R & D budgets and corporate earnings targets

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Abstract

Unlike other investments in the U.S., research and development budgets are not depreciated but expensed. Thus, pre-tax reported earnings fluctuate dollar-for-dollar with changes in R&D budgets. Because executives know more about the firm than outsiders, they may adjust R&D budgets in order to manage accounting earnings and stock prices. Discretionary changes in R&D may also reflect managerial incentives, taxes, and free cash flow. We study a panel of 100 U.S. companies with large R&D budgets for the decade between 1977 and 1986. On average, R&D budget adjustments reduce the anticipated gap between analysts' earnings forecasts and reported income. In the cross-section of firms, more gap closure is associated with high trading volume and high business risk. Less earnings management occurs if the CEO and institutional investors own an important fraction of the shares. © 1998 Elsevier Science B.V. All rights reserved.

1. Introduction

Since Berle and Means (1932), the separation of ownership and control is one of the traditional starting points in the theory of the firm. This separation is seen as a negative for allocational efficiency – perhaps unavoidably linked to the growth

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of business enterprise (Jensen and Meckling, 1976). One widespread concern is that American managers underinvest and that they put too much emphasis on the short run at the expense of long-term corporate interests (see, e.g., Jacobs, 1991). Many top executives in turn blame money managers and institutional investors. [1] The typical trader, they say, is short-sighted and simply gives too much weight to reported accounting earnings. Thus, when times are difficult, some managers see reason to inflate current earnings. After all, their employment, bonus, and the value of stock options may depend on it. In contrast, when the firm prospers and executives are at the cap of their bonus plans, they may shift income to the future or try to dampen investor optimism in other ways, e.g., by issuing earnings forecasts below analysts' predictions (McNichols, 1989).

Many of the firm's accounting choices only affect its investment and financing decisions in an indirect manner. In this study, we ask how the motive to manage earnings affects research and development spending directly. Investments differ in the degree to which accounting standards and the tax code require their depreciation against current income. Since SFAS2 (1974), R&D budgets are *fully* expensed. This tax regime strongly favors R&D. However, when management evaluates investment projects with identical net present value, it may prefer to delay or to accelerate those projects that have the biggest immediate effect on earnings. For instance, when profits are down, executives may be inclined to cut R&D spending. [2]

No reader will dispute that many executives are fascinated with reported earnings per share (EPS). Understanding earnings management, we believe, requires understanding managers' interests and beliefs. The empirical analysis below assumes that executives attend to share prices and that they think the stock market is sensitive to earnings news. Thus, their immediate concern is more with the shortfall or surplus in earnings, relative to target, than it is with earnings levels per se. We also assume that executives reckon they know more about the firm than outside investors. Lastly, managers' beliefs about investor sentiment may play a role.

There are at least three logical channels that link reported EPS with suboptimal investment, i.e., investment that is either 'too high' or 'too low'. The first is

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[1] See, e.g., Lowenstein (1991). One aspect of this problem is that some investors allegedly are misled by accounting choices because they cannot decipher the firm's financial statements. A mechanical relation between earnings and stock prices may be the end result.

[2] Porter (1992) states that intangible investments such as R&D "are often not treated as capital investments at all; rather they are...part of the annual budgeting process, which is driven by a concern for current profitability" (p. 10). Baldwin and Clark (1992) also state that U.S. firms underinvest in organizational assets such as R&D. "While the...costs are visible (and on someone's budget), the benefits...accrue only to the company as a whole, or only after a significant amount of time. Thus, managers of profit centers have incentives to skimp on capabilities. This tendency is exacerbated by the fact that...expenditures are not accounted for as capital, but are charged directly to expenses" (p. 76).

managerial self-interest and opportunism. Tying salary and bonus pay to reported income creates incentives to mislead (e.g., to cut corners on maintenance (Narayanan, 1985)). Watts (1986) (p. 11) states that linking bonuses to earnings may influence investment decisions "in ways that reduce real cash profitability". [3] In general, however, hubris – sustained by free cash flow and weak internal controls – may bring about *overinvestment* rather than underinvestment. That is, the firm may expand beyond its wealth-maximizing size (Jensen, 1993; Morck et al., 1990a).

The second channel that leads from EPS to suboptimal investment is *signalling*. The discretion allowed within generally accepted accounting principles may enhance the informativeness of earnings for firm value, e.g., by improving income predictability. Variations in R&D spending have similar effect. Among others, Chaney and Lewis (1995) build an asymmetric information model in which managers of high-value firms choose to smooth transitory changes in income even if this results in a more hefty tax bill. Investors realize that, in equilibrium, high-value companies consent to paying more taxes whereas low-value companies do not. The empirical analysis of Hunt et al. (1995) affirms that the stock market puts a premium on smoothness arising from discretionary earnings adjustments.

The final rationale is *investor sentiment*. Management may sense that investors have trouble unscrambling muddled earnings signals – in other words, that the market is easily fooled. [4] Some patterns in corporate decision-making also suggest the perceived relevance of investor sentiment and stock market pressure. [5] However, based on firm-level data, Morck et al. (1990b) conclude that lagged stock returns do not account for much of the variation in investment across firms beyond what is explained by growth in sales and cash flow. Another weakness of the sentiment hypothesis is that it is unclear what type of rational earnings management a psychotherapist would prescribe. For instance, while biases in judgment

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[3] However, performance plans that tie compensation to either a rule unrelated to current share prices (e.g., return on investment relative to competitors) or to share prices after a number of years appear to encourage capital expenditures (Larcker, 1983).

[4] When asked, most executives do express doubt about market rationality (see, e.g., Mayer-Sommer, 1979). Surely, managers thoughtfully consider *when* to release *what* information, e.g., firms publish good earnings reports promptly but they delay bad reports (Chambers and Penman, 1984). Likewise, Kalay and Loewenstein (1986, p. 387) find that managers can "reduce the immediate impact of a negative (dividend) announcement by deferring it". Lintner (1956, p. 100) even explains dividend smoothing practices as efforts that "minimize adverse stockholder reactions". Whether creative accounting 'works' is another matter. The evidence is mixed. Dukes (1976) studies the market reaction to the expending of R&D. Reported earnings are adjusted, it appears, before they are impounded in prices. Hand (1989) examines the earnings gains generated by debt-for-equity swaps. Swaps are often intended to smooth a transitory fall in reported EPS. Logically, swap gains should not affect share prices a second time, after the initial announcement. Prices react, however, as if there were a real addition to corporate wealth.

[5] Examples include the timing of equity issues (Korajczyk et al., 1990), management buyouts (Shleifer and Vishny, 1988), and spin-offs (Schipper and Smith, 1986).

may help to explain the surprising volatility in stock prices, e.g., if many traders naively extrapolate past earnings patterns (De Bondt and Thaler, 1985; Lakonishok et al., 1994), the data also hint that the market underreacts to earnings news (Bernard and Thomas, 1989).

In order to make some progress on these issues, this paper studies a panel of 100 U.S. corporations with large R&D budgets for the decade between 1977 and 1986. We employ financial analysts' earnings forecasts, one-year ahead, as a proxy for the firm's profit targets. We find that changes in R&D budgets anticipate extreme gaps between analysts' forecasts and reported income. In other words, managers set budgets that reduce these discrepancies. We are particularly interested in the cross-sectional determinants of R&D smoothing. We learn that discretionary changes in R&D spending that reduce the gap between analysts' forecasts and reported earnings are strongly associated with measures of informational asymmetry and managerial incentives. More gap closure occurs for companies with volatile stock prices and high trading volume. These findings suggest a link between managerial and investor horizons. Less gap closure occurs if the CEO and institutional investors own a large fraction of the firms' shares. We find no relation with past stock price performance or other possible measures of investor sentiment. [6]

Our theory accommodates overspending as well as investment myopia. Like any other budget, R&D budgets contain a cushion of slack. Organizational slack smooths actual performance relative to its potential. In good times, new projects easily absorb excess resources and assure authorization of the full budget. In bad times, slack mutes adversity: targets can still be met with a tight budget. Thus, budgeting exercises turn into calculations of what the firm, from a variety of perspectives, "can afford to spend" (Cyert and March, 1963, p. 272). For instance, agreeing with earlier work (Hall, 1992a), we find that the availability of funds influences R&D spending.

The paper is organized as follows. Section 2 puts our study into perspective with a review of the literature on R&D spending and earnings management. Section 3 discusses the data and motivates the variables. Section 4 explains the statistical tests and describes the results. Section 5 concludes.

2. R&D spending and earnings management

Does the corporate organizational form create an information gap and a divergence of interests that obstructs optimal investment? The study of R&D

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[6] Two previous studies ask related questions. Baber et al. (1991) find that firms adjust R&D budgets if their ability to report positive or increasing earnings hinges on it. Perry and Grinaker (1994) find that innovations in R&D spending and earnings surprises move together. However, except for some brief remarks on executive pay in Baber et al., neither study considers the cross-sectional determinants of R&D budget adjustments.

spending is pertinent to this question. First, the value of R&D projects is inherently difficult to judge. Sometimes, it may take a decade or more before positive cashflows are generated. Second, corporate management probably has a better idea about a project's eventual success or failure than do outside investors. Third, under current accounting standards, R&D has to be expensed. This means that a cut in R&D increases reported income dollar-for-dollar and that R&D spending may appear more 'costly' than other projects. Finally, the study of R&D is pertinent because innovation is one of the major forces behind economic growth and, more than other assets, R&D produces positive spillovers.

