The Excess Tax Depreciation Component of Deferred Taxes: Assumptions Versus Evidence

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Abstract

Several recent studies have examined the behavior of deferred taxes in an attempt to determine their proper balance sheet classification and likely information content. A key assumption underlying these studies, and most previous studies in the area, is that deferred taxes result principally from depreciation timing differences. This article, which is based on a detailed examination of Form 10-K reports for 122 sample companies over 15 years, demonstrates that this assumption is not currently valid. Results indicate that timing differences other than depreciation have a substantial impact on deferred tax behavior.

Introduction

The issuance of Statement of Financial Accounting Standards No. 96, "Accounting for Income Taxes" (SFAS 96) [FASB, 1987] has refocused attention on deferred taxes and their impact on financial reporting and security prices. Recently, several studies have re-examined the behavior of deferred taxes in an attempt to determine their proper balance sheet classification and likely information content.(1) A key assumption underlying these studies, and most previous studies in the area, is that deferred taxes result principally from depreciation timing differences.(2) This article, which is based on a detailed examination of Form 10-K reports for 122 sample companies over 15 years, demonstrates that this assumption is not currently valid. As accounting principles and tax laws have grown more complex, other sources of deferred taxes have become more common. As suggested by Wise [1986, p. 443], these other sources of deferred taxes can have a substantial impact on deferred tax behavior.

The purpose of this article is to demonstrate that timing differences other than depreciation can significantly influence deferred tax behavior. Results indicate that the composition of deferred taxes varies considerably over time and across companies.

The remainder of this article is organized as follows. Certain background information is briefly reviewed. The study's methodology and research findings are then addressed. The article concludes with a discussion of limitations and implications for future research.

Background Information

Prior to the issuance of SFAS 96, accounting for income taxes was governed principally by Accounting Principles Board Opinion No. 11 [APB 11, 1967].(3) This Opinion requires companies to use the "deferred method" of comprehensive interperiod tax allocation. Under this method, the resulting deferred tax provision reflects the net effect of all timing differences (both recurring and nonrecurring) using tax rates in effect for that period. In contrast to APB 11, SFAS 96 requires companies to use the "liability" method of comprehensive interperiod tax allocation. Under this method, the deferred tax provision is calculated using tax rates that are expected to be in effect when book-tax differences reverse.(4)

To date, most empirical studies involving accounting for income taxes have been concerned with the cyclical properties of deferred tax balances and their impact on financial reporting and security prices.(5) Livingstone [1969], Davidson, Skelton and Weil [1977], and Lasman and Weil [1978] are representative of earlier empirical studies in the area. More recent studies include Murdoch [1987], Lukawitz, Manes and Schaefer [1990], and Trezevant [1990]. Although these studies address different aspects of accounting for income taxes, almost all either implicitly or explicitly assume that deferred taxes result primarily from excess tax depreciation.(6) At one time, such an assumption may have been appropriate. However, as accounting principles and tax laws have grown more complex, other sources of book/tax

differences have become more common. Examples of these other differences include items relating to inventory and receivable valuation allowances, pension and compensation-related accruals, intercompany eliminations, foreign transactions, etc. This study provides empirical evidence to demonstrate that these other timing differences have a substantial impact on deferred tax behavior.

Research Methodology

This study analyzes firm-specific data to demonstrate that the excess tax depreciation component of deferred taxes is quite variable across companies and over time. The analysis is performed using COMPUSTAT and Form 10-K data for a sample of domestic manufacturers during the period 1973-1987.⁽⁷⁾ The sample is comprised of manufacturers since presumably one would want to test the validity of the assumption in question (i.e., deferred taxes result principally from depreciation timing differences) using capital-intensive firms. If one can demonstrate that timing differences other than depreciation have a substantial impact on the deferred tax behavior of capital-intensive firms, then one could expect a similar (or perhaps even more dramatic) result for other less capital-intensive companies.

