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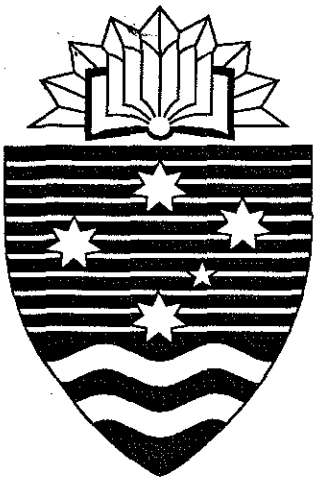
Income strategies of listed and unlisted companies: an empirical study of accounting method choices

Keith Duncan
Bond University, Keith_Duncan@bond.edu.au



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Keith Duncan

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INCOME STRATEGIES OF LISTED AND UNLISTED COMPANIES: AN EMPIRICAL STUDY OF ACCOUNTING METHOD CHOICES

KEITH DUNCAN*

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* ASSISTANT PROFESSOR ACCOUNTING AND FINANCE, BOND UNIVERSITY, AND VISITING ASSISTANT PROFESSOR OF ACCOUNTING, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES.

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INCOME STRATEGIES OF LISTED AND UNLISTED COMPANIES: AN EMPIRICAL STUDY OF ACCOUNTING METHOD CHOICES

Abstract

This paper explores whether the political and contracting environments for listed and unlisted companies gives rise to different wealth incentives for management to judiciously select a portfolio of accounting procedures for the firm. The analysis indicates significant differences in the method choices made by the managers of listed and unlisted firms. For the listed firms, size as a proxy for political costs is negatively related to portfolio choice, supporting the political cost hypothesis. In addition, leverage and directors' percentage ownership are positively related to portfolio choice and thus support the debt contracting cost hypothesis. In contrast, none of the contracting or political cost variables are significantly related to the choice of accounting method portfolio by unlisted firms. Overall the evidence provides some support for the positive accounting hypothesis that firms choose income strategies.

INCOME STRATEGIES OF LISTED AND UNLISTED COMPANIES: AN EMPIRICAL STUDY OF ACCOUNTING METHOD CHOICES

INTRODUCTION

Much empirical research has developed and tested Watts [1977] and Watts and Zimmerman's [1978, 1979] positive theory of lobbying and accounting method decisions. However, the majority of the voluntary method choice studies concentrate on single accounting method choices.[1] They examine individual accounting method choices for a cross-section of firms in isolation from all other accounting method choices made by those firms. The exception to this generalization is Zmijewski and Hagerman's [1981] portfolio choice study which maintains that managers do not choose accounting methods in isolation. Rather managers choose a portfolio of accounting procedures. The choice is a function of the net management wealth effects associated with the contracting and political costs the firm faces. In order to maximize management wealth Zmijewski and Hagerman [1981] contend that managers will choose accounting methods so at any point in time their firm will employ an optimal mix of accounting methods. That is, the firm's portfolio of methods will minimize the contracting and political costs to the firm and thus maximize the bonus payments and net share returns to managers.

This paper extends the sparse research to date (see Ronen and Aharoni [1989], and working paper by Aitken and Loftus [1991]) that builds on the notion that accounting choices are made at the portfolio level rather than at the individual level. The contribution of the paper is to explore the portfolio choices made by the managers of firms operating in significantly different political and contracting environments. Listed firms have a higher public image than unlisted firms and are subject to the discipline of public debt and equity markets. Thus it is expected that political and debt contracting cost variables as well as the level of managerial ownership will have a greater influence on the accounting portfolio choices of listed firms. The current paper focuses on explaining the joint choice of the methods used to account for inventories, depreciation, and asset revaluations. The analysis indicates the portfolio of methods chosen by listed and unlisted firms are different, but that only the method choices of listed firms are associated with contracting and political cost variables.

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1 For reviews of this literature see Kelly [1983], Holthausen and Leftwich [1983], Watts and Zimmerman [1986,1990], Wong [1988b] and Duncan [1991].

PORTFOLIO OF METHODS

GAAP affords managers discretion in the choice of method to use in recording a range of business transactions. However, in this study we are interested in only those method choices that impact on the determination of reported income. The set of possible method choices to study is further restricted to those methods for which the actual choices made by firms are cross-sectionally different for a reasonably large sample of firms.[2] This excludes method choices such as the decision to expense or capitalize research and development (R & D) expenditure, because the treatment of R & D expenditure is disclosed by only 17% of New Zealand listed companies. Three discretionary methods are identified as appropriate for the current study: inventory valuation, depreciation method for plant and equipment, and the basis (revalued or historic cost) for depreciating buildings.

Statement of Standard Accounting Practice 4 (SSAP4) covers the valuation and presentation of inventories. The standard allows the use of any of several methods of inventory valuation, including first in first out (FIFO), weighted average cost (WAC), last in first out (LIFO), basestock, and specific identification. However, SSAP4 as drafted for 1985, the sample year of this study, states in paragraph 5.5 that " ... the historical cost of inventories should be accounted for using the FIFO formula or a weighted average cost formula."

In addition, paragraph 5.6 allows the use of specific identification for of goods that are not normally interchangeable or that are associated with a specific project. Paragraph 5.7 allows the use of LIFO or base stock formula subject to disclosing the difference between inventory calculated on that basis, and inventory calculated on a FIFO or WAC basis. New Zealand tax law does not, however, allow the use of LIFO. Thus managers have in effect a choice between two formulae, FIFO and WAC. The former has an income increasing effect and the latter an income decreasing effect on current reported income, under the assumption that prices are increasing.