2.1. Informational asymmetry and investment

The traditional Modigliani–Miller view is that corporate investment and financial policies are independent. However, the information asymmetry between insiders and the capital markets results in a higher capital cost for external funds. Equity is issued when the market overvalues the firm (Myers and Majluf, 1984). As a result, stock prices fall (see, e.g., Asquith and Mullins, 1986). There is a pecking order in the financing of projects: first internal funds, then safe debt, and as a last resort, risky debt or equity. Thus, cashflow constrains investment. In interviews, executives agree that they try to avoid dependence on the capital market (Donaldson and Lorsch, 1983). [7]

The empirical evidence largely contradicts the systematic market undervaluation of long-term investments – i.e., total market myopia – as a plausible hypothesis. Maybe the most troubling observation is that the valuation of R&D implicit in stock prices has fallen steeply during the 1980s (Hall, 1993a,b; Hall and Hall, 1994). Market myopia is only one of several possible explanations. Studies of investment announcements find positive stock market reactions to investment increases and negative reactions to decreases (McConnell and Muscarella, 1985; Woolridge, 1988). For 95 reports of increased R&D spending between 1979 and 1985, Chan et al. (1990) find an average two-day abnormal return of 1.38%. Even in the face of quarterly earnings declines (33 cases), the

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[7] Suboptimal investment also appears in Miller and Rock (1985). The theory captures the informational content of dividends when management and shareholder interests are aligned but outsiders cannot observe current earnings. Managers signal by paying a dividend. They satisfy the sources-and-uses constraint by altering investment. All else equal, firms with large cashflows can pay high dividends and match the investment of low cashflow firms. However, low cashflow firms must invest less to pay high dividends. At the margin, they forego projects with higher returns than projects foregone by better firms. In the signaling equilibrium, dividends reveal cashflows but firms forego positive NPV projects. Myers (1989) model of accrual accounting is formally similar to Miller and Rock (1985). Investors are unable to distinguish cash outlays for operations from investment spending. Managers underinvest to appear to have lower operating costs. Strict accounting rules help to alleviate the problem. Other stimuli for underinvestment are based on agency theory. They include moral hazard (Myers, 1977) and the asset substitution problem (Jensen and Meckling, 1976). The arguments are relevant in our context since R&D is often a firm-specific intangible investment.

stock price reaction is significantly positive (1.01%). Event studies have draw-backs, however. Only a small percentage of all investment projects are examined and the selection is biased towards prominent projects. There is more selection bias because the announcements are voluntary. Also, the research says little about whether the market price reactions are of the correct magnitude. Lastly, as argued below, rational managers who care about stock prices may underinvest – even with positive price reactions.

Studies of corporate control present another opportunity to examine the market valuation of R&D. Does a long-run orientation encourage takeovers? The study of Hall (1988, p. 93) of 342 manufacturing firms acquired between 1977 and 1986 shows that on average the acquired firms invest "the same amount or slightly less in R&D as the industry norm." Hall (1990) finds that most corporate restructur-ings take place in industries where innovation does not play a large role. There is weak evidence that acquiring firms become less R&D intensive over time, a decline that is associated with highly-leveraged acquisitions. Of course, the decline may be nothing to worry about if high leverage imposes much-needed managerial discipline. [8] Another way to tackle the issue is to ask whether takeover barriers allow firms to increase R&D spending. In an interesting study, Meulbroek et al. (1990) report a decrease in the ratio of R&D expenditures to sales following the adoption of shark repellents. [9]

Despite weak empirical support, the theoretical literature lists several avenues that could lead rational managers in rational markets to sacrifice long-term investments to increase short-term profits. The recurring themes are asymmetric information and a concern with current stock prices. In Stein (1988), the immedi-ate concern is takeover fear. Stein's model is similar to Brennan (1990) who establishes an incentive to realize assets early whenever current market prices do not reflect asset values. In Stein (1989), investors use earnings to forecast firm value: higher earnings today are correlated with higher earnings tomorrow. The market anticipates the impetus to inflate current earnings and traps managers into behaving myopically. The ensuing signal-jamming inefficiencies justify building financial slack, corporate divestitures, etc. [10]

Some theoretical papers relax the notion of a rational stock market. The noise traders of De Long et al. (1990) hold false beliefs that add volatility to prices.

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[8] As in Jensen (1986, 1993), Kaplan (1989) and Smith (1990) report reductions in capital investment by firms that go private. (Market pressure suggests the opposite.) However, Bhagat et al. (1990) find that investment cuts are a minor source of value creation in targets of hostile takeovers. Note also that, with financial constraints, post-restructuring cuts do not prove initial overinvestment.

[9] The robustness of the results is in doubt, however. Using nearly identical samples and methods, Pugh et al. (1992) find that R&D/sales ratios *rise* after the passage of antitakeover amendments.

[10] Underinvestment occurs because the *level* of investment is unknown. Yet, when traders know investment but not its productivity, asymmetric information may induce *over*investment (Bebchuk and Stole, 1993). For a model that allows both over- and underinvestment, see Bizjak et al. (1993).

Rational investors with short horizons apply higher discount rates as a result. In Shleifer and Vishny (1990), arbitrage is cheaper for short-term than for long-term assets. Therefore, executives who are averse to mispricing avoid long-term projects.

Depending on its diagnosis, there are different remedies for suboptimal investment. A restructuring may be voluntary or forced by the market for corporate control. One set of solutions focuses on incentives and optimal contract design. This could range from changes in compensation contracts, a more effective board, and the creation of voting blocks, to privatization (Jensen, 1993). A second approach is to reduce the information gap between management and shareholders. More disclosure and/or earnings management fall into this category. [11]

2.2. Earnings management

Earnings management is about the strategic disclosure of facts. The reaction of shareholders and other parties to reported income is a major concern. Schipper (1989, p. 96) notes that an "absence of full communication is key for [its] existence." While executives may report in an objective manner (within the bounds of generally accepted accounting principles), they may not tell 'all'. Shin (1994) studies strategic disclosure as a variant of the persuasion game of Milgrom and Roberts (1986). It is assumed that rational shareholders are uncertain about what executives actually know. Blatant deception (e.g., lying) is not a viable option. A key result is that telling the whole truth, without withholding news, is not an equilibrium strategy. [12]

Different forms of earnings management include income smoothing, short-term earnings maximization, and the big bath. [13] Loosely speaking, income smoothing predicts a bent towards decisions that compress the time-series variability of

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[11] In privatizations, earnings manipulation may still occur in the short run. Managers who plan a buyout benefit from low stock prices. They can accelerate investment or cut reported earnings without diminishing the company's intrinsic value. DeAngelo (1986) does not find earnings management for a sample of 64 MBOs between 1973 and 1982. However, for 175 buyout offers between 1981 and 1988, Perry and Williams (1994) observe systematic reductions in accounting income prior to the proposals.

[12] Despite the value of early disclosure, e.g., less litigation (Skinner, 1994), most firms with big news keep silent prior to the earnings release (Kaznik and Lev, 1995). Only 9% (6%) of companies with unusually high (low) profits offer quantitative earnings and/or sales data in advance. In case of bad news, the likelihood of disclosure increases if earnings are particularly disappointing. Disclosure is further associated with firm size (+) and membership of high-tech (+) and regulated (−) industries.

[13] In the big bath, earnings are reduced further in a year of low profits, e.g., by writing down the value of inventories. Since every dollar charged now is a dollar added to future profits, this facilitates an earnings rebound. Yet, write-offs tend to push analyst earnings forecasts and share prices down (Elliott and Shaw, 1988). McNichols and Wilson (1988) study the provision for bad debts. The discretionary component in these decisions is income-decreasing for firms with low earnings. A lower bound on earnings in bonus plans may encourage bath behavior (Healy, 1985). Baths are more likely when management changes, e.g., dissidents who win proxy contests tend to take a bath (DeAngelo, 1988).

income. Most such decisions are accounting choices but they also involve invest-ment and financing decisions. Earnings management reflects a diversity of mo-tives. Apart from firm value, managers may consider tax and regulatory effects, political costs, union demands, restrictions in bond indentures, as well as their own interests (Watts and Zimmerman, 1986). Managerial self-interest includes salary and bonus, the value of stock options, career outlook and reputation, empire building, and hubris.

Some of these motives have been modeled formally. Lambert (1984) and Dye (1988) justify smoothing with the unobservability of managerial effort and skill. In other models, asymmetric information is the driving force. Even if manager and owner interests run parallel, smoothing is valuable since companies that can shift income across time lessen their chances of default and borrowing costs (Trueman and Titman, 1988). In general, earnings management may signal firm quality (Chaney and Lewis, 1995). The more a firm controls its strategic environment, the more investment risk falls and share prices rise (Lev and Kunitzky, 1974).

Income smoothing also reflects managers' beliefs about market rationality. Many think that investors 'suffer from financial illusion'. They "devote enormous ingenuity to... choosing accounting methods which stabilize and increase reported earnings" (Brealey and Myers, 1984, p. 276). As far back as 1953, Hepworth (1953) argued that stable earnings "reduce the effect of waves of optimism and pessimism on... business activity" (p. 34), i.e., they protect long-term investors from the pricing effects of noise traders. Recent empirical work affirms that steady earnings trends influence perceptions of future profitability and firm value (Hunt et al., 1995; Lakonishok et al., 1994).

3. Data and methods

We study a panel of 100 U.S. corporations with large R&D budgets for the decade between 1977 and 1986. This section describes the data sources, motivates the definitions of the variables, and offers sample descriptive statistics.

3.1. The sample

We build our sample using return data from the *Center for Research in Security Prices* (CRSP) at the University of Chicago, accounting data from *Compustat*, analyst earnings forecasts from *IBES* (1976–1985), institutional ownership data from *Moody's Handbook of Common Stocks*, executive compensation data from *Forbes* (1976–1985), and executive stock ownership from proxy statements. For a firm to be selected, we require: (1) complete CRSP monthly return data (1972–1986); (2) listing on the NYSE or the AMEX; (3) a December fiscal year-end; (4) an SIC code within the 2000–3999 range (manufacturing firms); (5) complete annual data for selected accounting items (1975–1988); (6) complete earnings

forecast data (1976–1985); and (7) complete institutional ownership data (1976–1985). From the firms that satisfy the above criteria, we study the top (in US$) 100 R&D spenders. Because the period is 1977–1986, much of the statistical analysis is based upon close to 100 companies × 10 years = 1000 observations. [14] Appendix A lists the sample companies and their industries (defined as in Fama and French, 1988). Sixty percent of the sample falls in four industries – business equipment, chemicals, pharmaceuticals, and durables. The largest number of sample firms (23) are in the business equipment industry. There is only one firm, Mohasco, in the apparel industry. For each firm, we show the average R&D spending over the period (in 1980 dollars), the average R&D spending as a percent of sales, and the R&D growth rate over the period 1975–1988. Among the sample companies, Martin Marietta (transportation industry) experienced the highest R&D growth rate, 43.4%. Only three companies had a negative R&D growth rate: Bethlehem Steel (−4.2%), USX (−0.7%) and Nashua (−0.5%).

