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Efficient and Opportunistic Choices of Accounting Procedures: Corporate Control Contests

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SYNOPSIS AND INTRODUCTION: Accounting numbers are an integral part of the firm's formal and informal contracts (Watts 1974; Holthausen and Leftwich 1983; Watts and Zimmerman 1986; Ball 1989; Christie 1990). This contracting-based theory of accounting is based on the premise that managers choose particular accounting procedures either efficiently to maximize the value of the firm, or opportunistically to make the manager better off at the expense of some other contracting party (Holthausen 1990). The relative amounts of efficiency and opportunism depend on controls on managers' accounting discretion. Such controls include monitoring by the board of directors, competition from the product markets and from within the firm by other managers, and the discipline of the market for corporate control.

It is difficult to determine whether managers make accounting choices to maximize firm-value. Empirical tests often assume opportunism and usually reject the null hypothesis of no association between accounting choice and firm-specific variables such as leverage (Christie 1990). However, many of the empirical regularities interpreted as evidence of opportunism can also be interpreted as occurring for efficiency reasons, which serves to confound these findings (Watts and Zimmerman 1986; Watts and Zimmerman 1990; Sweeney 1994). The few tests based on efficiency rationales find an association between the contracting variables and accounting choice (Zimmer 1986; Whittred 1987; Malmquist 1990; Mian and Smith 1990a).

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This paper measures the relative influences of efficiency and opportunism in accounting choice by examining a non-random sample that maximizes the probability of finding opportunism. Economics and finance studies document that corporate control actions such as tender offers and proxy fights discipline opportunistic managers. Therefore, we select a sample of takeover targets and examine this sample for evidence of managerial opportunism in choice of accounting procedures. A key assumption of our tests is that, prior to the control action, corporate control targets contain more non-value-maximizing managers than surviving firms in the same industry that were not targets of corporate control actions. This assumption allows us to use surviving firms' accounting procedures as the benchmark for the efficient accounting choice. In this application of Alchian's (1950) "economic Darwinism," surviving firms on average are more efficient than non-surviving firms. An unbiased estimate of accounting opportunism in this sample is an estimate of the upper bound on the amount of accounting opportunism in a random sample of firms. If there is little or no opportunism in our non-random sample, then for firms generally we can discount opportunism as an explanation for choice of the three accounting methods we study. Efforts to explain choice of accounting methods could then be redirected towards efficiency explanations.

We measure opportunism by comparing the frequency of choice of income-increasing procedures by takeover targets with the corresponding frequency of their surviving industry peers. We find that takeover targets select income-increasing depreciation, inventory, and investment tax credit (ITC) accounting methods more frequently than their surviving industry peers in up to 11 years preceding the control action. Our analysis includes a multiple regression that controls for efficient choice of accounting methods.

Our estimate of the upper bound on the frequency of opportunism is small relative to the mean choices of surviving firms. We conclude that some accounting opportunism exists in the takeover targets, but that efficiency is the more important explanation of accounting choice. However, while the frequency of opportunism is relatively small, the dollar effect on retained earnings of selecting an income-increasing method is large. For the median target firm, the after-tax effect on retained earnings if the firm had been on the alternative method is about 26 percent for depreciation, 9 percent for inventory, and around 5 percent for the ITC.

Key Words: *Accounting choice, Depreciation, Inventory, Investment tax credit, Takeovers, Efficiency, Managerial opportunism.*

Data Availability: *Data on takeovers are provided by Robert Comment.*

THE next section discusses efficient and opportunistic accounting choices. Section II describes the sample selection procedures and our benchmarks for efficient choice. Descriptive statistics on the samples are presented in section III. The results of the tests are contained in section IV, while section V summarizes the paper and provides some caveats.

I. Efficient and Opportunistic Accounting Choices

Determining the relative influence of efficiency and opportunism as factors affecting managers' accounting choices requires precise definitions of these terms. This section provides these definitions.

When organizing or reorganizing a firm, the contracting parties (including managers and outside claim holders) agree on the set of contracts that divide the firm's cash flows among the various contracting parties. Collectively, these parties have incentives to minimize agency costs (Jensen and Meckling 1976). While each party *ex-ante* has an incentive to write contracts that transfer wealth from the other parties, rational self-interest by these other parties limits such wealth transfers. If the contracts use accounting numbers, the manager's choice of methods over the life of the contracts is constrained to the *accepted set* of accounting procedures. Once the contracts are in place, the manager undertakes accounting and other decisions that, combined with random states of nature, produce cash flows that are distributed to the claim holders. Since future circumstances are likely to change and managers have specialized knowledge of which accounting methods would maximize the value of the firm, it may be optimal to allow managers some discretion over future accounting choices (Demski et al. 1984).

When writing the contracts prior to buying the outside claims, the contracting parties realize that the manager's future decisions can transfer wealth among all the contracting parties. Asymmetric information and costly monitoring prevent the contracting parties from perfectly monitoring managers. *Expected managerial opportunism* is the loss in value other contracting parties forecast the managers will cause, given contracting costs. Given the existing contracts, the outside debt- and share-holders discount the price they are willing to pay for their claims for any expected managerial actions that reduce their future returns. The claim holders are price protected against the *expected* amount of opportunism.

Managers' decisions (including choice of accounting methods from within the accepted set) can enhance their own expected welfare at the expense of other claim holders. However, since rational claim holders are price protected against expected opportunism, managers have an incentive to minimize expected opportunism; expected opportunism is efficient.[1] The firm-value-maximizing amount of expected opportunism occurs when the marginal cost of monitoring and contracting equals the marginal reduction in the cost of expected opportunism. The remaining expected opportunism is the Jensen and Meckling (1976) residual loss and is incorporated in the prices contracting parties pay for their claims. *Efficient* managerial actions increase *aggregate* wealth of parties to a contract, including the manager, after all contracting costs.[2]

Opportunism occurs when a manager's decision increases the manager's wealth, but does not create a net increase in aggregate wealth. Since claim holders are price protected, opportunism is the *excess* opportunism over that expected. The date expectations are formed is important to the definition. Expectations formed at the time contracts are negotiated affect the contracts written, including definition of the accepted set of accounting procedures, and the prices paid for the claims. As new information about firms' circumstances arrives, contracting parties revise both their assessments of the firm-value-maximizing decisions and their expectations of total managerial opportunism, given the existing contracts and enforcement mechanisms. Therefore, opportunism is the difference between the value effect of the decision made by a manager and that expected by shareholders at the time the decision is made. Opportunism occurs if: (1) circumstances change such that some firms' control systems allow managers to enrich themselves more than expected, or (2) mistakes are made in writing the initial contracts.

In the remainder of the paper, *opportunism* means the *unexpected* managerial actions that transfer wealth to managers from the debt- and share-holders, when there is no net increase in

[1] Whether agents or principals, or both, bear agency costs depends on the structure of labor and asset markets. In competitive securities markets, rational principals earn a normal return and the agent bears the agency costs.

[2] The wealth of some parties may initially decline with a given action, but, as long as aggregate wealth increases, side payments ensure that no party loses and at least one gains.

aggregate wealth. The term *opportunistic managers* refers to managers who take actions to increase their wealth at the expense of debt- and share-holders in excess of those decisions that were expected. The next two sub-sections describe how accounting procedures can either increase firm value (be efficient) or transfer wealth to managers (be opportunistic).

Efficient Accounting Choice

Accounting methods can be efficient (firm value-maximizing) in several ways. First, as discussed above, some expected opportunism is efficient. If the manager selects an accounting method that increases managerial wealth at the expense of other contracting parties who expected this choice, then this accounting method cannot be considered inefficient. Contracting costs ensure it is not optimal to eliminate all potential opportunism.

Second, decision making and internal control mechanisms such as make-versus-buy decisions, cost allocations, transfer pricing, capital budgeting, planning, pricing decisions, and performance evaluation and compensation are affected by accounting method choice. These decision and control mechanisms are inter-related, so value-maximization requires picking accounting methods that jointly optimize these decisions (Ball 1989; Christie et al. 1993). The efficient method varies across industries and through time as circumstances change. Internal and external accounting policies need not be the same, but they often are (Vancil 1978, 360). If accounting methods are chosen to maximize firm value, external reporting partly reflects accounting choices made for value-maximizing internal decision-making and control purposes.

Third, the efficient choice is affected by tax considerations. For example, one aspect of efficient choice of inventory method is minimization of the present value of taxes. Typically, efficiency involves choosing the income-decreasing method, but if a firm has a tax loss carry forward that is about to expire, value-maximization leads to choosing the income-increasing inventory method.