SSAP3 covers the depreciation of fixed assets and the "new" standard, issued in October 1984 and effective for the periods ending on or after 31 March 1985, states in paragraph 5.2 that:

> The depreciable amount should be allocated as fairly as possible to the periods expected to benefit from the use of the asset. The method of allocation should correspond to the expected pattern of exhaustion of the asset's service potential.

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2 The distribution of each method was determined by examining Ryan [1987].

Clearly the method chosen requires one to exercise judgment as SSAP3 does not recommend the universal use of any particular method. However, SSAP3 (Para 2.1(e)) as drafted for the reporting years prior to 1985 states that " ... the most suitable method for general application is the straight line method of calculating depreciation."

The New Zealand Society of Accountants shifted the emphasis of SSAP3 from a 'preferred' method to requiring professional judgment, thus allowing managers more discretion as to which method they adopted. Nevertheless, for both the 1984 and 1985 income years the New Zealand Inland Revenue Department allowed the use of diminishing value depreciation, an accelerated depreciation method, for plant and equipment. Some companies employ this depreciation method in their financial reports while others use the straight line method. Presumably tax minimization incentives would ensure most if not all companies adopt the tax allowed rates for tax purposes. Hence, management is able to choose one of two accounting methods to calculate the depreciation for plant and equipment reported in the firm's financial reports. Choosing straight-line depreciation increases current reported income, while choosing diminishing value, or accelerated depreciation, deflates current income.

It is standard practice in New Zealand and Australia for companies to revalue their land and buildings on a regular basis. The revalued amount is normally credited to an asset revaluation reserve in the shareholders' funds section of the balance sheet. Although it is common practice to revalue buildings, it is not mandatory; companies can choose whether or not to revalue their buildings. Generally, the revaluation of itself has no effect on current reported income. However, the income effect of the revaluation induced change in depreciation base can be quite considerable. SSAP3, as it applied to the 1985 reporting year states in paragraph 5.6 that for assets which have been revalued " ... the charge for depreciation should be based on the revalued amount."

By revaluing buildings, management avails itself of a greater depreciation charge each year. Thus revaluing buildings has a deflating effect on current reported income. However, there are some companies that revalue their buildings and do not depreciate them. For these companies the revaluation is income increasing as they will report reduced expenses. This 'revaluation and no-depreciation' option is adopted by only a few companies but will be more income increasing than historical cost depreciation. Firms adopting the 'no depreciation' option have been excluded from the sample for the current study.

Alternatively, some companies may revalue and charge deprecation on the revalued base and then amortize the revaluation reserve back into income, as recommended by *Technical Practice Aid 3*. This amortization effectively offsets the higher depreciation due to the revaluation and thus results in the revaluation decision having no income

effect. Unfortunately the data for this paper were collected before this possibility was considered so the exact proportion of firms affected thus is indeterminable. Nevertheless, only a very small proportion of firms are expected to adopt this strategy and the coding problems it poses are considered to be insignificant.

These three method choices can be aggregated to give an "income strategy" for each firm (Zmijewski and Hagerman [1981]). A firm's income strategy, the dependent variable for this study, will fall in the range from the most income increasing to the most income decreasing strategy depending on the specific combination of methods the firm chooses. Each firm's income strategy is determined by coding and summing the method choices in Table 1 as (1) for income increasing and (0) for income decreasing.

Insert Table 1 Here

Following Zmijewski and Hagerman's [1981] assumption that each accounting method choice has the same effect on income, there are four possible accounting method portfolios or income strategies. These range from choosing all the income increasing methods through to choosing all the income decreasing methods. The combinations of policies that make up these four possible strategy choices are shown in Table 2.

Insert Table 2 Here

Given the relatively low levels of disclosure by New Zealand firms, it is virtually impossible to measure the actual income effect of the accounting method choices being studied. A number of assumptions are necessary to even approximate the income effect of each firm's income strategy[3]. An alternative approach, employed by Zmijewski and Hagerman [1981], is to explore the behaviour of the model over a range of income effect assumptions. Three plausible alternative income effect assumptions are that: (1) depreciation base for buildings has twice the impact on income compared to either of the other two method choices; (2) depreciation base and inventory method choices have twice the income effect relative to that of the plant and equipment depreciation choice; and (3) depreciation base and plant and equipment depreciation method choices affect income twice as much as the inventory method choice. Each of these alternative assumptions results in a different set of possible income strategies which are labeled in Table 2 respectively as the 5, 6a and 6b strategy cases.

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3 Aitken and Loftus [1991] illustrate the problems associated with estimating the income effect of accounting method choices for Australian firms.

HYPOTHESES AND MEASURES

A common criticism of the accounting choice studies is the inconsistent use of proxy variables to measure political and contracting costs. Although the hypothesized relationships are well specified, the results of empirical testing are equivocal because of inconsistent and inappropriate choice of proxies. To overcome the inconsistency problem the current study uses proxies that have been employed widely in prior studies. Further, the appropriateness of the proxies is determined by evaluating the evidence of prior studies and the nature of the contracting and political environment surrounding the reporting of income by New Zealand firms.

The positive accounting literature maintains that large firms are subject to public scrutiny and that higher reported earnings increases the probability of government regulation and other political costs. Hence, large firms are more likely to choose accounting methods which decrease reported income. The conventional firm size hypothesis (Watts and Zimmerman [1978, 1986]) predicts a negative relation between firm size and income strategy, because the income increasing portfolios (i.e. 4, 5, and 6) imply high political costs. In this study size is measured by gross revenue and total assets as both measures are used extensively in the literature. The hypothesis tested is:

HYPOTHESIS 1: Ceteris paribus, firm size is negatively related to choice of income strategy.