Tables 1 and 2 list descriptive statistics. The variables are defined below. For now, it is interesting to see that the average firm in our sample spends US$140 million annually on R&D – equivalent to 3.4% of its sales (RDSL). The mean market value (MV) is close to US$3 billion and the mean balance sheet total (TA) is about US$4 billion. The medians are much lower. As shown in Fig. 1, the R&D-to-sales ratio rises from 2.9% to 4.1% between 1977 and 1986. Most of this increase comes after 1982. In nominal dollars, average R&D spending rises from US$73 million to US$221 million. In constant 1977 dollars, the increase is to just below US$150 million. Average reported earnings (A) does not move up as much and shows declines in 1979, 1983, and 1986.

Like most other investigations of earnings management, our panel data analysis studies survivor companies. The data screens and the selection of firms with large R&D budgets – rather than, e.g., tiny start-up firms with high R&D-to-sales ratios – skews the sample towards well-established, successful companies. Firms that experience a change in control, say, because of buyout, acquisition or

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[14] Prior to SFAS2 (1974), the definition of R&D varied across firms. Managers could either expense or capitalize R&D. Since our analysis requires past R&D data, the starting year is 1977. In rare instances CRSP monthly returns are missing. Such returns are computed as appropriate fractions of the next-reported return so long as there are fewer than six consecutive missing numbers. If there are more, the firm is dropped. Six datapoints for 1977 institutional ownership are missing. This reduces the number of observations from 1000 to 994. Because we do not require full compensation data and executive ownership data, the sample size falls in some cases to 682 observations. The required *Compustat* items are current assets (#4), property, plant and equipment (#8), long-term debt (#9), sales (#12), operating income before depreciation (#13), depreciation and amortization (#14), interest expense (#15), income taxes (#16), income before extraordinary items (#18), dividends (preferred and common) (#19 and #21), closing share price (#24), common shares outstanding (#25), common shares traded (#28), deferred taxes and investment tax credit (#35), research and development expense (#46), and common equity (#60).

Table 1
Sample descriptive statistics

Variable		Mean	Median	5%	95%
Company descriptor variables					
RD	US$ million	140	52	6	506
RDSL	%	3.43	2.64	0.48	8.62
MV	US$ million	2984	1189	164	9622
TA	US$ million	4061	1920	283	17,723
DIV	US$ million	129	45	5	543
Measures of earnings management					
S	US$ million	6	1	−20	43
EG	US$ million	−44	−6	−407	117
AEG	US$ million	109	28	2	559
ES	US$ million	−43	−6	−400	99
AES	US$ million	-103	24	1	542
BA	US$ million	0	0	−33	30
Measures of informational asymmetry					
VOL	%	49	39	16	112
IH	%	44	45	18	70
β		0.74	0.71	0.32	1.27
σ		7.20	6.88	4.84	10.52
FCF	US$ million	330	127	13	1185
DA	%	14	14	1	30
Measures of managerial incentives					
ΔSB	%	3.4	0.0	−25.4	43.3
SH	%	0.70	0.13	0.01	3.87
Other variables					
WL	%	66	51	−27	206
MB	ratio	1.53	1.34	0.55	3.27
Tax	US$ million	6	0	0	25

The entries are averages, medians, and 5th and 95th percentile observations for 1977–1986 (the smoothing measures) or 1976–1985 (others). RD = R&D spending; RDSL = R&D/sales; MV = market value of equity; TA = balance sheet total; DIV = total common dividends; S = smoothing measure; EG = unmanaged earnings *minus* forecasted earnings; AEG = absolute value of EG; ES = earnings *minus* forecasted earnings; AES = absolute value of ES; BA = R&D budget adjustment; β = CAPM beta; σ = CAPM residual risk; Vol = share turnover; IH = % of shares held by institutions; FCF = free cash flow; DA = long-term debt to asset ratio; ΔSB = relative % change in salary and bonus; SH = % of shares held by CEO; MB = ratio of MV to book value of equity; WL = 3-year past return; TAX = R&D tax credit.

bankruptcy, are not included. However, our methods also have important benefits. One definite plus of the regression panel data approach is that it allows us to judge the relative importance of the various determinants of earnings management for firms that truly represent 'corporate America'. The second advantage is perhaps

Table 2
R&D budgets and corporate income, 1977–1986

Year	ES	S	A	BA	BA/RD	RD	RDSL
A: All companies							
1977	−48.3	1.5	193.7	−0.1	1.3	73.5	2.9
1978	−5.7	1.6	191.9	1.6	5.4	78.2	2.8
1979	21.4	4.8	231.7	6.2	8.2	89.0	2.8
1980	22.5	6.9	276.9	6.6	7.2	105.9	2.9
1981	−16.0	3.6	314.4	4.7	12.0	125.2	3.0
1982	−117.8	2.3	335.5	2.1	0.7	145.2	3.2
1983	−35.1	8.3	256.3	−4.7	−3.8	165.4	3.6
1984	−7.4	4.7	290.2	0.9	0.8	181.7	3.8
1985	−128.9	12.0	371.6	−12.2	−4.5	206.1	3.9
1986	−117.2	9.5	297.7	−9.8	−6.2	220.7	4.1
B: Positive earnings gap							
1977	29.8	2.3	143.2	2.3	5.2	55.3	2.9
1978	41.4	3.5	188.0	3.6	7.6	67.6	2.9
1979	104.3	9.2	250.6	9.2	7.8	77.7	2.6
1980	126.1	13.5	459.6	14.1	12.0	133.9	2.9
1981	51.0	6.6	384.6	9.9	25.2	91.5	2.3
1982	47.7	15.0	485.1	16.6	8.3	190.6	3.5
1983	80.2	4.3	478.9	7.3	0.9	213.5	3.7
1984	93.8	6.8	384.3	7.4	6.2	208.0	3.6
1985	59.6	−0.1	253.7	0.4	1.0	158.5	4.3
1986	34.7	−2.5	370.6	8.9	2.3	206.6	4.4
C: Negative earnings gap							
1977	−92.5	1.1	222.3	−1.5	−0.8	83.9	3.0
1978	−63.1	−0.8	196.6	−0.9	2.8	91.1	2.7
1979	−102.8	−1.7	203.3	1.6	8.9	106.1	3.1
1980	−77.1	0.6	101.4	−0.6	2.5	79.1	2.9
1981	−83.1	0.6	244.3	−0.6	−1.3	159.0	3.6
1982	−154.0	−0.4	302.7	−1.0	−1.0	135.2	3.2
1983	−100.0	10.5	131.1	−11.3	−6.5	138.3	3.6
1984	−97.1	2.7	206.8	−4.9	−4.1	158.5	3.9
1985	−185.2	15.6	406.8	−16.0	−6.2	220.4	3.7
1986	−199.0	15.9	258.5	−19.9	−10.7	228.4	3.9

All entries are annual averages. For a list of symbols, see Table 1. BA/RD is the ratio of the R&D budget adjustment to the level of R&D (multiplied by 100). RDSL is the ratio of R&D spending to sales (multiplied by 100). Other variables are measured in million. A is reported net income. The averages are equally weighed.

more subtle. Many corporations may escape an outright change in ownership but chances are that they do not elude the pressures of the market for corporate control, i.e., its push toward value-maximization. These are the firms in our sample. Thus, our study complements earlier research on restructuring that is associated with actual changes in control. If income management appeases share-
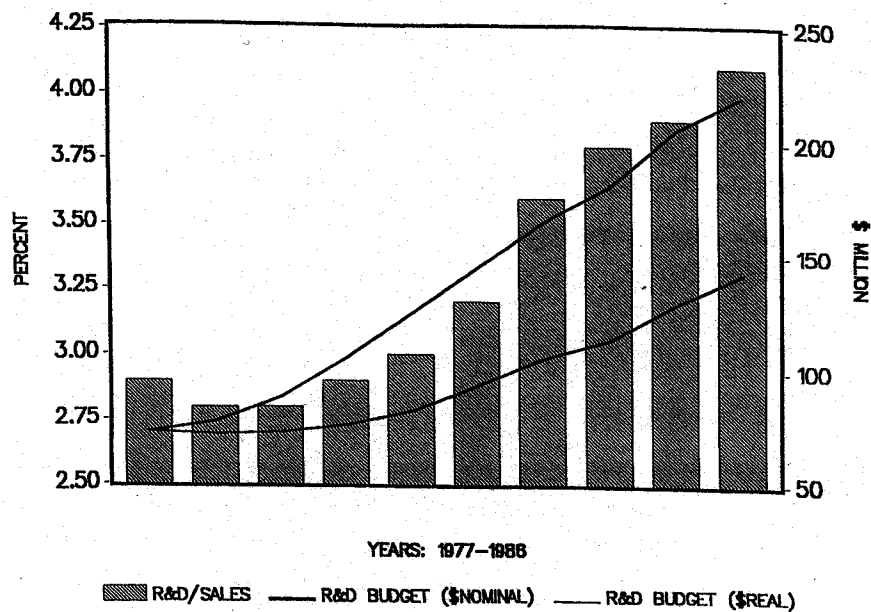
Fig. 1. Average R&D spending for 100 corporations.

holders and serves as a substitute for forced restructuring, then the cross-sectional tests that we present are less daring than they seem and the surprising strength of the results is indirect testimony to the power of the market for corporate control.

3.2. Measures of R&D earnings management

Earnings management with R&D is based on discretionary budget adjustments that narrow the gap between corporate earnings targets and executives' assessment of what the firm can in fact achieve. Let t be the year for which we observe, after the fact, reported earnings as well as R&D spending. What were the firm's profit targets for that year? Our proxy is the median financial analyst forecast made in December of year $t-1$, i.e., about 15 months before the earnings release. Forecasts this far ahead may be imprecise but they do capture expert opinion – likely reflected in market prices – of 'normal profits', conditional on all publicly available information. We assume that management has *additional privileged information* about the likely level of next year's earnings. What we want to find out is whether this information advantage relative to the market affects the size of the R&D budget decided at the end of year $t-1$.

