NSC93-2416-H-032-018-

93   08   01   94   07   31

94   10   18

ACCOUNTING CHOICE DETERMINANTS OF THE DEFERRED TAX ALLOWANCE ACCOUNT: AN EARNINGS MANAGEMENT PERSPECTIVE

ABSTRACT

The research is designed to identify accounting choice variables that influence managers' decisions to change the level of the deferred tax asset valuation allowance. Positive accounting theory forms the basis for the analysis. Only firms that change the valuation allowance are included in the empirical analysis. The results indicate that it is difficult to justify realizability of deferred tax assets attributable to net operating loss carryforwards, tax credit carryforward, and, partially, deferred compensation, probably because the realization period is long. The findings also indicate that closeness to debt constraints and political costs do not seem to provide any impetus for earnings management. On the other hand, managers of firms with bonus plans tied to income are more likely to report a large valuation allowance (decreasing income) when the lower bonus threshold is binding. The results provide consistent support for the idea that firms attempt to take a "big bath" rather than smooth their income in years when their earnings are below a normal earnings level. That is, managers take optional loss charges in a bad year to clear the way for stronger profits (and bonuses) in future years. The findings of this paper can provide insights into whether it is an appropriate accounting policy to give management considerable discretion to choose the level of the valuation allowance.

I. INTRODUCTION

The purpose of this study is to identify accounting choice variables that are significant determinants of the valuation allowance for deferred tax assets under Statement of Financial Accounting Standards (SFAS) No. 109, "Accounting for Income Taxes." The Statement substantially changes the accounting and reporting of deferred tax activities. Specifically, SFAS No. 109 permits the recognition of all deferred tax assets (including those generated by deductible temporary differences, operating loss carryforwards, and tax credit carryforwards), subject to the reduction by a valuation allowance if it is *more likely than not* that some portion or all of the deferred tax assets will not be realized. From year to year, managers must make an assessment to determine whether to record or adjust the deferred tax asset and valuation allowance accounts. Several observers (e.g., Miller & Skinner, 1998; Visvanathan, 1997, 1998) had indicated that the valuation allowance can be an instrument for earnings management because any changes in the valuation allowance affect income from continuing operations, and SFAS No. 109 considers future profitability of the firm as a whole, which involves a considerable amount of subjectivity.

Positive accounting theory forms the basis for the analysis. The analysis includes investigation of the relationships among observed valuation allowance changes and closeness to debt constraints, thresholds of income-based bonus plans, political sensitivity, "big bath" approach, and income smoothing. Regression analysis is used to determine which factors influence managers' decisions to change the level of the valuation allowance. The sample utilized in this study includes all publicly traded firms in the Compact Disclosure database that recorded deferred tax assets within a four-year period ended December 31, 2003. Only firms that change the valuation allowance are included in the empirical analysis.

The results suggest that it is difficult to justify realizability of deferred tax assets attributable to net operating loss carryforwards, tax credit carryforwards, and temporary differences associated with deferred compensation, probably because the realization period is long. The findings also indicate that closeness to debt constraints and political costs do not seem to provide any impetus for earnings management. However, the findings of this study provide some support for the hypothesis that managers of firms with bonus plans tied to income are more likely to choose a larger valuation allowance when the lower bonus threshold is binding. Specifically, this study found that firms attempt to take a "big bath" rather than smooth their income in years when their earnings are below a normal earnings level. Overall, the results show that a good deal of variation in the valuation allowance is explained by the "big bath" motivation.

The results of this study are consistent with the earlier research. A review of prior research indicates that few studies specifically tested earnings management in the context of valuation allowance. Miller and Skinner (1998) used a sample of 200 firms that took large Other Post-Employment Benefit (OPEB) charges when they adopted SFAS No. 106, "Employers' Accounting for Post-Retirement Benefits Other Than Pensions." The authors found no direct association between changes in the valuation allowance and either changes in leverage or a proxy for the incentive to smooth earnings. Using firms in the Standard & Poor's 500 index, Visvanathan (1997, 1998) also found no support for the debt/equity or income smoothing hypothesis. Different from Miller and Skinner (1998) and Visvanathan (1997, 1998), Chao, Kelsey, Horng, and Chiu (2004) explored the significant determinants of the deferred tax asset valuation allowance using a sample of large as well as small U.S. public firms. They found that valuation allowances appeared to vary inversely with earnings, suggesting that firms attempted

to take a "big bath" rather than smooth their income in years when their earnings were below a normal earnings level.

This study expands on the extant research in two substantive ways. First, this paper examines an accounting choice indicator, thresholds of bonus plans, as a determinant of valuation allowances that have not been considered in previous studies on SFAS No. 109. Second, in contrast to previous research that examined the aggregate level of deferred tax assets, this study performs a more focused analysis by examining the components of deferred tax assets (e.g., deductible temporary differences, operating loss carryforwards, tax credit carryforwards). The results could provide insights into the types of deferred tax assets that are most likely to be reserved.

The remainder of this paper is organized as follows. The first section summarizes the relevant accounting requirements for deferred tax asset measurement. The second section presents the research hypotheses. The third section describes the variables used in this study. The fourth section presents a brief discussion of the sample selection and provides a descriptive overview of the sample. The fifth section reports the findings. Summary and conclusions are provided in the final section.

II. HYPOTHESES DEVELOPMENT

Positive account theory (see Watts & Zimmerman, 1986), a subset of Jensen and Meckling's (1976) agency theory, provides an explanation of managers' accounting choices and establishes the existence of motives for earnings management. Based on the accounting choice literature, a number of variables (closeness to debt covenant restrictions, thresholds of bonus plans, political sensitivity, "big bath" behavior, and income smoothing) are hypothesized to affect managerial discretion over the valuation allowance.

