles at the 5% level. There are two possible explanations for this result. One is that, even though the classification of convertible financial instruments may not be specifically covered in debt covenants, managers do not expect lenders to simply accept the classification of an instrument. The other possible explanation is that managers simply choose the classification that best informs financial statement users of the degree of control they have over the conversion or redemption of the convertible instruments.

There are limitations to this study. One is that, to obtain a sample large enough to analyse I had to combine data from many years. While the possibility that changes in international and Australian accounting standards has been eliminated there may be changes that were not evident when this was tested using the 1995/96 period as the point of possible change.

In addition the sample size has forced the number of variables to be limited. Normally in this type of research size is included even if only as a control variable. The size limitation has also meant testing separate models and drawing conclusions about the relative merits of each. This is mitigated to a large degree by the fact that all models have provided consistent results.

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\* The proceedings erroneously fail to include Bradbury and van Zijl as co-authors.

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