Our measure of earnings smoothing resembles the metric used by Moses (1987). For each company j, we compare the *ex post gap* between actual reported accounting income (A_{jt}) and analyst earnings forecasts (F_{jt-1}) to the *ex ante gap*, i.e., the income surprise for t expected by company executives in December of year $t-1$ if *no* discretionary adjustments are made to the R&D budget. In other

words, the ex ante earnings gap is the difference between unmanaged earnings U_{jt} and F_{jt}. Both the ex ante and ex post gaps are expressed in absolute terms. Therefore, the smoothing measure (S_{jt}) is defined as $|U_{jt} - F_{jt}| - |A_{jt} - F_{jt}|$ or, in shorthand, AEG − AES. In the panel data analysis below, we normalize S_{jt} by company market value, sales, or assets. (We only show dollar variables standardized by market value. The flavor of the results does not change.)

Positive values of S_{jt} are consistent with *gap closure*. Gap closure occurs if discretionary R&D spending is lowered when managers expect actual earnings to fall short of analysts' forecasts or if R&D spending is increased when earnings are expected to beat analysts' forecasts. The point is simply that, with gap closure, both positive and negative earnings surprises are reduced relative to analysts' forecasts.

To find the unmanaged earnings number U_{jt} we need to know 'normal growth' R&D-spending. Let firm X have a bad year and report earnings of only US$400 million, a number that accounts for R&D expenses worth US$150 million. If R&D spending typically grows at a rate of 10% (g_j), and if last year's R&D spending was US$200 million, one may argue that this year's R&D budget falls US$70 million below normal ($150 - 220 = -70$). Thus, U_{jt} is US$330 million ($400 - 70 = 330$), i.e., the sum of actual earnings and the R&D budget adjustment: $A_{jt} + BA_{jt}$ where $BA_{jt} = RD_{jt} - RD_{jt-1} (1 + g_j)$. Several models are used to find the relevant growth rates in R&D. The results reported below use firm-specific exponential growth rates based on the period between 1975 and 1988. The average (median) growth rate is 12.04% (11.75%) with a standard deviation of 6.47%. [15]

Table 1 reports that, during 1977–1986, annual accounting earnings are on average US$43 million below analysts' expectations. Notwithstanding the general optimism, analysts are too pessimistic for many firms each year. Over the entire sample period, the earnings surprise is negative 59% of the time (585 of 994 observations). For two years (1979 and 1980), average earnings exceed average forecasts (i.e., ES is positive; see Table 2). The mean value of the smoothing measure (S) is US$6 million. The average S is positive in every year. However, S is negative for 42% of the sample firm years (421 of 994 observations). The mean earnings gap (AEG) is cut from US$109 million to US$103 million (AES). As expected, the average annual budget adjustments in R&D (BA) are consistently positive when unmanaged earnings beat analyst predictions and negative when they fall short.

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[15] Our central message does not change if we use other models of 'normal' R&D, e.g., (1) a simple random walk where the normal level of R&D spending is last year's budget, (2) a random walk plus drift with the drift component estimated over the prior 3 or 5 years, and (3) a trend model with the trend estimated over the prior 3 or 5 years.

3.3. The determinants of R & D earnings management

The role of earnings management – and accounting systems in general – is to provide information for decision making and to motivate and monitor employees. Therefore, three categories of factors govern how R&D budgets are set: (1) variables related to the characteristics of shareholders and the information asymmetry with management, (2) variables related to executive compensation and turnover, and (3) other variables, e.g., taxes. Because we study actual decision making, *all* predictor variables are measured prior to or at the end of year $t - 1$. This assures that much of the information that, according to the tests, influences the budgeting process is indeed available at that time. Table 3 lists the predictors of R&D earnings smoothings and presents a summary of the discussion that follows.

3.3.1. Measures of informational asymmetry

The demand for earnings smoothing depends on the characteristics of the firm's shareholders. Are many of them short-term traders? What is their level of sophistication? Do some investors own large controlling blocks of shares? We employ various measures. The first is share turnover (VOL). It is defined as the ratio of annual trading volume to the number of shares outstanding at the end of year $t - 1$. (The ratio is adjusted for stock splits, stock dividends, etc.) VOL is an indicator of transient ownership. Its inverse is the period over which the average investor holds the stock, i.e., the trading horizon. Short horizons may lead traders

Table 3

A summary of the determinants of R&D earnings management

Symbol	Predictor variable	Association with R&D smoothing
Measures of informational asymmetry		
VOL	Trading Volume/# of Shares	+
IH	Institutional Stockholdings	−
σ	Company Risk	+
FCF	Free Cash Flow	−
DA	Long-Term Debt/Assets	−
Measures of managerial incentives		
ΔSB	Relative Change in Salary and Bonus	+
NU	New CEO	+
SH	% of Company Shares Owned by CEO	−
YL	Career Years Left	−
OS	CEO is outsider	−
Other variables		
TAX	R&D Tax Credit	−

to rationally ignore certain types of information if the insight that is gained does not become common knowledge within a relevant time frame (Froot et al., 1992). Thus, informational asymmetry rises with volume.

The second measure is shareholdings by institutional investors. *Moody's* counts both the number of institutions (investment companies, insurance companies, bank trusts, endowment funds) (N) that own the stock and the total number of shares held. We compute the fraction of all shares held by institutions at the end of year $t - 1$ (IH). IH proxies for the dispersion of investors and perhaps also for their expertise. Ceteris paribus, if IH is large, it becomes less costly to communicate with shareholders (e.g., through meetings with analysts) – reducing the demand for earnings management.

As stated earlier, management's success in smoothing the operations of the firm influences its business risk and cost of capital. Previous work (e.g., Lev and Kunitzky, 1974), uses the stock's capital asset pricing model beta (β). We believe that the idiosyncratic risk is a better proxy. We use the standard error of the estimate (σ) for the market model regression. The CAPM beta is used as a substitute risk measure. The market model is estimated using returns for the 60 months ending with December of year $t - 1$. The market return is based on an equal-weighted index of all NYSE stocks.

Finally, two variables assess the firms's strategic resource flexibility, i.e., the extent to which it can escape the discipline of the capital markets in the short run. The long-term debt to assets ratio (DA) measures debt capacity. There is mounting evidence that financial distress affects operating decisions (e.g., hiring), especially for small or highly leveraged firms (Sharpe, 1994; Opler and Titman, 1994). The second variable is free cash flow (FCF). As in Lehn and Poulsen (1989), FCF equals operating income before depreciation *minus* income taxes (adjusted for changes in deferred taxes), minus gross interest expense on short- and long-term debt, *minus* total dividends on common and preferred stock. As a rule, high leverage and low free cash flow translate into high market pressure and more careful earnings management. Hopefully, they also cut into managerial extravagance (Jensen, 1986).

Table 1 lists descriptive statistics for VOL, IH, β, σ, DA, and FCF. The trading horizon of the average investor for the average company is 2 years. Since the sample screens remove small firms on purpose, the average β is below one. That DA is low is no surprise either. Much R&D capital is firm-specific and is best financed with equity. An important feature of the data, not shown in Table 1, is that VOL and IH both increase steadily between 1976 and 1985. In 1976, the median VOL is 28%. In 1985, it is 65%. For IH, the equivalent numbers are 30% and 58%. Both times, most of the increase comes after 1978.

3.3.2. Measures of managerial incentives

Managerial incentives include pay, reputation, and turnover. We rely on the surveys of CEO compensation reported by *Forbes*. The annual surveys comprise

about 800 firms that rank among the 500 largest U.S. companies (listed in the *Forbes 500*) on at least one of four criteria: profits, sales, assets, or market value of equity. We consider CEO remuneration consisting of salary and bonus (short-term compensation).

In the cross-section of firms, large CEO pay increases probably reflect superior managerial effort and capability. Since many corporate boards build short-term targets into bonus plans, past salary and bonus show the ability of top executives to manage the firm's environment as well as their ability to game the performance contract. Thus, unusually large past increases in salary and bonus should predict future R&D earnings smoothing. [16] To operationalize this idea, we compare each CEO's annual percent raise in salary and bonus to the median pay raise for all CEOs of similar firms (ΔSB). We use the SIC-classification of Fama and French (1988) to define the four industries most often represented in the sample: business equipment (23 CEOs), chemicals (12), drugs (14), and durable goods (12). All other firms are pooled in a separate group. For each group and year, we find the median percent pay raise for *all* CEOs listed by *Forbes*. Our methods reflect inter-industry variation in the link between executive pay and firm performance (Ely, 1991) and the view that pay may be set in a social comparison process (O'Reilly et al., 1988). As Table 1 shows, the mean (median) annual ΔSB is 3.4% (0%). [17]

What effects do long-term incentive plans have on earnings management? This is a formidable, yet highly relevant question. After all, stock option plans are more prevalent among high R&D companies than among other firms and, in the cross-section, the response of the total remuneration package to stock returns rises with R&D expenditure (Clinch, 1991). Similarly, Hagerty et al. (1992) report a positive relation between the fraction of a CEO's compensation that is paid with stock options and the fraction of the company's value represented by growth opportunities. They cite this result as proof that the labor market discourages managerial myopia. To the contrary, long-term incentive plans may stimulate

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[16] Discretionary budget adjustments allow managers to maximize their bonus awards by transfering corporate income between periods. Bonus schemes usually have lower (L) and upper (U) limits. There are three cases. Let E denote earnings before accruals. Loosely speaking, if $U > E > L$, managers prefer income-increasing accruals. Healy (1985) and Hotlhausen et al. (1995) find downward manipulation of earnings if $E > U$. Perhaps, if recent results are far above expectations, managers worry that performance goals will be increased for subsequent years (the 'ratcheting-target' hypothesis). If $E < L$, the pressure to improve reported earnings seems self-evident. However, Healy (1985) suggests that managers may 'take a bath'. Hotlhausen et al. (1995) conclude that Healy's big bath results are partly induced by his research methods.

[17] By assumption, new CEOs are paid the average salary and bonus in the industry (ΔSB = 0). Agency theory suggests the superiority of relative performance contracts that remove the market and industry components of firm performance – so that our methods may amount to double counting. Yet, based on the same *Forbes* data set, Janakiraman et al. (1992) conclude that most salary and bonus packages do not fit the agency model.

myopia, e.g., if managers fret about the near-term exercise of the stock options they own and if they believe that the stock market can be fooled. [18]

We consider the stockholdings of the CEO. Equity holdings should align management's interests with those of stockholders. Warfield et al. (1995) find discretionary accruals are decreasing in levels of managerial ownership. Thus, we would expect less earnings smoothing when equity holdings are large. Data on CEO ownership, including options exercisable within 60 days, is collected from the proxy statement. Proxy statements are difficult to obtain prior to 1978 when commercial firms, such as Disclosure, began making them widely available. Therefore, we have CEO stockholdings beginning in 1978. We compute SH, the percentage of shares held by the CEO, as the CEO's stockholdings divided by the number of shares outstanding. As reported in Table 1, the average (median) CEO equity holding is 0.7% (0.13%).