Debt/Equity

The debt/equity hypothesis (H_1) suggests that managers of firms facing higher contracting and monitoring costs of debt are more likely to make income-increasing accounting decisions than managers of firms facing lower contracting and monitoring costs of debt. Specifically, increases in earnings ease dividends, interest coverage, and leverage restrictions. If the debt/equity hypothesis can be used to explain managerial discretion over the valuation allowance, then it can be argued that managers of firms that are closer to violating the accounting-based constraints contained in debt covenants have stronger incentives to choose to reduce the valuation allowance (and increase income). To test this prediction, the proxy used in this study for restrictiveness of debt covenants is leverage (debt/equity). Thus, the initial hypothesis to be tested, stated in the alternative form, is:

H_1: *Ceteris paribus*, managers of firms with higher leverage are more likely to choose a smaller valuation allowance.

Bonus Plan Thresholds

The details of the bonus calculations vary across plans. Specifically, bonus plans usually provide a maximum amount of compensation, normally some portion of reported earnings over a target level of income, which can be transferred to the "bonus pool" from which bonuses are paid. If reported earnings are less than the target measure, no bonuses can be granted. Thus, managers' incentives to report the magnitude of earnings in a given year may vary with these details of bonus calculations. Prior studies (e.g., Healy, 1985) have posited that managers are more likely to choose income-decreasing accounting procedures when their bonus plan upper or lower bounds are binding, and income-increasing procedures when these bounds are not binding. This suggests that managers of firms with bonus plans tied to income are more likely to choose to record a large valuation allowance when the upper or lower bonus threshold is binding, and

record a small valuation allowance when both the lower and the upper bounds are not binding.

Accordingly, the two modified bonus plan hypotheses, stated in alternative form, are:

H_{2a}: *Ceteris paribus*, among firms with bonus plans tied to income, there is a negative relation between valuation allowance and the difference between the upper bonus threshold and operating earnings, conditional on meeting the lower bonus threshold.

H_{2b}: *Ceteris paribus*, among firms with bonus plans tied to income, there is a positive relation between valuation allowance and an indicator variable for whether operating earnings are below the lower bonus threshold.

Political Costs

The political costs hypothesis (H_3) suggests a positive relationship between political sensitivity and the probability of adopting accounting procedures that decrease reported earnings. The political costs imposed on the firms are a function of their size because larger companies are more visible and, therefore, more subject to government scrutiny and wealth transfers. Since accounting numbers, specifically reported earnings, are hypothesized to influence the actions of regulatory agencies, managers of large firms may have an incentive to make income-decreasing accounting decisions in order to avoid political attention. If the political costs hypothesis can be used to explain managerial discretion over the valuation allowance, then it can be argued that managers of larger, more visible firms have greater motivation to choose a larger valuation allowance (decreasing income) compared to managers of smaller firms. The third hypothesis to be tested, stated in the alternative form, is:

H_3: *Ceteris paribus*, managers of larger firms are more likely to choose a larger valuation allowance.

Big Bath

The big bath hypothesis (H_4) suggests that firms "save up" discretionary losses or accruals and then record several in a period in which the firm has already experienced below normal earnings. In other words, if a manager cannot manipulate earnings to reach a "target"

level, he/she will attempt to decrease current earnings in favor of increasing future earnings and, therefore, future bonuses. Because increases (decreases) in the valuation allowance decrease (increase) income, companies with a decline in earnings are predicted to choose to increase the valuation allowance. For purposes of this study, the "target" level of income is defined as the prior years' reported earnings. This leads to the second hypothesis to be tested, stated in the alternative form:

> H_4: *Ceteris paribus*, managers of firms for which current period earnings are negative and lower than the prior year's reported earnings are more likely to choose a larger valuation allowance.

Income Smoothing

The income smoothing hypothesis (H_5) suggests that managers use their accounting discretion to reduce the magnitude of the deviation of reported earnings from an earnings number that is "normal" or "expected" for the firm. This study, similar to Miller and Skinner (1998) and Visvanathan (1997, 1998), treats earnings management as an empirical issue and tests income smoothing without exploring why firms engage in this activity. If the income smoothing hypothesis can be used to explain managerial discretion over the valuation allowance, then it can be argued that managers of firms are more likely to choose to decrease the valuation allowance (and increase income) in years when earnings are temporarily depressed and to increase the valuation allowance (and decrease income) in years when earnings are temporarily high. The third hypothesis to be tested, stated in the alternative form, is:

> H_5: *Ceteris paribus*, changes in earnings (exclusive of valuation allowance effects) are positively correlated with changes in valuation allowance.

III. VARIABLES MEASUREMENT

Among the variables hypothesized to affect managerial discretion over the valuation allowance are: closeness to debt covenant restrictions, "big bath" approach, and income smoothing. These variables are proxied in the model as follows.

Dependent Variable

To test the hypotheses, the dependent variable (DTVA) is measured as the change in the deferred tax asset valuation allowance divided by the deferred tax asset. An analysis of changes in the valuation allowance is informative because it provides evidence on whether and how managers of a given firm change the allowance from one year to the next, which is central to the research hypotheses in this study. This variable is gathered from the Compustat database.

Independent Variables

The debt/equity hypothesis (H_1) was tested using the leverage variable (LEV), which is defined as the firm's ratio of the book value of total debt to the book value of shareholders' equity at year-end. This variable was used as a proxy for closeness to debt covenant restrictions and was gathered from the Compustat database. H_1 asserts that LEV is negatively related to DTVA.

Some support for the use of the debt/equity proxy was provided by Duke and Hunt (1990) and Press and Weintrop (1990). Duke and Hunt (1990) found that the debt/equity ratio was positively related to the existence and tightness of three common debt covenant restrictions (related to retained earnings, working capital, and net tangible assets). Press and Weintrop (1990) reported that, for firms with accounting constraints in their debt agreements, the ratio of total debt to the book value of shareholders' equity was correlated with proximity to the actual leverage constraint in debt covenants.