The study's time frame, 1973-1987, was chosen for two reasons. First, certain data required for the study were not routinely available until 1973. The material components of the deferred tax provision were not routinely disclosed until 1973, the effective date for Accounting Series Release (ASR) No. 149. Second, the test period ends in 1987 so that deferred taxes are calculated in a consistent manner throughout the study's time horizon. Firms that were "early adopters" of SFAS 96 changed to the liability method from the deferred method of interperiod tax allocation beginning in 1988.

Variable Definitions

This study's analysis of deferred tax behavior is performed using three principal variables of interest: the excess tax depreciation component of the annual deferred tax provision (ETD), the annual deferred tax provision (DTP), and the year-to-year (annual) change in the noncurrent deferred tax balance (ACDTB). All other variables used herein are derived from this variable set. Each of the principal variables is discussed below.

Excess Tax Depreciation Component (ETD). This variable, the excess tax depreciation component of the annual deferred tax provision, serves as the cornerstone for this study's analysis of deferred tax behavior. This component is computed as the difference between book and tax depreciation expense amounts for the year, multiplied by the applicable corporate income tax rate.

Unlike most previous studies which have relied solely on COMPUSTAT data, this study investigates deferred tax behavior using detailed, hand-collected information about this excess tax depreciation component. The study is then able to demonstrate that timing differences other than depreciation can have a substantial impact on deferred tax behavior. As noted earlier, ASR No. 149 requires publicly-traded companies to disclose the material components of the deferred tax provision in their Form 10-K reports.

Deferred Tax Provision (DTP) and Annual Change in Deferred Tax Balance (ACDTB). These variables, the annual deferred tax provision (DTP) and the annual change in the noncurrent deferred tax balance (ACDTB), serve as benchmarks for assessing the relative importance of depreciation timing differences over time and across companies. The deferred tax provision reflects the net of all timing differences for the year, including excess tax depreciation. The annual deferred tax provision is reported by COMPUSTAT as data item 50. The second benchmark variable (ACDTB) is calculated with reference to the noncurrent deferred tax balance. This balance reflects the cumulative total of all noncurrent timing differences (including excess tax depreciation) that have yet to reverse as of a given balance sheet date. Under APB 11, timing differences (and the related deferred tax balance) are classified as either current or noncurrent based on the assets and liabilities to which they relate.⁽⁸⁾ The year-to-year change in the noncurrent deferred tax balance is computed with reference to COMPUSTAT data item 74.

Of course, one would expect some relationship to exist between the deferred tax provision and the year-to-year change in the noncurrent deferred tax balance. However, since the deferred tax balance (as reported by COMPUSTAT) reflects only noncurrent timing differences, while the deferred tax provision consists of both current and noncurrent differences, one might expect to see some variation between the provision and the change in the balance. Because of this potential variation, both benchmark variables (DTP and ACDTB) are used in this study.

Data Analysis

This study assesses the relative impact of depreciation timing differences on deferred tax behavior using a sample of 122 publicly-traded manufacturers. These sample firms represent 19 different industries, as measured by two-digit SIC codes. All sample companies have calendar year-ends. The companies were chosen for inclusion in the sample because they consistently disclose the components of the deferred tax provision.⁽⁹⁾ As discussed earlier, such disclosures are critical to the study's analysis of deferred tax behavior.

To provide a frame of reference, summary information concerning the deferred tax balance activity of sample firms is presented first. Detailed discussion of deferred tax behavior and the relative importance of depreciation timing differences then follows.