We rely on three more measures of managerial incentives, all determined in year $t - 1$. YL is an estimate of the maximum number of career years that are left for the CEO. We set YL at 70 minus the executive's age. The mean and median YL in our sample are 11 years; the 95th percentile is 21 years. Many chief executives retire at ages 64–65. Nearly all do by age 70 (Gibbons and Murphy, 1992). In financial terms, reputation matters the most for young CEOs. Theory can justify numerous effects of career concerns on investment decisions. Unfortunately, it offers few clean predictions. YL may also be an index of ability. Chances are that young CEOs in large publicly held firms are exceptionally gifted. Such individuals, Zweibel (1995) shows, have reason to avoid the conservative decision-making that is associated with smoothing income.

NU is a dummy variable that equals one if a new CEO is in his first year on the job (12.3% of the sample). New CEOs may be associated with earnings smoothing if they arrive at a time of reduced expectations. Firm performance typically declines in the years leading up to CEO departures (Warner et al., 1988; Murphy and Zimmerman, 1993). Some managers get fired. Those who retire voluntarily may be 'lame ducks'. By taking an earnings bath, they prepare the way for their successors. A second dummy variable, OS, equals one if the new CEO is an outsider who has been with the company for three years or less. The selection of outsiders is non-routine and relatively infrequent (11.6% of the sample). Non-routine executive changes are often the symptom of poor firm performance in a volatile industry environment (Pourciau, 1993). [19]

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[18] For more discussion, see Bizjak et al. (1993) and Skinner (1993). Skinner offers broad evidence that, in the cross-section of firms, management compensation plans depend ex ante on investment opportunity sets (e.g., the mix of growth opportunities and assets-in-place). The nature of the contracts, in turn, affects accounting choice ex post. Bizjak et al. make a similar point but they focus on asymmetric information between management and shareholders as the driving force.

[19] This may cause empirical problems. NU and OS are endogenous variables if turnover is linked to company performance (Murphy and Zimmerman, 1993).

3.3.3. Other variables

A factor that deserves special attention is the Reagan tax credit for R&D spending (TAX). Concerned about the decline in corporate R&D during the 1970s, Congress enacted a provision in the *Economic Recovery Act of 1981* which allowed firms to claim a non-refundable tax credit based on incremental R&D expenses in addition to the usual deduction. The credit was effective for expenses incurred after June 1981. It expired at the end of 1985. The *Tax Reform Act of 1986* retroactively extended the credit for three more years until end 1988. Put simply, the annual credit equals 25% (after December 1985, 20%) of the excess of certain R&D expenses over-and-above the average R&D expenses incurred in the base period, i.e., the three preceding tax years. To illustrate, suppose a company spent US$300, US$320, and US$340 million on R&D during the last 3 years and US$400 million the current year. Then, the credit was US$20 million. [20] Ceteris paribus, the tax credit discourages the smoothing of R&D expenditures. The IRS rewards spending increases for a limited period. If for some reason R&D spending *has* to fall, a 'big bath' strategy establishes a favorable tax position for subsequent years.

4. Tests and results

To repeat, our study is motivated by two questions: (1) Do discretionary budget adjustments in R&D spending push reported earnings towards analyst earnings forecasts? (2) Which factors account for the cross-sectional variation in R&D earnings management? In order to answer the first question, simple univariate tests are presented. To answer the second, we rely on panel data regression tests.

4.1. Univariate tests

As stated before, positive values of S are consistent with smoothing. The first test checks whether the sample mean of S for the entire 1977–1986 period, and for each year separately, is equal to zero. The evidence in Table 4 (columns 1 and 2) firmly rejects this view. The average S is US$5.5 million but there is important year-to-year variation. In 1985, the average S reaches US$12 million.

Is income smoothing symmetric? The literature on the big bath suggests that the previous results may be driven by firms with earnings that fall below analyst expectations. Table 2 lists S separately for firms with earnings gaps (EG = $U - F$)

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[20] If the firm was a start-up that did not exist during one or more of the base years, research expenses for that year were set at zero for purposes of computing average expenses. Also, in no event could the base period expenses be less than half of the current year's qualified expenses. Finally, since the credit was not allowed to reduce the tax liability below zero, a 3-year carryback and a 15-year carryforward for unused credits were available.

Table 4
Univariate tests of R&D earnings management

Year	S (1)	t-stat. (2)	BA− (3)	BA+ (4)	t-stat. (5)	BA/RD− (6)	BA/RD+ (7)	t-stat. (8)
1977	1.6	1.96	−1.5	2.3	2.64	−0.8	5.2	2.40
1978	1.6	1.57	−0.9	3.6	2.09	2.8	7.6	1.29
1979	4.8	1.83	1.6	9.2	1.60	8.9	7.8	−0.77
1980	6.9	2.61	−0.6	14.1	2.77	2.5	12.0	2.45
1981	3.6	1.67	−0.6	9.9	2.32	−1.3	25.2	2.27
1982	2.3	0.67	−1.0	16.6	1.33	−1.0	8.3	2.03
1983	8.3	1.91	−11.3	7.3	2.06	−6.5	0.9	2.03
1984	4.7	1.43	−4.9	7.4	1.74	−4.1	6.2	3.26
1985	12.0	3.26	−16.0	0.4	2.21	−6.2	1.0	1.95
1986	9.5	2.20	−19.9	8.9	2.43	−10.7	2.3	3.94
All	5.5	5.68	−6.3	8.0	6.59	−2.4	8.6	6.07

We test whether the average annual smoothing measures (S) equal zero (columns 1 and 2), whether the average budget adjustments (in US$ million) differ between firms with positive (BA+) and negative (BA−) earnings gaps (columns 3–5), and whether the average budget adjustments as a fraction of the R&D budget (multiplied by 100) differ between firms with positive (BA/RD+) and negative (BA/RD−) earnings gaps (columns 6–8). In each case, the averages are equally weighed.

that are larger and smaller than zero. Simple t-tests contradict the big bath as a broad description of the data. The test results are even sharper if we remove firms with EG close to zero. In fact, S rises systematically with the absolute earnings gap (AEG), AEG between unmanaged earnings and analyst's forecasts.

As noted in the discussion of the sample statistics, the medians of many variables are much lower than the means. The sample may be influenced by extreme observations. Therefore, non-parametric tests are appropriate. Non-parametric tests that check whether the percent of data points with positive S equals 50% for 1977–1986 also reject. Non-parametric tests also contradict the big bath as the driving force behind the results. The results of these tests are available from the authors.

Tables 2 and 4 also report, for both groups, the budget adjustments (BA + and BA −) and BA as a fraction of R&D spending (BA/RD + and BA/RD −). If EG is without consequence, then the average BA and BA/RD should be indistinguishable. (As Table 2 illustrates, the groups do not differ in terms of reported income, R&D spending, or RDSL.) However, the t-tests for differences in means reject equality for the 1977–1986 period and for nearly every year (Table 4, columns 5 and 8).

What is the economic significance of the R&D budget adjustments? BA looks substantial compared to the average annual growth in R&D expenditures of US$16.8 million. For all firms with positive earnings gaps, the unusual budget growth amounts to US$8.0 million. For firms with negative gaps, there is a cut (or, more precisely, a reduction in the increase) of US$6.3 million. Because our

sample purposively selects high technology companies with large R & D budgets, these funds may well represent 'sustaining investments' (Strong and Meyer, 1990) that are required for the firm's core business.

4.2. Panel data

All the regression tests relate to one central question: What explains the cross-sectional variation in R & D earnings management (S)? Table 5 reports pooled time-series cross-sectional OLS regressions for the complete 1977–1986 period. The predictors include the variables described in Section 2 as well as dummy variable intercepts for the industries most frequently represented in the sample. In some cases, we try alternative but related variables, e.g., the capital asset pricing model beta serves as a substitute risk measure. All the dollar variables (S, AEG, FCF, TAX) are normalized by the market value of equity for each company and multiplied by 100.

To examine the robustness of the empirical findings, we study numerous variations of the regression framework. For instance, (1) we add year-to-year dummy variables (they are never significant), (2) we normalize the dollar variables by total company assets and sales (no change), or (3) we trim the data for outliers. [21] Table 6 repeats the regressions of Table 5 with all variables (except for the dummies) replaced by ranks for vitile (20) portfolios. This non-parametric rank regression procedure may be seen as an instrumental variables solution to any errors-in-variables problems that may be caused by nonlinearity. It has other advantages, e.g., we can retain all data points and it is easy to infer the relative importance of the multiple regression coefficients (see Iman and Conover, 1979). The findings in Table 6 only change at the margin if we work with individual firms rather than portfolios. Table 7 reports the regressions of Table 5 using one-way fixed effects regressions. Dummy variables are created for each company.

The results in Tables 5–7 broadly agree with the predictions summarized in Table 3. [22] Ceteris paribus, R & D earnings smoothing is *higher* (1) if the trading

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[21] Firms having a Studentized residual greater than 3 are classified as outliers; influential outliers are identified as those with a computed Cook's distance measure greater than 0.693 (the 50% limit for $F(2, \infty)$). Cook's distance combines the influence of observations with unusual predictors and the influence of observations with an unusual response into one overall measure. Influential outliers are removed from the sample and the equations are estimated again. While there is some loss of explanatory power (as measured by R^2), the results are similar.

[22] The results hold for different R&D expectation models. Another concern is whether the regression coefficients are similar if we break down the sample by industry groups. While there is mild variation in the findings, it does not justify additional tables. While the signs of the regression coefficients generally stay the same, their statistical significance goes down, probably because of the reduced number of data points. The explanatory power of the regressions falls the most for the drug industry. It rises the most for the 49 firms that do not belong to any of the four major industries in the sample.