The influence of bonus plans on DTVA may vary with the magnitude of earnings. Specifically, managers of firms with bonus plans tied to income are more likely to choose to record a large valuation allowance when the upper or lower bonus threshold is binding, and record a small valuation allowance when both the lower and the upper bounds are not binding. The relation between the deferred tax asset valuation allowance and bonus plan incentives will be tested using the measures of the implied threshold effects developed by Bartov (1993).[1] His definition of the upper bound effect as the distance from the upper bonus threshold means that the variable is increasing negative as pre-tax earnings rise above the upper threshold and increasing positive as pre-tax earnings fall below the threshold. Following this perspective, BONUSUPP measures the difference between the upper threshold and operating earnings (i.e., a before-tax income number), conditional on the existence of the earnings-based bonus plan as well as meeting the lower threshold,[2] while BONUSLOW is a dummy variable coded one if the firm maintains a management bonus plan that is based on reported income and if operating earnings fall below the lower bonus threshold, and zero otherwise.[3] Similar to Bartov (1993), lower and upper thresholds of (5 percent, 10 percent), (10 percent, 20 percent), and (20 percent, 30 percent) of the firm's market value of equity will be tested, respectively. The variables BONUSUPPand BONUSLOW will be used to test H_{2a} and H_{2b}, respectively. A negative (positive) relationship between BONUSUPP (BONUSLOW) and DTVA is predicted.

---

[1] Bartov (1993) defined the lower and upper bounds of the bonus plan as a percentage of the firm's market value of equity (MV) at the beginning of the year. He tested lower and upper bonus thresholds (X, Y) of (5 percent, 10 percent), (10 percent, 20 percent), and (20 percent, 30 percent). If pre-tax income exceeds X percent of MV, then BONUSUPP = (Y*MV – pre-tax income) / MV; otherwise BONUSUPP takes the value zero. If pre-tax income is less than X percent of MV, then BONUSLOW is equal to one; else BONUSLOW is coded zero.

[2] The income-smoothing effect and the bonus-plan effect partially overlap. Thus, one must be controlled for the other in the cross-sectional analysis. For instance, if operating earnings are up from last year and also above the upper bound of the bonus plan, managers may choose to record a large valuation allowance to bring the reported earnings closer to either last year's earnings (the income-smoothing effect) or to the upper bound of the bonus plan (the bonus-plan effect).

[3] This variable also partially captures the "big bath" phenomenon: if a firm has a loss, managers will increase the loss by recording a large valuation allowance. However, this is not a problem because no inferences are drawn about the validity of the bonus plan hypothesis.

Firm size is the most commonly used proxy for political sensitivity. Although other proxies for the political costs have been tried, some simultaneously (e.g., Meyer, Karim, & Gara, 2000), none has been uncritically acclaimed. Most of these proxies also suffer from the problem that they are expost measures of political costs. Thus, the political costs hypothesis (H_3) was tested using firm size as a measure of political costs.

With respect to political sensitivity as put forth in H_3, firm size (SIZE) is measured as the firm's market value of common stock at year-end (MV). This variable is gathered from the Compustat database. SIZE is expected to be positively associated with DTVA. Sensitivity of the results to other measures of firm size, such as total assets (TA) and net sales (NS), is assessed because there is no reason to choose one measure of size over another.

Operationalizing when a firm is likely to take a "big bath" is a difficult task. Under the big bath hypothesis (H_4), the usual prediction is that firms will record discretionary losses and accruals in the same period when reported earnings are negative and at a level lower than that in the prior year. Therefore, this study adopts a comparison of current period operating earnings to the prior year's operating earnings, defining an indicator variable BBATH that is coded one if current period operating earnings are negative and lower than the prior year's operating earnings, and zero otherwise. The indicator variable BBATH is designed to capture the firms pursuing a big bath strategy.

H_4 asserts a positive relationship between BBATH and DTVA. Managers are more likely to choose to increase the deferred tax asset valuation allowance (and decrease income) when BBATH equals one, indicating a historically low level of operating earnings. Data on the dummy variable BBATH are available from the Form 10-K filings or the Compustat database.

To test the income smoothing hypothesis (H_5), a desired or target level of income must be specified. Tests for income smoothing typically assume that the target for smoothing is the prior year's earnings (operating income or net income). Bartov (1993), relying on Archibald (1967) and White (1970), justifies the use of the prior year's earnings for two reasons: (1) It is relatively simple, and (2) it appears more realistic than other definitions, which require managers to achieve constant annual growth rates. To date, there is no evidence that a more complicated or more widely used target measure provides a better model of income-smoothing behavior. Therefore, this study uses the prior year's operating earnings, excluding the effect of changes in deferred taxes, as the target income measure.

The difference between current year's operating income and the target income level (i.e., the prior year's operating earnings) represents the amount of discretionary income or loss that a firm must recognize in order to reach its desired level of earnings. For tests of H_5, change in current period operating earnings is divided by total assets to form the variable EARN. Data on current period operating earnings and total assets are gathered from the Form 10-K filings or the Compustat database. H_5 predicts that EARN is positively associated with DTVA.

Control Variables

Due to the potential differences in the relationships between the components of deferred tax assets and the valuation allowance, the sources of deferred tax assets are disaggregated into four categories: net operating loss carryforwards (NOL), and other carryforwards such as tax credit carryforwards (OC), temporary differences related to other postretirement benefits (OPEB) and deferred compensation (DC). These four components are identified based on previous research of frequently cited components. Net operating loss carryforwards and tax credit carryforwards are a source of deferred tax assets because a firm can offset current losses against

future taxable income. The change in each of the specific components of deferred tax assets from one year to the next is deflated by lagged deferred tax assets in the cross-sectional analysis. A positive relation between DTVA and the proportion of deferred tax assets that result from NOL and OC, respectively, is expected. For the other components of deferred tax assets, no sign prediction about the relation with DTVA is made. OPEB and DC are included only as controls. A significant, positive coefficient on a component of the deferred tax asset would indicate that it is difficult to justify realizability of the deferred tax asset. On the other hand, a negative coefficient would suggest that firms could more easily justify realizability. Data on NOL, OC, OPEB, and DC are available from the Form 10-K filings.