The problem with size, however, is that it could proxy for any number of underlying factors, including political costs (Ball and Foster [1982]). Further, Bowen, Noreen and Lacey's [1981] evidence implies that firm size on its own may not capture a firm's political costs. Ball and Foster [1982] suggest that industry membership is a more appropriate proxy for the political costs a firm might incur. There is some empirical evidence that industry membership is related to method choices in a fashion consistent with the political cost hypothesis (see Bazley *et al* [1985] and Bowen *et al* [1981]). The Commerce Act 1975 provides a measure of the political sensitivity of New Zealand industries. The first and second schedules to *The Positive List of Controlled Goods and Services 1981* regulations specify goods and services subject to price control under Part IV of the Commerce Act 1975. Firms dealing in goods and services appearing on the "positive list" as it stood at the start of 1985 are likely to be under political scrutiny during 1985. A binary dummy variable is used to proxy for this political sensitivity (1 if firm dealt in goods and services on the list, and 0 otherwise). Hence the following hypothesis is tested:

HYPOTHESIS 2: Ceteris paribus, membership of a politically sensitive industry is negatively related to choice of income strategy.

An alternative size-industry hybrid proxy is Zmijewski and Hagerman's [1981] firm sales to industry sales concentration ratio. Large firms in politically sensitive industries are expected to attract greater political attention, and hence political costs, than relatively small firms in the same industry. This suggests the hypothesis that:

HYPOTHESIS 3: Ceteris paribus, sales concentration is negatively related to choice of income strategy.

Reported tax rate, defined as reported income tax expense divided by net income before tax, is an alternative measure of political costs. Wong [1988a] notes that New Zealand company reported tax rates are highly political, giving firms an incentive to use export tax credits to 'manage' their income and reported tax expense ratios.[4] Wong's [1988a] analysis can, however, be extended to any method choice which both alters reported income, and creates an offsetting permanent taxation difference so as to leave reported tax expense unchanged. Such method choices that change reported income relative to reported tax expense would therefore have an impact on reported tax rates and thus represent a tool for reducing political visibility associated with low reported tax rates. Of the three methods examined in the current study only the basis for building depreciation has an impact on income **and** creates a permanent difference which increases the reported tax rate. Basing building deprecation on a revalued amount reduces income but creates a permanent difference that leaves, ceteris paribus, tax expense unchanged. Thus, this choice increases the reported tax rate. None of the other methods, however, affect the reported income - tax expense relationship, rather they impact on deferred tax. Therefore, as the revaluation option features in the more income decreasing strategies it is hypothesized that:

HYPOTHESIS 4: Ceteris paribus, reported tax rate is positively related to choice of income strategy.[5]

Restrictive covenants in debt agreements limit executives' ability to expropriate wealth from debt holders. Emanuel [1976], Smith and Warner [1979], and Whittred and Zimmer [1986] report that interest cover and leverage restrictions are common accounting-based constraints imposed by debt covenants. The income increasing method portfolios are more likely to be chosen by firms that are close to their interest cover

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4 Export tax credits were themselves highly politicized and were treated as either a reduction in tax expenses or as an addition to sales. The first treatment reduced tax expense relative to income, reducing the reported tax rate. The second treatment increased income and tax expense but increased tax expense proportionately more, thus increasing the reported tax rate.

5 When it comes the reporting of tax all else is of course not equal. Other factors, such as export tax credits and deferred tax issues, impact on the treatment of tax in financial reports (see Wong [1987 and 1988a]).

constraint as increasing income reduces the tightness of the constraint. Low interest coverage is a proxy for this closeness, given that New Zealand public debt agreements impose a "boiler plate" constraint of three (Wong [1988a]). Hence the following hypothesis is tested:

HYPOTHESIS 5: Ceteris paribus, interest coverage ratio is negatively related to choice of income strategy.

Leverage is employed extensively to test the debt covenant hypothesis. An underlying assumption in the research is that leverage proxies for closeness to debt constraints. This may be invalid given the cross-sectional variation in the leverage constraint[6] in New Zealand debt agreements (see Emanuel [1976]). Nevertheless, it is argued that firms with high levels of debt are more likely to choose income increasing accounting methods which inflate shareholders' retained earnings and equity and thus avoids violating the firm's debt contracts. Therefore the hypothesis tested is that:

HYPOTHESIS 6: Ceteris paribus, leverage is positively related to choice of income strategy.

The existence of earnings based executive bonus schemes could also affect the choice of income strategy. Where there is an earnings based compensation/bonus scheme, executives have a wealth incentive to choose an income increasing portfolio of methods (Healy [1985]; Murphy [1985]). Unfortunately New Zealand companies are not required to disclose bonus scheme data and they do not do so voluntarily (Wong [1987]). Nevertheless, evidence suggests there is an increasing use of executive bonus schemes in New Zealand (Hart [1987]). Thus, rather than exclude the testing of the bonus hypothesis from the current study a retrospective survey of New Zealand listed and unlisted companies was conducted. The results indicated that only 33.5% (64/191) the listed companies and 11.4% (22/193) the unlisted companies that returned the questionnaire operated a profit based bonus scheme in the sample year.[7] Even though these percentages are low, a zero/one dummy variable is included in the analysis to avoid creating a correlated omitted variable problem. Essentially the hypothesis tested is:

HYPOTHESIS 7: Ceteris paribus, the existence of an income based bonus plan is positively related to choice of income strategy.

Zmijewski and Hagerman [1981] provide evidence of a 'threshold' below which the positive accounting theory model is not valid. They maintain that small firms and firms in less concentrated industries will be below this 'threshold'. Penno and Simon [1986]

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6 Defined in the majority of New Zealand loan agreements to be total liabilities to total assets.