Fourth, Jensen (1988, 24) argues that when industries have excess capacity and slowing growth, exit is often less costly via merger and orderly liquidation than by disorderly, expensive bankruptcy. Firms become takeover targets because of poor operating performance, independent of managers' opportunism. For example, if shifts in the industry supply or demand curves cause an industry to contain too many firms, takeovers eliminate the excess capacity. In the short run, some firms in the industry face financial distress and *ceteris paribus* move closer to the constraints in their debt covenants. Faced with a contracting industry and in financial distress, income-increasing accounting methods increase firm value by reducing recontracting costs with debt-holders. If income-increasing accounting methods minimize the costs of financial distress, then they are not *per se* evidence of managerial opportunism.

Opportunistic Accounting Choice

Self-interested managers seek ways to raise their compensation above the value of their marginal product to the firm. Boards of directors, auditors, stock-based compensation plans, competition in the product markets, competition from other managers and corporate control contests limit the agency costs of self-interested managers. But all these devices are costly and limited in their ability to eliminate managerial self-dealing. We define opportunistic accounting choice as the income-increasing accounting methods in excess of those expected, given the information at the time the accounting choices are made. Opportunistic managers are predicted to pursue income-increasing accounting methods for two reasons: (i) to increase compensation via formal and informal compensation schemes that base executive pay on reported earnings and (ii) to reduce the likelihood senior management is forcibly removed for poor operating performance due to bad decisions.

Holthausen and Leftwich (1983, 84) argue that, with costly contracting, compensation plans create incentives for managers to select non-firm-value-maximizing accounting procedures. Formal bonus plans often create incentives for managers to choose income-increasing accounting methods to inflate earnings (Healy 1985). In firms without formal plans, but where executive pay is based on accounting earnings, managers have incentives to choose income-increasing accounting methods. Considerable evidence exists documenting the positive association between executive pay and accounting earnings after controlling for stock price movements (Antle and Smith 1986; Sloan 1993). Abdel-khalik (1985) and Healy et al. (1987) find that compensation committees do not nullify the effect of accounting changes.[3]

Managers are replaced either directly by the board firing them or by takeovers that lead to replacing the existing board and senior managers. Weisbach (1988) and Murphy and Zimmerman (1992) report that executive turnover is higher when accounting earnings are lower than last year's earnings after controlling for stock performance.[4] Weisbach concludes that directors use accounting earnings performance more than stock returns in their decision to replace the CEO. DeAngelo (1988) argues that non-value-maximizing managers choose income-increasing methods more frequently than value-maximizing managers to help defeat proxy contests.

Shleifer and Vishny (1989) argue that managers use a variety of entrenchment schemes, including use of disclosure policies that make it harder for non-managers to estimate the gains from replacing incumbent managers. Accounting procedure choice is one way managers mask non-value-maximizing expenditures from outsiders. Because they do not have access to all the parameters involved in the accounting calculations, it is difficult for outsiders to determine the value-maximizing accounting methods for the firm. If outsiders conclude that managers selected opportunistic accounting choices, it is difficult for them to produce pro-forma statements using alternative accounting methods. For example, while outsiders know that straight-line depreciation is being used, they do not know the assumed asset lives nor the estimated salvage values necessary to convert from straight-line to accelerated depreciation.

Measuring the Relative Importance of Efficiency and Opportunism

To estimate the upper bound on the amount of accounting opportunism in a random sample, we select a non-random sample of firms that ex-post reveal a higher fraction of opportunistic managers. Our non-random sample consists of firms subjected to corporate control actions. Prior to the corporate control actions, managers of these firms are likely to select more opportunistic accounting methods than managers in a random sample of firms. By comparing our estimate of the upper bound on the amount of accounting opportunism with the average choices of surviving firms, we can assess the relative importance of opportunism and efficiency in accounting choice.

After reviewing the evidence, Shleifer and Vishny (1988, 11) conclude, "In sum, internal control devices are not especially effective in forcing managers to abstain from non-value-maximizing conduct. In these circumstances, it is not surprising that external means of coercion such as hostile takeovers can come to play a role."[5] Our maintained hypothesis is that takeover

[3] Healy et al. (1987) explain this finding by the relatively small effect of the accounting change on compensation. They report that the potential effect on executive compensation of switching to straight-line depreciation is 1.5% per year. However, if the accounting change was made for efficiency reasons (e.g., to better approximate opportunity costs for internal decision making), then one would not expect the board to undo the effect of the accounting change on compensation.

[4] Blackwell et al. (1994) report similar results for lower-level managers of Texas banks.

[5] See Morck et al. (1988, 1989), Bhide (1989), Dann and DeAngelo (1988), Ruback (1988), Mitchell and Lehn (1990), and Shivdasani (1992).

targets have a higher incidence of non-value-maximizing managers than non-targets.[6] We argue that, prior to becoming control targets, these managers are more likely to use income-increasing accounting procedures than managers of their industry peers that never become takeover targets.[7]

Two studies, Groff and Wright (1989) and DeAngelo (1988), are related to our paper. Groff and Wright report that 79 firms receiving tender offers in 1975-79 choose more income-increasing accounting methods than a control sample of industry-size-leverage matched non-takeover targets in the year before the control action. Their study examines only one type of corporate control action (tender offers). Finally, they focus only on the accounting method choices in the year prior to the tender offer, which could be affected by anticipation of the takeover. DeAngelo (1988) finds that incumbent managers exercise their discretion to increase accounting accruals during 86 proxy contests over board of director seats. While she does not examine accounting procedures used prior to the contest, her examination of unexpected earnings and accounting accruals leads her to conclude that, during the contest, incumbent managers exercise their discretion to increase reported earnings (even though cash flows are not higher). The Groff and Wright (1989) and DeAngelo (1988) findings are consistent with incumbent managers acting opportunistically with respect to accounting choices. However, unlike this study, Groff and Wright and DeAngelo do not attempt to determine the relative importance of efficiency and opportunism in their findings.

II. Sample Selection and Measurement of Variables

This section describes the takeover sample, our measure of the benchmark for efficient accounting choice and measurement of variables.

Takeover Sample

Our sample of corporate control targets is drawn from Robert Comment's Mergers and Acquisitions Database. Targets must also have monthly returns available on *CRSP* and financial data on the *Compustat* Annual Industrial, Full Coverage and OTC, or Annual Research files, which encompass both surviving and non-surviving firms.

The 1990 version of the Comment Database contains 4,638 control actions covering all NYSE and AMEX firms through 1989. We focus on the initial control action in selecting our sample of targets. Our analysis is in event time and covers the 12 years from -11 to 0 where year "0" is the year of the public announcement of the first control action for the target in the Comment file. The stock return analysis is based on month zero rather than year zero. We limit the sample period to 1981-1988. *Compustat* first discloses data on three accounting methods (depreciation, inventory, and the investment tax credit) in 1972, so 1981 is the first year with ten years of accounting method disclosures prior to and including the initial control action. We use all data available in each period, so the number of observations changes over time.

Seven types of control actions are selected, yielding a sample of 543 firms with data on the *CRSP* and *Compustat* files. The seven included categories of control actions and their frequencies

[6] Corporate control actions take several forms, including mergers, tender offers, and proxy contests. Mergers entail a direct negotiation between the bidder and target which is then subject to shareholder approval. In tender offers, bidders offer directly to the shareholders to purchase their stock. With enough shares, the bidder gains control of the board of directors. Proxy contests involve a direct solicitation of the shareholders to elect a dissident slate of directors to the board.

[7] Opportunistic managers might choose income-deflating methods to increase outsiders' expectations that they are in fact non-opportunistic. If opportunistic managers try to "hide" among non-opportunistic managers in this way, our tests are biased against finding opportunism.

Table 1

Description of Takeover Sample According to Type of First Control Action 1981-1989*

	No. of Firms	*%*
Merger proposal	222	41%
Targeted repurchase of over 5% of outstanding shares	126	23%
Unnegotiated tender offer to be followed by merger	70	13%
Negotiated tender offer to be followed by merger	68	13%
Proxy fight over board seats	29	5%
Unnegotiated partial tender offer	22	4%
Negotiated partial tender offer (no merger planned)	6	1%
Total number of firms	543	100%

* The sample consists of all firms on the Comment database in these categories with data on the *CRSP* and *Compustat* files. The first control action is defined as the first chronological control action for each firm in the Comment database.

are listed in table 1. Merger proposals, at 41 percent of the sample, are the largest single category. These are announcements the company has received a proposal that the board has not yet agreed to accept or reject. The next largest category (23 percent of the sample) is targeted share repurchases ("greenmail"). Prior research on greenmail actions finds these transactions further entrench incumbent management (Dann and DeAngelo 1983; Bradley and Wakeman 1983; Klein and Rosenfeld 1988). None of the other types of tender offers and proxy fights in table 1 accounts for more than 13 percent of the sample.

Our sample excludes initial control actions that are friendly deals, to reduce the likelihood of including value-maximizing managers in the takeover sample.[8] We also exclude cleanup offers by parents, asset sales and voluntary liquidations. Cleanup mergers occur after a takeover for which the date of the earlier partial merger is not on the file. It is unlikely that these excluded actions are aimed at replacing non-value-maximizing managers. While the categories chosen to include or exclude from the takeover sample are somewhat arbitrary, the results are not sensitive to the sample selection criteria as discussed in more detail below.

