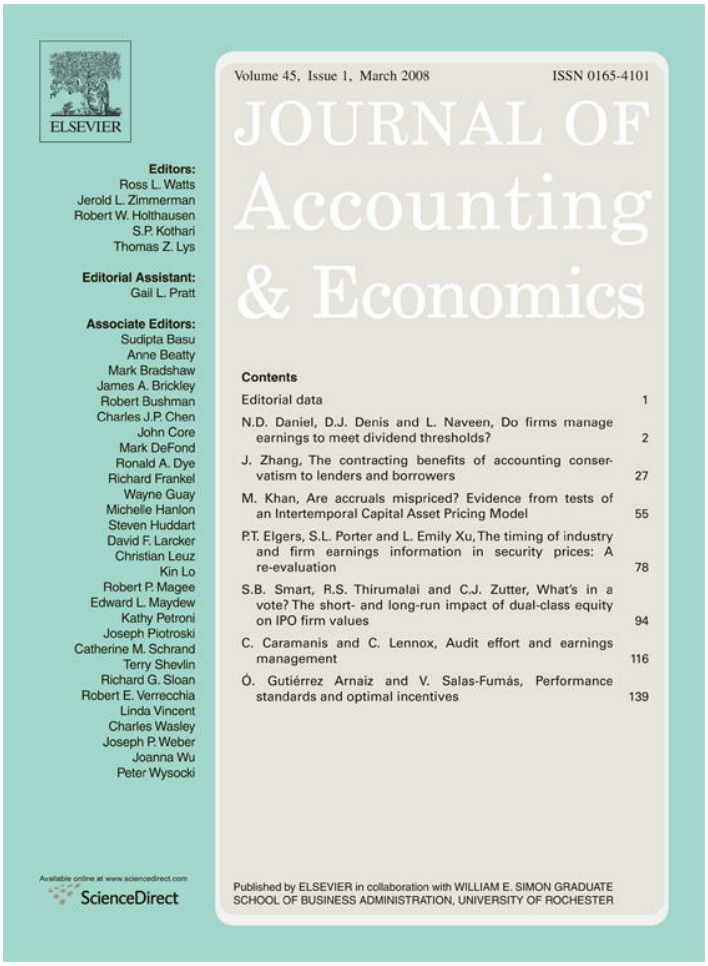

Available online at www.sciencedirect.com
ScienceDirect
Journal of Accounting and Economics 45 (2008) 2–26
JOURNAL OF Accounting & Economics
www.elsevier.com/locate/jae

Do firms manage earnings to meet dividend thresholds?☆

Naveen D. Daniel[a], David J. Denis[b,*], Lalitha Naveen[c]

[a]*LeBow College of Business, Drexel University, USA*
[b]*Krannert School of Management, Purdue University, USA*
[c]*Fox School of Business, Temple University, USA*

Received 9 March 2007; received in revised form 30 October 2007; accepted 2 November 2007
Available online 19 November 2007

Abstract

Dividend-paying firms tend to manage earnings upward when their earnings would otherwise fall short of expected dividend levels. This behavior is evident only in firms with positive debt and is more aggressive prior to the Sarbanes-Oxley Act, subsequent to the 2003 dividend tax cut, in high-payout firms, in firms whose CEOs receive higher dollar dividends and have higher pay-performance sensitivities, and in firms that raise less outside equity. Moreover, this earnings management behavior appears to significantly impact the likelihood of a dividend cut. Our findings imply that managers treat expected dividend levels as an important earnings threshold.

JEL classification: G35

Keywords: Dividend policy; Dividend smoothing; Earnings management; Accruals

1. Introduction

Since Lintner's (1956) pioneering study, it has been well known that managers are reluctant to cut dividends. Indeed, managers appear willing to go to great lengths to avoid dividend cuts. In a survey of CFOs, Brav et al. (2005) report that managers are willing to sell assets, layoff employees, raise external funds, or even bypass positive-NPV projects before cutting dividends. Such behavior is puzzling in the context of dividend irrelevance, but is consistent with DeAngelo and DeAngelo's (2006a) contention that dividends are

☆We thank Murillo Campello, Harry DeAngelo, Mark DeFond (the referee), Diane Denis, Michelle Hanlon, S.P. Kothari (the editor), Tim Kruse, John McConnell, Eric Press, Raghu Rau, David Reeb, Liwei Shan, Paul Simko, Kumar Venkataraman, Ralph Walkling, seminar participants at the Darden School, Georgia State University, Purdue University, Southern Methodist University, Syracuse University, Temple University, Texas Tech University, University of Delaware, University of Kentucky, University of Miami, and University of Michigan, and session participants at the Financial Management Association's Annual Meeting in Orlando for helpful comments.
*Corresponding author.
E-mail addresses: nav@drexel.edu (N.D. Daniel), djdenis@purdue.edu (D.J. Denis), lnaveen@temple.edu (L. Naveen).

0165-4101/$ - see front matter © 2007 Elsevier B.V. All rights reserved.
doi:10.1016/j.jacceco.2007.11.002

of first-order importance to investors. The reluctance to cut dividends is also consistent with the large negative stock price reactions observed around the announcement of dividend reductions.[1]

In this study, we examine whether firms manage earnings to meet dividend thresholds. Our investigation is motivated in part by the observation that dividend restrictions are among the most common covenants in debt contracts. For example, Kalay (1982) finds that of 150 randomly selected firms, every firm had a dividend restriction in at least one of its debt instruments. Similarly, Bradley and Roberts (2004) report that 84% of all private debt contracts over the period 1993–2001 include dividend restrictions. These covenants typically stipulate the maximum funds available for dividends in terms of the firm's accounting earnings and equity raised since the time of the debt issue.[2]

The existence of such covenants implies that the level of reported earnings is an important determinant of dividends. This implication is consistent with the evidence in Lintner (1956) and with our observation that dividend payments exceed reported earnings for fewer than 7% of dividend payers in our sample. If reported earnings are an important dividend threshold, managers have the incentive to manage earnings upwards to avoid dividend cuts when reported earnings would otherwise be below expected dividend levels (e.g., see Watts and Zimmerman, 1986). In other words, even though managing earnings does not alter the firm's capacity to pay dividends by generating additional cash, managing earnings upward still affects the firm's ability to pay dividends by allowing the firm to circumvent constraints imposed by the firm's debt covenants.

We test the hypothesis that firms manage earnings upwards when they anticipate that "pre-managed" earnings will be lower than expected dividend payments. To do so, we first define *total accruals* as the difference between reported earnings before extraordinary income and operating cash flow.[3] We then decompose total accruals into its *non-discretionary* (i.e., related to the operations of the firm) and *discretionary* (i.e., under managerial control) components.

Following prior studies (e.g., DeFond and Park, 1997), we estimate pre-managed earnings as operating cash flow plus *non-discretionary* total accruals minus preferred dividends. In other words, pre-managed earnings represent income in the absence of earnings management. We then compare these pre-managed earnings to an estimate of expected dividends. Also consistent with prior literature (e.g., Healy and Palepu, 1990; DeAngelo and DeAngelo, 1990; DeAngelo et al., 1994), we assume that expected dividends are equal to dividends in the prior year. Our key independent variable is *Deficit*, which equals *Max*(0, earnings shortfall), where earnings shortfall is calculated as expected dividends minus pre-managed earnings. We hypothesize that discretionary total accruals are positively associated with *Deficit*.

Using a sample of S&P 1500 firms over the period 1992–2005, we find that a significant fraction of dividend payers (24%) have a positive *Deficit*. We then report several findings consistent with the hypothesis that firms manage earnings to meet dividend thresholds. First, firms are significantly more likely to manage earnings upward when pre-managed earnings are below expected dividend levels than when they are not. We find that 81% of payers with $Deficit > 0$ manage earnings upwards; that is, they have positive discretionary total accruals. In contrast, only 42% of payers with $Deficit = 0$ have positive discretionary total accruals. These findings are robust to controls for other determinants of discretionary accruals—e.g., managerial incentives, firm size, market-to-book ratio, leverage, earnings levels, and retained earnings—to alternative measures of discretionary accruals, and they do not appear to be driven by firms managing earnings towards other thresholds. Moreover, we find that dividend payers exhibit an unusually high frequency of reported earnings just above the expected dividend level. This result, along with a battery of additional tests, implies that our findings are not simply due to a spurious association between discretionary accruals and *Deficit*.

Second, for the sub-sample of dividend payers, we examine the impact of regulation, prior dividend policy, managerial incentives, and proxies for the tightness of dividend restrictions on the sensitivity of discretionary accruals to *Deficit*. We find that in response to an earnings shortfall, earnings management is more aggressive prior to the passing of the Sarbanes-Oxley Act, subsequent to the 2003 dividend tax cut, in

[1]See, for example, Pettit (1972), Aharony and Swary (1980), and Grullon et al. (2002).

[2]More specifically, as discussed in Smith and Warner (1979) and Kalay (1982), for debt issued at time 0, the dividend restriction specifies the maximum payable dividend, D_T^*, in any subsequent period T as the following: $D_T^* = F + k \times \sum_{t=0}^{T} E_t + \sum_{t=0}^{T} S_t - \sum_{t=0}^{T-1} D_t$, where E_t is the net earnings for period t, S_t is the net proceeds from sale of stock, F is a fixed number, and k is a constant between 0 and 1.

[3]See Bradshaw et al. (2001), Hribar and Collins (2002), and Bergstresser and Philippon (2006).

firms with high-payout ratios, in firms whose CEOs receive higher dollar dividends, in firms whose CEOs have higher pay-performance sensitivities, and in firms that raise less outside equity. Consistent with the dividend threshold being related to debt covenants, we find no relation between discretionary accruals and *Deficit* for the sub-sample of payers with no outstanding debt.

Finally, we find that the earnings management behavior of dividend payers significantly affects the likelihood of a dividend cut. Among those firms with a positive *Deficit*, only 2.3% cut dividends if they eliminate the earnings shortfall through discretionary accruals. By contrast, of those firms with positive *Deficit* that do not eliminate the earnings shortfall through discretionary accruals, 15.2% cut dividends in that year. This result is robust to controls for other determinants of the likelihood of dividend cuts such as earnings levels, dividend levels, stock returns, and the magnitude of the contemporaneous cash flow shock.

Collectively, these results support the view that (i) reported earnings are a binding constraint on dividend levels, and (ii) firms actively manage earnings in order to maintain dividends by circumventing this constraint.

Our findings thus contribute to the earnings management literature by documenting that expected dividend levels represent an important additional earnings threshold. More broadly, our results have implications for the literatures that examine the information content of dividends and the earnings quality of dividend-paying firms. Finally, because earnings management is potentially costly to shareholders,[4] the fact that managers are willing to incur these costs in order to maintain the firm's dividend level implies that managers treat dividends as being of first-order importance. We discuss these implications further in the paper's conclusion.

The rest of the paper proceeds as follows. Section 2 discusses related literature and provides a context for our study. Section 3 provides a brief description of the data and methodology used in the paper. Section 4 analyzes the association between discretionary accruals and *Deficit*. Section 5 analyzes which types of firms engage in dividend-related earnings management. Section 6 examines whether earnings management affects the likelihood of a dividend cut. Section 7 concludes.

2. Related literature

Under generally accepted accounting principles (GAAP), managers have discretion in reporting earnings. They can manage reported earnings by (among other things) accelerating recognition of revenue, deferring recognition of expenses, altering inventory accounting methods, changing estimates of bad debt, and revising assumptions related to pension assets.

Many studies have examined whether managers are opportunistic in terms of managing earnings.[5] One strand of the literature examines earnings management around corporate events. These studies conclude that firms manage earnings around stock offers (Teoh et al., 1998a, b; Shivakumar, 2000; DuCharme et al., 2004; Bergstresser et al., 2006) and acquisitions (Bergstresser et al., 2006; Louis, 2004).

Another strand of the literature explores managerial incentives for earnings management. Healy (1985) finds that managers manage earnings in response to their bonus schemes. More recently, Bergstresser and Philippon (2006) find that earnings smoothing is higher in firms with higher levels of stock-based incentives, while Burns and Kedia (2006) report that earnings restatements are more common at firms in which the CEOs have large option portfolios. Neither study considers the effect of dividend payment status or earnings shortfall (with respect to expected dividends) on firms' discretionary accruals. Using a sample of 37 Finnish firms, Kasanen et al. (1996) document that firms manage earnings upwards in response to pressure from large institutional shareholders to pay dividends.