7 Further detail on the bonus survey is available from the author.

suggest an alternative approach for testing this 'threshold effect'. They argue that whether a firm is listed (manager-controlled) or unlisted (owner-controlled) should impact on accounting method choice.[8] This dichotomization into owner and manager controlled firms draws on the earlier work of Williamson [1967]. In particular, the dependence on external equity markets for financing, and/or the use of accounting numbers in incentive compensation plans provides an incentive for manager-controlled firms to choose income increasing accounting methods. The use of management percentage ownership to proxy for compensation incentives is an interesting variation to the bonus plan hypothesis. An alternative hypothesis is that listed firms are subject to more political scrutiny and hence will choose income reducing methods to avoid potential political costs. Thus one would expect the contracting and political cost variables to be more important for the method choices of listed firms than unlisted firms. The hypothesis tested is that:

HYPOTHESIS 8: Ceteris paribus, listing status is a significant factor in explaining income strategy.

The extent to which the incentives of senior executives (directors) of listed firms are in line with those of their shareholders can be proxied by ownership percentage.[9] The greater the percentage of shares held by directors the more likely they are to make method choices in line with shareholder wealth incentives. This is due to a direct effect on executive wealth of any change in share prices and the fact that the value of executive human capital relates positively to changes in shareholder wealth (Holthausen and Leftwich [1983]; Fama [1980]). In an information efficient capital market directors would have an incentive to avoid political and debt renegotiation costs due to the negative impact of such costs on the value of the firm's shares. This gives us two competing expectations. If the firm is subject to high political costs relative to debt costs then executives would have an incentive to choose income reducing policies. However, if the situation is vice versa, the incentive is to choose an income increasing portfolio. Therefore the non-directional hypothesis is that:

HYPOTHESIS 9: Ceteris paribus, the percentage ownership by directors is a significant factor in explaining listed firms' income strategy.

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8 Penno and Simon (1986) refer to public firms and 'privately-held firms' rather than listed and unlisted. However they define the term 'privately-held firm' as being synonymous with 'closed corporations' in that the company's shares are not sold in active markets. The converse being the case for public firms.

9 Unfortunately no data was available on the percentage ownership by directors of unlisted firms thus this hypothesis only relates to the listed firms in the sample.

SAMPLE

The sampling frame for the study consists of the 256 firms listed on the New Zealand Stock Exchange at the end of 1985, and the 435 unlisted public firms participating in the University of Otago Company Report Library project. Firms classified as operating in specialist industrial sectors such as dairy co-operatives, milk producers, stock yard companies, financial institutions, insurance companies and property companies, were excluded because the nature of their business and capital structure makes them vastly different from most other firms in the New Zealand market. This industry criterion and the availability of accounts left 145 listed firms and 223 unlisted firms from which to draw a sample. Deleting those listed firms that did not use the methods examined by the current study, did not charge deprecation or did not disclose sales, left a final sample of 125 listed firms. Similar method choice and disclosure problems reduced the unlisted sample to 139, of which 125 were randomly selected for inclusion in the study. The total sample of 250 firms is representative of the manufacturing, wholesale and retail sectors.

RESULTS

Both univariate and multivariate statistical tests are employed to test the hypotheses. Univariate tests are used to explore the differences in the accounting methods chosen by listed and unlisted firms. A multivariate test, N-probit analysis, is used to test the positive theory model on the whole sample of 250 firms and then separately for the 125 listed and 125 unlisted firms.

Univariate Analysis

A series of chi-square tests are performed to determine if there are any differences in the distribution of individual methods or the portfolio of methods chosen by listed versus unlisted firms. The results reported in Panel A of Table 3 show there is no difference in the proportion of listed versus unlisted firms using FIFO or weighted average cost (WAC) methods to account for inventory. FIFO is the most popular method with over eighty percent of both the listed and unlisted firms choosing this method.

In contrast to the inventory method results, Panel B of Table 3 indicates there is a significant difference between the depreciation method used for plant and equipment. Over ninety percent of the listed firms use the income increasing method, straight line depreciation, but only forty six percent of the unlisted firms use this method. The remaining fifty four percent of the unlisted firms used the tax allowed method, diminishing value. This pattern for the unlisted firms is consistent with Penno and Simon [1986].

A similar result is found for the choice of depreciation base. Panel C of Table 3 shows that eighty two percent of the listed firms adopt the income decreasing policy of revaluing their buildings. In contrast only forty one percent of the unlisted firms revalue their buildings.

Finally there is some difference in the distribution of method portfolios chosen by listed and unlisted firms. Because the listed firms tended to choose similar methods, more so than the unlisted firms (see Panels A, B and C of Table 3), the resultant distribution of portfolios for the listed firms is marginally tighter than for the unlisted firms. Panel D of Table 3 reports the distribution and test statistics for the 4, 5, 6a, and 6b strategy cases. The 5 and 6a strategy cases evidence the greatest difference (significant at less than 1%) between the listed and unlisted firms, with the choices by the listed firms being more clustered than for the unlisted firms. A similar pattern is found for the 6b strategy case (significant at the 2% level) but the differences are weaker for the 4 strategy case (significant at the 5% level).

Insert Table 3 Here.

The comparative distributions of the explanatory variables for listed versus unlisted firms are examined using a series of Mann-Whitney U tests, the results of which are reported in Panel A of Table 4. As expected there is a significant difference in size, as measured by natural log (Ln) of revenue and Ln of total assets, between listed and unlisted firms. The listed firms are significantly larger than the unlisted firms. However, there is no difference in the ranking of the explanatory variables reported tax rate, interest cover ratio and total liabilities to total assets ratio (book values).