Table 5
Panel data regression tests of R&D earnings management

Eq. no.	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.019 [0.1]	−0.029 [−0.1]	0.123 [0.3]	0.277 [0.7]	−0.067 [0.2]	0.017 [0.0]
DBEQ		−0.215 [−1.8]		−0.170 [−1.0]		−0.202 [−1.2]
DCHE		−0.118 [−0.8]		−0.095 [−0.5]		−0.086 [−0.4]
DRUG		−0.421 [−2.9]		−0.411 [−2.2]		−0.426 [−2.3]
DURA		−0.318 [−2.0]		−0.354 [−1.7]		−0.339 [−1.6]
VOL	0.008 [5.0]	0.009 [4.8]	0.008 [4.0]	0.010 [4.3]	0.010 [4.8]	0.011 [4.7]
IH	−0.009 [−2.9]	−0.005 [−1.4]	−0.010 [−2.3]	−0.007 [−1.4]	−0.009 [−2.2]	−0.007 [−1.4]
σ	0.056 [2.0]	0.051 [1.7]	0.094 [2.4]	0.073 [1.7]	0.081 [2.0]	0.072 [1.7]
FCF	−0.028 [−11.4]	−0.030 [−11.7]	−0.032 [−10.5]	−0.034 [−10.7]	−0.032 [−10.4]	−0.033 [−10.5]
ΔSB			0.004 [1.6]	0.005 [1.8]	0.004 [1.6]	0.005 [1.8]
NU			0.276 [1.5]	0.263 [1.4]	0.181 [1.0]	0.185 [1.0]
SH			−0.058 [−1.9]	−0.045 [−1.5]	−0.052 [−1.8]	−0.045 [−1.5]
YL			−0.023 [−1.9]	−0.018 [−1.5]		
OS			−0.229 [−1.2]	−0.272 [−1.4]		
AEG	0.036 [11.9]	0.035 [11.3]	0.035 [9.1]	0.033 [8.5]	0.033 [8.9]	0.032 [8.2]
TAX					−0.489 [−2.6]	−0.403 [−1.9]
Adj. R^2	0.29	0.29	0.32	0.33	0.32	0.33

We report pooled time-series cross-sectional OLS regressions (*t*-statistics are in brackets). The dependent variable is the smoothing measure (*S*). For other symbols, see DBEQ, DCHE, DRUG, and DURA are dummy variables. The dummy is one if the firm is in the business equipment, chemical, drug, or durable goods industry, respectively. It is zero otherwise. Eqs. (2), (4), and (6) include annual dummies that are not reported. There are $n = 994$ data points in Eqs. (1) and (2). Otherwise, $n = 682$.

Table 6
Pooled time-series cross-sectional rank regressions

Eq. no.	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-0.322 [-1.6]	-0.273 [-1.1]	-0.193 [-0.6]	-0.037 [-0.1]	-0.045 [-0.2]	-0.030 [-0.1]
DBEQ		-0.231 [-1.7]		-0.175 [-0.9]		-0.138 [-0.7]
DCHE		-0.238 [-1.4]		-0.291 [-1.3]		-0.194 [-0.8]
DRUG		-0.344 [-1.9]		-0.423 [-1.7]		-0.362 [-1.5]
DURA		-0.373 [-2.1]		-0.481 [-2.0]		-0.434 [-1.8]
VOL	0.035 [3.4]	0.031 [2.4]	0.039 [2.7]	0.040 [2.2]	0.058 [3.9]	0.051 [2.9]
IH	-0.026 [-2.5]	-0.028 [-2.3]	-0.029 [-2.1]	-0.034 [-2.2]	-0.025 [-1.8]	-0.034 [-2.2]
σ	0.021 [2.1]	0.025 [2.3]	0.028 [2.1]	0.030 [2.1]	0.017 [1.3]	0.028 [1.9]
FCF	-0.030 [-3.2]	-0.039 [-3.5]	-0.035 [-2.7]	-0.046 [-3.1]	-0.036 [-2.9]	-0.044 [-3.0]
ΔSB			0.014 [1.2]	0.016 [1.4]	0.015 [1.2]	0.015 [1.3]
NU			0.406 [1.8]	0.373 [1.7]	0.379 [1.8]	0.346 [1.6]
SH			-0.032 [-2.6]	-0.033 [-2.6]	-0.026 [-2.1]	-0.031 [-2.4]
YL			-0.008 [-0.6]	-0.005 [-0.4]		
OS			0.015 [1.3]	0.257 [1.2]		
AEG	0.065 [6.9]	0.063 [6.3]	0.068 [5.3]	0.064 [4.7]	0.067 [5.3]	0.063 [4.6]
TAX					-0.037 [-2.8]	-0.037 [-2.0]
Adj. R^2		0.08	0.09	0.09	0.10	0.10

We show pooled time-series cross-sectional rank regressions (t-statistics are in brackets). The dependent variable is the smoothing measure. Every predictor variable is ranked and sorted into 20 groups. The regressions are run with the ranks on the right-hand side. Eqs. (2), (4), and (6) include annual dummy variables that are not reported. For a list of symbols, see Tables 1–3.

Table 7
Fixed effects regressions

Eq. no.	(1)	(2)	(3)	(4)
VOL	0.006 [2.6]	0.007 [2.4]	0.005 [1.7]	0.006 [2.2]
IH	−0.010 [−2.3]	−0.007 [−1.2]	−0.010 [−1.6]	−0.007 [−1.2]
σ	0.013 [0.3]	−0.007 [−0.1]	0.028 [0.4]	0.000 [0.0]
FCF	−0.030 [−11.0]	−0.032 [−9.4]	−0.033 [−9.4]	−0.032 [−9.2]
ΔSB		0.006 [2.1]	0.005 [2.0]	0.005 [2.1]
NU		0.307 [1.6]	0.409 [1.9]	0.408 [1.9]
SH		−0.062 [−1.0]	−0.067 [−1.1]	−0.067 [−1.1]
YL			−0.024 [−1.1]	−0.025 [−1.1]
OS			−0.013 [0.0]	0.020 [0.1]
AEG	0.042 [11.7]	0.042 [8.6]	0.044 [9.1]	0.042 [8.7]
TAX		−0.768 [−3.6]		−0.771 [−3.6]
R^2	0.40	0.44	0.43	0.44
F-value	2.91 [0.0]	2.44 [0.0]	2.39 [0.0]	2.44 [0.0]

We show one-way fixed effects regressions (t-statistics are in brackets). The dependent variable is the smoothing measure. Dummy variables are created for each company. For a list of symbols, see Tables 1–3. The F-value reported in the table (with a p-value below) is for the company dummies.

horizon of the average investor is short, (2) if shareholders bear much business risk, (3) if the CEO gets big pay raises, (4) if the firm is in a year of transition with a new CEO, and (5) if the absolute earnings gap is large. All else equal, R&D earnings smoothing is *lower* (1) if a larger percentage of the shares is held by institutions, (2) if there is plenty of free cash flow, (3) if the CEO owns a large percentage of the firm's shares, and (4) if the Reagan R&D tax credit is valuable.

Some of the findings agree with prior research, e.g., that R&D is associated with institutional holdings (Hansen and Hill, 1991) or that tax credits can strongly influence R&D spending (Hines, 1991; Hall, 1992b). Mansfield (1993) wonders whether the observed tax effects are partly cosmetic. In his view, the mere redefinition of other activities as R&D may well explain the boom in R&D during the early 1980s. Also, accounting standards do allow considerable latitude in the decision to expense or capitalize assets that have alternative uses (e.g., laboratory equipment). Lev and Kunitzky (1974) find a positive link between various risk measures and income smoothing. Again, Tables 5 and 6 reaffirm the earlier findings. Although not shown in the tables, the results are comparable if we substitute β for return volatility (σ), or if we employ the ratio of long-term debt to assets (DA) as a measure of debt capacity (rather than free cash flow). [23]

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[23] While agreeing with prior work (Hall, 1992a), the cash flow results have a familiar alternative interpretation: the supply of R&D investment opportunities may be positively correlated with current performance. This caveat applies to almost every study of investment with liquidity constraints.

Other results not listed in the tables have to do with variables that relate to the effect of investor sentiment on market prices. The pressure to manage earnings may be most severe if investors misprice the company. Two possible proxy variables are (1) the total stock return for the 3-year period ending in December of year $t - 1$ (WL) and (2) the ratio of market value to book value of equity (MB) at the end of year $t - 1$. Table 1 lists descriptive statistics for WL and MB. Do R&D investment decisions change if current market prices are in conflict with managers' assessments of fundamentals? As it turns out, neither WL nor MB is significantly related to the R&D smoothing measure S (results are available from the authors).

5. Conclusions

By definition, financial decision making involves choice over time. If we take news stories as gospel, short-termism permeates the economic landscape at all levels, public and private. Americans do not save enough for old age, we are told, politicians keep their eyes fixed on the next election, the stock market is myopic, and so on. Business leaders too, perhaps, are obsessed with today's profits and skimp on investment. [24]

Do the data validate these claims for corporate investment? In theory, myopia could occur so long as managers worry about current stock prices and know more about the firm's likely fortunes than outsiders do. The usual arguments that start with share prices and end with corporate investment spending run through earnings. For this reason, R&D spending is of special interest. Since 1974, research budgets are not depreciated but expensed and therefore pre-tax reported earnings fluctuate dollar-for-dollar with changes in R&D. Executives may adjust R&D to smooth accounting earnings and to signal firm value. Alternatively, they may try to influence investor sentiment. Finally, discretionary adjustments in R&D may also reflect managerial incentives, available funds, debt capacity, and taxes.

Our empirical design formulates a stringent test of this theory. For a panel of 100 U.S. corporations with large R&D budgets between 1977 and 1986, we find that changes in R&D reduce the perception gap between reported income and

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[24] In an October 1989 speech to magazine publishers and editors in New York, Chrysler's Lee Iacocca *further* blamed brokers, analysts, pension funds, M&A specialists, and educators. "The whole country seems to be in short-term feeding frenzy," Iacocca said. He asked rethorically: "Do you think more companies would be building research and development centers if they didn't pay a penalty in their stock price for investing in such long-term assets?"

analysts' earnings predictions. The results are symmetric. They hold just as well when earnings exceed analyst forecasts as when earnings fall short. What is even more interesting and new is that much of the cross-sectional variation in gap closure is explained by measures of informational asymmetry and managerial incentives. Less gap closure occurs if the CEO and institutional investors own a large fraction of the firms' shares. More gap closure occurs for companies with volatile stock prices and high trading volume.