IV. SAMPLE SELECTION AND DATA DESCRIPTION

A search of all firms included in the Compact Disclosure database is used to identify companies that recorded deferred tax assets in any event year within a four-year period ended December 31, 2003, regardless of whether they recorded a deferred tax asset valuation allowance. The search is performed on the text string "deferred tax asset." The entire population of deferred tax asset firms must be included because companies are required to report their valuation allowance position whether they record a zero or positive value for this account.

To be subsequently included in the sample, firms must (1) have SIC codes among 2000-3999, 5000-5999, and 7000-8799, (2) use December 31 as their year-end, (3) have a deferred tax asset/total asset ratio of at least 0.01 for the years ended 2001-2003, and (4) have detailed disclosures relating to the components of the deferred tax asset and valuation allowance for the years ended 2001-2003. The SIC code restriction is used to exclude firms in the regulated industries (e.g., utility, transportation, insurance, financial services) from the sample because these firms may behave differently as a result of the added incentives and limitations associated

with regulation. Firms that are acquired or merged are also excluded. Using calendar year-end criterion in selecting the sample eliminates potential bias associated with differing time periods such as varying economic circumstances. The restriction on deferred tax asset/total asset ratio is used to ensure that sample firms have at least a minimum level of deferred tax assets relative to total assets on their balance sheets. Limiting the sample with these criteria, 465 firms remain resulting in 1,395 firm-year observations for the three-year period ended December 31, 2003.

Data were collected from the Compustat database and from annual reports/Form 10-K filings and proxy statements found on the SEC's EDGAR and Lexis-Nexis databases. All variables used in this study were gathered for the years ended 2001-2003.

Table 1 presents the industry information about the sample. The breakdown indicates a fairly even distribution across the various industries, with only two industries containing more than 10% of the sample firms. These industries are business services (10.97%) and industrial machinery and equipment (10.75%). Moreover, the full sample was compared to the industry classifications of the entire original population. The sample of firms and industries is not significantly different from the entire population.

Descriptive statistics for the variables of interest in 2001, 2002, and 2003 are presented in Tables 2, 3, and 4, respectively.[4] Only firms that changed the valuation allowance were included in the empirical analysis. The analysis of changes in the valuation allowance provides evidence on whether and how managers of a given firm change the allowance from one year to the next, which is central to the research hypotheses in this study. Changes in the valuation allowance were non-zero for 337 firms in 2001, 346 firms in 2002, and 332 firms in 2003.

---

[4] Given the nature of the leverage variable, any firm with a negative debt/equity ratio was given a debt/equity ratio of seven. In addition, the values of debt/equity ratios larger than seven were set to seven. The univariate and multivariate analyses were performed using a maximum of five, seven, and nine without a significant change in the estimated coefficients. The reported results use the maximum of seven.

Based on the distribution of changes in the valuation allowance, it is evident that managers of many firms do not change the allowance very much from one year to the next. For instance, the mean (median) DTVA is 0.24 (0.04) in 2001, 0.23 (0.03) in 2002, and 0.22 (0.03) in 2003. There is also a strong relation between the likelihood that managers set the valuation allowance at zero and the likelihood that managers change the allowance from one year to the next. Of the 129 firms that set the valuation allowance at zero in 2001, 108 (83.72%) also had no allowance in 2000. On the contrary, of the 337 firms with a positive value for the valuation allowance in 2001, 303 (89.91%) changed the dollar amount of the allowance from the level set in 2000. The numbers are similar for the two subsequent event years, indicating that some firms set the valuation allowance at zero initially and then leave it unchanged in subsequent years while other firms set a non-zero allowance and change the dollar amount each year.

BBATH indicates that current period operating earnings are negative and lower than the prior year's operating earnings for 86 (25.52%) firms in 2001, 73 (21.10%) firms in 2002, and 79 (23.80%) firms in 2003. These firms are in poor financial condition and, therefore, are more likely to take a "big bath."

V. RESULTS

Multivariate testing is performed by estimating the following regression model:

$$DTVA = \beta_0 + \beta_1 LEV + \beta_2 BONUSUPP + \beta_3 BONUSLOW + \beta_4 SIZE + \beta_5 BBATH + \beta_6 SMOOTH$$
$$+ \beta_7 NOL + \beta_8 OC + \beta_9 OPEB + \beta_{10} DC + \varepsilon$$

where DTVA, LEV, BONUSUPP, BONUSLOW, SIZE, BBATH, EARN, NOL, OC, OPEB, and DC variables are the same as those defined earlier in this study; βs are the regression coefficients; ε is the random error component.

In addition to estimating the full model with all the variables of interest, the stepwise method of estimating the regression is utilized to further explore the model by adding or deleting a single independent variable at each step to arrive at a final, reduced model that is considered "the best." The results between the full models and the reduced models (not reported in tables) are very similar.

As discussed earlier in this study, the political costs hypothesis was expanded to include three different proxies (i.e., MV, NS, TA) for firm size. These proxies were highly correlated with each other and could not be included in the same model. Therefore, multiple regression models were estimated with each of these measures of firm size separately for each of the three event years. The results for the nine significant models are not qualitatively different. Tables 5 through 7 report results for the regression model using MV to proxy for firm size.

The results for the control variables, changes in the components of deferred tax assets, are generally consistent with what were expected. The estimated coefficients on the changes in deferred tax assets that are attributable to NOL and OC are significantly positive in all the year-by-year equations. In addition, the estimated coefficient on DC for the year 2003 is statistically positive. The positive associations between these components of deferred tax assets (i.e., NOL, OC, DC) and DTVA are consistent with the hypothesis that changes in net operating loss carrying forwards, tax credit carryforwards, and deferred compensation provide evidence on future realizability of deferred tax assets.