The descriptive statistics for each variable (mean and standard deviation), are also shown in Table 4. Panel B of Table 4 reports the number of firms in the sample that responded to the bonus scheme questionnaire. A chi-square test indicates that the frequency of earnings based bonus schemes is significantly greater for the listed firms than for the unlisted firms. However, as only a subset of the sample firms returned a completed questionnaire the multivariate analysis in the next section incorporates a dummy variable to capture the effect of non-response on the estimation of the model. Finally, Panel C of Table 4 indicates there is a marginally significant difference in the industry political cost proxy between listed and unlisted firms.

Insert Table 4 Here.

Multivariate Tests

To test the hypotheses of the study several specifications of the following multivariate model are estimated:

$$\begin{aligned}\text{PORTFOLIO} = \alpha_1 - \beta_1\ \text{LNREV} - \beta_2\ \text{INDUSTRY} - \beta_3\ \text{SALECONC} + \beta_4\ \text{TAXRATE} \\ - \beta_5\ \text{INTCOV} + \beta_6\ \text{TLIAB/TASS} + \beta_7\ \text{BONUS} + \beta_8\ \text{RESPONSE} \\ + \beta_9\ \text{STATUS} + \beta_{10}\ \text{FRACOWN} + \varepsilon\end{aligned}$$

where:

PORTFOLIO	= Method choice income strategy
α_1	= Constant
LNREV	= Natural log of revenue[10]
INDUSTRY	= Industry dummy (1=industry on positive list, 0=otherwise)
SALECONC	= Sales concentration[11]
TAXRATE	= Reported tax rate
INTCOV	= Interest cover ratio
TLIAB/TASS	= Total liabilities/Total assets
BONUS	= Earnings based bonus scheme (1=bonus scheme, 0=otherwise)
RESPONSE	= Response dummy (1=responded to bonus survey, 0=otherwise)
STATUS	= Listing status (1=unlisted firms, 0=listed firms)
FRACOWN	= Percentage of firm owned by directors (listed sub-sample only)
ε	= error term.

N-chotomous probit analysis was used to estimate the coefficients of the model because the ordinal scale of the dependent variable makes regression analysis an inappropriate technique.[12] This is because the assumptions that the error term in the regression will be normally distributed, have an expected value of zero and be homoskedastic, are all violated. The second problem is that regression implicitly assumes that the dependent variable has a cardinal scale (Zmijewski and Hagerman [1981]; McKelvey and Zavonia [1975]). N-chotomous probit over comes these problems and estimates the regression

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10 Ln of total assets (a measure of size) is not included in this model as it was highly correlated (r = 0.94) with Ln of revenue. Therefore its inclusion would have confounded the results of any statistical tests.

11 Defined as firm sales/total sales for sample firms in the same industry.

12 Nevertheless, the same substantive results as those reported in the paper for the N-probit analysis are obtained using OLS regression.

coefficients of the true underlying regression model. An asymptotic t-test is used to test the significance of the estimated coefficients.[13]

Table 5 reports the coefficients estimated for the model with each of the four different strategy cases defined in turn as the dependent variable. Panel A of Table 5 presents the estimated coefficients for the whole sample (250 companies) and Panels B and C respectively report the results for the sub-sample of 125 listed companies and sub-sample of 125 unlisted companies.

Insert Table 5 Here.

Only the 5 and 6a strategy models estimated for the 250 firm sample (reported in Panel A of Table 5) are statistically significant (at the 0.10 level). Further, listing status (STATUS) is the only highly significant ($p < 0.025$) independent variable for the 5 and 6a strategy case models. Neither the 4 nor 6b strategy models are significant even though they both correctly classify 60.4 and 57.2 percent of the companies in sample. The significant positive coefficient for STATUS implies that listed firms (coded as 0) are more likely to choose income reducing portfolios than are unlisted companies (coded as 1). When STATUS is removed from the equation and the model re-estimated, LNREV becomes significant for the 5, 6a and 6b strategy cases. This suggests that the pattern in Panel A could either be due to firm size (as proxied by LNREV) or listing status. The differences in the estimated model coefficients (reported in Panels B and C of Table 5) for the listed and unlisted company sub-samples points to listing status as the variable driving the results observed for the total sample. The significant differences reported in Table 4 between the LNREV for listed and unlisted firms also supports this conclusion.

Interest cover ratio is negatively related to the dependent variable for the 5 strategy case but the relationship is not highly significant ($p < 0.10$). The negative sign implies that firms with low interest cover ratios choose accounting policies which tend to increase income. This is consistent with the hypothesis that firms with lower interest cover ratios are closer to their debt covenants and hence attempt to loosen these constraints by choosing accounting policies which increase net earnings.

Of the remaining independent variables only TAXRATE and RESPONSE in the 6b strategy model, and TAXRATE in the 4 strategy model, are marginally significant ($p < 0.10$). However, the insignificance and low explanatory power ($R^2 < 3\%$) of the 4 and

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13 The properties of the t-test are not well specified where small samples are employed. Hence to enhance the confidence in the major findings a randomization test [see Noreen (1986)] was also conducted for the models reported in Panel B of Table 5. The randomization test statistics are significant at the same or better levels of significance as the t-test statistics in Table 5. Thus only the conventional t-test statistics are reported in the table.

6b strategy models casts doubt on the validity of any interpretation of these coefficients. The results reported in Table 5 for the 250 company sample therefore provide little support for the hypothesis that firms choose accounting methods in accordance with an income strategy decision process. The accounting method decisions of the sample companies appear to be driven by listing status rather than the economic consequences variables. Equally plausible is the proposition that listing status is a **proxy** for the traditional economic consequences variables. To try and distinguish between these two possibilities, further analysis of listing status is conducted.