Benchmarks for Efficient Accounting Choice

Estimating opportunism in accounting choice requires a control for efficient choices, but we do not know which accounting methods maximize firm value. Nor do we know how such efficient choices, including the amount of expected opportunism, vary across industries. Economic Darwinism predicts that the average accounting method of the surviving, non-takeover-target firms in the target's industry reflects the efficient accounting choice. If some of the surviving firms have opportunistic managers who are too entrenched to be removed, surviving firms' accounting choices might also reflect some opportunism. This possibility reduces the power of our tests by reducing differences between our target firms and their surviving industry peers.

[8] The friendly deals comprise 266 cases where there are merger talks or the company seeks a buyer, and 220 cases where a merger agreement is announced with no prior tender offer.

We construct an "industry index" of accounting choice. All firms in the target's three-digit SIC industry on the Annual Industrial *Compustat* file are included in the index if: (i) the firm's accounting-method choice is disclosed and (ii) the firm is not listed in the Comment file. Our results do not change if two-digit SIC codes are used instead of three-digit codes. Restricting the index to Annual Industrial *Compustat* firms ensures that they are surviving firms. Surviving firms are used because the maintained hypothesis is that these firms are more likely to use efficient accounting methods than non-surviving firms. *Ceteris paribus*, calculating an industry index increases the power of the tests over choosing a single control firm in the target's industry by reducing the sampling variation in the benchmark portfolio.

Measurement of Accounting Variables

An income-increasing accounting method either defers an expense to a later period or recognizes revenue earlier rather than later in time. For the three accounting methods studied (depreciation, inventory, and ITC), each target and surviving firm's accounting-method choice in year t is coded "1" if the income-increasing method is selected (straight-line depreciation, FIFO, and flow through for ITC) or "0" if the income-decreasing method is chosen (accelerated depreciation, LIFO, and deferral for ITC).[9] The "industry index" accounting method is the percentage of the surviving non-target firms in the target firm's industry using the income-increasing accounting method (e.g., straight-line depreciation).

III. Descriptive Statistics

Sample Composition

The frequency of calendar years of initial takeover bids (year 0 in event time) is almost uniformly distributed over the nine year sample period with 1986 exhibiting the largest concentration of the observations (16 percent). The one-digit SIC composition of the takeover sample resembles the industry composition of the population of *CRSP-Compustat* firms.

Effects of Accounting Choices on Retained Earnings

Critical assumptions underlying our tests are that straight-line depreciation, FIFO, and flow through for the ITC are income-increasing and have an economically important effect. Sweeney (1994) finds that one of the first debt constraints violated by firms that default on bond covenants is the equity constraint. Therefore, we estimate the retained earnings of target firms as if they use the alternative method. Retained earnings for the median target firm using straight-line depreciation would be about 26 percent lower if it used sum-of-years-digits depreciation.[10] Retained earnings for the median target firm using LIFO would be about 9 percent higher if it used FIFO.[11] If target firms using deferral for the ITC had been using flow through, the median retained

[9] While labeling LIFO as income-decreasing misclassifies those firms in declining-cost industries, there are only three firm-year observations with negative LIFO reserves out of more than 16 thousand observations. Also, our conclusions are not sensitive to alternative ways of classifying inventory methods as income-increasing or decreasing based on the average method used in the industry.

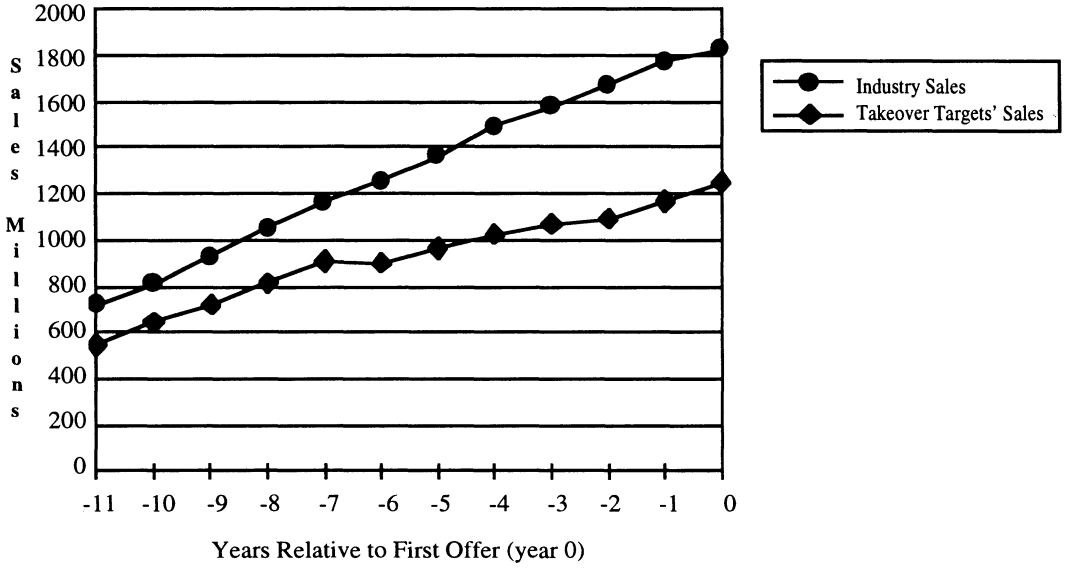
[10] Minus 26% is the ratio of the cumulative after-tax change in depreciation from straight-line to sum-of-years-digits divided by retained earnings. The change in depreciation is calculated using the firm's estimated asset life (historical cost of the assets divided by depreciation expense) and average age of the assets (accumulated depreciation divided by depreciation expense).

[11] For each target on LIFO, we calculate the ratio of the after-tax LIFO reserve to retained earnings.

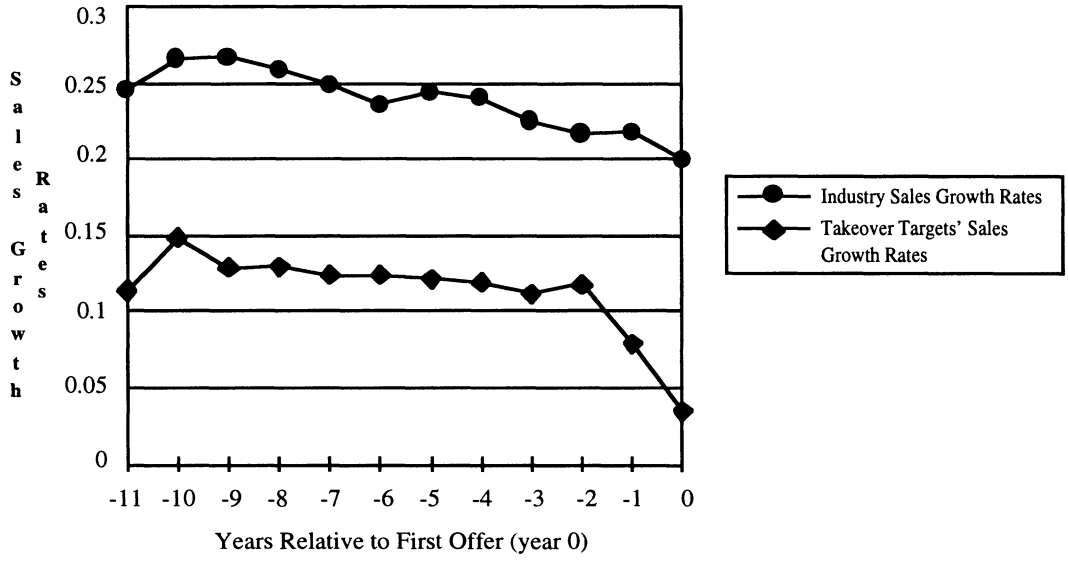
Figure 1

Sales and Growth Rates of Takeover Targets and their Industries

Panel A Sales: Takeover Targets versus Industry Mean



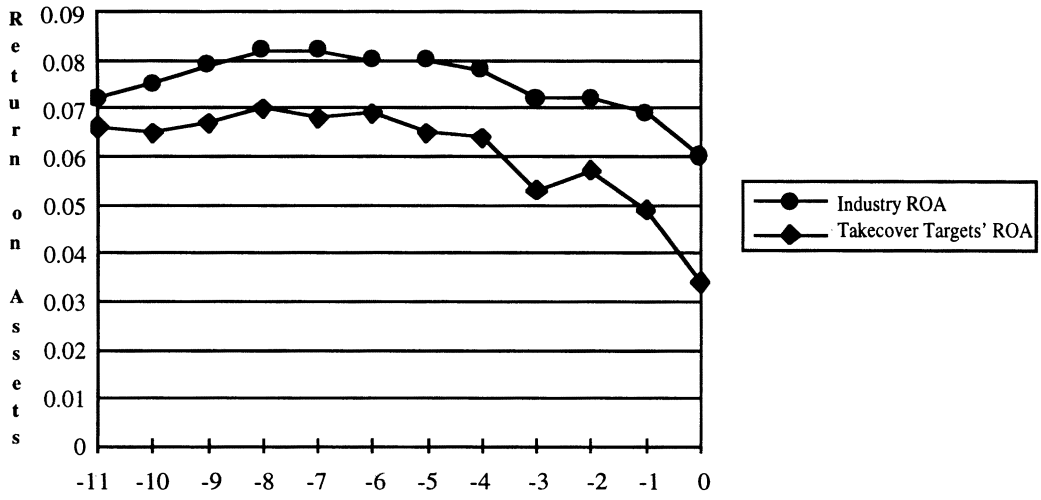
Panel B Sales Growth Rates: Takeover Targets versus Industry Mean*



*Sales growth rates are calculated as sales in year t divided by sales in year t-1 less one for each target and industry firm. The industry firms' growth rates are averaged. Then, the cross-sectional averages in growth rates in sales for takeover targets and their industries are calculated.