A third strand of the literature considers whether firms manage earnings to meet important thresholds. Burgstahler and Dichev (1997) find that firms manage earnings upwards to avoid reporting losses and to avoid reporting earnings declines. The authors examine the earnings distributions of firms, and find an abnormally low frequency of small negative earnings and small earnings declines and an abnormally high frequency of

[4]For example, Erickson et al. (2004) show how earnings management can lead to the firm paying higher taxes (in present value terms). Francis et al. (2005) argue that firms with poorer earnings quality have higher costs of debt and equity. However, Core et al. (2006) argue that there is no evidence that accruals quality is a priced risk factor.

[5]Healy and Wahlen (1999), Dechow and Skinner (2000), and Fields et al. (2001) provide excellent reviews of the earnings management literature.

small positive earnings and small earnings increases. DeGeorge et al. (1999) add to this literature by documenting that firms manage earnings to meet analysts' earnings forecasts. Our paper adds to this literature by testing whether expected dividend levels represent a unique threshold towards which firms manage earnings.

Finally, a related set of studies examine whether managers of firms with binding debt covenants make income-increasing accounting choices. DeAngelo et al. (1994) examine a sample of 76 financially troubled firms with a record of persistent losses and dividend reductions. They find no significant difference in total accruals for firms with and without binding debt constraints, in the 10 years prior to the dividend cut. Healy and Palepu (1990) study a sample of 126 firms that experience tightness in their dividend constraints and find no evidence that these firms make accounting changes to circumvent the dividend restriction. DeFond and Jiambalvo (1994) study 94 firms that reported debt covenant violations and find some evidence that in the year prior to and the year of violation, abnormal accruals are significantly positive.

While these papers make important contributions, their analyses are limited to smaller samples of distressed firms. DeAngelo et al. (1994) observe that "(such a sample) is characterized by a selection bias that limits the generality of our inferences." Distressed firms could be different because they attract greater scrutiny from auditors and stakeholders. Perhaps more importantly, managing earnings to meet a dividend threshold in such firms would be, at best, a short-run solution since any income-increasing discretionary accruals would have to be reversed in subsequent periods. That is, a dividend cut is likely to be inevitable if the company is truly distressed.

3. Data and summary statistics

Our primary sample consists of the S&P 1500 firms listed on *Compustat*'s Execucomp database for the period 1992–2005. We restrict our main analysis to this dataset because it contains data on managerial compensation, which, as noted in Section 2, has been shown to be an important determinant of earnings management. As in prior studies, we exclude financial firms (SIC codes 6000–6999), utilities (SIC codes 4400–4999), and firms that are not publicly traded (CRSP share code not equal to 10 or 11). As we discuss later in the paper, our main results are robust to using broader samples of *Compustat* firms.

3.1. Accrual measures

As in Hribar and Collins (2002) and Bradshaw et al. (2001), we define *total accruals* as income before extraordinary items (*EBEXTRA*) minus operating cash flows. Managers have discretion over a portion of the accruals, commonly referred to as the discretionary accruals.

We next estimate the non-discretionary and discretionary components of total accruals. Following the cross-sectional model of Jones (1991), we regress total accruals on a constant, change in sales, and gross property, plant and equipment (PPE).[6] Consistent with prior literature, all variables (including the constant) are scaled by lagged assets to mitigate the effect of heteroskedasticity. (We confirm the presence of heteroskedasticity using the Breusch and Pagan (1979) test.) Each regression is estimated separately for each two-digit SIC industry for each year, using only firms that are listed on Execucomp. We do this to ensure that the discretionary accruals (as the residual from the regression) are centered around zero.[7] We require at least five observations for each regression. The discretionary and non-discretionary components of total

[6]We use the cross-sectional version of the Jones model following studies that suggest that this has the highest power in detecting earnings management. Specifically, Dechow et al. (1995) find that the modified time-series Jones model is better specified for detecting earnings management than the other models they examine (they do not examine the cross-sectional version of the Jones model). Subsequently, studies such as Subramanyam (1996) and Bartov et al. (2001) find that the cross-sectional version of the Jones model (as used in DeFond and Jiambalvo, 1994) is better specified than the time-series version. We later report that our results are robust to several alternative measures of accruals.

[7]Because our intercept is scaled by lagged assets, we do not technically have an intercept term in the econometric sense, and the residuals will not average to zero. We re-compute the discretionary accrual measures using an additional intercept term (i.e., the independent variables are intercept, inverse of lagged assets, change in sales scaled by lagged assets, and PPE scaled by lagged assets). The discretionary accrual measures calculated in this alternative fashion have a correlation of 0.93 with the accrual measures reported in the paper.

accruals are the residual and predicted values from the above regressions. Finally, the dollar values of discretionary and non-discretionary components are obtained by multiplying the values calculated above by the firm's lagged assets. Our main variable of interest is dollar discretionary total accruals (henceforth, *DTACC*).

3.2. Earnings deficit measures

Our primary research question is whether firms manage earnings upwards when they anticipate that pre-managed earnings will be lower than expected dividend payments. We first estimate earnings available for distribution to shareholders (*Earnings*) as *EBEXTRA* minus preferred dividends. Recall that *EBEXTRA* is the sum of operating cash flow and total accruals. The latter consists of a non-discretionary component which is outside of management control. Therefore, we define pre-managed earnings as the operating cash flow plus non-discretionary total accruals minus preferred dividends. In other words, our measure of pre-managed earnings captures what reported income would be in the absence of discretionary accruals.

Our key independent variable is *Deficit*, which takes the value of zero when the expected dividend payments are lower than the pre-managed earnings. When expected dividend payments are larger than pre-managed earnings, *Deficit* equals expected dividends minus pre-managed earnings. We adopt this non-linear specification because we have no predictions for discretionary accruals when pre-managed earnings exceed expected dividend levels.

Throughout the paper, we use the term "dividend" to refer to regular cash dividend payments by firms. Firms that paid dividends in the prior year are classified as *payers* while all others are classified as *non-payers*.[8] As noted earlier, we define a firm's expected dividend as the prior year's dividend. Thus, for non-payers, the expected dividend is zero. We later report that our findings are robust to alternative measures of expected dividends.

3.3. Summary statistics

Appendix provides a comprehensive description of all variables used in this study, along with their corresponding *Compustat* data item numbers. In Table 1, we report summary statistics for the key variables. Throughout the paper, all variables are winsorized at the 1st and 99th percentile levels to minimize the impact of outliers. As shown in Panel A, firms pay dividends in 49% of the sample firm-years. This is higher than the corresponding proportion of dividend payers in the *Compustat* universe because Execucomp comprises larger, more profitable firms relative to *Compustat*. The average firm has over $3 billion in assets and sales and an income before extraordinary items (*EBEXTRA*) of $163 million. Although *EBEXTRA* is the sum of operating cash flow and total accruals, the mean of operating cash flows and mean of total accruals do not sum up to the mean *EBEXTRA* because the reported values are means of winsorized values.

Consistent with prior studies (e.g., Dechow and Dichev, 2002), average total accruals are negative ($= -\$175$ million). In our sample, preferred dividends are small in magnitude and hence average *Earnings* ($= \$162$ million) are very similar to average *EBEXTRA*.

As mentioned earlier, *DTACC* is the residual from a regression of total accruals on firm characteristics. Thus, not surprisingly, the average *DTACC* is close to zero (median = 0). Pre-managed earnings, which is operating cash flows plus non-discretionary total accruals minus preferred dividend is $176 million.

In Panel B, we report summary statistics for the sub-sample of dividend payers. We find that 24% of the payers exhibit a positive *Deficit* (i.e., expected dividends exceed pre-managed earnings). The average deficit for these firms is $111 million. We use CRSP data to measure dividend history as the number of uninterrupted years over which the firm has paid dividends. The average dividend-paying firm has 22 years of dividend history. Finally, we find that the average dividend check received by the CEO (computed as share ownership × annual dividends) of dividend-paying firms is about $490,000.

[8]Note that an individual firm can change its status from payer to non-payer over the course of the sample period. This occurs in approximately 15% of the sample firm-years. Our results are not sensitive to whether or not we include these observations.

Table 1
Summary statistics

	N	Mean	Median	S.D.
Panel A: All firms				
Payer	16,901	0.49		
Sales	16,922	3,294	882	7,331
Total assets	16,922	3,177	801	7,453
Income before extraordinary items (EBEXTRA)	16,922	163	35	547
Operating cash flow	16,910	336	72	950
Total accruals	16,548	−175	−36	495
Earnings	16,922	162	35	545
Non-discretionary total accruals	16,048	−144	−34	328
Discretionary total accruals, *DTACC*	16,048	−19	0	238
Pre-managed earnings	16,048	176	33	583
Retained earnings	16,858	765	162	2,308
Panel B: Dividend payers				
Fraction of firms with *Deficit* > 0	7,872	0.24		
Deficit for firms with Deficit > 0	1,893	111	34	185
Dividends	8,226	106	20	247
Dividend history (years)	7,810	22	21	15
CEO dividends	8,056	0.49	0.10	1.21

The sample comprises firms from Execucomp for the period 1992–2005. *Payer* equals 1 in a given year if the firm paid cash dividends in the prior year (regardless of whether the firm paid cash dividends in the current year), and equals 0 otherwise. *Dividends* is the annual cash dividend. *EBEXTRA* is income before extraordinary items. *Total Accruals* is *EBEXTRA* minus *Operating Cash Flow*. *Non-Discretionary Total Accruals* and *Discretionary Total Accruals (DTACC)* are the predicted and residual values of *Total Accruals*, computed using cross-sectional Jones (1991) model. *Earnings* is earnings available for shareholders, and equals *EBEXTRA* minus preferred dividend. *Pre-managed Earnings* is the earnings that would have been reported in the absence of earnings management, and equals *Operating Cash Flow* + *Non-Discretionary Total Accruals*−preferred dividends. *Deficit* measures the shortfall in *Pre-managed Earnings* with respect to expected dividends and is measured as *Max*(0, expected dividends−*Pre-managed Earnings*). A positive *Deficit* indicates that the firm cannot cover expected dividends from *Pre-managed Earnings*. For *Non-Payers*, the expected dividends equal zero, while for *Payers* expected dividends equal the prior year's dividends. Dollar amounts are expressed in $millions. All variables are defined in the Appendix. All variables are winsorized at the 1st and 99th percentile levels to remove the effect of outliers. This may result in the mean of some variables not matching the means of the underlying components (for example, mean *Discretionary Total Accruals* and the mean *Non-Discretionary Total Accruals* do not sum up to the mean *Total Accruals*).

4. Discretionary accruals and dividend thresholds

In this section, we provide evidence on whether the discretionary accruals of dividend payers are positively associated with the extent to which their reported earnings would otherwise fall short of a dividend threshold. We first present our main results, then consider alternative explanations for the evidence.

4.1. Baseline results

As a first test of whether dividend payers manage earnings to meet dividend thresholds, we examine whether firms that have a deficit manage their earnings upwards; that is, they exhibit a positive *DTACC*. Panel A of Table 2 presents the results. We find that 42% of payers with *Deficit* = 0 have positive *DTACC*. In sharp contrast, 81% of payers with *Deficit* > 0 have positive *DTACC*.

In Panel B, we examine whether the discretionary accruals of payers increase in the level of *Deficit*. Each year, we sort firms into six groups on the basis of *Deficit*. One group consists of all firms with *Deficit* = 0, while the other five groups sort the remaining firms into quintiles on the basis of *Deficit*. Within each group, we report the average *Deficit* and *DTACC*. We find that, on average, firms with no deficit exhibit negative discretionary accruals. By contrast, for firms with positive deficits, discretionary accruals are positive and increasing monotonically in the level of *Deficit*.

Table 2
Univariate results

Panel A. Are payers with deficit more likely to manage earnings upwards?

	Discretionary total accruals ≤ 0	Discretionary total accruals > 0	Total
Firm-years with *Deficit* = 0	3,422	2,537	5,979
	58%	42%	100%
Firm-years with *Deficit* > 0	356	1,537	1,893
	19%	81%	100%
Total	3,798	4,074	7,872
	48%	52%	100%

Panel B. Do payers with higher levels of deficit have higher levels of discretionary total accruals?