Listed versus Unlisted Companies

Watts and Zimmerman [1978, p. 118] argue that small firms, operating under lower levels of regulation and political costs, are more likely to select accounting methods which increase reported earnings, if the expected gain in compensation is greater than the foregone tax consequences. Zmijewski and Hagerman [1981] interpret this to mean that the management compensation variable would be more important for firms facing low political costs than those facing high political costs. Other political and contracting cost variables that relate to public exposure, such as the debt covenant variables and public debt markets, could also be more important for the high political cost/regulated firms than for the low political cost/unregulated firms. To test these hypotheses Zmijewski and Hagerman [1981] partition their sample into high and low political cost sub-samples on the basis of median size and industry sales concentration ratio to see if the model is descriptive of both sub-samples of firms.

Rather than split on the basis of median size or concentration ratio, this study partitions on the basis of listing status - listed versus unlisted firms. However, the theoretical argument still applies as the listed firms are significantly larger, in terms of revenue and total assets, than the unlisted firms (see Table 4). Further, the significantly higher media profile of listed firms would support the contention that these firms have higher political costs (Wong [1988a]). Thus the political cost measures, LNREV, INDUSTRY, SALECONC and TAXRATE are expected to be less significant for the unlisted than listed firms. The debt covenant variables, INTCOV and TLIAB/TASS, are expected to be more important for listed than unlisted firms due to the listed firms' exposure to public debt markets and the associated greater re-negotiation costs. Finally, the existence of an earnings based bonus scheme should be more significant for unlisted relative to listed firms.

The results of the N-probit analyses for the listed and unlisted sub-samples are reported in Panels B and C of Table 5. Consistent with Zmijewski and Hagerman [1981] the model appears to be more appropriate for the listed, high political cost, firms than for the

low political cost, unlisted firms. For the sub-sample of listed firms, the political cost proxy LNREV is significant ($p < 0.025$) and in the right direction for all four strategy cases. The negative coefficient for LNREV implies that listed firms with high political costs choose income reducing policies.

The other political cost variables, INDUSTRY and SALECONC, are significant ($p < 0.05$) across all four strategy cases but both variables take the incorrect sign. These results imply that companies producing goods and services on the "positive list" and firms that have high firm sales/industry sales concentration ratios are more likely to choose income increasing methods. This is contrary to the hypothesized relationship and suggests that either these variables are acting as a proxy for some other unknown variable or alternatively that the political cost incentives are not as hypothesized. The favourable results of prior studies that have employed these proxies suggests the former explanation is more likely (see Bazley *et al* [1985]; Zmijewski and Hagerman [1981]).

A more encouraging result is that the estimated coefficient for TLIAB/TASS is positive, consistent with the hypothesis, and is significant at the 0.01 level for all four strategy cases. This suggests that listed firms with high leverage ratios (TLIAB/TASS) choose income increasing policies. Further, the significant ($p < 0.025$) positive coefficient for FRACOWN across all four strategies is consistent with income increasing methods being chosen by companies in which the directors have a large shareholding. It was argued that a high percentage ownership by directors would align their wealth interests with those of shareholders. Hence the positive coefficient for FRACOWN suggest that it is in the shareholders interest to choose income increasing methods.

None of the remaining variables - TAXRATE, INTCOV, BONUS nor RESPONSE - exhibit any significant and stable patterns across the different strategy cases for the listed firms. Nevertheless, all four models for the listed firms are significant at less than 1 percent and explain between 22.9 and 25.7 percent of the variance in the respective dependent variables. In general, the results for the high political cost sub-sample of listed firms provides some support for the theory and are consistent with the major findings of Zmijewski and Hagerman [1981].

The results for the low political cost sub-sample of unlisted firms provide a stark contrast to those for the listed firms. TAXRATE is the only predictor variable that is significant ($p < 0.10$) across all the strategy cases. The negative coefficient for TAXRATE is contrary to the relationship hypothesized. However, none of the models are significant at the 0.10 level and the estimated R^2 statistics are all less than 6%. Thus it appears that the accounting method choices of unlisted firms are unrelated to the political cost, debt contracting cost and bonus scheme proxy variables. That is, the positive accounting model is not descriptive of unlisted firms.

Predictive Ability

The predictive rates for the models based on the unlisted sub-sample and the total sample are meaningless due to the insignificance of these models. Predictive ability levels of the listed firms' models are quite high. The 4, 5, 6a, and 6b strategy models for the listed firms respectively classify correctly 66.4, 62.4, 65.6, and 64 percent of the 125 sample observations. This classification rate is significantly greater than Zmijewski and Hagerman's [1981] study. To determine the relative importance of these prediction rates they can be compared to a naive policy which assumes an equal probability of choosing each case for each strategy model. The prediction rates of the model are much better than under this naive classification and the differences are very significant. However, if we use as our evaluation standard Ball and Foster's [1982] 'naive' forecast that firms will always choose the most common strategy, then the results are less impressive. Table 5 reports the predictive ability of such a 'naive' forecast. The predictions of the estimated models are not significantly better than the second 'naive' forecast assumption. This is consistent with Zmijewski and Hagerman [1981] and casts some doubt on the explanatory power of the model.

DISCUSSION

This study investigated the descriptive validity of the positive theory model of accounting method choice. It was argued that accounting choices are made jointly and that the net choice made by a firm constitutes an income strategy. Further, a firm's choice of strategy is driven by the economic consequences of the decision. The results indicate a difference in the method choices made by firms and that these differences are systematically related to listing status and LNREV. These findings are consistent with Penno and Simon [1986] but contrast with the findings of Zmijewski and Hagerman [1981] and other positive accounting studies. However, when listing status (STATUS) is dropped and the model re-estimated the size/political cost variable LNREV becomes significant mainly because LNREV is significantly related to listing status. This result supports Ball and Foster's [1982] contention that the 'normal' significant size/political cost result obtained in the literature could be a proxy for a more fundamental variable.