Aggregate Deferred Tax Behavior. Table 1 provides a summary of deferred tax balance activity for the sample companies during the study's test period. This information demonstrates that with respect to aggregate deferred tax behavior the sample firms are representative of the underlying population. As reported in Table 1, increases in deferred tax balances occurred, on average, 82.4% of the time during the study's test period, while decreases occurred, on average, 17.6% of the time. These results are consistent with previous studies that have reported increases ranging from approximately 76 to 84% and corresponding decreases ranging from 24 to 16%. (See, e.g., Davidson, Rasch and Weil [1984].) In addition to the reported averages, the general pattern of increases and decreases shown in Table 1 is also consistent with previous studies. In particular, the rise in the number of deferred tax decreases reported for the early 1980's has been attributed to the economic downturn occurring at the time. (See, e.g., Skekel and Fazzi [1984].) Readers should note that the number of companies reported in Table 1 (column 2) varies across years because of missing data items in the COMPUSTAT data base.

The Relative Importance of Depreciation Timing Differences. The relative importance of depreciation timing differences is assessed for each sample observation by comparing the excess tax depreciation component of the annual deferred tax provision (ETD) to (1) the total deferred tax provision (DTP) and (2) the year-to-year (annual) change in the noncurrent deferred tax balance (ACDTB). By making these comparisons, one can determine, for each sample observation, the portion of the benchmark variable (DTP and ACDTB) that is accounted for by depreciation timing differences. Both comparisons are made to demonstrate that the study's results are not a function of a given benchmark. Results of a third comparison involving the cumulative effect of depreciation timing differences on deferred tax behavior are also provided.

Table 2 reports the median values by year for the first two comparisons (ETD/DTP and ETD/ACDTB).(10) Graphical depictions are provided in Figure 1. The median provides a measure of central tendency which is not influenced by outlier observations.(11) As indicated in Table 2 and by Figure 1, considerable variability is present in the median values over time. By demonstrating that this variability exists, one can suggest that timing differences other than depreciation have a substantial impact on deferred tax behavior. The similarity of the Figure 1 line graphs also confirms that the variability is not a function of the benchmark variable.

Table 1
Summary of Annual Deferred Tax Balance Activity
1973-1987

Year (1)	No. of companies with change during year (2)	Companies with increases		Companies with decreases	
		No. of companies (3)	Percentage of column 2 (4)	No. of companies (5)	Percentage of column 2 (6)
1973	107	94	87.9%	13	12.1%
1974	111	90	81.1%	21	18.9%
1975	112	96	85.7%	16	14.3%
1976	111	96	86.5%	15	13.5%
1977	109	91	83.5%	18	16.5%
1978	108	95	88.0%	13	12.0%
1979	111	97	87.4%	14	12.6%
1980	112	101	90.2%	11	9.8%
1981	113	104	92.0%	9	8.0%
1982	113	89	78.8%	24	21.2%
1983	114	87	76.3%	27	23.7%
1984	113	80	70.8%	33	29.2%
1985	111	84	75.7%	27	24.3%
1986	107	79	73.8%	28	26.2%
1987	107	84	78.5%	23	21.5%
Total	1,659 =====	1,367 =====		292 ===	
Mean			82.4%		17.6%

Table 2

Median Values by Year for

Comparison of Excess Tax Depreciation (ETD) to Deferred Tax Provision (DTP) -- Column (1)
and

Comparison of Excess Tax Depreciation to Annual Change in Deferred Tax Balance (ACDTB) -- Column (2)
1973-1987

Year	Median Value ETP/DTP (1)	N	Median Value ETD/ACDTB (2)	N
1973	.75	116	.73	107
1974	.64	117	.79	111
1975	.63	119	.61	112
1976	.61	115	.76	111
1977	.62	116	.73	109
1978	.66	117	.77	108
1979	.54	116	.67	111
1980	.58	117	.74	112
1981	.61	117	.70	113
1982	.50	116	.81	113
1983	.71	116	.71	114
1984	.59	115	.64	113
1985	.58	111	.78	111
1986	.63	108	.66	107
1987	.33	105	.59	107
Total		1,721		1,659