The results for all of the regression models are not qualitatively different. The LEV and MV variables are not significantly related to DTVA in all regression equations. The implication is that closeness to debt constraints and political sensitivity does not seem to provide any impetus for earnings management. Sensitivity analysis was conducted using net sales (NS) and total

assets (TA) to proxy for firm size instead of market value of common stock (MV). The results are not qualitatively different (not reported in tables).

For bonus plan lower (upper) thresholds of 5 percent (10 percent), the results indicate that the BONUSUPP variable is not significantly associated with DTVA. The predicted positive relation for the BONUSLOW variable is consistent with managers reporting relatively higher valuation allowance for deferred tax assets (decreasing income) when their bonus plan lower bounds are binding. However, these bonus plan threshold results must be interpreted with caution because they are sensitive to the lower (upper) bound definitions as 5 percent (10 percent), 10 percent (20 percent), and 20 percent (30 percent) of the firm's market value of equity, respectively. As alternative thresholds of 10 percent (20 percent) or 20 percent (30 percent) are tested, the estimated coefficients for these alternative thresholds are not significant (not reported in tables).

The coefficient estimate on EARN is not statistically significant in all the regression models. On the other hand, the coefficients on BBATH indicate a significant positive relation to DTVA in all regression specifications. Given that the big bath firms all had negative earnings changes, these findings indicate that although these firms had negative operating earnings at a level lower than the prior year's operating earnings, they still attempted to take a "big bath" rather than smooth their earnings. The significant coefficients on BONUSLOW and BBATH appear to suggest that managers take optional loss charges in a bad year to clear the way for stronger profits (and bonuses) in future years.

VI. SUMMARY AND CONCLUSIONS

This study explores accounting choice variables that are significant determinants of the valuation allowance for deferred tax assets under SFAS No. 109. Because any changes in the

valuation allowance affect income from continuing operations, and because the Statement considers future profitability of the firm as a whole, which involves a considerable amount of subjectivity, many have expressed concerns that valuation allowance can be an instrument for earnings management. However, little academic research has been devoted to testing the earnings management assertions by analyzing factors influencing the measurement of the valuation allowance. The results of this study can help clarify the findings of the related studies on SFAS No. 109.

The results suggest that it is difficult to justify realizability of deferred tax assets attributable to net operating loss carryforwards, other carryforwards such as tax credit carryforwards, and temporary differences associated with deferred compensation, probably because the realization period is long. The findings also indicate that closeness to debt constraints and political costs do not seem to provide any impetus for earnings management. However, the findings of this study provide some support for the hypothesis that managers of firms with bonus plans tied to income are more likely to choose a larger valuation allowance when the lower bonus threshold is binding. Specifically, this study found that firms attempt to take a "big bath" rather than smooth their income in years when their earnings are below a normal earnings level. Overall, the results show that a good deal of variation in the valuation allowance is explained by the "big bath" motivation.

This study expands on the extant research in two substantive ways. First, this paper examines an accounting choice indicator, thresholds of bonus plans, as a determinant of valuation allowances that have not been considered in previous studies on SFAS No. 109. Second, in contrast to previous research that examined the aggregate level of deferred tax assets, this study performs a more focused analysis by examining the components of deferred tax assets

(e.g., deductible temporary differences, operating loss carryforwards, tax credit carryforwards). The results could provide insights into the types of deferred tax assets that are most likely to be reserved.

This study does not include all of the potential accounting choices that impact reported earnings. The research examines whether the accounting decision to change the level of the deferred tax asset valuation allowance is being used to manage earnings. By looking at only one accounting choice, this study provides an incomplete view of the effect of managers' accounting decisions on reported earnings. Other accounting choices, such as inventory valuations, depreciation methods, investment tax credit accounting methods, pension and postretirement benefit assumptions, and accrual decisions, also impact reported income. In many cases the income effects of these accounting decisions are not noticeable because they are not separately disclosed in the financial statements. Thus, this study assumes that other accounting choices are made independent of managers' decisions to change the valuation allowance.

In establishing the valuation allowance for deferred tax assets, SFAS No. 109 requires consideration of both current and future profitability. Specifically, the Statement discourages changes in the valuation allowance that simply mimic changes in current earnings (FASB, 1992, para. 102). The findings of this study suggest a different behavior, however. A negative relationship is observed between changes in current profitability and changes in the valuation allowance, increasing the variations in current profitability over time. Specifically, the results of this study indicate that a good deal of variation in the valuation allowance and current earnings is explained by the "big bath" motivation.

Overall, the information gained from this research provides a better understanding of the earnings management potential permitted by the FASB, through managerial discretion over the

valuation allowance, for this particular pronouncement and industries. Evidence of earnings management motivations can provide insights into whether it is an appropriate accounting policy to give management considerable discretion to choose the level of the valuation allowance. This study provides empirical evidence that contributes to the extant literature on deferred taxes as well as expands our knowledge regarding earnings management.