Figure 2

Mean Accounting Rates of Return of Takeover Targets and their Industries*



* Accounting rates of return are calculated as net income before interest divided by total assets. Net income before interest is computed by adding after-tax interest to net income using the highest marginal Federal corporate tax rate in that calendar year.

earnings would be about 5 percent higher.[12] These medians are significantly different from zero at the 0.01 level and are fairly constant over the event years -11 to -1.

Firm-Performance Measures

Takeover targets are predicted to have worse performance than their industry peers for two reasons. First, opportunistic managers invest sometimes in unprofitable projects to further entrench themselves at shareholder's expense (Shleifer and Vishny 1989) or consume higher levels of perquisites than their industry peers. Second, exogenous industry-wide contraction causes the worst performing firms to become takeover targets (Jensen 1988). Accounting data and abnormal stock returns are presented that are consistent with both these possibilities.

Accounting Performance Measures. Targets are smaller than their industry cohorts. Figure 1 panel A is the time series of mean sales for the takeover targets and their corresponding industry mean sales. In all 12 years, targets have statistically significantly smaller mean sales than their three-digit SIC industry peers. In years -6 to 0, the size differences become more pronounced. While we report year zero for descriptive reasons, the results in year zero should be interpreted cautiously for two reasons. First, the number of observations declines from 524 firms in year-1 to 355 firms in year zero as targets are acquired. Second, even when we have data for year zero, we have no way of determining whether they reflect the decisions of new management. The *t*-

[12] For targets on deferral, the balance sheet deferred ITC is divided by retained earnings.

Table 2

Mean Monthly Abnormal Stock Returns Preceding Takeover Bid

Estimation Months #	*Takeover Targets*	*Industry Indices*	*Differences between Target Firms and their Industries*	*Number of Paired Differences*
-185,-150	-0.0056*	-0.0012*	-0.0052*	305
-149,-114	-0.0050*	-0.0013*	-0.0037*	360
-113,-78	-0.0074*	-0.0023*	-0.0048*	385
-77,-42	-0.0073*	-0.0005	-0.0064*	429
-41,-6	-0.0071*	-0.0004	-0.0070*	494

Estimation months are relative to month 0, the month of the first control action. Each of the five periods comprises 36 months.

* Statistically different from zero at the 0.05 level or greater (one-tail test).

statistics on the difference in mean sales (not reported) range from -2.26 (in year -7) to -4.44 (in year -2). The results for total assets are qualitatively the same as sales.

Figure 1 panel B plots the mean annual sales growth rates of the targets and their industry indices. For both targets and their industry peers, growth rates are generally declining prior to the control action. In all 12 years the targets have smaller sales growth rates than surviving non-target firms in the same industry. All 12 of the differences are reliably different from zero at the 0.05 level with *t*-statistics (not reported) ranging from -5.05 (in year -1) to -9.23 (in year -9).

Figure 2 plots the accounting rates of return (ROAs) of the targets and their industry counterparts.[13] Takeover target ROAs are smaller than their industry peers. In year -7 the mean difference in ROA between the targets and their industries is -1.2% (not reported). The mean ROA difference increases to -1.9% by year -1. In all years -10 to 0, the difference between target and industry ROAs is reliably different from zero at the 0.05 level (one-tail test) with *t*-statistics ranging from -2.06 (in year -10) to -4.75 (in year -1). Figures 1 and 2 are consistent with our maintained hypothesis that takeover targets perform worse than surviving firms in their industries as documented in other studies (e.g., Bhide 1989).

Abnormal Stock Returns. Abnormal stock market performance is estimated using Jensen (1968) alphas for five non-overlapping three-year periods ending six months before the first control action. We use a monthly equally-weighted market index comprising all surviving, non-

[13] ROA is calculated as net income before interest divided by total assets. Net income before interest is computed by adding after-tax interest to net income using the highest marginal Federal corporate tax rate in that calendar year.

target firms on the *CRSP* file. We also examine industry abnormal performance by applying the same procedure to the portfolio of surviving firms in each target's three-digit SIC industry.

Table 2 presents the cross-sectional means of the estimated abnormal returns for the targets and their industries. In each of the five non-overlapping three year periods, the mean abnormal return of the target firms is reliably less than zero at the 0.05 level. The targets' mean estimated abnormal return is about -8.5% per year (-.0071 per month) over the months -41 to -6 preceding the first control action. The negative performance persists back 15 years and is present to a lesser extent in the industry index as well.

Table 2 also reports that, relative to the surviving firms in their industries on *CRSP*, takeover targets exhibit statistically significant negative abnormal stock returns in the 15 years preceding the first control action. These negative abnormal returns for the targets and (to a lesser extent) their industry cohorts are consistent with the findings for sales growth rates and ROAs in figures 1 and 2. These findings are similar to Palepu's (1986) results and are consistent with poorly performing firms and those in declining industries subsequently becoming takeover targets. In the next section, we find persistence in the accounting method choices. The target firms have been using more income-increasing accounting methods than their industry peers for up to 11 years prior to the control contest.

IV. Empirical Tests

This section presents multivariate tests of the efficient and opportunistic accounting-choice hypotheses. The evidence indicates that efficiency is more likely than opportunism to explain the accounting choices of a random sample of firms. These findings are robust to alternative sample selection criteria and model specifications.

Multivariate Tests of Efficient and Opportunistic Choice Hypotheses

Measuring opportunism requires an estimate of the efficient choice at the time of the manager's decision. We estimate annual models to allow for the arrival of new information that changes the firm-value-maximizing accounting choice, including the expected opportunism. Therefore, estimation of opportunism requires separate cross-sectional regressions for each accounting procedure annually for years -11 to -1. The controls for efficient choices include the average choice of surviving firms, the existence of tax losses and measures of operating performance.[14]

Under the efficiency hypothesis described above, value-maximizing managers choose income-increasing accounting methods to reduce the costs of financial distress (e.g., debt covenant violation and bankruptcy). We predict also that tax loss carry forwards provide an incentive to choose an income-increasing inventory method. Thus, for efficiency reasons, takeover targets, which are more likely to be in financial distress and have tax loss carry forwards, choose income-increasing methods.[15]

For each of the three accounting methods studied (depreciation, inventory, and investment tax credit), the firm's accounting-method choice in year t is coded "1" if the income-increasing

[14] A *changes* approach (time differencing) provides estimates of changes in opportunism, not the estimates of the *level* of opportunism we require. Also, the annual cross-sectional models reported trace out the time-series behavior of differences between targets and their industry peers.

[15] Accumulated tax losses and financial distress are related, but the tax losses affect only the inventory method choice, not depreciation or ITC.

method is selected or "0" if the income-decreasing method is chosen.[16] The annual industry index is the percentage of surviving non-target firms in the industry using the income-increasing method in the same calendar year as the target. This industry index is assumed to capture efficient choices, including expected opportunism. The index is subtracted from the target's choice (i.e., zero/one) in each year in event time. Year 0 is the year of the first control action. Similarly, each explanatory variable is differenced from its corresponding industry mean.

The estimated cross-sectional regressions are

$$M^j_{it} = a^j_{0t} + a^j_{1t}D_i + a^j_{2t}CARRY_{it} + a^j_{3t}COVER_{it} + a^j_{4t}RET_{it} + a^j_{5t}RISK_{it} + a^j_{6t}LEV_{it} + a^j_{7t}SIZE_{it}, \quad (1)$$

where

t = -11, -10, .., -1,
j = 1 (depreciation choice), 2 (inventory choice), 3 (ITC choice),
M^j_{it} = j^{th} accounting-method choice by firm i (1 = income-increasing, 0 otherwise) less the industry average of the j^{th} accounting method choice,
D_i = 1 if the i^{th} firm is a corporate control target, 0 otherwise,
$CARRY_{it}$ = 1 if tax-loss carry forward, 0 otherwise less industry mean CARRY,
$COVER_{it}$ = (Net income + after-tax interest)/(interest) less industry mean COVER,
RET_{it} = Firm i's stock return less industry mean RET,[17]
$RISK_{it}$ = Standard deviation of firm i's stock return less industry mean RISK,[18]
LEV_{it} = (Book value of debt/book value of total assets) less industry mean LEV,
$SIZE_{it}$ = log(sales) less log(industry mean sales).