	N	Deficit	Discretionary total accruals	% Of firms with discretionary total accruals > Deficit
Deficit = 0	5,979	0	−44.35	
All firms with *Deficit* > 0	1,893	111.34	98.77	55
Low = 1	385	3.75	17.22	74
2	378	15.15	19.87	57
3	378	37.97	43.07	50
4	378	100.14	100.63	52
High = 5	374	404.79	316.88	43

The sample comprises dividend-paying firms from Execucomp for the period 1992–2005. *Payer* equals 1 in a given year if the firm paid cash dividends in the prior year (regardless of whether the firm paid cash dividends in the current year), and equals 0 otherwise. *Earnings* is earnings available for shareholders, and is equal to income before extraordinary items minus preferred dividend. *Pre-managed Earnings* is the earnings that would have been reported in the absence of earnings management, and equals *Operating Cash Flow* + *Non-Discretionary Total Accruals*−preferred dividends. *Non-Discretionary Total Accruals* and *Discretionary Total Accruals* (*DTACC*) are the predicted and residual values of *Total Accruals*, computed using cross-sectional Jones (1991) model. *Deficit* measures the shortfall in *Pre-managed Earnings* with respect to expected dividends and is measured as *Max*(0, expected dividends−*Pre-managed Earnings*). A positive *Deficit* indicates that the firm cannot cover expected dividends from *Pre-managed Earnings*. For *Non-Payers*, the expected dividends are zero, while for *Payers* expected dividends equal the prior year's dividends. Panel A provides, for a sample of *Payers*, a 2×2 frequency table based on *Deficit* and *DTACC*. In Panel B, *Payers* are first sorted into two groups each year based on whether the deficit is positive or zero. Firms with positive deficit are then sorted into five groups each year based on level of deficit. The mean *Deficit* and *DTACC* are reported for each group.

The last column of Panel B indicates that a substantial portion of firms with a positive *Deficit* eliminate the *Deficit* through discretionary accruals. Nearly three-fourths of firms in the lowest quintile (of *Deficit*) have discretionary accruals that are at least as large as their *Deficit*. Not surprisingly, the proportion decreases with the magnitude of the Deficit since more firms in these quintiles will find the Deficit too large to eliminate with discretionary accruals. Nonetheless, the corresponding proportion of firms that eliminate the Deficit in Quintiles 2–5 is still 57%, 50%, 52%, and 43%, respectively.

In Table 3, we extend our univariate analysis by examining the association between *Deficit* and discretionary accruals after controlling for other factors that have been shown to affect *DTACC*. Specifically, we estimate cross-sectional regressions of *DTACC* on *Deficit* and a series of control variables based on the evidence in prior studies; firm size, leverage, market-to-book ratio, managerial incentives, and two-digit industry and year dummies.[9] We use three measures of managerial incentives: delta, vega, and cash compensation. Following Core and Guay (2002), we compute delta as the change in the dollar value of the executive's wealth for a

[9]We follow Bergstresser and Philippon (2006) and Burns and Kedia (2006) in using lagged values of firm size, leverage, and incentives. For variables such as retained earnings, lagged values are more appropriate because contemporaneous values of retained earnings will be affected by any earnings management done in response to the existence of *Deficit*. Our main results are qualitatively similar, however, if we use contemporaneous values of all control variables.

Table 3
Do dividend payers manage earnings to meet expected dividends?

	Dependent variable: discretionary total accruals ($DTACC_t$)			
	Model 1	Model 2	Model 3	Model 4
$Deficit_t$ for payers (β_1)		0.937*** (8.4)		0.896*** (7.8)
$Deficit_t$ for non-payers (β_2)		−0.138 (0.9)		−0.097 (0.6)
Pre-managed earnings$_t$			−0.342*** (12.9)	
Expected dividends$_t$			0.395*** (6.1)	
Payer		26.372***(3.9)	14.516***(2.9)	30.590*** (4.6)
Retained earnings$_{t-1}$		−0.013** (2.1)	0.033***(4.9)	−0.007 (0.7)
Delta$_{t-1}$	−0.017** (2.4)	−0.015** (2.4)	−0.006 (1.6)	−0.011* (1.8)
Vega$_{t-1}$	−0.175*** (2.7)	−0.139** (2.1)	−0.038 (0.8)	−0.100 (1.6)
Cash compensation$_{t-1}$	0.038*** (3.9)	0.040*** (4.3)	0.042*** (5.4)	0.042*** (4.2)
Firm size$_{t-1}$	−21.330*** (3.8)	−27.135*** (5.7)	−13.469*** (3.0)	−25.113*** (4.9)
Leverage$_{t-1}$	13.216 (0.5)	0.331 (0.0)	−9.741 (0.5)	19.962 (0.9)
Market-to-book$_{t-1}$	−1.106 (0.6)	1.317 (0.7)	3.848** (2.3)	0.629 (0.3)
Earnings$_{t-1}$				0.049 (1.3)
Forecasted earnings$_t$				−0.083* (1.8)
Observations	13,495	13,425	13,425	11,424
R^2	0.060	0.143	0.319	0.146
t-statistics ($\beta_1 = \beta_2$)		5.4		4.7

The dependent variable is the dollar *Discretionary Total Accruals (DTACC)*. The sample comprises firms from Execucomp for the period 1992–2005. *Payer* equals 1 in a given year if the firm paid cash dividends in the prior year (regardless of whether the firm paid cash dividends in the current year), and equals 0 otherwise. *Non-Payer* equals (1−*Payer*). *Earnings* is earnings available for shareholders, and is equal to income before extraordinary items minus preferred dividend. *Pre-managed Earnings* is the earnings that would have been reported in the absence of earnings management, and equals *Operating Cash Flow* + *Non-Discretionary Total Accruals*−preferred dividends. *Non-Discretionary Total Accruals* and *Discretionary Total Accruals* are the predicted and residual values of *Total Accruals*, computed using cross-sectional Jones (1991) model. *Deficit* measures the shortfall in *Pre-managed Earnings* with respect to expected dividends and is measured as *Max*(0, expected dividends−*Pre-managed Earnings*). A positive *Deficit* indicates that the firm cannot cover expected dividends from *Pre-managed Earnings*. For *Non-Payers*, the expected dividends are zero, while for *Payers* expected dividends equal the prior year's dividends. *Deficit for Payers* equals *Deficit* × *Payer*. *Deficit for Non-Payers* equals *Deficit* × *Non-Payer*. All variables are defined in the Appendix. All variables are winsorized at the 1st and 99th percentile levels to remove the effect of outliers. Intercept, year dummies, and two-digit SIC dummies are included in the regressions but their coefficients are not reported below. The absolute value of t-statistics corrected for heteroskedasticity and firm-level clustering of standard errors are reported in parentheses. Asterisks (***, **, and *) indicate significance at the 1%, 5%, and 10% level, respectively.

one-percentage-point change in stock price. Similarly vega is computed as in Guay (1999) as the change in the dollar value of the executive's wealth for a 0.01 change in the annualized standard deviation of stock returns.[10] Total cash compensation is the sum of salary and bonus.

In addition, we include the balance-sheet retained earnings to control for the potential inventory of payable funds. In theory, the entire amount of retained earnings is not available for dividend payments by the firm, only the unrestricted retained earnings (*Compustat* annual data item 97). This latter variable is not widely reported by firms, however, and is available only for 22% of our sample firms. For this sub-sample, the correlation between unrestricted retained earnings and retained earnings is 93%. Our results in Table 3 are very similar if we replace retained earnings by the unrestricted retained earnings. Coefficient estimates are reported with the absolute values of t-statistics in parentheses. Throughout the paper, reported t-statistics are corrected for heteroskedasticity and for correlation of residuals within firms (see Petersen, 2006).

[10]Guay (1999) shows that the change in value of an option for a 0.01 change in standard deviation of returns is many times higher than the change in value of a stock for a similar change in standard deviation. In his sample, the average vega of an option is $0.167. In comparison, the average vega of a share is $0.005, (median is $0.00 and the 75th percentile value is $0.002). Consequently, in this study, we use the vega of the option portfolio to measure the total vega of the stock and option portfolio. Coles et al. (2006) and Rajgopal and Shevlin (2002) adopt the same approximation.

Model 1 of Table 3 reports the results of a baseline regression using only the control variables. We find that *DTACC* is negatively related to both vega and delta, although this relation becomes weaker in our subsequent regressions.[11] Healy (1985) and subsequent studies show that accrual policies of managers are related to their bonus plans. Consistent with these studies, we find that *DTACC* is strongly positively related to cash compensation. Finally, *DTACC* is negatively related to firm size, but unrelated to leverage and market-to-book ratio.

We next include additional variables that we expect to be related to earnings management through our hypothesized dividend channel. In particular, we include the prior year's retained earnings, an indicator variable for whether or not the firm pays dividends, and our *Deficit* variable. We consider *Deficit* for dividend payers and non-payers separately. For payers, *Deficit* (when positive) represents the shortfall in pre-managed earnings with respect to expected dividend payments. For non-payers, expected dividend payments are zero, and hence *Deficit* effectively represents the shortfall in pre-managed earnings with respect to zero, which is just the shortfall with respect to the "loss-avoidance" threshold of Burgstahler and Dichev (1997).

The results, reported in Model 2, indicate that, for dividend payers, the coefficient on *Deficit* is significantly positive. By contrast, the coefficient on *Deficit* for non-payers is not significantly different from zero, implying that for these firms, the loss avoidance threshold is not important. The results for payers are consistent with the view that the expected dividend level is an important earnings threshold. In addition, we find that dividend payers have higher levels of discretionary accruals and that accruals are negatively associated with retained earnings. The latter result is consistent with retained earnings being a proxy for the inventory of earnings from which dividends can legally be paid. Finally, we find that inclusion of our dividend-related variables increases the R^2 from 6% to 14%. In other words, the dividend-related variables explain a substantial amount of the cross-sectional variation in earnings management relative to variables used in prior studies.

A firm will have a high *Deficit* if either its pre-managed earnings are low or its expected dividends are high. To examine how these variables individually affect discretionary accruals, we replace *Deficit* with its two constituent variables, the level of pre-managed earnings and the level of expected dividends. The results, reported in Model 3, indicate that discretionary accruals are negatively associated with the level of pre-managed earnings and positively related to the expected level of dividends.[12]

Finally, in Model 4, we include the prior year's earnings and current year's forecasted earnings (obtained from IBES) to control for the tendency of firms to manage earnings to meet prior year's earnings levels (Burgstahler and Dichev, 1997) and to meet analysts' forecast (DeGeorge et al., 1999). We continue to find that, for payers, the coefficient on *Deficit* is significantly positive, while the coefficient on *Deficit* for non-payers is statistically insignificant.

Collectively, the findings in Table 3 support the view that the expected dividend level is an important earnings threshold. When the expected dividend level is high relative to pre-managed earnings levels, firms appear to manage earnings through discretionary accruals so as to report higher earnings. The fact that the association between discretionary accruals and *Deficit* exists only for dividend payers implies that the expected dividend level represents a unique earnings threshold. Firms are not simply managing earnings upwards when earnings are low. Rather, controlling for the level of earnings and earnings expectations, the deviation between pre-managed earnings and expected dividend levels explains a substantial amount of the cross-sectional variation in discretionary accruals.

[11] Bergstresser and Philippon (2006) find a positive relation between earnings *smoothing* and incentives, but our results are not comparable with theirs for two reasons: (i) their dependent variable is different (they use *absolute* value of *total* accruals), and (ii) their independent variable is incentive ratio, which is defined as delta scaled by delta plus cash compensation. Burns and Kedia (2006) examine the extreme case of earnings management, namely earnings restatements, and find that the probability that a firm will restate earnings increases in delta.

[12] Becker et al. (1998), Reynolds and Francis (2001), Frankel et al. (2002), and Menon and Williams (2004) find that operating cash flows are an important determinant of discretionary accruals. Since *Deficit* = *Max*(0, expected dividends−pre-managed earnings), and pre-managed earnings = operating cash flow + non-discretionary accruals, we do not include operating cash flow and the *Deficit* variable together in the same regression. Instead, in untabulated results, we replace pre-managed earnings by its two components: operating cash flows and non-discretionary accruals. Consistent with prior literature, we find that *DTACC* is significantly negatively related to operating cash flow. Importantly, we continue to find that the coefficient on expected dividends is significantly positive.

4.2. Spurious correlation between Deficit and DTACC?

One concern with our findings to this point is that they might be the result of a spurious correlation between *Deficit* and discretionary accruals (*DTACC*). Recall that *Deficit* is defined as *Max*(0, earnings shortfall), where earnings shortfall equals expected dividends minus pre-managed earnings. Pre-managed earnings in turn is operating cash flow plus non-discretionary accruals minus preferred dividends. Thus, pre-managed earnings is effectively the total reported earnings minus *DTACC* minus preferred dividends. This could lead to a spurious positive relation between *DTACC* and *Deficit*.[13]

Such a spurious association seems unlikely to be driving our results for several reasons. First, we note that any spurious relation will be weakened by the fact that we use *Deficit*, which equals *Max*(0, earnings shortfall) rather than the earnings shortfall itself.[14] Second, if the relation is spurious, we expect a similar positive relation between *DTACC* and *Deficit* for payers and non-payers. We find, however, that the coefficient on *Deficit* for payers is significantly positive and significantly different from that of non-payers. Third, when we replace *Deficit* with pre-managed earnings and expected dividends in Model 3 of Table 3, we find the coefficient on expected dividends is significantly positive, suggesting that, controlling for the level of pre-managed earnings, the higher the expected dividends, the higher the *DTACC*.