TABLE 1
Industry Information of Sample Companies

SIC Code	Industry	No. of Firms	% of Sample
2000	Food and Kindred Products	14	3.01
2100	Tobacco Products	2	0.43
2200	Textile Mill Products	7	1.51
2300	Apparel and Other Textile Products	8	1.72
2400	Lumber and Wood Products	3	0.65
2500	Furniture and Fixtures	5	1.08
2600	Paper and Allied Products	6	1.29
2700	Printing and Publishing	7	1.51
2800	Chemical and Allied Products	43	9.25
2900	Petroleum and Coal Products	4	0.86
3000	Rubber and Misc. Plastics Products	8	1.72
3100	Leather and Leather Products	2	0.43
3200	Stone, Clay, and Glass Products	4	0.86
3300	Primary Metal Industries	17	3.66
3400	Fabricated Metal Products	14	3.01
3500	Industrial Machinery and Equipment	50	10.75
3600	Electronic and Other Electric Equipment	44	9.46
3700	Transportation Equipment	13	2.80
3800	Instruments and Related Products	33	7.10
3900	Miscellaneous Manufacturing Industry	8	1.72
5000	Wholesale Trade – Durable Goods	13	2.80
5100	Wholesale Trade – Nondurable Goods	6	1.29
5200	Building Materials and Garden Supplies	3	0.65
5300	General Merchandise Stores	5	1.08
5500	Automotive Dealers and Service Stations	2	0.43
5600	Apparel and Accessory Stores	1	0.22
5700	Furniture and Home Furnishings Stores	4	0.86
5800	Eating and Drinking Places	19	4.09
5900	Miscellaneous Retail	10	2.15
7000	Hotels and Other Lodging Places	9	1.94
7300	Business Services	51	10.97
7500	Auto Repair, Services, and Parking	2	0.43
7800	Motion Pictures	3	0.65
7900	Amusement and Recreation Services	7	1.51
8000	Health Services	21	4.52
8100	Legal Services	1	0.22
8200	Educational Services	3	0.65
8300	Social Services	4	0.86
8700	Engineering and Management Services	9	1.94
Total		465	100

TABLE 2
Descriptive Statistics for Firms that Change the Valuation Allowance in 2001
N = 337 Firms

Variable	Mean	25%	Median	75%	Standard Deviation
DTVA	0.240	-0.036	0.038	0.271	0.789
LEV	1.715	0.165	0.718	2.142	2.162
BONUSUPP	0.018	0.000	0.000	0.060	0.421
BONUSLOW	0.463	0.000	0.000	1.000	0.398
MV	6.157	3.451	5.164	7.479	3.245
NS	5.246	2.945	4.457	6.547	3.451
TA	6.584	4.476	6.132	7.849	4.184
BBATH	0.462	0.000	0.000	1.000	0.423
EARN	-0.001	-0.045	0.000	0.002	0.354
NOL	0.022	-0.432	0.000	0.665	0.260
OC	0.008	-0.467	0.000	0.511	0.284
OPEB	0.041	-0.292	0.000	0.062	0.312
DC	0.006	-0.165	0.000	0.022	0.095

Notes. Variables are defined as follows:

DTVA	=	Change in the deferred tax asset valuation allowance divided by the deferred tax asset at the end of the prior year.
LEV	=	Ratio of the book value of total debt to the book value of shareholders' equity at year-end.
BONUSUPP	=	The difference between the upper threshold and operating earnings, conditional on the existence of the earnings-based bonus plan as well as meeting the lower threshold, and zero otherwise.
BONUSLOW	=	An indicator variable coded one if the firm maintains a management bonus plan that is based on reported income and if operating earnings fall below the lower bonus threshold, and zero otherwise.
MV	=	The nature logarithm of market value of common stock in millions of dollars at year-end.
NS	=	The nature logarithm of net sales in millions of dollars at year-end.
TA	=	The nature logarithm of total assets in millions of dollars at year-end.
BBATH	=	An indicator variable that equals one if current period operating earnings are negative and lower than the prior year's operating earnings, and zero otherwise.
EARN	=	Change in current period operating earnings divided by total assets at the end of the prior year.
NOL	=	Change in the deferred tax asset attributable to net operating loss carryforwards divided by the deferred tax asset at the end of the prior year.
OC	=	Change in the deferred tax asset attributable to carryforwards other than NOLs divided by the deferred tax asset at the end of the prior year.
OPEB	=	Change in the deferred tax asset attributable to other postretirement benefits divided by the deferred tax asset at the end of the prior year.
DC	=	Change in the deferred tax asset attributable to deferred compensation divided by the deferred tax asset at the end of the prior year.

TABLE 3
Descriptive Statistics for Firms that Change the Valuation Allowance in 2002
N = 346 Firms

Variable	Mean	25%	Median	75%	Standard Deviation
DTVA	0.234	-0.042	0.027	0.248	1.001
LEV	1.611	0.153	0.734	1.876	2.237
BONUSUPP	0.023	0.000	0.000	0.075	0.452
BONUSLOW	0.418	0.000	0.000	1.000	0.354
MV	5.276	2.894	4.758	6.479	4.541
NS	4.630	2.163	3.796	5.014	3.895
TA	5.944	3.476	5.271	6.741	4.915
BBATH	0.685	0.000	0.000	1.000	0.395
EARN	-0.033	-0.078	-0.043	0.004	0.457
NOL	0.052	-0.361	0.017	0.773	0.397
OC	0.008	-0.248	0.023	0.509	0.376
OPEB	0.041	-0.160	0.012	0.042	0.284
DC	0.006	-0.009	0.023	0.067	0.153

<u>Notes.</u> Variables are defined as follows:

DTVA	=	Change in the deferred tax asset valuation allowance divided by the deferred tax asset at the end of the prior year.
LEV	=	Ratio of the book value of total debt to the book value of shareholders' equity at year-end.
BONUSUPP	=	The difference between the upper threshold and operating earnings, conditional on the existence of the earnings-based bonus plan as well as meeting the lower threshold, and zero otherwise.
BONUSLOW	=	An indicator variable coded one if the firm maintains a management bonus plan that is based on reported income and if operating earnings fall below the lower bonus threshold, and zero otherwise.
MV	=	The nature logarithm of market value of common stock in millions of dollars at year-end.
NS	=	The nature logarithm of net sales in millions of dollars at year-end.
TA	=	The nature logarithm of total assets in millions of dollars at year-end.
BBATH	=	An indicator variable that equals one if current period operating earnings are negative and lower than the prior year's operating earnings, and zero otherwise.
EARN	=	Change in current period operating earnings divided by total assets at the end of the prior year.
NOL	=	Change in the deferred tax asset attributable to net operating loss carryforwards divided by the deferred tax asset at the end of the prior year.
OC	=	Change in the deferred tax asset attributable to carryforwards other than NOLs divided by the deferred tax asset at the end of the prior year.
OPEB	=	Change in the deferred tax asset attributable to other postretirement benefits divided by the deferred tax asset at the end of the prior year.
DC	=	Change in the deferred tax asset attributable to deferred compensation divided by the deferred tax asset at the end of the prior year.