The variability across sample observations is perhaps best captured by frequency distributions of the ETD/DTP and ETD/ACDTB comparison values. Histograms depicting these distributions are presented in Figures 2 and 3. As indicated by the distributions, the relative importance of depreciation timing differences (as compared to the deferred provision and the year-to-year change in the deferred balance) is quite variable across sample observations. (If this were not the case, one would expect the distributions to be clustered around 1.0, i.e., deferred taxes result primarily from depreciation timing differences.) For both comparisons, nearly 40% of the observations had values of less than .50. In addition, the existence of negative values suggests that the benchmark variable can be negative without having a reversal in depreciation timing differences, or alternatively, a reversal can occur, but other timing differences exist to prevent the benchmark from being negative. The dispersion present in the frequency distributions confirms that, for many companies, deferred taxes do not result principally from excess tax depreciation.(12) The similarity of the distributions presented in Figures 2 and 3 also confirms that the study's results were not driven by the choice of a benchmark variable.

To provide further evidence concerning the variable composition of deferred taxes, results of a third comparison involving the cumulative effect of depreciation

timing differences are also provided. These results demonstrate that the relative importance of depreciation timing differences is not only variable over the short-run (as evidenced by the ETD/DTP and ETD/ACDTB comparisons), but is also quite variable over a much longer time horizon.

Figure 4 depicts the relationship between the sum of the ETD values over the study's entire time horizon, 1973-1987 (ETDS), and the overall change in the deferred tax balance from the beginning to the end of the study's time horizon, 1/1/73 to 12/31/87 (OCDTB)-(13) By making this comparison, one can determine, for each sample observation, the portion of the overall change in the deferred tax balance that is accounted for (on a net basis) by depreciation timing differences. The histogram presented in Figure 4 demonstrates in a clear and convincing fashion that even over the long-term, depreciation timing differences have quite a variable effect on deferred tax behavior.

When reviewing Figure 4, it should be noted that the distribution is more positively skewed than those shown in Figures 2 and 3. This skewness is not surprising since one would expect both variables (ETDS and OCDTB) to be routinely positive. Indeed, the overall change in the deferred tax balance was positive for every sample observation, and the sum of the depreciation timing differences was also positive for all but two companies.

Conclusions

This study has provided empirical evidence to demonstrate that the excess tax depreciation component of deferred taxes varies considerably across companies and over time. This evidence contradicts the commonly held view that deferred taxes result primarily from depreciation timing differences. The composition of deferred taxes is of current interest given the ongoing controversy surrounding accounting for income taxes, including issues involving the balance sheet classification and information content of deferred taxes. Although the study's sample was restricted to manufacturers, the results should be generalizable to other firms. One could reasonably expect the composition of deferred taxes to be even more variable for other, less capital-intensive companies.

Suggestions for Future Research

The study's findings may also have implications for future research involving accounting for income taxes. As demonstrated, it is no longer valid to assume that deferred taxes result principally from excess tax depreciation. Studies should therefore consider the variable composition of deferred taxes in their research designs. One could even suggest that existing studies, which have assumed that deferred taxes result principally from

Figure 1
Graph of Median Values of Excess Tax Depreciation
Comparisons Reported in Table 2
1973-1987

depreciation timing differences, should be re-examined in light of the evidence presented herein. ●

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*****Footnotes*****

1. See, for example, Lukawitz, Manes and Schaefer [1990] and Givoly and Hayn [1989]. These recent studies are extensions of earlier works in the area, including Beaver and Dukes [1972].
2. Previous studies making this assumption include, for example, Graul and Lemke [1976], Karlinsky [1983], and Brown and Lippitt

[1987]. Also, as defined in APB No. 11, a timing difference "is a difference between the periods in which transactions affect taxable income and the periods in which they enter into the determination of pretax accounting income. Timing differences originate in one period and reverse or 'turn around' in one or more subsequent periods" [par. 13-e]. These differences are now referred to as "temporary" by SFAS 96.

3. Since the effective date of SFAS 96 has been deferred, APB Opinion No. 11 remains in effect for corporations that were not "early adopters" of Statement 96.
4. Other changes were also made by SFAS 96, including imposing restrictions on the recognition of deferred tax debits (i.e., assets).