The latter findings support a relation between investor horizons and managerial horizons, superficially in accord with Porter (1992) and others. However, reality is more complex than a simple story of myopic underinvestment suggests. For instance, when company earnings are above analyst expectations, the growth in R&D budgets typically *beats* the long-term trend. Thus, market forces do not always discourage farsighted decision making. What may be happening is that income management affects the *timing* of R&D spending rather than its long-term average level. Much remains unclear. There may be profound differences between industries (even though we find little evidence to support that view). It could also be that market pressures change the *selection* of R&D projects. A recent story in the *Wall Street Journal* – entitled 'Corporate Labs Change the Goal of Their Research to Fast Payoffs' – offers the example of General Electric where "the portion of R&D... devoted to long-term projects is down to 15% from 30% in the 1980s" (May 22, 1995). All these hypotheses – and others – require further investigation.

Acknowledgements

Appendix A. List of sample companies

Company and industry	R&D growth rate (%)	R&D/ sales (%)	R&D spending (1980 US$)
1. Apparel			
Mohasco	1.2	0.94	6.74
2. Automobile			
Chrysler	10.2	2.56	375.63
Eaton	13.9	2.66	76.91
TRW	16.4	1.81	88.41
3. Business equipment			
Ametek	15.9	2.26	9.29
Bard (C.R.)	26.8	2.33	7.14
Caterpillar	3.0	2.89	201.35
Champion Spark Plug	7.0	1.41	10.67
Cincinnati Milacron	9.9	3.75	25.52
Clark Equipment	3.7	1.88	23.83
Control Data	16.4	6.05	183.74
Cooper Industries	23.1	0.69	12.60
Cummins Engine	10.9	2.83	48.57
Foxboro	9.1	6.94	34.86
General Signal	15.4	3.97	56.44
Honeywell	7.4	6.24	303.17
Int'l Business Machines	13.9	6.17	1903.77
Johnson & Johnson	16.5	5.56	273.02
NCR	12.4	6.04	204.79
Pitney-Bowes	16.7	2.27	27.79
Raytheon	17.9	2.90	141.83
Smith International	8.6	2.20	15.32
Square D	16.4	2.30	23.20
Sundstrand	12.2	3.49	32.11
Texas Instruments	18.6	5.40	207.19
Timken	15.1	1.36	14.84
Unisys	15.3	5.68	192.38
4. Chemical			
Dexter	12.8	3.54	16.85
Dow Chemical	12.7	3.72	360.97
Du Pont (E.I.) De Nemours	13.3	3.36	663.79
Grace (W.R.)	12.4	1.01	55.13
Int'l Flavors and Fragrances	8.6	6.55	28.14

Monsanto	15.2	1.44	75.95
Nalco Chemical	9.7	4.18	25.09
Olin	9.1	2.10	37.93
Pennwalt	7.3	2.82	28.52
Rohm & Haas	11.2	4.55	76.76
Union Carbide	2.7	2.31	206.59
Witco	9.9	1.36	15.01

5. Construction

Boise Cascade	9.0	0.18	5.49
Emhart	8.4	2.09	34.31
Gillette	7.2	2.46	52.34
Norton	12.0	1.82	20.30
Owens Corning Fibrglas	8.3	1.74	40.48
PPG Industries	13.1	3.18	107.25
Stanley Works	9.2	0.66	6.12

6. Drug

Abbott Laboratories	18.3	5.66	126.24
American Cyanamid	13.2	4.90	160.51
Avon Products	8.1	1.31	33.09
Bristol-Myers	15.6	4.29	142.81
Colgate-Palmolive	9.3	1.17	54.65
Lilly (Eli)	13.9	8.99	226.22
Merck	14.1	9.50	262.27
Pfizer	14.5	5.54	173.66
Robins (A.H.)	14.8	6.15	29.20
Schering-Plough	15.3	6.77	105.63
SmithKline Beckman	20.6	8.27	162.82
Squibb	16.4	5.93	98.14
Upjohn	13.3	10.07	172.82
Warner-Lambert	11.2	4.15	128.80

7. Durables

AMP	13.7	9.08	105.18
Armstrong World Inds	6.9	2.77	38.35
Bausch & Lomb	8.9	3.46	17.75
Brunswick	7.7	2.51	31.31
Eastman Kodak	11.5	6.56	596.07
General Electric	10.2	3.07	749.70
Goodrich (B.F.)	3.1	1.81	54.05
Goodyear Tire and Rubber	8.7	2.34	202.73
Motorola	17.0	6.92	238.04

Polaroid	5.5	8.60	113.39
Rubbermaid	12.8	1.21	4.37
Whirlpool	9.4	1.57	39.26

8. Food

Borden	4.8	0.45	19.79
CPC International	4.6	0.93	36.19
Hershey Foods	18.5	0.39	5.28
Kellogg	18.8	0.81	17.80

9. Metal

Alcan Aluminum	14.0	1.02	47.12
Aluminum Co. of America	10.7	1.60	75.33
Bethlehem Steel	−4.2	0.73	45.16
Reynolds Metals	2.9	0.90	29.05
USX	−0.7	0.47	66.33

10. Metal Products

Combustion Engineering	6.8	1.76	49.42
Diebold	17.4	1.78	6.19

11. Miscellaneous

Bemis	6.9	1.25	8.85
Dennison Mfg	9.2	2.17	11.39
Kimberly-Clark	16.9	1.60	44.85
Minnesota Mining and Mfg	13.2	5.00	305.15
Nashua	−0.5	1.73	10.37
Scott Paper	7.3	1.48	32.65
Texaco	12.5	0.27	111.28

12. Oil

Atlantic Richfield	9.6	0.54	109.55
Exxon	10.1	0.60	496.74
Phillips Petroleum	8.6	0.75	90.18

13. Transportation

Boeing	10.6	5.81	487.72
Fairchild Industries	20.5	1.68	14.09
General Dynamics	26.4	1.96	107.04
Lockheed	25.3	2.62	156.14
Martin Marietta	43.4	1.52	49.79
Northrop	22.7	5.99	147.98
United Technologies	9.4	6.24	684.14

References

Asquith, P., Mullins, D.W., 1986. Equity issues and offering dilution. Journal of Financial Economics 15, 61–89.

Baber, W.R., Fairfield, P.M., Haggard, J.A., 1991. The effect of concern about reported income on discretionary spending decisions: The case of research and development. Accounting Review 66, 818–829.

Baldwin, C.Y., Clark, K.B., 1992. Capabilities and capital investment: New perspectives on capital budgeting. Journal of Applied Corporate Finance, 67–82.

Bebchuk, L.A., Stole, L.A., 1993. Do short-term objectives lead to under- or overinvestment in long-term projects? Journal of Finance 48, 719–729.

Berle, A.A., Jr., Means, G.C., 1932. The Modern Corporation and Private Property. Macmillan, New York.

Bernard, V.L., Thomas, J., 1989. Post-earnings announcement drift: Delayed price response or risk premium? Journal of Accounting Research, 1–36.

Bhagat, S., Shleifer, A., Vishny, R.W., 1990. Hostile takeovers in the 1980s: the return to corporate specialization. Brookings Papers Economic Activity: Microeconomics.

Bizjak, J.M., Brickley, J.A., Coles, J.L., 1993. Stock-based incentive compensation and investment behavior. Journal of Accounting Economics 16, 349–372.

Brealey, R., Myers, S., 1984. Principles of Corporate Finance. McGraw-Hill, New York.

Brennan, M.J., 1990. Latent assets. Journal of Finance 45, 709–730.

Chambers, A.E., Penman, S.H., 1984. Timeliness of reporting and the stock price reaction to earnings announcements. Journal of Accounting Research 22, 21–47.

Chan, S.H., Martin, J.D., Kensinger, J.W., 1990. Corporate research and development expenditures and share value. Journal of Financial Economics 26, 255–276.

Chaney, P.K., Lewis, C.M., 1995. Earnings management and firm valuation under asymmetric information. Journal of Corporate Finance 1, 319–345.

Clinch, G., 1991. Employee compensation and firms' research and development activity. Journal of Accounting Research 29, 59–78.

Cyert, R.M., March, J.G., 1963. A Behavioral Theory of the Firm. Prentice-Hall, Englewood Cliffs, NJ.

DeAngelo, L., 1986. Accounting numbers as market valuation substitutes: A study of management buyouts of public stockholders. Accounting Review 61, 400–420.

DeAngelo, L., 1988. Managerial performance evaluation, information costs, and corporate governance: A study of proxy contests. Journal of Accounting Economics 10, 3–36.

De Bondt, W.F.M., Thaler, R.H., 1985. Does the stock market overreact? Journal of Finance 40, 793–805.

De Long, B., Shleifer, A., Summers, L.H., Waldmann, R.J., 1990. Noise trader risk in financial markets. Journal of Political Economy 98, 703–738.

Donaldson, G., Lorsch, J.W., 1983. Decision making at the top: The shaping of strategic direction. Basic Books, New York.

Dye, R.A., 1988. Earnings management in an overlapping generations model. Journal of Accounting Research 26, 235–495.

Dukes, R.E., 1976. An investigation of the effects of expensing research and development costs on security prices. In: Schiff, M., Sorter, G. (Eds.), Proceedings of the conference on topical research in accounting. Ross Institute of Accounting Research, New York.

Elliott, J.A., Shaw, W.H., 1988. Write-offs as accounting procedures to manage perceptions. Journal of Accounting Research 26, 91–119.

Ely, K.M., 1991. Interindustry differences in the relation between compensation and firm performance variables. Journal of Accounting Research 29, 37–58.

Fama, E.F., French, K., 1988. Permanent and temporary components of stock prices. Journal of Political Economy 96, 246–273.

Froot, K.A., Scharfstein, D., Stein, J.C., 1992. Herd on the street: Informational inefficiencies in a market with short-term speculation. Journal of Finance 47, 1461–1484.

Gibbons, R., Murphy, K.J., 1992. Does executive compensation affect investment? Working paper #4135. NBER, Cambridge, MA.

Hagerty, K., Ofer, A., Siegel, D., 1992. Managerial compensation and incentives to engage in far-sighted behavior. Working paper. Northwestern University, Evanston, IL.