A dummy variable, D, is included in equation (1) to capture the difference in accounting choice for takeover targets. To use this dummy, the regressions are estimated using the takeover targets and two industry and size matched non-targets for each target. Two non-target firms with sales just less than the target and just more than the target in the same industry, but which never were targets, are selected if they have data on the *CRSP* and the annual industrial *Compustat* files. The matching is based on sales in the year prior to the initial control action. The two industry-size matched firms are assigned the target's first takeover bid date as year zero.

Under our maintained hypotheses, the regressions estimate the upper bound on accounting opportunism. Opportunism cannot exist when both targets and their industry peers are all using the income-increasing method; all these firms are making efficient choices. To increase the power to detect opportunism, observations are deleted if the target and all the firms in its industry use the income-increasing accounting method. Significance levels are slightly lower when the observations where opportunism cannot exist are included, but none of the paper's inferences change.

[16] Specifically, *Compustat* footnote item 15 is used to classify depreciation method choice. Firms using both straight-line and accelerated are coded 0.5. Footnote item 8 is used to classify ITC choice. If the first significant digit of data item 59 is LIFO, the firm is classified as a LIFO firm; otherwise it is classified as a FIFO firm.

[17] RET_{it} is the continuously compounded 36 month raw stock return for firm i ending in the last month of calendar year t. The corresponding industry return is the continuously compounded return on the industry portfolio over 36 months ending in the same calendar month as the target's return. Because of the forward-looking nature of stock prices and because we do not know when the market first starts to anticipate adverse firm performance, we choose a long window (36 months) to capture changes in the market's expectations of performance.

[18] $RISK_{it}$ is the standard deviation of the 12 monthly raw stock returns for firm i in calendar year t.

Table 3

Cross-Sectional Regressions of Depreciation Choice

$$M_{it}^{j} = a_{0t}^{j} + a_{1t}^{j}D_{i} + a_{2t}^{j}CARRY_{it} + a_{3t}^{j}COVER_{it} + a_{4t}^{j}RET_{it} + a_{5t}^{j}RISK_{it} + a_{6t}^{j}LEV_{it} + a_{7t}^{j}SIZE_{it}$$

	CONST.	*D*	*CARRY*	*COVER*	*RET*	*RISK*	*LEV*	*SIZE*	R^2	*N*	
Predicted sign	?	+	?	–	–	+	+	–			
Year	*Annual Regressions Coefficients & t-statistics*										*Industry Mean*
-11	-0.013	0.027	-0.071	0.000	0.001	0.058	0.524	-0.015	.05	569	0.770
	(-0.66)	(1.01)	(-1.73)	(0.75)	(0.06)	(0.22)	(5.36)	(-1.83)			
-10	-0.022	0.036	0.001	0.000	-0.014	-0.064	0.416	-0.017	.04	633	0.774
	(-1.23)	(1.45)	(0.14)	(0.07)	(-0.75)	(-0.24)	(4.54)	(-2.31)			
- 9	-0.010	0.035	-0.000	-0.000	0.009	0.444	0.372	-0.015	.04	779	0.769
	(-0.58)	(1.52)	(-0.03)	(-0.44)	(0.51)	(1.78)	(4.68)	(-2.11)			
- 8	-0.021	0.026	0.012	-0.001	0.017	-0.126	0.441	-0.023	.06	850	0.776
	(-1.33)	(1.25)	(0.36)	(-1.29)	(0.99)	(-0.55)	(5.59)	(-3.54)			
- 7	-0.012	0.034	0.026	-0.000	0.035	0.067	0.355	-0.022	.05	868	0.777
	(-0.77)	(1.62)	(0.77)	(-1.32)	(1.96)	(0.29)	(4.70)	(-3.49)			
- 6	-0.022	0.035	0.011	-0.000	-0.012	-0.003	0.297	-0.022	.04	905	0.776
	(-1.22)	(1.72)	(0.32)	(-0.13)	(-0.55)	(-0.02)	(4.10)	(-3.49			
- 5	-0.023	0.039	-0.014	0.000	-0.021	0.248	0.227	-0.015	.02	926	0.781
	(-1.07)	(1.98)	(-0.45)	(0.82)	(-0.78)	(1.01)	(3.41)	(-2.54)			
- 4	-0.001	0.042	-0.020	0.000	0.009	0.077	0.290	-0.016	.03	957	0.785
	(-0.28)	(2.20)	(-0.69)	(0.20)	(0.38)	(0.39)	(4.44)	(-2.83)			

(Continued)

Table 3 *(Continued)*

- 3	-0.011	0.039	0.002	0.000	0.008	-0.130	0.110	-0.017	.01	992	0.788
	(-0.58)	(2.07)	(0.06)	(0.10)	(0.33)	(-0.67)	(2.30)	(-2.96)			
- 2	0.002	0.040	-0.016	0.000	0.021	0.032	0.299	-0.015	.03	1001	0.791
	(0.09)	(2.18)	(-0.60)	(0.53)	(0.91)	(0.19)	(5.04)	(-2.77)			
- 1	0.013	0.030	-0.018	0.000	0.046	0.218	0.214	-0.012	.02	1017	0.799
	(0.83)	(1.67)	(-0.70)	(0.44)	(2.10)	(1.50)	(3.86)	(-2.31)			
Years	*Mean Coefficients & Z statistics**										
-11 to -7	-0.016	0.032	-0.006	-0.000	0.010	0.076	0.421	-0.018	.05	5	0.773
	(-1.28)	(1.65)	(-0.18)	(-0.96)	(1.33)	(1.35)	(8.28)	(-4.27)			
-6 to -1	-0.008	0.038	-0.009	0.000	0.009	0.074	0.239	-0.016	.03	6	0.787
	(-0.57)	(2.59)	(-0.68)	(0.78)	(1.04)	(1.97)	(7.04)	(-4.97)			

* Z statistic adjusted for time-series dependence in the *t*-statistics from the annual cross-sectional regressions using an AR(2) process.

M^j_{it} = j^{th} accounting-method choice by firm i (1 = income-increasing, 0 otherwise) less the industry average of the j^{th} accounting method choice,
D_i = 1 if the i^{th} firm is a corporate control target, 0 otherwise,
$CARRY_{it}$ = 1 if tax-loss carry forward, 0 otherwise less industry mean CARRY,
$COVER_{it}$ = (Net income + after-tax interest)/(interest) less industry mean COVER,
RET_{it} = Firm i's stock return less industry mean RET,
$RISK_{it}$ = Standard deviation of firm i's stock return less industry mean RISK,
LEV_{it} = (Book value of debt/book value of total assets) less industry mean LEV,
$SIZE_{it}$ = log(sales) less log(industry mean sales).

Table 4

Cross-Sectional Regressions of Inventory Choice‡

$$M_{it}^{j} = a_{0t}^{j} + a_{1t}^{j}D_{i} + a_{2t}^{j}CARRY_{it} + a_{3t}^{j}COVER_{it} + a_{4t}^{j}RET_{it} + a_{5t}^{j}RISK_{it} + a_{6t}^{j}LEV_{it} + a_{7t}^{j}SIZE_{it}$$

	CONST.	*D*	*CARRY*	*COVER*	*RET*	*RISK*	*LEV*	*SIZE*	R^2	*N*	
Predicted sign	?	+	+	−	−	+	+	−			
Year	*Annual Regressions Coefficients & t-statistics*										*Industry Mean*
-11	-0.060	0.077	0.176	-0.001	0.031	0.713	0.262	-0.038	.06	498	0.804
	(-2.07)	(1.92)	(2.52)	(-1.04)	(0.85)	(1.65)	(1.69)	(-3.05)			
-10	-0.083	0.027	0.161	-0.000	-0.067	0.258	0.434	-0.055	.07	554	0.773
	(-2.90)	(0.67)	(2.36)	(-0.71)	(-1.96)	(0.60)	(2.75)	(-4.51)			
- 9	-0.060	0.021	0.086	0.000	-0.044	0.970	0.422	-0.046	.06	608	0.745
	(-2.05)	(0.54)	(1.34)	(0.07)	(-1.39)	(2.15)	(2.86)	(-3.86)			
- 8	-0.068	0.040	0.131	0.001	-0.048	0.714	0.459	-0.048	.06	692	0.713
	(-2.45)	(1.08)	(2.17)	(1.37)	(-1.55)	(1.74)	(3.15)	(-4.22)			
- 7	-0.20	0.021	0.094	0.001	-0.016	0.526	0.573	-0.038	05	745	0.668
	(-0.72)	(0.59)	(1.69)	(1.35)	(-0.49)	(1.29)	(4.22)	(-3.54)			
- 6	-0.031	0.044	0.119	0.000	-0.007	0.907	0.207	-0.036	.04	765	0.656
	(-0.94)	(1.24)	(2.05)	(0.46)	(-0.16)	(2.23)	(1.54)	(-3.28)			
- 5	-0.046	0.033	0.092	0.000	0.009	0.806	0.234	-0.046	.04	796	0.646
	(-1.18)	(0.97)	(1.72)	(0.31)	(0.19)	(1.82)	(1.87)	(-4.42)			