Figure 2
Histogram for Comparison of Excess Tax
Depreciation (ETD) to Deferred Tax Provision (DTP)
1973-1987

(n = 1,721)

5. See Beechy [1983] and Beresford et al. [1983] for in-depth reviews of the literature.
6. As a specific case in point, both Davidson, Skelton and Weil [1977] and Davidson, Rasch and Weil [1984] implicitly assumed that deferred taxes result principally from depreciation timing differences. In both studies, the authors used only COMPUSTAT data and assumed that if the (1) deferred tax balance decreased during the year, (2) gross property, plant, and equipment decreased during the year, and (3) income taxes were paid or payable during the year, then the decrease in the deferred tax balance must have resulted from a reversal in depreciation timing differences (i.e., deferred taxes result principally from depreciation timing differences). A detailed analysis of this study's sample companies revealed that the inferential approach used by these earlier studies overstates the actual incidence of reversals (based on detailed Form 10-K data) by more than 2 to 1.
7. Standard & Poor's Annual Industrial COMPUSTAT data base was used for the analysis.
8. Under Statement of Financial Accounting Standards No. 37, "Balance Sheet Classification of Deferred Taxes" [FASB, 1980], timing differences that are not associated with an asset or liability account are classified as current or noncurrent based on the expected reversal date of the specific timing difference.
9. Although publicly-traded firms are required to disclose the material components of the de-

Figure 3
Histogram for Comparison of Excess Tax Depreciation (ETD) to
Annual Change in Deferred Tax Balance (ACDTB)
1973-1987

(n = 1,659)

ferred tax provision in their Form 10-K reports, many firms do not consistently and routinely provide such disclosures. This is confirmed by previous research, including Craig [1987], Schwartz [1983] and Hasselback [1976]. Also, it should be noted that the applicable disclosures were sometimes provided in narrative form, e.g., "depreciation timing differences were the primary cause of deferred taxes." If such disclosures were made, it was assumed, for purposes of the ETD value, that 100% of the deferred tax provision resulted from depreciation timing differences. Such an assumption may have had the effect of overstating the study's ETD variable. Of course, such an overstatement would actually strengthen the study's results, since the evidence suggests that the effect of depreciation timing differences

is still quite variable (even in the presence of this potential overstatement).

10. The number of observations reported in Table 2 varies across years and by comparison because of missing data items in the COMPUSTAT data base. Also, note that the number of observations reported for the ETD/ACDTB comparison agrees with the number reported in Table 1 (summary activity) since both reflect deferred tax balance activity.
11. Since both benchmark values could tend toward zero, the mean values for the two comparisons were influenced by outlier observations. Accordingly, the median values, as opposed to the means, are reported.

Figure 4
Histogram for Comparison of Sum of Excess Tax
Depreciation (ETDS) to Overall Change in Deferred
Tax Balance (OCDTB)
1973-1987

(n = 104)

12. Frequency distributions for both comparisons (ETD/DTP and ETD/ACDTB) were also prepared using three 5-year time intervals, 1973-1977, 1978-1982, and 1983-1987. These distributions reflected the same basic pattern as those presented in Figures 2 and 3.
13. As indicated in Figure 4, the total number of observations is 104. In order for an observation to be included as part of this cumulative comparison, the deferred tax balance amounts as of 1/1/73 and 12/31/87 needed to be available in the COMPUSTAT data base. As indicated by Tables 1 and 2, this information was available for 107 sample companies, i.e., n for 1973 and 1987. In addition, the depreciation timing difference variable (ETD) had to be available

for every year during the study's time horizon. (This requirement exists since ETDS represents the sum of every year's ETD amount.) Of the 107 companies initially available for this cumulative comparison, 104 disclosed an ETD value for every year of the study's 15-year horizon, 1973-1987. Three companies were missing one year's ETD value and were therefore excluded from the cumulative comparison, thus resulting in 104 total sample observations.

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