Hall, B.H., 1988. The effect of takeover activity on corporate research and development. In: Auerbach, A.J. (Ed.), Corporate Takeovers: Causes and Consequences. Univ. of Chicago Press, Chicago.

Hall, B.H., 1990. The impact of corporate restructuring on industrial research and development. Brookings Papers Economic Activity, 85–135.

Hall, B.H., 1992. Investment and research and development at the firm level: Does the source of financing matter? Working paper #4096. NBER, Cambridge, MA.

Hall, B.H., 1992. R&D tax policy during the eighties: Success or failure? Working paper #4240. NBER, Cambridge, MA.

Hall, B.H., 1993a. The stock market's valuation of R&D investment during the 1980s. American Economic Review 83, 259–264.

Hall, B.H., 1993. Industrial research during the 1980s: Did the rate of return fall? Brookings Papers Economic Activity, 289–330.

Hall, B.H., Hall, R.E., 1994. The value and performance of U.S. corporations. Brookings Papers Economic Activity, 1–49.

Hand, J.R.M., 1989. Did firms undertake debt–equity swaps for an accounting paper profit or true financial gain? Accounting Review 64, 587–623.

Hansen, G.S., Hill, C.W.L., 1991. Are institutional investors myopic? A time-series study of four technology-driven industries. Strategic Management Journal 12, 1–16.

Healy, P.M., 1985. The effect of bonus schemes on accounting decisions. Journal of Accounting Economics 7, 85–107.

Hepworth, S.R., 1953. Smoothing periodic income. Accounting Review 28, 32–39.

Hines, J.R., Jr., 1991. On the sensitivity of R&D to delicate tax changes: The behavior of U.S. multinationals in the 1980s. Working paper #3930. NBER, Cambridge, MA.

Hotlhausen, R., Larcker, D.F., Sloan, R.G., 1995. Annual bonus schemes and the manipulation of earnings. Journal of Accounting Economics 19, 29–74.

Hunt, A., Moyer, S.E., Shevlin, T., 1995. Earnings volatility, earnings management, and equity value. Working paper. Univ. of Washington.

Iman, R.L., Conover, W.J., 1979. The use of the rank transform in regression. Technometrics 21, 499–509.

Jacobs, M.T., 1991. Short-term America. The Causes and Cures of our Business Myopia, Harvard Business School Press, Boston.

Janakiraman, S.N., Lambert, R.A., Larcker, D.F., 1992. An empirical investigation of the relative performance evaluation hypothesis. Journal of Accounting Research 30, 53–69.

Jensen, M.C., 1986. Agency costs of free cash flow, corporate finance and takeovers. American Economic Review 76, 323–329.

Jensen, M.C., 1993. The modern industrial revolution, exit, and the failure of internal control systems. Journal of Finance 48, 831–880.

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

Kalay, A., Loewenstein, U., 1986. The informational content of the timing of dividend announcements. Journal of Financial Economics 17, 373–388.

Kaplan, S.N., 1989. The effects of management buyouts on operating performance and value. Journal of Financial Economics 24, 217–254.

Kaznik, R., Lev, B., 1995. To warn or not to warn: Management disclosures in the face of an earnings surprise. Accounting Review 70, 113–134.

Korajczyk, R.A., Lucas, D., McDonald, R.L., 1990. Understanding stock price behavior around the time of equity issues. In: Hubbard, R.G., (Ed.), Asymmetric Information, Corporate Finance, and Investment. University of Chicago Press, Chicago.

Lakonishok, J., Shleifer, A., Vishny, R.W., 1994. Contrarian investment, extrapolation, and risk. Journal of Finance 49, 1541–1578.

Lambert, R.A., 1984. Income smoothing as rational equilibrium behavior. Accounting Review 59, 604–618.

Larcker, D.F., 1983. The association between performance plan adoption and corporate capital investment. Journal of Accounting Economics 5, 3–30.

Lehn, K., Poulsen, A., 1989. Free cash flow and stockholder gains in going private transactions. Journal of Finance 44, 771–787.

Lev, B., Kunitzky, S., 1974. On the association between smoothing measures and the risk of common stocks. Accounting Review 49, 259–270.

Lintner, J., 1956. Distribution of incomes of corporations among dividends, retained earnings and taxes. American Economic Review 46, 97–113.

Lowenstein, L., 1991. Why managements should (and should not) have respect for their shareholders. Journal of Corporation Law 17, 1–27.

Mansfield, E., 1993. Comments. Brookings Papers Economic Activity, 331–334.

Mayer-Sommer, A.P., 1979. Understanding and acceptance of the efficient markets hypothesis and its accounting implications. Accounting Review 54, 88–106.

McConnell, J.J., Muscarella, C.J., 1985. Corporate capital expenditure decisions and the market value of the firm. Journal of Financial Economics 14, 399–421.

McNichols, M., 1989. Evidence of informational asymmetries from management earnings forecasts and stock returns. Accounting Review 64, 1–27.

McNichols, M., Wilson, G.P., 1988. Evidence of earnings management from the provision for bad debts. Journal of Accounting Research 26, 1–31.

Meulbroek, L., Mitchell, M., Mulherin, H., Netter, J., Poulsen, A., 1990. Shark repellents and managerial myopia: An empirical test. Journal of Political Economy 98, 1108–1117.

Milgrom, P.R., Roberts, J., 1986. Relying on the information of interested parties. Rand Journal of Economics 17, 18–32.

Miller, M.H., Rock, K., 1985. Dividend policy under asymmetric information. Journal of Finance 40, 1031–1051.

Morck, R., Shleifer, A., Vishny, R.W., 1990a. Do managerial objectives drive bad acquisitions? Journal of Finance 45, 31–48.

Morck, R., Shleifer, A., Vishny, R.W., 1990b. The stock market and investment: Is the market a sideshow? Brookings Papers Economic Activity, 2, 157–215.

Moses, O.D., 1987. Income smoothing and incentives: Empirical tests using accounting changes. Accounting Review 62, 358–377.

Murphy, K.J., Zimmerman, J.L., 1993. Financial performance surrounding CEO turnover. Journal of Accounting Economics 16, 273–315.

Myers, S.C., 1977. Determinants of corporate borrowing. Journal of Financial Economics 5, 147–175.

Myers, S.C., 1989. Signaling and accounting information. Working paper. Massachusetts Institute of Technology, Cambridge, MA.

Myers, S.C., Majluf, N.S., 1984. Corporate financing and investment decisions when firms have information that investors do not have. Journal of Financial Economics 13, 187–221.

Narayanan, M.P., 1985. Managerial incentives for short-term results. Journal of Finance 40, 1469–1484.

Opler, T.C., Titman, S., 1994. Financial distress and corporate performance. Journal of Finance 49, 1015–1040.

O'Reilly, C.A. III, Main, B.G., Crystal, G.C., 1988. CEO compensation as tournament and social comparison: A tale of two theories. Administration Science Quarterly 33, 257–274.

Perry, S.E., Grinaker, R., 1994. Earnings expectations and discretionary research and development spending. Accounting Horizons 8, 43–51.

Perry, S.E., Williams, T.H., 1994. Earnings management preceding management buyout offers. Journal of Accounting Economics 18, 157–179.

Porter, M.E., 1992. Capital choices: Changing the way America invests in industry. Journal of Applied Corporate Finance, 4–16.

Pourciau, S., 1993. Earnings management and nonroutine executive changes. Journal of Accounting Economics 16, 317–336.

Pugh, W.N., Page, D.E., Jahera, J.S. Jr., 1992. Antitakeover charter amendments: Effects on corporate decisions. Journal of Financial Research 15, 57–68.

Schipper, K., 1989, Commentary on earnings management. Accounting Horizons, 91–102.

Schipper, K., Smith, A., 1986. The corporate spin-off phenomenon. In: Stern, J.M., Chew, D.H., Jr. (Eds.), The Revolution in Corporate Finance. Blackwell, New York.

Sharpe, S.A., 1994. Financial market imperfections, firm leverage, and the cyclicality of employment. American Economic Review 84, 1060–1074.

Shin, H.S., 1994. News management and the value of firms. Rand Journal of Economics 25, 58–71.

Shleifer, A., Vishny, R.W., 1988. Management buyouts as a response to market pressure. In: Auerbach, A.J. (Eds.), Mergers and Acquisitions. University of Chicago Press, Chicago.

Shleifer, A., Vishny, R.W., 1990. Equilibrium short horizons of investors and firms. American Economic Review 80, 148–153.

Skinner, D.J., 1993. The investment opportunity set and accounting procedure choice: Preliminary evidence. Journal of Accounting Economics 16, 407–445.

Skinner, D.J., 1994. Why firms voluntarily disclose bad news. Journal of Accounting Research 32, 38–60.

Smith, A.J., 1990. Corporate ownership structure and performance: the case of management buyouts. Journal of Financial Economics 27, 143–164.

Stein, J., 1988. Takeover threats and managerial myopia. Journal of Political Economy 96, 61–80.

Stein, J., 1989. Efficient capital markets, inefficient firms: a model of myopic corporate behavior. Quarterly Journal of Economics 104, 655–669.

Strong, J.S., Meyer, J., 1990. Sustaining investment, discretionary investment, and valuation: A residual funds study of the paper industry. In: Hubbard, R.G. (Ed.), Asymmetric Information, Corporate Finance, and Investment. University of Chicago Press, Chicago.

Trueman, B., Titman, S., 1988. An explanation for accounting income smoothing. Journal of Accounting Research 26, 127–139.

Warfield, T.D., Wild, J.J., Wild, K.L., 1995. Managerial ownership, accounting choices, and informativeness of earnings. Journal of Accounting Economics 20, 61–91.

Warner, J., Watts, R.L., Wruck, K., 1988. Stock prices and top management changes. Journal of Financial Economics 20, 461–492.

Watts, R.L., 1986. Does it pay to manipulate eps? In: Stern, J.M., Chew, D. (Eds.), The Revolution in Corporate Finance. Blackwell, New York.

Watts, R.L., Zimmerman, J.L., 1986. Positive Accounting Theory. Prentice-Hall, Englewood Cliffs, NJ.

Woolridge, J.R., 1988. Competitive decline and corporate restructuring: Is a myopic stock market to blame? Journal of Applied Corporate Finance 1, 26–36.

Zweibel, J., 1995. Corporate conservatism and relative compensation. Journal of Political Economy 103, 1–25.