TABLE 4
Descriptive Statistics for Firms that Change the Valuation Allowance in 2003
N = 332 Firms

Variable	Mean	25%	Median	75%	Standard Deviation
DTVA	0.223	-0.049	0.027	0.256	0.852
LEV	1.876	0.184	0.854	2.469	2.368
BONUSUPP	0.020	0.000	0.000	0.058	0.407
BONUSLOW	0.398	0.000	0.000	1.000	0.332
MV	5.998	3.072	4.795	6.962	3.884
NS	4.789	2.854	3.807	6.106	4.018
TA	6.004	4.160	5.645	7.287	4.512
BBATH	0.245	0.000	0.000	0.000	0.413
EARN	0.010	-0.017	0.019	0.056	0.528
NOL	0.047	-0.274	0.000	0.426	0.210
OC	0.008	-0.219	0.000	0.399	0.236
OPEB	0.041	-0.102	0.000	0.120	0.247
DC	0.006	-0.009	0.000	0.013	0.043

Notes. Variables are defined as follows:

DTVA = Change in the deferred tax asset valuation allowance divided by the deferred tax asset at the end of the prior year.

LEV = Ratio of the book value of total debt to the book value of shareholders' equity at year-end.

BONUSUPP = The difference between the upper threshold and operating earnings, conditional on the existence of the earnings-based bonus plan as well as meeting the lower threshold, and zero otherwise.

BONUSLOW = An indicator variable coded one if the firm maintains a management bonus plan that is based on reported income and if operating earnings fall below the lower bonus threshold, and zero otherwise.

MV = The nature logarithm of market value of common stock in millions of dollars at year-end.

NS = The nature logarithm of net sales in millions of dollars at year-end.

TA = The nature logarithm of total assets in millions of dollars at year-end.

BBATH = An indicator variable that equals one if current period operating earnings are negative and lower than the prior year's operating earnings, and zero otherwise.

EARN = Change in current period operating earnings divided by total assets at the end of the prior year.

NOL = Change in the deferred tax asset attributable to net operating loss carryforwards divided by the deferred tax asset at the end of the prior year.

OC = Change in the deferred tax asset attributable to carryforwards other than NOLs divided by the deferred tax asset at the end of the prior year.

OPEB = Change in the deferred tax asset attributable to other postretirement benefits divided by the deferred tax asset at the end of the prior year.

DC = Change in the deferred tax asset attributable to deferred compensation divided by the deferred tax asset at the end of the prior year.

TABLE 5
Multiple Regression Results for the Year 2001 Using MV

$$\text{DTVA} = \beta_0 + \sum_{i=1}^{5} \beta_i \cdot X_i + \varepsilon$$

Adjusted R^2 = 0.412

Variable	Predicted Sign	Coefficient Estimate	p-value
Intercept		0.027	0.175
X_1 = LEV	-	0.010	0.209
X_2 = BONUSUPP	-	-0.037	0.349
X_3 = BONUSLOW	+	0.020	0.009
X_4 = MV	+	0.001	0.241
X_5 = BBATH	+	0.304	0.000
X_6 = SMOOTH	+	0.009	0.407
X_7 = NOL	+	0.357	0.000
X_8 = OC	+	0.124	0.057
X_9 = OPEB	?	0.033	0.433
X_{10} = DC	?	0.287	0.117

Notes. Variables are defined as follows:

DTVA	=	Change in the deferred tax asset valuation allowance divided by the deferred tax asset at the end of the prior year.
LEV	=	Ratio of the book value of total debt to the book value of shareholders' equity at year-end.
BONUSUPP	=	The difference between the upper threshold and operating earnings, conditional on the existence of the earnings-based bonus plan as well as meeting the lower threshold, and zero otherwise.
BONUSLOW	=	An indicator variable coded one if the firm maintains a management bonus plan that is based on reported income and if operating earnings fall below the lower bonus threshold, and zero otherwise.
MV	=	The nature logarithm of market value of common stock in millions of dollars at year-end.
BBATH	=	An indicator variable that equals one if current period operating earnings are negative and lower than the prior year's operating earnings, and zero otherwise.
EARN	=	Change in current period operating earnings divided by total assets at the end of the prior year.
NOL	=	Change in the deferred tax asset attributable to net operating loss carryforwards divided by the deferred tax asset at the end of the prior year.
OC	=	Change in the deferred tax asset attributable to carryforwards other than NOLs divided by the deferred tax asset at the end of the prior year.
OPEB	=	Change in the deferred tax asset attributable to other postretirement benefits divided by the deferred tax asset at the end of the prior year.
DC	=	Change in the deferred tax asset attributable to deferred compensation divided by the deferred tax asset at the end of the prior year.