(Continued)

Table 4 (*Continued*)

- 4	-0.051	0.064	0.139	-0.000	0.018	0.392	0.193	-0.045	.05	839	0.624
	(-1.42)	(1.96)	(2.79)	(-0.45)	(0.39)	(1.10)	(1.61)	(-4.61)			
- 3	-0.079	0.078	0.064	-0.001	-0.012	0.483	0.282	-0.045	.05	874	0.614
	(-2.35)	(2.40)	(1.29)	(-1.15)	(-0.27)	(1.35)	(2.43)	(-4.58)			
- 2	-0.075	0.024	0.065	-0.000	-0.009	0.507	0.334	-0.056	.06	879	0.617
	(-2.36)	(0.75)	(1.35)	(-0.14)	(-0.21)	(1.66)	(2.94)	(-5.74)			
- 1	-0.082	0.030	0.101	0.000	-0.013	0.544	0.244	-0.054	.06	886	0.620
	(-2.64)	(0.93)	(2.18)	(0.67)	(-0.29)	(1.89)	(2.25)	(-5.75)			
Years	*Mean Coefficients & Z statistics**										
-11 to -7	-0.058	0.037	0.130	0.000	-0.029	0.637	0.434	-0.045	.06	5	0.741
	(-2.78)	(2.11)	(7.07)	(0.52)	(-1.45)	(6.20)	(5.90)	(-5.45)			
-6 to -1	-0.061	0.046	0.097	-0.000	-0.002	0.607	0.249	-0.047	.05	6	0.630
	(-2.71)	(3.32)	(7.28)	(-0.13)	(-0.10)	(7.66)	(4.64)	(-7.37)			

‡ See legend to table 3 for definitions of variables.

* Z statistic adjusted for time-series dependence in the t-statistics from the annual cross-sectional regressions using an AR(2) process.

Surviving non-target firms in the industry are assumed on average to use accounting methods that maximize firm-value. Efficient accounting choices are predicted to vary systematically with tax losses (CARRY) and, through bond covenants, with variables related to performance. We include one variable (COVER) that measures current performance and four variables (RET, RISK, LEV and SIZE) that measure past or cumulative firm performance (Christie 1990; Holthausen and Leftwich 1983; Watts and Zimmerman 1986). Firms with tax-loss carry forwards (CARRY) are more likely to choose FIFO if product costs are increasing. Firms with more variable cash flows and earnings (RISK) are more likely to have been in financial distress earlier and switched to an income-increasing method (Sweeney 1994). *Ceteris paribus*, poorly performing firms will have lower income to interest exposure (COVER), lower stock returns in the preceding three years (RET) and higher leverage (LEV). These firms are more likely to use income-increasing accounting methods. Also, firm size will vary with performance. *Ceteris paribus*, larger firms will tend to be better performers than smaller firms; to become large they were above average performers earlier. Thus, it is less likely these firms switched to an income-increasing method earlier. An alternative explanation for the predicted negative sign on SIZE is larger firms are subjected to greater political scrutiny and are more likely to choose income-decreasing accounting methods (Watts and Zimmerman 1986).

Tables 3, 4 and 5 report the regression results of the three accounting methods. The row labeled "Predicted Sign" contains the predictions of the opportunistic hypothesis for the dummy variable, D, and the efficiency hypothesis for the remaining variables. The next 11 rows in each table report annual cross-sectional regressions for years -11 to -1.[19] To help interpret the regression results, the right-most column reports the proportion of non-target firms in the target's industry using the income-increasing accounting method.

The last two rows in each table labeled Mean Coefficient & Z statistic contain the mean coefficient and asymptotic normal test statistics from the five annual regressions (-11 to -7) and the six annual regressions (-6 to -1). We refer to these two groups of years as the earlier and later periods. The Z statistics are computed as the mean of the individual *t*-statistics divided by a standard error that is adjusted for autocorrelation in the annual *t*-statistics (Christie 1990). The *t*-statistics estimated in the annual cross-sections are not independent over time because of time-series dependence in accounting choices. To adjust for the dependence in the annual *t*-statistics, we make an AR(2) correction for autocorrelation. The AR(2) correction is selected as the best representation of the underlying time-series process for the *t*-statistics after examining correlograms. Given the AR(2) assumption about time-series dependence, each aggregate test statistic is an asymptotically normally distributed Z statistic.[20]

Depreciation Method Choice. Table 3 reports the results for the depreciation regressions. In the last two rows, the mean coefficient on the takeover dummy variable over the first five years is 0.032 and over years -6 to -1 it is 0.038. The average coefficient in the last six years is about 20 percent higher than in the earlier period; the t statistic on this difference is 3.2. The average coefficient is significant at about the 0.05 level (one-tail test) in the earlier period and about the 0.0025 level in the later period. The 11 annual coefficients on the takeover dummy variable, D, are all positive, but only those in years -6 to -1 are statistically different from zero at the 0.05 level

[19] It is possible that the regression residuals are correlated across accounting methods in a given year. However, since the explanatory variables are identical across accounting methods, seemingly unrelated regression collapses to applying ordinary least squares to each equation; see Theil (1971 ch. 7).

[20] We are using asymptotic theory with either five or six observations. However, each of the *t*-statistics being aggregated has large degrees of freedom and hence is approximately normally distributed. For practical purposes we are aggregating dependent normal variates.

(one-tail test). The target firms choose straight-line depreciation more frequently than their industry peers and there is a tendency for this frequency to increase through time.

To put the foregoing results in perspective, only three to four out of 100 takeover targets select an income-increasing depreciation method more frequently than their industry peers, after controlling for differences in firm performance, capital structure, and size. The last column indicates that about 78 percent of the targets' industry peers choose straight-line depreciation. The propensity of targets to choose straight-line only 3.8% more of the time is small relative to the average probability of a firm choosing straight-line of 78 percent. Under our maintained hypothesis, the industry index and changes in the industry index reflect efficient choices. This suggests that although accounting opportunism appears to be present in the target sample, it is a second order effect in explaining depreciation method choice. This statement is conditional on the assumption that the mean accounting choice for the industry peer group is determined efficiently.

The variables, CARRY, COVER, RET and RISK, individually have little incremental explanatory power beyond the other variables in the depreciation model and often alternate signs across years. Under the efficiency hypothesis, the coefficient on RET is predicted to be negative; lower stock returns indicate greater financial distress and thus a greater likelihood of income-increasing accounting methods. Inconsistent with the efficiency hypothesis, RET tends to have a positive coefficient. RISK has the predicted positive sign; it is significant at the 0.01 level over the later period. Leverage (LEV) and SIZE have the signs predicted by the efficiency hypothesis and are statistically significant at least at the 0.01 level both in aggregate and in individual years.

Inventory Method Choice. Table 4 reports the regressions for the inventory models. The Z statistics in the last two rows on the takeover dummy variable from aggregating the five and six annual *t*-statistics are both statistically significantly positive (2.11 and 3.32). Even though the takeover dummy variable is significant only in three of the 11 cross-sectional regressions (years -11, -4 and -3), the aggregate test statistics on the dummy variable allow us to reject the null hypothesis of no opportunism by target managers, after accounting for the time-series dependence in the annual *t*-statistics. The mean coefficients on the takeover dummies are of similar magnitude to those reported for the depreciation regressions in table 3.

As in the depreciation case, the average coefficient on the takeover dummy increases from the earlier to later period; the increase is about 25 percent with a t statistic of 1.2. The last column in table 4, reports that the targets' peers have decreased their use of FIFO from 80.4% in year -11 to 62.0% in year -1. While target firms have a greater propensity to choose FIFO than their industry peers after controlling for differences in firm performance, capital structure, and size, the magnitude of 4 percent is small relative to the industry mean of about 65 percent.

Tax-loss carry forward (CARRY) has the predicted sign (+) and is statistically significant at the 0.05 level (one-tail test) in eight of the 11 years. The aggregate Z statistics for both the earlier (7.07) and the later (7.28) periods reject the null hypothesis of no association at the 0.001 level. RISK, LEV, and SIZE have the predicted signs and are statistically significant at the aggregate level. As in the depreciation model, the COVER and RET coefficients are insignificant.