Nonetheless, we take several additional steps to ensure that our findings are not driven by a spurious association between *DTACC* and *Deficit*. A first approach is to attempt to calibrate the magnitude of any bias associated with a spurious association, then test whether the evidence of earnings management in our sample is stronger than would be expected from a purely spurious association. The data in Panel A of Table 2 provides one way of doing this. Specifically, under the spurious association hypothesis, we expect that a greater proportion of firms with earnings surpluses (i.e., $Deficit = 0$) would exhibit negative discretionary accruals than positive discretionary accruals. Consistent with this, the data in Table 2 show that 58% of the surplus firms have negative discretionary accruals and 42% have positive discretionary accruals. The difference of 16% provides an estimate of the impact of the bias associated with spurious association.[15] Under the spurious association hypothesis, we expect a similar differential between the percentage of deficit firms (i.e., $Deficit > 0$) with positive and negative discretionary accruals. Contrary to this, however, we find that the difference to be almost four times this large for the deficit firms; 81% of these firms exhibit positive discretionary accruals while only 19% exhibit negative discretionary accruals. These findings imply that the frequency of positive discretionary accruals among the deficit firms is substantially greater than would be expected under the spurious association hypothesis.

As a related approach, we adopt an experimental design similar to that of Elgers et al. (2003). Specifically, we randomly assign the calculated discretionary accruals to the sample firms. Thus, in effect, we randomly assign measurement error in the calculation of discretionary accruals to the sample firms. We then re-estimate *Deficit* using the new measure of *DTACC* and replicate our tests in Model 2 of Table 3. Consistent with some spurious association in the data, we find that the coefficient on *Deficit* for payers and the coefficient on *Deficit* for non-payers are both significantly positive. Moreover, the two coefficients are statistically and economically indistinguishable from each other. This further supports our argument that if our main findings were driven by a spurious relation between *DTACC* and *Deficit*, we should find similar positive coefficients on *Deficit* for both payers and non-payers.

As a third approach, we instrument for *Deficit* using a performance measure, operating cash flow (data item #308 from the statement of cash flows), that is correlated with pre-managed earnings but does not involve the estimation of discretionary accruals.[16] Specifically, we redefine *Deficit* as *Max*(0, expected dividends−(operating cash flow−preferred dividend)). Using this alternative measure of *Deficit*, we continue to find a positive relation between *DTACC* and *Deficit* for payers (coefficient = 1.88; *t*-statistic = 4.9), but not for non-payers (coefficient = 0.06; *t*-statistic = 0.3).

[13]See Lim and Lustgartern (2002) and Elgers et al. (2003) for detailed analyses of this issue and its impact on prior studies.

[14]Recall that only 24% of the sample firms have $Deficit > 0$.

[15]We note that this difference most likely represents an upper bound on the impact of the bias insofar as firms attempt to smooth earnings by managing them downwards in years in which earnings are high.

[16]Note that this measure of operating cash flow does not have the "backing out" problem associated with the balance sheet approach to estimating operating cash flow used prior to the adoption of SFAS 95 in 1988 (see Elgers et al., 2003).

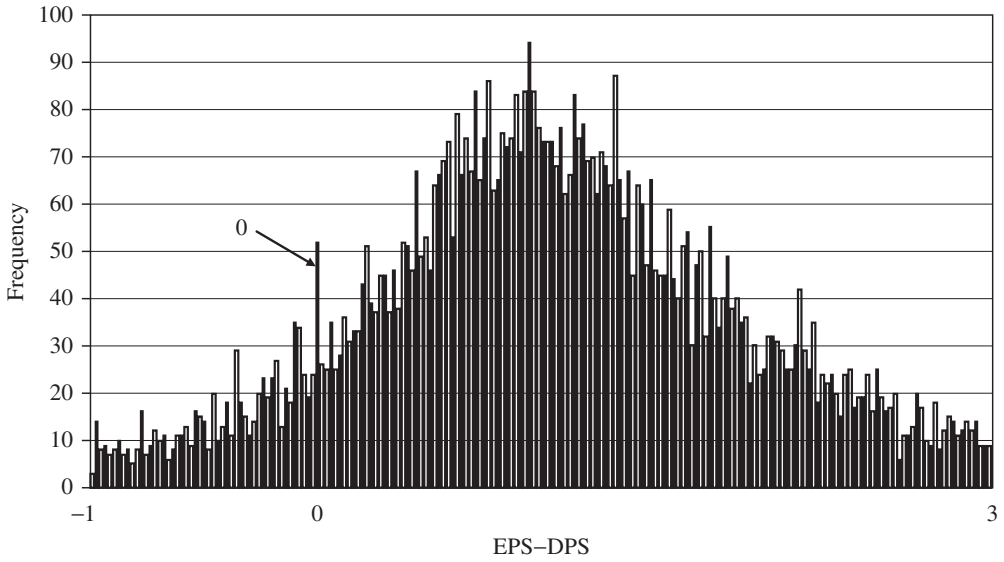

Fig. 1. Frequency distribution of EPS minus DPS. EPS is income before extraordinary items divided by number of shares. DPS is dividends divided by number of shares. Interval width is 2 cents. Zero represents the dividend threshold. The figure uses a sample of 8,342 dividend-paying firms included in Execucomp from 1992 to 2005.

As a fourth approach, we test for non-linearity in the relation between *DTACC* and *Deficit*. Under the spurious association hypothesis, we expect a linear relation; that is, the relation between *DTACC* and *Deficit* should be the same regardless of the size of the *Deficit*. To test this, we sort all payers and non-payers with a positive deficit into quintiles on the basis of their *Deficit*. We then re-estimate Model 2 of Table 3, allowing the slope coefficient on *Deficit* to differ for payers and non-payers in Quintiles 1 and 5. Contrary to the spurious association hypothesis, we find the coefficient on *Deficit* is significantly greater for payers in Quintile 1 and is significantly lower for payers in Quintile 5, as compared to payers in the middle three quintiles. This finding is consistent with the view that as *Deficit* gets too large, firms are unable to manage earnings towards the dividend threshold.[17]

As a final approach, we examine the frequency distribution of earnings. Burgstahler and Dichev (1997) and subsequent papers establish the importance of earnings thresholds by examining the frequency distribution of earnings around the relevant threshold. In other words, rather than seeking direct evidence on earnings management by analyzing discretionary accruals, this approach tests for earnings management behavior by observing the outcome of this behavior. Under this approach, if expected dividend levels represent important earnings thresholds, we expect an unusually high number of firms to report earnings just above the threshold.

Consistent with the methodology of Burgstahler and Dichev (1997), we first compute the difference between reported earnings before extraordinary items and dividends for the sample of payers.[18] We scale the difference by the number of shares (see Durtschi and Easton, 2005 for a discussion of the merits of different scaling measures). Under the null hypothesis of no earnings management towards a dividend threshold, we expect a relatively smooth pattern of reported earnings in which the number of observations in a given interval is approximately equal to the average of the number of observations in the two adjacent intervals. By contrast, if dividends are an important threshold for managers, we expect an unusually high frequency of observations in which earnings are just above the expected dividend level.

Fig. 1 shows the plot of the frequency distribution of the scaled difference between earnings per share and dividends per share in 2 cent increments. Consistent with earnings management towards a dividend threshold, the number of observations immediately to the right of zero is more than twice that in the adjacent intervals (52 versus average of 25). Following Burgstahler and Dichev (1997), we calculate a test statistic equal to the

[17]See also DeAngelo and DeAngelo (1990) and DeAngelo et al. (1994) for similar evidence in the case of distressed firms.

[18]Our results are similar if we use net income rather than EBEXTRA as the earnings measure.

difference between the actual and expected number of observations, divided by the estimated standard deviation of the difference.[19] Using this approach, we find that the difference in the frequency of observations just above zero is statistically different from zero at the 0.01 level ($t = 3.4$). The evidence thus indicates an unusual frequency of reported earnings just above the dividend threshold.

We conclude, therefore, that our findings do not appear to be driven by a spurious association between *DTACC* and *Deficit*. While such a spurious association is undoubtedly present in the data, it is not large enough to explain our findings. Moreover, as we show in Sections 5 and 6, the earnings management hypothesis yields predictions regarding cross-sectional and time-series variability in earnings management behavior, and the impact of the discretionary accruals on dividend payments which are supported by the data. The spurious association hypothesis makes no such predictions.

4.3. Alternative estimates of accruals

Kothari et al. (2005) and Dechow et al. (1995) report that the Jones model for discretionary accruals is sensitive to firm performance. Therefore, we re-estimate discretionary accruals in three ways. First, following Kothari et al. (2005), we compute asset-scaled discretionary accruals for each firm as the discretionary accruals (scaled by lagged assets) based on the Jones (1991) model minus the discretionary accruals (also scaled by lagged assets) of a firm matched on ROA, industry, and year. Kothari et al. (2005) argue that performance-matched discretionary accrual measures are more reliable indicators of earnings management in certain cases when using non-random samples of firms (such as, say, firms that restate earnings). While our sample is not non-random, we nevertheless check whether our results are robust to estimating accruals using their methodology. Second, as suggested by Kothari et al. (2005) and adopted in Carter et al. (2007), we include ROA as an additional regressor in the Jones (1991) model and label this the "modified KLW" model. Third, we compute discretionary accruals using the modified Jones model introduced by Dechow et al. (1995). As shown in the first three columns of Table 4, our results remain qualitatively the same; *DTACC* is positively related to *Deficit* for payers and the coefficient on *Deficit* is significantly different from that for non-payers.[20]

In addition to these performance-sensitive methods, we also estimate discretionary accruals using the method of Teoh et al. (1998a, b), the Ball and Shivakumar (2006) method, and the working capital accruals model of Dechow and Dichev (2002). In Teoh et al. (1998a, b), total accruals are based on net income, rather than on EBEXTRA. Ball and Shivakumar's (2006) method includes variables that capture the asymmetric timely loss recognition of firms. Following the suggestion of McNichols (2002), we augment the Dechow and Dichev (2002) model with variables from the Jones (1991) model.

As shown in columns (4)–(6) of Table 4, our primary result is robust to these alternative methodologies. The coefficient on *Deficit* for payers continues to be statistically and economically significant and is significantly different from the coefficient on *Deficit* for non-payers.[21] Moreover, although we present and discuss the robustness results only for Model 2 of Table 3, in untabulated results, we find that all our main results are robust to these alternative estimation techniques.[22]

[19]Burgstahler and Dichev (1997) note that the variance of the difference between the expected and actual number of observations is approximately equal to the sum of variances of the individual components of the difference. Thus, the variance can be expressed as $Np_i(1-p_i)+(1/4)N(p_{i-1}+p_{i+1})(1-p_{i-1}-p_{i+1})$, where N is the total number of observations and p_i is the probability that an observation will fall in interval i.

[20]Note that the positive coefficient on *Deficit* for non-payers is not inconsistent with our hypothesis. Indeed, we would expect a positive coefficient to the extent that non-payers manage earnings in order to avoid reporting losses. Moreover, as discussed above, any spurious association between *DTACC* and *Deficit* will induce a positive coefficient. The main test of our hypothesis is that, if firms are managing earnings towards a dividend threshold, the coefficient on *Deficit* for payers should be positive and different from that of non-payers.

[21]The negative coefficient on *Deficit* for non-payers in the Ball and Shivakumar (2006) regression is somewhat surprising (though not inconsistent with our hypothesis). We conjecture that this is due to the fact that a loss-avoidance threshold is less relevant for non-payers with negative earnings. Consistent with this conjecture, if we restrict the sample to firms with positive earnings over the prior two years, we find the coefficient on *Deficit* to be non-negative, regardless of which model of discretionary accruals we use. As an added robustness test, we repeat all our regressions from Tables 3 and 4 excluding the sample of firms that would have reported losses if they did not have income-increasing discretionary accruals (about 10% of the observations). All our results are qualitatively similar for this smaller sample.

[22]We choose Model 2 of Table 3 as the base-case here because it has about 15% more observations than Model 4 due to Model 4 requirement of IBES estimates. Nonetheless, we replicate Table 4 results using Model 4 of Table 3, and we get qualitatively similar results.