TABLE 6
Multiple Regression Results for the Year 2002 Using MV

$$\mathbf{DTVA} = \beta_0 + \sum_{i=1}^{5} \beta_i \cdot X_i + \varepsilon$$

Adjusted R^2 = 0.448

Variable	Predicted Sign	Coefficient Estimate	p-value
Intercept		-0.019	0.457
X_1 = LEV	-	0.007	0.261
X_2 = BONUSUPP	-	-0.028	0.285
X_3 = BONUSLOW	+	0.032	0.000
X_4 = MV	+	0.012	0.517
X_5 = BBATH	+	0.314	0.000
X_6 = SMOOTH	+	-0.029	0.398
X_7 = NOL	+	0.186	0.000
X_8 = OC	+	0.308	0.000
X_9 = OPEB	?	-0.080	0.348
X_{10} = DC	?	0.265	0.142

<u>Notes.</u> Variables are defined as follows:

DTVA	=	Change in the deferred tax asset valuation allowance divided by the deferred tax asset at the end of the prior year.
LEV	=	Ratio of the book value of total debt to the book value of shareholders' equity at year-end.
BONUSUPP	=	The difference between the upper threshold and operating earnings, conditional on the existence of the earnings-based bonus plan as well as meeting the lower threshold, and zero otherwise.
BONUSLOW	=	An indicator variable coded one if the firm maintains a management bonus plan that is based on reported income and if operating earnings fall below the lower bonus threshold, and zero otherwise.
MV	=	The nature logarithm of market value of common stock in millions of dollars at year-end.
BBATH	=	An indicator variable that equals one if current period operating earnings are negative and lower than the prior year's operating earnings, and zero otherwise.
EARN	=	Change in current period operating earnings divided by total assets at the end of the prior year.
NOL	=	Change in the deferred tax asset attributable to net operating loss carryforwards divided by the deferred tax asset at the end of the prior year.
OC	=	Change in the deferred tax asset attributable to carryforwards other than NOLs divided by the deferred tax asset at the end of the prior year.
OPEB	=	Change in the deferred tax asset attributable to other postretirement benefits divided by the deferred tax asset at the end of the prior year.
DC	=	Change in the deferred tax asset attributable to deferred compensation divided by the deferred tax asset at the end of the prior year.

TABLE 7
Multiple Regression Results for the Year 2003 Using MV

$$\text{DTVA} = \beta_0 + \sum_{i=1}^{5} \beta_i \cdot X_i + \varepsilon$$

Adjusted $R^2 = 0.472$

Variable	Predicted Sign	Coefficient Estimate	p-value
Intercept		-0.001	0.879
X_1 = LEV	-	0.015	0.365
X_2 = BONUSUPP	-	-0.045	0.195
X_3 = BONUSLOW	+	0.028	0.000
X_4 = MV	+	0.009	0.297
X_5 = BBATH	+	0.313	0.000
X_6 = SMOOTH	+	0.054	0.265
X_7 = NOL	+	0.367	0.000
X_8 = OC	+	0.159	0.004
X_9 = OPEB	?	-0.052	0.390
X_{10} = DC	?	0.328	0.026

<u>Notes.</u> Variables are defined as follows:

DTVA	=	Change in the deferred tax asset valuation allowance divided by the deferred tax asset at the end of the prior year.
LEV	=	Ratio of the book value of total debt to the book value of shareholders' equity at year-end.
BONUSUPP	=	The difference between the upper threshold and operating earnings, conditional on the existence of the earnings-based bonus plan as well as meeting the lower threshold, and zero otherwise.
BONUSLOW	=	An indicator variable coded one if the firm maintains a management bonus plan that is based on reported income and if operating earnings fall below the lower bonus threshold, and zero otherwise.
MV	=	The nature logarithm of market value of common stock in millions of dollars at year-end.
BBATH	=	An indicator variable that equals one if current period operating earnings are negative and lower than the prior year's operating earnings, and zero otherwise.
EARN	=	Change in current period operating earnings divided by total assets at the end of the prior year.
NOL	=	Change in the deferred tax asset attributable to net operating loss carryforwards divided by the deferred tax asset at the end of the prior year.
OC	=	Change in the deferred tax asset attributable to carryforwards other than NOLs divided by the deferred tax asset at the end of the prior year.
OPEB	=	Change in the deferred tax asset attributable to other postretirement benefits divided by the deferred tax asset at the end of the prior year.
DC	=	Change in the deferred tax asset attributable to deferred compensation divided by the deferred tax asset at the end of the prior year.

REFERENCES

Archibald, T. R. (1967). The return to straight-line depreciation: An analysis of a change in accounting methods. Journal of Accounting Research, 4(Supplement), 164-180.

Bartov, E. (1993). The timing of asset sales and earnings manipulation. The Accounting Review, 68(4), 840-855.

Duke, J. C., & Hunt, H. G. (1990). An empirical examination of debt covenant restrictions and accounting-related debt proxies. Journal of Accounting and Economics, 12(1/3), 45-63.

Financial Accounting Standards Board (1987). Statement of Financial Accounting Standards No. 96, Accounting for Income Taxes. Stamford, CT: Author.

Financial Accounting Standards Board (1992). Statement of Financial Accounting Standards No. 109, Accounting for Income Taxes. Stamford, CT: Author.

Healy, P. M. (1985). The effect of bonus schemes on accounting decisions. Journal of Accounting and Economics, 7(1-3), 85-107.

Jensen, M. C., & Meckling, W. H. (1976, October). Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics, 3, 305-360.

Meyer, M. J., Karim, K. E., & Gara, S. C. (2000). Political costs and accounting method choice: The pharmaceutical industry. The Mid-Atlantic Journal of Business, 36(4), 193-215.

Miller, G. S., & Skinner, D. J. (1998). Determinants of the valuation allowance for deferred tax assets under SFAS 109. The Accounting Review, 73(2), 213-233.

Press, E. G., & Weintrop, J. B. (1990). Accounting-based constraints in public and private debt agreements: Their association with leverage and impact on accounting choice. Journal of Accounting and Economics, 12(1/3), 65-95.

Visvanathan, G. (1997, August). An empirical analysis of deferred tax assets as reported under SFAS No. 109. Paper presented at the Annual Meeting of the American Accounting Association, Dallas, TX.

Visvanathan, G. (1998). Deferred tax valuation allowances and earnings management. Journal of Financial Statement Analysis, 3(4), 6-15.

Watts, R. L., & Zimmerman, J. L. (1978). Towards a positive theory of the determination of accounting standards. The Accounting Review, 53(1), 112-134.

White, G. (1970). Discretionary accounting decisions and income normalization. Journal of Accounting Research, 8(2), 260-274.