The general applicability of the model is tested to determine if it behaves differently for high political and contracting cost, listed firms versus low political and contracting cost, unlisted firms. The results indicate that the model is inappropriate for low political and contracting cost unlisted firms. The results for the listed firms suggest size related political costs (i.e. LNREV), debt contracting costs associated with high leverage (i.e. TLIAB/TASS), and the percentage of the firm owned by directors (i.e. FRACOWN), all

impact on the accounting method portfolio chosen by companies. However, the results for the other contracting cost variables are contrary to the hypothesized relationships or are insignificant. More important is the within sample predictive ability of the model. The models for the listed companies have the highest prediction rates and coefficients of determination. Nevertheless none of the models can predict significantly better than the simple naive forecast that firms choose the most common strategy. This questions the usefulness of the portfolio approach and the positive accounting theory in general.

An alternative explanation for the observed differences between listed and unlisted firms' portfolios is that the larger listed firms can afford to maintain a separate set of tax accounts and thus can accommodate the choice of non-tax preferred methods. The evidence in Table 3 is consistent with more listed firms choosing the non-tax preferred methods of straight line depreciation for plant and equipment and revalued base for buildings. Revaluing buildings can involve significant expense associated with the hiring of an independent valuer making this option too costly for smaller firms. However, directors can use their own valuation and need not got to the extra expense of an external valuer. Both the revaluation and straight line depreciation method choices involve extra bookkeeping costs to maintain separate tax and financial accounting books. Bookkeeping costs do not, however, explain the significant coefficients in the N-probit model estimated for the listed firms. Further, the low predictive ability of the model suggests that researchers should be cautious in the weight they place on any significant coefficients in the model.

The evidence presented in this paper provides some support for the positive theory model and the hypothesis that firms choose income strategies. Nevertheless further work is required, particularly to develop better proxies for the theoretical constructs. Ball and Foster [1982] discuss the use of proxy measures for political and debt constraint costs and contend that the inconsistent results for studies using these variables reflect the immaturity of this research paradigm rather than any fundamental flaw in the paradigm.

This conclusion is echoed by Watts and Zimmerman [1990] in their recent review of positive accounting research. In particular, the income effect of the dependent variable needs to be measured directly so the relative importance of different method choices can be properly weighted. The equal and arbitrary weighting of the method choices, employed in this portfolio study as well as other single method choice studies, is likely to confound any research results until such issues are resolved. A recent working paper by Aitken and Loftus [1991] represents a first step in this direction in that they estimate dollar weights for each method choice. However, given current levels of financial disclosure this exercise unfortunately requires a lot of assumptions on the part of the researchers. It can but be hoped better data will be available to future researchers to further this line of research.

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Table 1: Dichotomous Classification of Income Effect

Accounting Procedure	Income Increasing (1)	Income Decreasing (0)
Inventory Cost Flow	FIFO	Weighted Ave. Cost
Plant and Equipment Depreciation Method	Straight Line	Diminishing Value
Basis for Depreciating Buildings	Historical Cost	Revaluation

Table 2: Income Strategies

Attribute	Inventory	Plant & Equip Depreciation	Depreciation Base	Income Strategy Choices 4	5	6a	6b
Most Income	0	0	0	1	1	1	1
Decreasing	0	1	0	2	2	2	3
	1	0	0	2	2	3	2
	0	0	1	2	3	3	3
	1	1	0	3	3	4	4
	0	1	1	3	4	4	5
Most Income	1	0	1	3	4	5	4
Increasing	1	1	1	4	5	6	6

Table 3: Comparison of Methods Selected by Listed and Unlisted Firms

METHOD		LISTED	UNLISTED	ROW TOTAL	STATISTICS
PANEL A: INVENTORY METHOD					
Fifo		103	110	213	
W.Ave.Cost		22	15	37	X^2 = 1.14
Col. Total		125	125	250	Sig. = 0.285
PANEL B: DEPRECIATION METHOD		(plant & equipment)			
Straight Line		114	57	171	
Diminishing Value		11	68	79	X^2 = 58.04
Col. Total		125	125	250	Sig. = 0.000
PANEL C: DEPRECIATION BASE		(buildings)			
Historic Cost		23	74	97	
Revaluation		102	51	153	X^2 = 42.11
Col. Total		125	125	250	Sig. = 0.000
PANEL D: PORTFOLIO CHOICE					
		4 Strategy Case			
Most Decreasing	1	0	4	4	
	2	26	27	53	
	3	83	68	151	
Most Increasing	4	16	26	42	X^2 = 7.89
Col. Total		125	125	250	Sig. = 0.048
		5 Strategy Case			
Most Decreasing	1	0	4	4	
	2	26	24	50	
	3	76	26	102	
	4	7	45	52	
Most Increasing	5	16	26	42	X^2 = 58.74
Col. Total		125	125	250	Sig. = 0.000
		6a Strategy Case			
Most Decreasing	1	0	4	4	
	2	17	5	22	
	3	9	22	31	
	4	81	26	107	
	5	2	42	44	
Most Increasing	6	16	26	42	X^2 = 83.01
Col. Total		125	125	250	Sig. = 0.000
		6b Strategy Case			
Most Decreasing	1	0	4	4	
	2	9	19	28	
	3	17	8	25	
	4	78	65	143	
	5	5	3	8	
Most Increasing	6	16	26	42	X^2 = 14.87
Col. Total		125	125	250	Sig. = 0.011