Table 4
Alternative measures of discretionary accruals

	Dependent variable: discretionary total accruals ($DTACC_t$)					
	Kothari et al. (2005)	Modified Kothari et al. (2005)	Modified Jones (1991)	Teoh et al. (1998a, b)	Ball and Shivakumar (2006)	Augmented Dechow and Dichev (2002)
	(1)	(2)	(3)	(4)	(5)	(6)
$Deficit_t$ for payers (β_1)	1.137*** (17.8)	0.671*** (6.0)	0.946*** (8.7)	0.931*** (8.1)	0.456*** (4.9)	0.401*** (5.3)
$Deficit_t$ for non-payers (β_2)	0.435*** (5.0)	−0.015 (0.2)	−0.141 (0.9)	−0.152 (1.0)	−0.162** (2.0)	0.031 (1.0)
Payer	14.594** (2.0)	26.423*** (4.0)	26.063*** (3.9)	27.537*** (4.1)	5.938 (1.5)	1.224 (0.4)
Retained $earnings_{t-1}$	−0.025*** (3.9)	−0.033*** (4.1)	−0.013** (2.2)	−0.012* (1.9)	−0.001 (0.3)	0.002 (0.4)
$Delta_{t-1}$	−0.013** (2.3)	−0.013** (2.4)	−0.015** (2.3)	−0.015** (2.3)	−0.000 (0.1)	−0.003 (1.6)
$Vega_{t-1}$	−0.041 (0.7)	−0.124** (2.0)	−0.143** (2.2)	−0.146** (2.2)	0.004 (0.1)	−0.028 (1.0)
Cash $compensation_{t-1}$	0.031*** (3.3)	0.032*** (3.7)	0.040*** (4.3)	0.041*** (4.4)	0.021*** (3.5)	0.015*** (2.7)
Firm $size_{t-1}$	−42.716*** (8.6)	−21.823*** (4.3)	−26.893*** (5.7)	−28.653*** (6.0)	−15.343*** (4.7)	4.891* (1.7)
$Leverage_{t-1}$	−25.179 (1.0)	7.162 (0.3)	−0.867 (0.0)	−1.294 (0.1)	−17.629 (1.1)	4.145 (0.4)
Market-to-$book_{t-1}$	−0.119 (0.1)	−3.492** (2.1)	1.459 (0.8)	2.216 (1.2)	3.219*** (2.7)	1.720** (2.1)
Observations	13,378	13,304	13,423	13,425	11,351	11,436
R^2	0.259	0.204	0.146	0.136	0.069	0.131
t-statistics ($\beta_1 = \beta_2$)	6.5	5.0	5.4	5.5	4.8	4.5

The dependent variable is the dollar *Discretionary Total Accruals (DTACC)* estimated according to the various models. The sample comprises firms from Execucomp for the period 1992–2005. *Payer* equals 1 in a given year if the firm paid cash dividends in the prior year (regardless of whether the firm paid cash dividends in the current year), and equals 0 otherwise. *Non-Payer* equals (1−*Payer*). *Earnings* is earnings available for shareholders, and is equal to income before extraordinary items minus preferred dividend. *Pre-managed Earnings* is the earnings that would have been reported in the absence of earnings management, and equals *Operating Cash Flow* + *Non-Discretionary Total Accruals*−preferred dividends. *Non-Discretionary Total Accruals* and *Discretionary Total Accruals* are the predicted and residual values of *Total Accruals*, computed using the various models. *Deficit* measures the shortfall in *Pre-managed Earnings* with respect to expected dividends and is measured as *Max*(0, expected dividends−*Pre-managed Earnings*). A positive *Deficit* indicates that the firm cannot cover expected dividends from *Pre-managed Earnings*. For *Non-Payers*, the expected dividends are zero, while for *Payers* expected dividends equal the prior year's dividends. *Deficit for Payers* equals *Deficit* × *Payer*. *Deficit for Non-Payers* equals *Deficit* × *Non-Payer*. *Deficit* for payers and non-payers thus vary depending on the model used to compute *DTACC*. All variables are defined in the Appendix. All variables are winsorized at the 1st and 99th percentile levels to remove the effect of outliers. Intercept, year dummies, and two-digit SIC dummies are included in the regressions but their coefficients are not reported below. The absolute value of t-statistics corrected for heteroskedasticity and firm-level clustering of standard errors are reported in parentheses. Asterisks (***, **, and *) indicate significance at the 1%, 5%, and 10% level, respectively.

4.4. Other robustness tests

4.4.1. Additional control variables

Although our control variables are based on those widely used in the literature on earnings management, other studies have suggested additional control variables. To ensure that our results are not driven by correlated omitted variables, we include the following variables in our regression specifications in Tables 3 and 4: (i) cash flow volatility (as in Doyle et al., 2007), (ii) sales growth (Doyle et al., 2007; Menon and Williams, 2004), (iii) bankruptcy risk (Menon and Williams, 2004; Reynolds and Francis, 2001) proxied by z-score (Altman, 1968), and (iv) an indicator variable if the firm is audited by a Big-N auditor (e.g., Francis et al., 1999; Becker et al., 1998). Our main results are qualitatively similar when we include these additional variables. The coefficient on *Deficit* for payers continues to be statistically and economically significant and is significantly different from that of non-payers.

4.4.2. Alternative sample selection criteria

As noted in Section 3, our primary sample is limited to firms listed in the *Execucomp* database in order to include data on managerial compensation as control variables. This dataset is available only from 1992. We repeat all of our analysis on the larger set of firms that are covered on *Compustat*. For these tests, we are unable to include data on managerial compensation, but can consider a longer time series. We replicate our tests on two *Compustat* samples, one from 1988 to 2005 and the second from 1971 to 1987. The statement of cash flows (SCF) is available only from 1988 onwards (pursuant to SFAS 95). Recent papers (e.g., Hribar and Collins, 2002) argue that data from the SCF are superior for the analysis of accruals. Thus, for the 1988–2005 sample, we calculate all accrual measures based on data from the SCF. For the 1971–1987 sample, we use data from the balance-sheet to compute the accruals measures. For each of these *Compustat* samples, we include all firms listed on *Compustat* in the regressions used to estimate discretionary and non-discretionary accruals.

Our findings using these alternative samples are qualitatively identical to those using our primary sample. For payers, discretionary accruals are significantly associated with *Deficit* and the relation between *DTACC* and *Deficit* is significantly stronger for payers than for non-payers.

4.4.3. Alternative estimates of expected dividends

In our sample, payers increase dividends in 38% of the firm-years, maintain dividends in 59% of the firm-years, and decrease dividends in 3% of the firm-years. Thus, by setting the expected dividend to be equal to last year's dividend, we understate the true expected dividend. To assess the impact of this understatement, we first use the model of Lintner (1956) to estimate the predicted change in dividend as a function of earnings and the prior dividend. We then estimate the expected dividend as the prior year's dividend plus the predicted change. The problem with this approach is that it overstates the likelihood of a dividend cut. For example, the model predicts that dividends will be cut in 41% of the firm-years. Nonetheless, our results are robust to the alternative measure of expected dividends. Our results are also robust if we set the predicted change in dividends equal to zero when the Lintner model predicts a dividend decrease and equal to the predicted change when the Lintner model predicts an increase.

Our main results have been estimated using the prior year's dollar dividends from *Compustat* (data 21) as the measure of expected dividends. This includes all cash dividend payments by the firm, including special dividends.[23] If investors do not expect the firm to repeat its special dividends in each year, the prior year's dividend will overstate the true expected dividend. To control for this, we define the expected dividends as the prior year's dividend less special dividends. Our results are very similar using this alternative definition.

Finally, we attempt to control for the impact of repurchases and share issuances on the number of shares outstanding. If a firm repurchases shares, it can maintain the same dividend per share (DPS) while decreasing the dollar dividends relative to the prior year. In such a case, the prior year's dividends will tend to overstate the expected dividend level. Similarly, if a firm issues new shares, the prior year's dividends will understate the expected dividend level. To address this possibility, we compute the expected dividends based on the DPS in the last quarter of the prior fiscal year ($DPS_{q4,t-1}$). The expected dividend in year t is, therefore, computed as $DPS_{q4,t-1} \times \sum_{q=1}^{4} Shares_{q,t}$, where *Shares* is the number of shares outstanding at the end of each of the four quarters of the current year. For firms that pay semi-annual or annual dividends, we do an equivalent computation, based on the prior year's semi-annual or annual DPS. The notion is that when managers plan dividend payments, they have a reasonable idea of the number of shares that will be outstanding at any point during the year. Our results are similar if we use this latter proxy for expected dividends.

5. What types of firms engage in dividend-based earnings management?

In an attempt to shed further light on the earnings management behavior that we observe, we examine possible determinants of the propensity to manage earnings to meet dividend thresholds. We do so by testing

[23]We note, however, that special dividends have nearly disappeared over the period spanned by our sample (see DeAngelo et al., 2000).

for time-series and cross-sectional differences in the sensitivity of discretionary accruals to *Deficit*. For these tests, we restrict our sample to dividend payers since many of our partitioning variables (e.g., payout ratio) are, by definition, zero for non-payers. The results are presented in Table 5. The independent variables are the same as those in Model 2 of Table 3. For brevity, we report only the coefficient on the *Deficit* variable.

We hypothesize that dividend-related earnings management depends on the regulatory environment, the firm's past dividend policy, the CEO's incentives, and the existence/tightness of dividend constraints in debt contracts. First, we consider the impact of recent regulation, specifically, the Sarbanes-Oxley regulation of 2002 and the Jobs and Growth Tax Relief Reconciliation Act of 2003 (henceforth, 2003 dividend tax cut), which reduced taxes on dividends. We hypothesize that the Sarbanes-Oxley regulations make it more difficult for firms to manage earnings, and thus the sensitivity of discretionary accruals to *Deficit* will be lower in the post-Sarbox period. The dividend tax cut, however, makes it more attractive for firms to pay dividends (Chetty and Saez, 2005) and we, therefore, expect that the sensitivity of discretionary accruals to *Deficit* will be higher in the post-tax-cut period. To ensure that we isolate the effects of these two regulations, we define 2002 as the post-Sarbox (pre-tax-cut) period and the period 1992–2001 as the pre-Sarbox (pre-tax-cut) period. Similarly, we define 2003–2005 as the Post-Tax Reform (post-Sarbox) period and 2002 as the Pre-Tax Reform (post-Sarbox) period. We then test whether the sensitivity of discretionary accruals to the size of the *Deficit* differs across the different groups. The results indicate that while the coefficient on *Deficit* is significantly positive in both the pre- and the post-Sarbox period, it is significantly higher in the pre-Sarbox period (1.041 versus 0.421). This is consistent with other evidence of decreases in earnings management following passage of the Sarbanes-Oxley Act in Koh et al. (2006) and Cohen et al. (2005). We also find that the coefficient on *Deficit* in the post-tax-cut period is significantly higher relative to the pre-tax-cut period (0.971 versus 0.421).

Second, we consider the impact of prior dividend policy. DeAngelo and DeAngelo (1990, 2006b) argue that the managers of firms with a long history of paying dividends have greater incentives to avoid dividend cuts. Thus, we hypothesize that firms with long dividend histories will be more likely manage earnings to avoid dividend reductions than will be firms with short dividend histories. To test this possibility, we partition the sample into two groups based on the length of the firm's dividend history. Dividend history is defined as the number of uninterrupted years over which the firm has paid dividends. We find that that the coefficient on *Deficit* is higher for firms with a longer dividend history; however, the difference across the two groups is not statistically significant.

We also perform sub-sample analyses using the lagged value of dividend payout ratio. Because firms with higher dividend payout ratios may have clienteles that are more concerned with maintaining the dividend level, we hypothesize that such firms will be more inclined to manage earnings to avoid a dividend cut. Consistent with this, we find the coefficient on *Deficit* to be significantly higher for high-payout firms relative to low-payout firms (1.176 versus 0.570, $p<0.01$).

Third, we consider the effect of managerial incentives. Because the failure to meet a dividend threshold increases the probability of a dividend cut, we hypothesize that CEOs who receive higher dollar dividends from the firm are more likely to manage earnings to avoid such cuts. To test this hypothesis, we partition the sample into two equal-sized groups on the basis of the total dollar dividends received by the CEO. The results indicate that the coefficient on *Deficit* is significantly positive for both high and low CEO dividend groups, but that the coefficient for the high CEO dividend group is significantly higher than that for the low CEO dividend group.