ITC Method Choice. The takeover dummy variable for the ITC choice in table 5 is positive, but not statistically significant, in all of the annual regressions. The magnitude of the coefficients on the takeover dummy is similar to those for depreciation and inventory. Targets choose the ITC income-increasing method (flow through) 3 percent more often than their peers, whereas they choose straight-line or FIFO about 4 percent more frequently.[21] Using the AR(2) adjusted Z

[21] The ITC was eliminated in 1986. Since only firms using deferral remain in our samples after 1986, the number of observations in the regressions fall in years -4 to -1.

Table 5

Cross-Sectional Regressions of ITC Choice‡

$$M_{it}^{j} = a_{0t}^{j} + a_{1t}^{j}D_i + a_{2t}^{j}CARRY_{it} + a_{3t}^{j}COVER_{it} + a_{4t}^{j}RET_{it} + a_{5t}^{j}RISK_{it} + a_{6t}^{j}LEV_{it} + a_{7t}^{j}SIZE_{it}$$

	CONST.	*D*	*CARRY*	*COVER*	*RET*	*RISK*	*LEV*	*SIZE*	R^2	*N*	
Predicted sign	*?*	+	*?*	–	–	+	+	–			
Year	*Annual Regressions Coefficients & t-statistics*										*Industry Mean*
-11	-0.066	0.020	-0.010	-0.001	0.057	-0.109	0.160	-0.044	.02	323	0.858
	(-1.62)	(0.39)	(-0.13)	(-1.43)	(1.26)	(-0.21)	(0.88)	(-2.79)			
-10	-0.085	0.020	0.011	-0.002	-0.012	0.392	0.067	-0.048	.04	353	0.868
	(-2.31)	(0.41)	(0.15)	(-2.55)	(-0.30)	(0.74)	(0.39)	(-3.21)			
- 9	-0.103	0.036	0.048	-0.000	-0.088	0.717	0.150	-0.044	.05	418	0.877
	(-2.90)	(0.83)	(0.69)	(-0.88)	(-2.34)	(1.47)	(1.00)	(-3.24)			
- 8	-0.083	0.006	-0.003	-0.001	-0.060	1.218	0.231	-0.043	.06	443	0.887
	(-2.34)	(0.15)	(-0.04)	(-1.15)	(-1.62)	(2.66)	(1.45)	(-3.22)			
- 7	-0.063	0.026	0.058	-0.001	-0.017	0.521	0.325	-0.042	.04	447	0.890
	(-1.75)	(0.61)	(0.83)	(-0.60)	(-0.45)	(1.03)	(2.07)	(-3.29)			
- 6	-0.038	0.019	0.008	-0.001	0.019	1.484	0.205	-0.032	.05	458	0.895
	(-0.97)	(0.48)	(0.12)	(-1.35)	(0.40)	(3.25)	(1.42)	(-2.55)			
- 5	-0.028	0.038	0.111	-0.001	0.031	0.533	0.228	-0.035	.04	466	0.899
	(-0.58)	(0.96)	(1.76)	(-0.69)	(0.54)	(1.04)	(1.63)	(-3.01)			

(Continued)

Table 5 *(Continued)*

- 4	-0.015	0.044	0.124	0.001	0.068	0.530	0.264	-0.037	.05	461	0.908
	(-0.30)	(1.16)	(2.11)	(0.74)	(1.18)	(1.33)	(1.84)	(-3.46)			
- 3	-0.025	0.034	0.079	-0.000	0.052	0.232	0.281	-0.037	.04	455	0.917
	(-0.58)	(0.93)	(1.41)	(-0.57)	(0.96)	(0.56)	(2.09)	(-3.37)			
- 2	-0.024	0.010	0.080	-0.000	0.061	0.336	0.237	-0.040	.04	434	0.921
	(-0.56)	(0.25)	(1.39)	(-0.53)	(1.12)	(0.89)	(1.73)	(-3.56)			
- 1	-0.067	0.047	0.070	0.001	0.031	0.496	0.387	-0.042	.06	397	0.924
	(-1.59)	(1.20)	(1.21)	(1.02)	(0.55)	(1.49)	(2.98)	(-3.72)			
Years	*Mean Coefficients & Z statistics**										
-11 to -7	-0.080	0.022	0.021	-0.001	-0.024	0.548	0.187	-0.044	04	5	0.876
	(-3.17)	(1.01)	(0.37)	(-2.14)	(-1.33)	(2.01)	(1.62)	(-5.61)			
-6 to -1	-0.033	0.032	0.079	-0.000	0.044	0.602	0.267	-0.037	.06	6	0.911
	(-1.22)	(1.92)	(1.81)	(-0.41)	(1.67)	(2.76)	(2.98)	(-6.38)			

‡See legend to table 3 for definitions of variables.
*Z statistic adjusted for time-series dependence in the *t*-statistics from the annual cross-sectional regressions using an AR(2) process.

statistics, the probability of observing the aggregate test statistics is about 0.08 in the earlier period and 0.015 in the later period. As with the other methods, the frequency of use of the income-increasing method (flow through) increases about 45 percent from the earlier to later period; the t statistic on this difference is 2.6.

RISK, LEV and SIZE again have statistically significant coefficients with the predicted signs. From the last column of table 5, there is a long-term trend from deferral to flow through for the targets' industry peers with 92.4% of the industry peers using flow through by year -1.

Other results to note from tables 3, 4 and 5 are:

1. The size variable is always negative and significant. Notwithstanding the non-target firms included in the regression are matched to the targets on the basis of size, there is still variation in size between the target sample firms and their matched counterparts.

2. The total amount of variation explained by the model (R^2) is generally small, never exceeding 7 percent. This is in part because all the variables are differenced from their corresponding industry means.

3. The tax loss carry forward variable, CARRY, is statistically significant only in the inventory model. We include it in the other models as another proxy variable for firm performance. The fact that CARRY is only significant in the inventory model adds credence to taxes being important only in the inventory accounting choice and suggests that other variables are capturing firm performance in the depreciation and ITC models. These findings are consistent with those reported by El-Gazzar et al. (1986).

The data also reflect a trend towards straight-line depreciation, LIFO and flow through for ITC for the surviving non-target firms. Given our maintained hypothesis that surviving industry peers make efficient accounting choices, these trends are due to changes in efficient choices.

Model Specification. There are two model specification issues. The first is endogeneity. Since some of the explanatory variables in these regressions (e.g., COVER and LEV) depend on the choice of accounting method (the dependent variable), there are endogenous variables on the right hand side of equation (1). Therefore, the regressions are misspecified.

The second specification issue stems from the selection bias we deliberately induce by our sampling procedure. One can think of an indicator function with variables causing some firms to be taken over, and another function determining choice of accounting procedure. Failure to account for the relation between the indicator function and the accounting choice function can lead to inconsistent estimators; see Maddala (1991) for a survey. The theory is not rich enough to allow us to distinguish variables causing takeovers from variables affecting accounting choice. To the extent that poor performance affects both the probability of a takeover and the choice of accounting method, some of the explanatory variables are the same in the two cases. In the absence of a richer theory, we estimate what amounts to a reduced form, conduct specification tests, and investigate the sensitivity of our results to different sample selection methods and alternative explanatory variables.

The White (1980) specification test is a joint test of specification and heteroscedasticity. Since unreported tests using weighted least squares produce similar White statistics to those we report below, we treat significant White statistics as evidence of misspecification, not heteroscedasticity. The White test rejects the null hypothesis that the depreciation regressions are well specified (at the 5 percent level) in two of the 11 years. The situation is worse for the

inventory and ITC regressions for which the White statistic rejects in eight and 11 of the 11 years. The White statistics from (unreported) regressions where the variables are not differenced from their industry means are three to ten times those we find here. That is, the 'levels' regressions that appear in Hagerman and Zmijewski (1979) and Skinner (1993) are probably badly misspecified. Differencing all the variables from the industry means dramatically improves, but obviously does not solve, the specification question.

Sensitivity Analysis

The findings reported above are insensitive both to additional restrictions on the sample selection and to alternative model specifications. We construct a "non-synergistic" takeover portfolio where the control action is not undertaken to capture synergies between the bidder and target. The non-synergistic portfolio contains only initial control actions of the following types: unnegotiated tender offer to be followed by merger; unnegotiated partial tender offer; proxy fight over board seats; targeted repurchase of over 5 percent of the outstanding shares. In addition, the first unnegotiated tender offer cannot be made by another corporation. This constraint eliminates takeovers that might occur for synergistic reasons. An offer by an individual or private partnership cannot be motivated by synergies, but should contain a greater frequency of control actions aimed at disciplining non-value-maximizing managers. This sampling procedure produces 184 "non-synergistic" targets with data on both the *Compustat* and *CRSP* files.

All the target firms in the original sample not included in the "non-synergistic" portfolio are included in the "other takeover" portfolio. The other takeover portfolio contains 359 firms with data on both *CRSP* and *Compustat*. In the multivariate tests, two dummy variables are included: one for the non-synergistic sample and one for the other takeover firms.