Table 4: Explanatory Variables for Listed Versus Unlisted Firms

PANEL A Continuous Variables	MEAN	Std.Dev.	MEAN RANK MW U-TEST LISTED	UNLISTED	Z SCORE	2-TAILED P
Ln Revenue	16.48	2.43	161.34	89.66	7.84	0.00
Ln Total Assets	16.12	2.23	165.08	85.92	8.65	0.00
Sales Concentration	0.08	0.16	159.06	91.94	7.34	0.00
Tax Rate	27.86%	24.57	120.68	130.32	1.06	0.29
Interest Cover	22.17	110.56	131.31	119.69	1.27	0.20
Tot.Liab/Tot.Assets	0.50	0.20	119.34	131.66	1.35	0.18
Director % Own	5.15%	9.12	N/A	N/A	N/A	N/A

PANEL B Bonus Scheme Variable	OBSERVED NUMBER LISTED	UNLISTED	X^2	P
No Earnings Based Bonus Scheme	34	59		
Earnings Based Bonus Scheme	28	7		
Total Responses	62	66	17.51	0.00

PANEL C Industry Variable	OBSERVED NUMBER LISTED	UNLISTED	X^2	P
Not Politically Sensitive	95	107		
Politically Sensitive	30	18		
Total	125	125	3.12	0.08

TABLE 5: N-probit Analysis of Income Strategies

Variable	Expected Sign	PANEL A: All 250 Companies				#PANEL B: 125 Listed Companies				PANEL C: 125 Unlisted Companies			
		4 Case Strategy	5 Case Strategy	6a Case Strategy	6b Case Strategy	4 Case Strategy	5 Case Strategy	6a Case Strategy	6b Case Strategy	4 Case Strategy	5 Case Strategy	6a Case Strategy	6b Case Strategy
CONSTANT		*2.572	2.646	2.759	2.422	3.097	2.806	3.566	3.166	1.561	1.689	1.794	1.463
		(3.69)	(3.99)	(4.19)	(3.54)	(2.16)	(2.03)	(2.55)	(2.30)	(2.16)	(2.42)	(2.58)	(2.05)
LNREV	(--)	-0.019	-0.035	-0.043	-0.007	-0.205	-0.185	-0.214	-0.161	0.048	0.035	0.029	0.054
		(0.49)	(0.95)	(1.16)	(0.17)	(2.48)	(2.33)	(2.66)	(2.04)	(1.04)	(0.79)	(0.66)	(1.18)
INDUSTRY	(--)	0.719	0.101	0.052	0.110	0.703	0.646	0.575	0.749	-0.366	-0.254	-0.28	-0.324
		(0.39)	(0.58)	(0.30)	(0.62)	(2.59)	(2.53)	(2.20)	(2.91)	(1.30)	(0.93)	(1.05)	(1.17)
SALECONC	(--)	0.641	0.051	0.113	-0.003	1.768	1.388	1.573	1.493	-0.393	-0.314	-0.274	-0.421
		(0.12)	(0.11)	(0.24)	(0.01)	(2.13)	(1.77)	(1.96)	(1.90)	(0.52)	(0.43)	(0.38)	(0.56)
TAXRATE	(+)	-0.004	-0.003	-0.002	-0.005	-0.004	-0.004	-0.001	-0.007	-0.005	-0.005	-0.005	-0.006
		(1.28)	(1.16)	(0.74)	(1.60)	(0.83)	(0.89)	(0.25)	(1.44)	(1.40)	(1.45)	(1.28)	(1.50)
INTCOV	(--)	-0.001	-0.001	-0.001	-0.001	0.009	0.009	0.007	0.010	-0.001	-0.001	-0.001	-0.001
		(0.94)	(1.19)	(1.59)	(0.51)	(1.16)	(1.23)	(0.99)	(1.36)	(1.07)	(1.09)	(1.49)	(0.69)
TLIAB/TASS	(+)	0.134	0.176	0.078	0.181	2.432	2.437	2.342	2.381	-0.272	-0.224	-0.301	-0.213
		(0.35)	(0.49)	(0.22)	(0.49)	(2.61)	(2.79)	(2.58)	(2.75)	(0.63)	(0.54)	(0.73)	(0.50)
BONUS	(+)	0.139	0.171	0.157	0.155	-0.099	-0.098	-0.105	-0.067	0.151	0.249	0.286	0.113
		(0.60)	(0.77)	(0.72)	(0.69)	(0.31)	(0.31)	(0.34)	(0.22)	(0.34)	(0.57)	(0.66)	(0.26)
RESPONSE	(+/--)	-0.168	-0.188	-0.115	-0.214	-0.309	-0.355	-0.273	-0.396	0.012	0.027	0.108	-0.069
		(1.07)	(1.26)	(078)	(1.57)	(1.17)	(1.40)	(1.07)	(1.58)	(0.06)	(0.14)	(0.54)	(0.34)
STATUS	(+/--)	0.030	0.364	0.388	-0.011	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		(0.171)	(2.15)	(2.31)	(0.06)								
FRACOWN	(+/-)	N/A	N/A	N/A	N/A	0.031	0.029	0.029	0.031	N/A	N/A	N/A	N/A
						(2.33)	(2.31)	(2.22)	(2.39)				
Estimated R^2		0.0228	0.0641	0.0673	0.0289	0.2568	0.2404	0.2299	0.2548	0.0513	0.0428	0.0517	0.0464
N-Probit X^2		4.73	14.67	15.85	6.27	26.14	26.69	24.07	28.78	5.59	4.93	6.19	5.20
(df)		(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(8)	(8)	(8)	(8)
Model % Predict		60.8	40.8	43.2	57.2	66.4	62.4	65.6	64.0	55.2	36.8	34.4	52.0
Naive % Predict		60.4	40.8	42.8	57.2	66.4	60.8	64.8	62.4	54.4	36.0	33.6	52.0

* Coefficient (asymptotic t-test)
N/A = Not Applicable
Randomization tests support the t-statistics