Also, because dividend cuts are associated with large stock price declines, we hypothesize that CEOs with high pay-performance sensitivity will be more inclined to manage earnings to meet dividend thresholds. To test this hypothesis, we partition the sample into two equal-sized groups on the basis of the CEO's pay-performance sensitivity, *Delta*, in the prior year. The results show that the coefficient on *Deficit* for the high-delta group is significantly higher than the coefficient on *Deficit* for the low-delta group.

Finally, we conduct sub-sample analyses using variables that proxy for the importance of dividend constraints coming from the firm's debt covenants, e.g., whether or not the firm has debt, the ratio of lagged retained earnings to expected dividends, and the ratio of outside equity raised to *Deficit*. If firms manage earnings to avoid violating dividend restrictions in debt covenants, then we would not expect to observe such behavior in zero-debt firms. One limitation in pursuing this analysis, however, is that over 95% of dividend

Table 5
What types of firms are more likely to manage earnings towards dividend threshold?

	Coefficient on *Deficit*		Difference in coefficients across the two groups	*p*-value
	High group (post-regulation) [positive debt]	Low group (pre-regulation) [zero debt]		
Regulation				
Sarbanes-Oxley	0.421	1.041***	−0.620	0.010
Tax reform act	0.971***	0.421	0.550	0.090
Prior dividend policy				
Dividend history	1.085***	0.827***	0.258	0.134
Dividend payout	1.176***	0.570***	0.606	0.003
CEO incentives				
CEO dividends	1.094***	0.657***	0.437	0.015
CEO delta	1.024***	0.673***	0.351	0.027
Tightness of constraints				
Debt versus zero debt	0.931***	0.090	−0.841	0.000
RE/expected dividends	0.949***	0.943***	0.005	0.983
Equity raised/*Deficit*	0.256*	0.556***	−0.300	0.074

The dependent variable is the dollar *Discretionary Total Accruals*. We report regression results for sub-samples of dividend payers only. The independent variables correspond to Model 2 in Table 3. Throughout the table, for brevity, only the coefficient on *Deficit* is reported. The sample comprises firms from Execucomp for the period 1992–2005. *Payer* equals 1 in a given year if the firm paid cash dividends in the prior year (regardless of whether the firm paid cash dividends in the current year), and equals 0 otherwise. *Earnings* is earnings available for shareholders, and is equal to income before extraordinary items minus preferred dividend. *Pre-managed Earnings* is the earnings that would have been reported in the absence of earnings management, and equals *Operating Cash Flow* + *Non-Discretionary Total Accruals*−preferred dividends. *Non-Discretionary Total Accruals* and *Discretionary Total Accruals* are the predicted and residual values of *Total Accruals*, computed using cross-sectional Jones (1991) model. *Deficit* measures the shortfall in *Pre-managed Earnings* with respect to expected dividends and is measured as *Max*(0, expected dividends−*Pre-managed Earnings*). A positive *Deficit* indicates that the firm cannot cover expected dividends from *Pre-managed Earnings*. For *Payers* expected dividends equal the prior year's dividends. *Post-Sarbox* corresponds to fiscal year 2002 and *Pre-Sarbox* corresponds to fiscal years 1992–2001. *Post-Tax Reform* corresponds to fiscal years 2003–2005 and *Pre-Tax Reform* corresponds to the fiscal year 2002. *Dividend Payout* is defined as cash dividends divided by earnings available for shareholders. *Dividend History* is the number of years of uninterrupted dividend payments. *CEO Dividends* is the dollar dividends that the CEO receives, and equals CEO's fractional ownership × annual dividends in the current year. *CEO Delta* is the CEO's pay-performance sensitivity in the prior year. RE/expected dividends is the ratio of last year's retained earnings (balance sheet number) to expected dividends. *Equity raised*/*Deficit* is the ratio of net equity raised (issued less repurchased) to *Deficit*. High and low groups in each year for each variable are based on the median value of that variable. For debt versus zero debt, the groups are based on whether the firm has leverage or not. For the subsamples based on equity raised/*Deficit*, only firms with a positive *Deficit* are used. The second-last column reports the difference in the coefficient on *Deficit* between the *high* and *low* sub-groups. The last column reports the corresponding p-values, which are based on the Chow test. All variables used in the regression are winsorized at the 1st and 99th percentile levels to remove the effect of outliers. Asterisks (***, **, and *) indicate significance at the 1%, 5%, and 10% level, respectively.

payers have debt. Hence, the sub-sample of zero debt dividend payers comprises only 354 firm-years. This limitation notwithstanding, we find that the coefficient on the *Deficit* variable is significantly positive for firms with debt, but is statistically insignificant for payers with no debt.[24] In the case of retained earnings, we find no significant difference in the sensitivity of discretionary accruals to *Deficit* for the group with high versus the group with low values of these variables. As noted earlier, a plausible explanation is that the entire amount of retained earnings is, at best, a noisy proxy for the earnings that are legally available for dividend payments.

[24]We do not examine sub-samples based on leverage because it is likely to be the presence of debt, rather than the amount, that determines dividend restrictions. Consistent with this, Press and Weintrop (1990) find no association between leverage and the proximity to dividend constraints while Dichev and Skinner (2002) conclude that leverage is a poor proxy for the tightness of covenant constraints.

Defining *cash raised from equity* as stock issued (data #108) less stock repurchased (data #115), we examine whether firms with a deficit that raise equity engage in less earnings management. These numbers are taken from the cash flow statement. Starting with the sub-set of payers with a *Deficit*, we form two sub-groups based on the median value of the ratio of *cash raised from equity* to *deficit*. Firms that have a high ratio have the option to use the new equity to pay dividends, and may, therefore, engage in less earnings management. We find results consistent with our expectation. We find that the coefficient on *Deficit* for the high-ratio group is significantly lower than that for the low-ratio group (0.256 versus 0.556, $p = 0.074$).

Overall, the results suggest that the regulatory environment (i.e., Sarbanes-Oxley and 2003 dividend tax cut), prior dividend policy, CEO incentives, and tightness of debt-related dividend constraints have an important influence on the likelihood of the firm engaging in earnings management to meet a dividend threshold. Further, we note that evidence of cross-sectional differences in the sensitivity of discretionary accruals to *Deficit* provides additional reassurance that our accruals evidence is not driven by a spurious association between *DTACC* and *Deficit*.

6. Does earnings management affect the likelihood of a dividend cut?

Our results to this point suggest that firms behave as if reported earnings are a binding constraint on dividend levels. That is, firms with expected dividend payouts in excess of pre-managed earnings attempt to maintain dividends by increasing their discretionary accruals. A natural question, therefore, is whether this behavior is effective in helping firms avoid dividend cuts.

To address this issue, we first partition the sample of dividend payers into four groups on the basis of whether they exhibit a positive *Deficit* before and after accounting for discretionary accruals. We then calculate the percentage of firms within each group that cut dividends in that year. Using data from the CRSP distribution files, we define a dividend cut as either an omission or a decrease in dividends. Details of the procedure for doing so are provided in Appendix.

The results, reported in Panel A of Table 6, show that of the 5,732 firms that exhibit an earnings surplus relative to expected dividends before earnings management, 5,285 still exhibit a surplus after earnings are managed. We calculate the surplus after earnings management as the difference between the firm's *reported* earnings and the expected dividends. Among these 5,285 firms, only 1.4% cut dividends. By contrast, dividends are cut in 8.5% of the firms that had a surplus prior to earnings management but a shortfall after. More interesting is the set of firms that exhibit a positive *Deficit* prior to earnings management. Our earlier results show that these firms are more likely to manage earnings upwards. Consistent with this, we find that 1,006 of the 1,729 firms with a shortfall prior to earnings management are able to eliminate the *Deficit* through discretionary accruals. Among these firms, only 2.3% cut dividends. This rate of dividend cuts is substantially different from the 15.2% rate for the firms that do not eliminate the *Deficit* through earnings management. These findings imply that the earnings management behavior has an important impact on the likelihood of a dividend cut.

Interestingly, the rate of dividend cut for firms that had a shortfall after earnings management is 12.6%, more than 8 times higher than the corresponding rate for firms that did not have a shortfall after earnings management (see last row on Panel A). Thus, it appears that the probability of a dividend cut is strongly associated with whether or not the firm reports earnings in excess of dividends.

Panel B of Table 6 provides further insights by reporting the magnitude of the *Deficit*, the discretionary accruals, the contemporaneous cash flow shock, and the permanence of the cash flow shock for each of the four groups analyzed in Panel A. We define the cash flow shock and the permanence of the shock as in Guay and Harford (2000). Specifically, cash flow shock is equal to the difference between the average cash flow-to-assets ratio in years t and $t-1$ and the average of the same ratio in years $t-4$ through $t-2$, where t is the year in which *Deficit* is computed. Cash flow permanence is equal to the difference in the average ratio of cash flow to assets in years $t+1$ through $t+3$ and that in years $t-4$ through $t-2$.

Not surprisingly, the data in Panel B indicate that firms that exhibit an earnings shortfall before earnings management have larger cash flow shocks compared to firms that have a surplus before earnings management (-2.85% and -4.13% versus 0.65% and -1.06%). More interestingly, there is a substantial difference between those firms that eliminate the *Deficit* through earnings management and those that do not. Firms that

Table 6
Does earnings management help dividend payers avoid dividend cuts? Univariate evidence

Panel A: % of each group that had a dividend cut

	Surplus after earnings are managed	*Shortfall after* earnings are managed	
Surplus before earnings are managed	1.4% (5,285)	8.5% (447)	1.9% (5,732)
Shortfall before earnings are managed	2.3% (1,006)	15.2% (723)	7.7% (1,729)
	1.5% (6,291)	12.6% (1,170)	3.3% (7,461)

Panel B: Deficit, accrual, and cash flow measures across the four groups

	Surplus before earnings are managed		*Shortfall before* earnings are managed	
	Surplus after earnings are managed	*Shortfall after* earnings are managed	*Surplus after* earnings are managed	*Shortfall after* earnings are managed
Number of observations	5,285	447	1,006	723
Deficit ($million)	0	0	87.65	144.31
Cash flow shock	0.65%	−1.06%	−2.85%	−4.13%
Cash flow permanence	−0.11%	−0.79%	−1.23%	−2.42%
DTACC ($million)	−27.09	−254.51	173.96	15.47

The table reports data for a sample of firms that paid dividends in the prior year. The sample comprises firms from Execucomp for the period 1992–2005. We do two independent sorts on the sample firms, based on whether their pre-managed earnings (i.e., before earnings are managed) are sufficient to cover expected dividends, and based on whether their reported earnings (i.e., after earnings are managed) are sufficient to cover expected dividends. Panel A reports the percentage of firms within each group that cut (reduced or omitted) their dividends. See Section 3.3 for details on how dividend cut is estimated. The numbers in parentheses represent the total number of firms in each group. *Earnings* is earnings available for shareholders, and is equal to income before extraordinary items minus preferred dividend. *Pre-managed Earnings* is the earnings that would have been reported in the absence of earnings management, and equals *Operating Cash Flow* + *Non-Discretionary Total Accruals*−preferred dividends. *Non-Discretionary Total Accruals* and *Discretionary Total Accruals* (*DTACC*) are the predicted and residual values of *Total Accruals* computed using cross-sectional Jones (1991) model. The firm is classified as having a shortfall before earnings are managed if expected dividends > *Pre-managed Earnings*. The firm is classified as having a shortfall after earnings are managed if expected dividends > *Earnings*. If there is no shortfall, the firm is said to have a surplus. Expected dividends equal the prior year's dividends. *Deficit* is measured as *Max*(0, expected dividends−*Pre-managed Earnings*). Cash flow shock and cash flow permanence are defined as in Guay and Harford (2000). Cash flow shock is the average cash flow to lagged assets over years t and $t-1$ minus the average cash flow to lagged assets in years $t-2$ to $t-4$, where year t is the year in which accruals are computed. Cash flow permanence is the average cash flow to lagged assets over years $t+1$ to $t+3$ minus the average cash flow to lagged assets in years $t-2$ to $t-4$, where year t is the year in which accruals are computed. All variables are defined in the Appendix. All variables are winsorized at the 1st and 99th percentile levels to remove the effect of outliers.

eliminate the *Deficit* exhibit a cash flow shock of −2.85%. Of this total shock, only 1.23% remains by year $t+3$. In other words, over one-half of the shock is temporary. By contrast, those firms that do not eliminate the deficit exhibit a shock of −4.13%, of which 2.42% still remains by year $t+3$. Thus, firms that exhibit larger and more permanent cash flow shocks are less likely to eliminate the shortfall through earnings management.