The results from the non-synergistic and other takeover portfolios are similar to those reported above. We conduct an F test on equality of the coefficients on the non-synergistic and other takeover dummies. At the 5 percent level, the data reject the null of equality in only one instance out of 33 (inventory, year -1).

The qualitative nature of the results reported in tables 3 through 5 is robust to even finer partitioning of the sample. Table 1 reports 23 percent of the targets are firms whose first control action is a "Targeted share repurchase of over 5 percent of outstanding shares." We examine whether these transactions are representative of the remaining control actions. The qualitative conclusions of the earlier tests are unchanged when the multivariate tests are repeated after deleting targeted share repurchases.

As another robustness check of the regression findings, we include two additional variables in the regression models. Accounting return on assets (ROA) and book value to cost (the ratio of property, plant, and equipment net of accumulated depreciation to the original cost of property, plant, and equipment) are included in the models to control for possible omitted correlated variables. Both variables are differenced from their industry means. ROA is perhaps a more direct measure of firm performance than COV, RET, RISK, and SIZE. Book value to cost is included to capture systematic differences in the age of the firm's assets or maturity. The *t*-statistics on the takeover dummy variables (not reported) are slightly more statistically significant when these two variables are added to the regression; the remaining variables are essentially unaffected. We conclude the results in tables 3, 4 and 5 are robust to the inclusion of these variables.

The results are not sensitive to using only firms with all 11 years of accounting methods reported on *Compustat*. Finally, for each firm-year observation we construct a single portfolio of accounting choices using various weighting schemes to combine the three accounting methods (Zmijewski and Hagerman 1981; Sweeney 1994). The previous inferences are unchanged.

V. Conclusions

By examining firms that eventually become takeover targets, this paper is the first to test the relative influence of efficiency and opportunism on accounting choices. Efficiency assumes accounting procedures facilitate internal decision making and control, minimize taxes, reduce costly bond covenant renegotiations, and minimize the costs of expected opportunism. Opportunism assumes income-increasing accounting methods increase managers' wealth at the expense of shareholders. Opportunism is the difference between total opportunism and that expected given the contracts and information available at the time the accounting choices are made.

Other papers have examined the accounting choices of managers involved in corporate control actions (Groff and Wright 1989; DeAngelo 1988), but do not differentiate between opportunism and efficiency. Our research design provides an estimate of the upper bound of opportunism in a random sample by estimating the amount of opportunism in a non-random sample of firms—takeover targets—where accounting opportunism is most likely to exist. Our tests also incorporate variables to control for efficient choice, include more types of corporate control actions over a longer time period, and examine a longer event window of up to 11 years before the control action.

Similar to Groff and Wright (1989) and DeAngelo (1988), we find takeover-target managers select more income-increasing depreciation, inventory and investment tax credit methods than their surviving non-target industry peers. However, the incremental frequency with which target managers select income-increasing accounting methods is small relative to efficiency explanations. This suggests that accounting opportunism is a second-order effect, even in the target sample where opportunism is expected to be most pronounced.

We also find that targets' use of income-inflating methods persists over time. Targets have been using income-inflating methods more frequently than their industry peers for at least 11 years, although the frequency is higher as the takeover event nears. These results reflect the selection bias that is designed into our sampling process; firms suggested by the corporate control literature to have ex-post contained opportunistic managers are selected. Long-standing differences in accounting methods result from managerial opportunism that persists over long periods of time before the market for corporate control identifies such behavior. The selection bias interpretation is also consistent with the negative abnormal capital market returns evidence in the third section. Target firms have systematically under-performed their industry peers for at least 15 years before becoming a target; see especially table 2 and figures 1 and 2.[22]

While the market for corporate control appears to take a long time to eliminate opportunistic managers, this is consistent with Palepu (1986), which documents the difficulty of predicting takeover targets using publicly available data. While it is possible that the long-standing tendency of the target firms to choose income-increasing methods is unrelated to opportunism, the multivariate regressions reported in tables 3, 4 and 5 control for any variables that are known to be systematically associated with cross-sectional differences in choice of accounting procedures.

We conclude that efficiency is more important than opportunism in explaining accounting choice. Nonetheless, there are two types of caveats to consider. The first type applies to all studies of accounting procedure choice, while the second type is specific to this study. All studies of accounting procedure choice require assumptions that opportunistic managers choose income-

[22] We do not have data on tenure of CEOs in our samples. However, Gibbons and Murphy (1990) report that the median CEO tenure is 7.9 years for 1,631 CEOs representing 916 firms in *Forbes'* compensation surveys. A median tenure of 7.9 years, coupled with our finding of the persistence of income-inflating methods, suggests problems with target firms' internal controls rather than a particular CEO who is opportunistic.

increasing accounting procedures. Presumably these methods increase the present value of executive compensation and reduce the likelihood the CEO is replaced. However, ranking accounting measures according to their income effects, while useful for operationalizing the opportunistic accounting-choice hypothesis, ignores many dimensions of how accounting numbers are used. For example, if value-maximizing managers choose accounting methods that most closely approximate the opportunity cost of the resources consumed (Ball 1989), then value-maximizing managers will rank accounting procedures on their association with opportunity costs, rather than their effect on earnings.[23]

Second, interpretation of the results depends on the properties of our estimate of opportunism in the target sample. An unbiased estimate of opportunism in this sample is an estimate of the upper bound on the amount of opportunism in a random sample of surviving firms. However, there are several potential sources of bias in our estimate of opportunism.

One potential bias arises if our maintained hypotheses (takeovers are a device to remove opportunistic managers, and surviving non-takeover targets are the appropriate benchmark for efficient choice) are false. Misclassifications could arise from including (i) value-maximizing managers in the takeover sample and (ii) opportunistic managers in the benchmark sample. In response, we conduct sensitivity analyses using subsets of the sample. After excluding friendly mergers and, in one analysis other takeovers that are potentially synergistic, we find no evidence that any subset of the sample differs in systematic ways from the remainder. Similarly, all the explanatory variables in the multiple regressions are assumed to measure efficiency reasons for accounting choice. If these variables are related to opportunism, or if any misclassifications are related to accounting choice, then the relative importance of opportunism is understated.

Another potential bias results if SIC codes are not the appropriate definition of an industry to benchmark the efficient accounting choice set. SIC codes, which classify firms by production technology, misclassify firms by product markets (Benston 1975). However, if a major determinant of the firm's contracts (including accounting procedures) is the underlying production technology, then SIC codes are probably associated with contracting methods. The three accounting methods we study are primarily determined by production technology. Even if this assumption is inappropriate, there is no obvious directional bias in our estimate of opportunism.

We study only three well understood and visible accounting choices. If, as Healy (1985) suggests, managers manipulate accruals in ways that are hard to monitor, then our approach underestimates the aggregate amount of opportunism in accounting choice more generally. Finally, accounting choices of takeover targets might differ from those of their surviving industry peers in some economic dimensions unrelated to opportunism and not captured in our control variables. If so, such correlated omitted variables cause our estimate of opportunism in the target sample to be biased. Without a more precise theory of what causes takeover actions, and better theories of efficient accounting choice to identify the excluded variables, there is nothing further we can do about these limitations.

Even if our estimates of opportunism are understated, it is unlikely they are biased by the order of magnitude required to invalidate our primary conclusion that efficiency is a more plausible explanation than opportunism for most accounting choices. Of the above caveats, we take use of earnings effects to dichotomize accounting methods most seriously. Most firms are not in financial distress, and economic Darwinism predicts they have sufficient internal controls to provide managers with an incentive to maximize value. If value-maximizing managers judge

[23] Also, some accounting choices, such as consolidation policy, do not affect income yet affect contracts (Mian and Smith 1990a and 1990b).

accounting methods by their effect on taxes, internal decision making and control, then trying to explain choices of accounting procedures with reference to their directional effect on earnings is unlikely to be productive.

Subject to the above caveats, we conclude that our results are consistent both with target managers selecting accounting methods efficiently to reduce taxes and the costs of financial distress, and with the existence of accounting opportunism. However, managerial accounting opportunism is small relative to the frequency of procedure choices we attribute to efficiency, even in our non-random sample specifically chosen to contain a higher than normal frequency of opportunistic managers. We find accounting opportunism to be a second order effect in this sample, and surmise that, in a randomly selected sample, opportunism is an even less important determinant of choice of accounting methods for depreciation, inventory and the ITC.

Independent of whether our research design leads to an unbiased estimate of the upper bound on the amount of opportunism in choice of depreciation, inventory and ITC methods, opportunism is unlikely to explain the time-series changes towards straight-line depreciation, LIFO and the flow through method of accounting for the ITC we observe for surviving firms. Nor is opportunism likely to explain the variation in average choice across industries for surviving firms. Economic Darwinism implies that these time-series and cross-sectional differences require efficiency explanations.

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