The last row of Panel B reports the discretionary accruals for each sub-group. Not surprisingly, income-increasing discretionary accruals are positive in the sets of firms that exhibit a pre-earnings management shortfall. Notably, however, the firms that do not eliminate the shortfall exhibit substantially smaller discretionary accruals despite their larger cash flow shocks. It appears that for these firms, the larger and more permanent cash flow shocks limit the firm's ability to manage earnings through discretionary accruals. These findings do raise the possibility, however, that the higher rate of dividend cuts in this sub-group are due to the larger cash flow shocks, not to the earnings *Deficit*.[25]

[25]A somewhat puzzling finding in Table 6 is that about 447 firm-years have a surplus before earnings management, but manage earnings downwards (*DTACC* = −$254.51 million) and cut dividends (8.5%). One possible explanation is that CEOs in this group of firms took an "earnings bath" (as in Murphy and Zimmerman, 1993). Consistent with this, in untabulated results, we find that this group has

Table 7 analyzes the dividend-cut decision in more detail by estimating a set of logit models in which the dependent variable is equal to one if the firm cuts its dividend and zero otherwise. In the baseline model (Model 1), we find that the likelihood of a dividend cut is negatively related to the level of earnings per share and positively related to the prior period's DPS. These results are consistent with Lintner (1956). In addition, while we find that the likelihood of a dividend cut is negatively related to the contemporaneous cash flow shock, we find no relation between the likelihood of a dividend cut and the current and prior period's stock returns.[26]

In Model 2, we add a dummy variable equal to one if the firm exhibits an earnings shortfall before earnings are managed (i.e., *Deficit* > 0). The significant positive coefficient on this variable indicates that, controlling for the contemporaneous cash flow shock and other determinants of dividend cuts, firms are more likely to cut dividends when their pre-managed earnings are below the expected dividend level.

In Model 3, we add an additional dummy variable equal to one if the firm has an earnings shortfall prior to earnings management, but a surplus following earnings management. Thus, the coefficient on this variable reflects whether the likelihood of a dividend cut is affected by the earnings management behavior for firms with a positive *Deficit*. The significant negative coefficient on this additional variable implies that firms with a shortfall are significantly less likely to cut dividends if they manage earnings to exceed the expected level of dividends. Further, the sum of these two coefficients (= 1.361–1.466) is insignificantly different from zero, implying that firms with an earnings shortfall are able to avoid dividend cuts by managing earnings beyond their dividend threshold.

In Model 4, we further decompose the dividend-cut decision by including a set of three binary variables to capture the impact of earnings management behavior. The first is equal to one if the firm exhibits an earnings surplus relative to expected dividends both before and after accounting for discretionary accruals. The second is equal to one if the firm has a shortfall both before and after accounting for discretionary accruals. The third is equal to one if the firm has a surplus before, but a shortfall after accounting for discretionary accruals. The omitted group is thus the set of firms that have a shortfall before, but a surplus after earnings management. Therefore, the coefficients on the three binary variables measure the likelihood of a dividend cut for that sub-group relative to the omitted group.

The results indicate that dividend cuts are more likely when firms have post-earnings management shortfalls than when they do not. Regardless of whether a firm has a surplus or a shortfall prior to earnings management, if it has a shortfall after earnings management, it is more likely to cut dividends relative to a firm that has a shortfall before but a surplus after earnings management. By contrast, if a firm has a surplus prior to earnings management and a surplus following earnings management, its likelihood of a dividend cut is no different than that of a firm that has a shortfall before but a surplus after earnings management.

Finally, in Model 5, we include two new variables to our baseline specification. The first is an indicator variable that equals 1 if the firm has an earnings shortfall after earnings management. The second is an indicator variable that equals 1 if the firm's reported earnings exceed expected dividends, but fall short of prior year's earnings. Thus, the former variable equals 1 if the firm's earnings do not exceed their dividend threshold, while the latter variable equals 1 if the level of reported earnings reaches the dividend threshold, but falls short of the prior year's earnings level. The combination of the two variables thus yields some insight into the importance of the dividend threshold relative to the prior year's earnings in explaining the likelihood of a dividend cut. If firms cut dividends primarily because of reductions in earnings, we expect similar positive coefficients on the two variables. By contrast, if the dividend threshold is of particular

(*footnote continued*)
significantly higher rate of CEO turnover and significantly poorer stock and accounting performance compared to the group of firms that had a surplus both before and after earnings management. Further, the discretionary accruals for this group are primarily non-operating in nature, again, suggestive of an earnings bath. Another possibility suggested by DeAngelo and DeAngelo (1990) and DeAngelo et al. (1994) is that poorly performing firms might manage earnings downward and cut dividends in order to increase bargaining power with other stakeholders (such as employees) by signaling that the firm is indeed in financial distress.

[26]In unreported regressions, we also include cash flow permanence as an independent variable. This variable is not statistically significant in any of the models and does not alter our main inferences.

Table 7
Does earnings management help dividend payers avoid dividend cuts? Multivariate evidence

	Dependent variable = 1 if firm cut dividends				
	(1)	(2)	(3)	(4)	(5)
DPS_{t-1}	1.399*** (9.7)	1.255*** (8.5)	1.143*** (7.6)	0.985*** (7.1)	1.021*** (7.6)
EPS_t	−0.376*** (9.5)	−0.333*** (8.7)	−0.227*** (5.2)	−0.140*** (3.2)	−0.150*** (3.5)
Stock $returns_t$	−0.136 (0.5)	−0.127 (0.5)	−0.022 (0.1)	0.083 (0.3)	0.101 (0.4)
Stock $returns_{t-1}$	−0.471 (1.6)	−0.466 (1.5)	−0.361 (1.2)	−0.240 (0.8)	−0.226 (0.8)
Cash flow $shock_t$	−3.878*** (2.8)	−2.595* (1.8)	−2.606* (1.7)	−2.318 (1.5)	−2.950** (2.1)
Dummy = 1 if *shortfall before* earnings are managed		0.700*** (4.2)	1.361*** (6.2)		
Dummy = 1 if *shortfall before* but *surplus after* earnings are managed			−1.466*** (5.1)		
Dummy = 1 if *surplus before* and *surplus after* earnings are managed				−0.174 (0.7)	
Dummy = 1 if *shortfall before* and *shortfall after* earnings are managed				1.739*** (6.1)	
Dummy = 1 if *surplus before* but *shortfall after* earnings are managed				1.077*** (3.4)	
Dummy = 1 if *shortfall after* earnings are managed					1.585*** (7.5)
Dummy = 1 if $earnings_t < earnings_{t-1}$ and $expected\ dividends_t < earnings_t$					−0.123 (0.5)
Observations	6,985	6,727	6,727	6,727	6,985
Pseudo-R^2	0.176	0.184	0.200	0.210	0.208

The table reports data for a sample of all dividend-paying firms on Execucomp from 1992–2005. A firm is defined as a payer in a given year if it paid cash dividends in the prior year. The dependent variable equals 1 if the firm cut (reduced or omitted) its dividends. See Section 3.3 for details on how dividend cut is estimated. EPS is earnings divided by number of shares. DPS is dividends divided by number of shares. All per-share numbers are adjusted for stock-splits. Stock returns are annual returns for the relevant fiscal year. *Pre-managed Earnings* is the earnings that would have been reported in the absence of earnings management, and equals *Operating Cash Flow + Non-Discretionary Total Accruals*−preferred dividends. *Non-Discretionary Total Accruals* and *Discretionary Total Accruals* are the predicted and residual values of *Total Accruals* computed using cross-sectional Jones (1991) model. The firm is classified as having a shortfall *before* earnings are managed if expected dividends > *Pre-managed Earnings.* The firm is classified as having a shortfall *after* earnings are managed if expected dividends > *Earnings.* If there is no shortfall the firm is said to have a surplus. Expected dollar dividends equal the prior year's dividends. Cash flow shock is defined as in Guay and Harford (2000). Cash flow shock is the average cash flow to lagged assets over years t and $t-1$ minus the average cash flow to lagged assets in years $t-2$ to $t-4$, where year t is the year in which dividend cut variable is computed. All variables are defined in the Appendix. All variables are winsorized at the 1st and 99th percentile levels to remove the effect of outliers. Intercept, year dummies, and 2-digit SIC dummies are included in the regressions but their coefficients are not reported below. The absolute value of t-statistics corrected for heteroskedasticity and firm-level clustering of standard errors are reported in parentheses. Asterisks (***, **, and *) indicate significance at the 1%, 5%, and 10% level, respectively.

importance, we expect the coefficient on the first indicator variable to be larger than that on the second indicator.

We find that the coefficient on the dividend threshold binary variable is significantly positive, while the coefficient on the earnings binary variable is insignificantly different from zero. This finding provides support for the view that the decision to cut dividends is strongly related to whether or not the firm meets its dividend threshold, but is unrelated to whether or not the firm meets its prior year's earnings threshold.[27]

To gauge the economic importance of our results, we use Model 5 without industry and year dummy variables. We drop the industry and year dummies because otherwise we would have to estimate the significance separately for each industry and year (or we would have to report the average probabilities across various industry-year combinations). Holding all the continuous variables at their median values and the two indicator variables at zero, we find that the probability of a dividend cut is 1.5%. When the earnings deficit dummy variable equals one, however, the probability of a dividend cut increases more than four times, to 6.5%. For comparison purposes, we examine the change in probability of a dividend cut induced by a change from the 25th to the 75th percentile of the other continuous variables. While such a change is not strictly comparable to a change from 0 to 1 in the indicator variable, it appears that none of the other variables induce changes in the probability of dividend cut as large as the earnings deficit dummy variable.

Our findings in Table 7 thus provide further support for the joint hypothesis that (i) expected dividend levels represent important earnings thresholds, and (ii) firms manage earnings to circumvent earnings-related dividend constraints. Even after controlling for earnings levels, dividend levels, cash flow shocks, and other earnings thresholds, the likelihood of a dividend cut is significantly related to whether the firm's reported earnings meet its expected dividend level.[28]

7. Conclusions

Prior studies have suggested that reported earnings are a constraint on dividends because of the presence of dividend covenants in debt contracts that link maximum cash distributions to (among other things) current period earnings. Using a sample of S&P 1500 firms over the period 1992–2005, we report several findings that associate earnings management with expected dividend levels. Specifically, we find that (i) the level of discretionary accruals increases in *Deficit* for dividend payers, but not for non-payers; (ii) the sensitivity of discretionary accruals to the earnings *Deficit* is limited to firms with debt and is stronger prior to the passing of the Sarbanes-Oxley regulation, following the 2003 dividend tax cut, in firms with high-payout ratios, in firms whose CEOs receive higher dollar dividends, in firms whose CEOs have higher pay-performance sensitivities, and in firms that raise less equity; and (iii) firms are more likely to cut dividends if they do not eliminate the earnings shortfall through discretionary accruals.

These findings imply that firms view expected dividend levels as important earnings thresholds. Consequently, they manage earnings to meet expected dividend levels even though such earnings management behavior has no cash flow consequences and, therefore, does not affect the firm's capacity to pay dividends. In this sense, our study contributes to the literature that documents the factors that drive earnings management in firms. Prior studies have documented abnormal discretionary accruals in the context of executive compensation (Healy, 1985; Bergstresser and Philippon, 2006; Burns and Kedia, 2006; Efendi et al., 2007), external financing events (Shivakumar, 2000; Teoh et al., 1998a, b), and other threshold earnings levels (Bergstresser et al., 2006). Our study adds to this literature by documenting that expected dividend levels represent an important additional earnings threshold.

[27]In untabulated results, we augment the logit regressions in Table 6 with an indicator variable equal to 1 if reported earnings are below analysts' forecasts of earnings. Similarly, if we include an indicator variable that equals 1 if the reported earnings are greater than expected dividends but less than forecasted earnings, the coefficient on this variable is statistically insignificant.

[28]Note that the dividend cut evidence provides additional reassurance that our accruals evidence is not driven by a spurious association between *DTACC* and *Deficit*.

Second, our findings potentially have implications for the literatures that examine the information content of dividends and the earnings quality of dividend-paying firms. Prior studies report mixed evidence on whether changes in dividends predict future changes in earnings.[29] To the extent that some dividend-paying firms increase their discretionary accruals in response to the *Deficit*, these firms will exhibit lower future earnings because the discretionary accruals will have to be subsequently reversed. Similarly, some studies (e.g., Caskey and Hanlon, 2005; Skinner, 2004) examine whether dividend payers have higher earnings quality as measured by persistence of earnings. Again, if discretionary accruals tend to reverse, the persistence of earnings will be lower for dividend payers who increase discretionary accruals in response to a *Deficit*.

Finally, our findings provide indirect evidence on the importance of dividends to firms. Because earnings management can lead to higher taxes being paid by the firm (Erickson et al., 2004) and, possibly, higher costs of capital (Francis et al., 2004, 2005), managers must perceive the value of maintaining the firm's dividend as being at least as high as these offsetting costs. In this sense, our findings support the survey findings presented in Brav et al. (2005) and provide indirect support for the view that dividends are of first-order importance to firms.

We conclude by noting an important caveat to the interpretation of our findings. Although we argue that the earnings management behavior that we document is related to dividend restrictions in bond covenants, we provide only indirect evidence on this claim. In this sense, our findings should be viewed as suggestive, but not conclusive evidence that dividend-related bond covenants affect discretionary accruals. An alternative explanation based on the prospect theory of Kahneman and Tversky (1979) is that corporate decision-makers derive value from gains and losses with respect to a certain reference point, rather than absolute levels of wealth.[30] To the extent that managers consider the current dividend level to be an important reference point, our findings can also be viewed as being consistent with the predictions of this specific version of prospect theory.

Appendix A. Definitions of variables used in the study

This appendix defines the variables used in the study. Stock return data and quarterly dividend data are taken from CRSP, firm-level data from *Compustat*, analysts' forecasts data from I/B/E/S, and compensation data from Execucomp. *Compustat* data items are defined as data# (Table A.1).

A.1. Dividend-cut measures

For firms making quarterly dividend payments, we define a dividend decrease as having occurred in a given year if the (split-adjusted) DPS in at least one quarter is lower than that of the prior quarter. Following Christie (1994), Michaely et al. (1995), and Lie (2005), we classify a firm as having a dividend omission if the firm has an established dividend history but subsequently has not paid dividends for a specified period of time. Specifically, a dividend omission occurs in a given year if (i) the firm has paid dividends for at least 8 prior quarters and, (ii) at least 210 days have elapsed since the previous dividend payment. We consider a gap of 210 days to account for the fact that quarterly dividends could be as much as two quarters apart and then allow for an extra delay of 1 month. For firms making semi-annual dividend payments, we define a dividend decrease as having occurred in a given year if the (split-adjusted) DPS in at least one semi-annual period is lower than that of the prior semi-annual period. A dividend omission occurs in a given year if (i) the firm has paid dividends for at least four prior semi-annual periods and, (ii) at least 395 days have elapsed since the previous dividend payment. Finally, for firms making annual dividend payments, we define a dividend decrease as having occurred in a given year if the (split-adjusted) DPS in that year is lower than that of the prior year. A dividend omission occurs in a given year if (i) the firm has paid dividends for at least two prior years and, (ii) at least 760 days have elapsed since the previous dividend payment.

[29] Benartzi et al. (1997), Nissim and Ziv (2001), and Benartzi et al. (2005).

[30] Burgstahler and Dichev (1997) offer a similar explanation for their finding that firms appear to manage earnings in order to avoid reporting losses or earnings declines.

Table A.1
Compustat data item numbers and definitions of main variables used in the study

Variable	Definition	Compustat data item
Sales		Data12
Assets		Data6
Operating cash flow (OCF)		Data308
Funds from operations		Data110
Preferred dividends		Data19
Retained earnings (from balance sheet)		Data36
Dividends		Data21
Payer		= 1 if data21 in prior year > 0 = 0 otherwise
Shares outstanding for per-share computation		Data54
Cumulative adjustment factor[a]		Data27
Cash raised from equity		Data108–data115
Net income		Data178
ROA	Return on assets	Data178/lagged data6
EBEXTRA	Income before extra-ordinary items	Data18 (also data123)
Earnings	EBEXTRA−preferred dividend	Data18–data19
Payout ratio	Dividends/earnings	Data21/(data18–data19)
Firm size	Log(assets)	Log(data6)
Effective tax rate	Taxes/pre-tax income	Data16/data170
Leverage	Debt/book value of assets	(Data9 + data34)/data6
Market-to-book	(Book assets−book equity + market equity)/book assets	(Data6−data60 + data199 × data25)/data6

Variable	Definition
Delta	Expected dollar change in CEO wealth for a 1% change in stock price
Vega	Expected dollar change in CEO wealth for a 0.01 change in stock return volatility
Cash compensation	Salary + bonus
CEO dividend	Fractional CEO ownership × dividends
Dividend history	Number of years of uninterrupted dividend payments
Forecasted earnings	I/B/E/S mean estimate one month prior to fiscal year end × number of shares outstanding
CF shock	Average of OCF to lagged assets over years t and $t-1$ minus the average of OCF to lagged assets over years $t-2$ to $t-4$, where year t is the year in which accruals, deficit, and dividend cut are computed
CF permanence	Average of OCF to lagged assets over years $t+1$ to $t+3$ minus the average of OCF to lagged assets in years $t-2$ to $t-4$, where year t is the year in which accruals, deficit, and dividend cut are computed
Expected dividends	Dividends paid in prior year
Pre-managed earnings	OCF + non-discretionary accruals−preferred dividends[b]
Deficit	*Max*(0, expected dividends−pre-managed earnings)

[a]All per-share numbers are adjusted for stock splits. To adjust for stock splits, number of shares is multiplied by the adjustment factor and price is divided by the adjustment factor.

[b]Calculation of non-discretionary accruals is described in *A4* to *A10* below.

References

Aharony, J., Swary, I., 1980. Quarterly dividend and earnings announcements and stockholders' returns: an empirical analysis. Journal of Finance 35, 1–12.

Altman, E., 1968. Financial ratios, discriminant analysis, and the prediction of corporate bankruptcy. Journal of Finance 23, 589–609.

Ball, R., Shivakumar, L., 2006. The role of accruals in asymmetrically timely gain and loss recognition. Journal of Accounting Research 44, 207–242.

Bartov, E., Gul, F., Tsui, J., 2001. Discretionary-accruals models and audit qualifications. Journal of Accounting and Economics 30, 421–452.
Becker, C., DeFond, M., Jiambalvo, J., Subramanyam, K., 1998. The effect of audit quality on earnings management. Contemporary Accounting Research 15, 1–24.
Benartzi, S., Michaely, R., Thaler, R., 1997. Do changes in dividends signal the future or the past? Journal of Finance 52, 1007–1034.
Benartzi, S., Grullon, G., Michaely, R., Thaler, R., 2005. Dividend changes do not signal changes in future profitability. Journal of Business 78, 1659–1682.
Bergstresser, D., Philippon, T., 2006. CEO incentives and earnings management: evidence from the 1990s. Journal of Financial Economics 80, 511–529.
Bergstresser, D., Desai, M., Rauh, J., 2006. Earnings manipulation and managerial investment decisions: evidence from sponsored pension plans. Quarterly Journal of Economics 121, 157–196.
Bradley, M., Roberts, M., 2004. The structure and pricing of bond covenants. Working Paper, Duke University and University of Pennsylvania.
Bradshaw, M., Richardson, S., Sloan, R., 2001. Do analysts and auditors use information in accruals? Journal of Accounting Research 39, 45–74.
Brav, A., Graham, J., Harvey, C., Michaely, R., 2005. Payout policy in the 21st century. Journal of Financial Economics 77, 483–527.
Breusch, T., Pagan, A., 1979. A simple test for heteroscedasticity and random coefficient variation. Econometrica 47, 1287–1294.
Burgstahler, D., Dichev, I., 1997. Earnings management to avoid earnings decreases and losses. Journal of Accounting and Economics 24, 99–126.
Burns, N., Kedia, S., 2006. The impact of performance-based compensation on misreporting. Journal of Financial Economics 79, 35–67.
Carter, M., Lynch, L., Zechman, S., 2007. Changes in bonus contracts in the post-Sarbanes-Oxley era. Working Paper, Wharton School.
Caskey, J., Hanlon, M., 2005. Do dividends indicate honesty? The relation between dividends and the quality of earnings. Working Paper, University of Michigan.
Chetty, R., Saez, E., 2005. Dividend taxes and corporate behavior: evidence from the 2003 dividend tax. Quarterly Journal of Economics 120, 791–833.
Christie, W., 1994. Are dividend omissions truly the cruelest cut of all? Journal of Financial and Quantitative Analysis 29, 459–480.
Cohen, D., Dey, A., Lys, T., 2005. Trends in earnings management in the pre- and post-Sarbanes-Oxley periods. Working Paper, USC and Northwestern University.
Coles, J., Daniel, N., Naveen, L., 2006. Managerial incentives and risk-taking. Journal of Financial Economics 79, 431–468.
Core, J., Guay, W., 2002. Estimating the value of employee stock option portfolios and their sensitivities to price and volatility. Journal of Accounting Research 40, 613–630.
Core, J., Guay, W., Verdi, R., 2006. Is accruals quality a priced risk factor? Working Paper, University of Pennsylvania, Wharton School.
DeAngelo, H., DeAngelo, L., 1990. Dividend policy and financial distress: an empirical investigation of troubled NYSE firms. Journal of Finance 45, 1415–1431.
DeAngelo, H., DeAngelo, L., 2006a. The irrelevance of the MM dividend irrelevance theorem. Journal of Financial Economics 79, 293–315.
DeAngelo, H., DeAngelo, L., 2006b. Capital structure, payout policy and financial flexibility. Working Paper, University of Southern California.
DeAngelo, H., DeAngelo, L., Skinner, D., 1994. Accounting choice in troubled companies. Journal of Accounting and Economics 17, 113–143.
DeAngelo, H., DeAngelo, L., Skinner, D., 2000. Special dividends and the evolution of dividend signaling. Journal of Financial Economics 57, 309–354.
Dechow, P., Dichev, I., 2002. The quality of accruals and earnings: the role of accrual estimation errors. Accounting Review 77, 35–59.
Dechow, P., Skinner, D., 2000. Earnings management: reconciling the views of accounting academics, practitioners and regulators. Accounting Horizons 14, 235–250.
Dechow, P., Sloan, R., Sweeney, A., 1995. Detecting earnings management. Accounting Review 70, 193–225.
DeFond, M., Jiambalvo, J., 1994. Debt covenant violation and manipulation of accruals. Journal of Accounting and Economics 18, 145–176.
DeFond, M., Park, C., 1997. Smoothing income in anticipation of future earnings. Journal of Accounting and Economics 23, 115–139.
DeGeorge, F., Patel, J., Zeckhauser, R., 1999. Earnings management to exceed thresholds. Journal of Business 72, 1–33.
Dichev, I., Skinner, D., 2002. Large-sample evidence on the debt covenant hypothesis. Journal of Accounting Research 40, 1091–1123.
Doyle, J., Ge., W., McVay, S., 2007. Accruals quality and internal control over financial reporting. Accounting Review, in press.
DuCharme, L., Malatesta, P., Sefcik, S., 2004. Earnings management, stock issues and shareholder lawsuits. Journal of Financial Economics 71, 27–49.
Durtschi, C., Easton, P., 2005. Earnings management? The shapes of the frequency distributions of earnings metrics are not evidence ipso facto. Journal of Accounting Research 43, 557–592.
Efendi, J., Srivastava, A., Swanson, E., 2007. Why do corporate managers misstate financial statements? The role of in-the-money options and other incentives. Journal of Financial Economics 85, 667–708.
Elgers, P., Pfeiffer, R., Porter, S., 2003. Anticipatory income smoothing: a re-examination. Journal of Accounting and Economics 35, 405–422.

Erickson, M., Hanlon, M., Maydew, E., 2004. How much will firms pay for earnings that do not exist? Evidence of taxes paid on allegedly fraudulent earnings. Accounting Review 79, 387–408.
Fields, T., Lys, T., Vincent, L., 2001. Capital markets research in accounting. Journal of Accounting and Economics 31, 255–307.
Francis, J., Maydew, E., Sparks, C., 1999. The role of big 6 auditors in the credible reporting of accruals. Auditing: A Journal of Practice and Theory 18, 17–34.
Francis, J., LaFond, R., Olsson, P., Schipper, K., 2004. Cost of equity and earnings attributes. Accounting Review 79, 967–1010.
Francis, J., LaFond, R., Olsson, P., Schipper, K., 2005. The market pricing of accruals quality. Journal of Accounting and Economics 39, 295–327.
Frankel, R., Johnson, M., Nelson, K., 2002. The relation between auditors' fees for nonaudit services and earnings management. Accounting Review 77, 71–105.
Grullon, G., Michaely, R., Swaminathan, B., 2002. Are dividend changes a sign of firm maturity? Journal of Business 75, 387–424.
Guay, W., 1999. The sensitivity of CEO wealth to equity risk: an analysis of the magnitude and determinants. Journal of Financial Economics 53, 43–71.
Guay, W., Harford, J., 2000. The cash-flow permanence and information content of dividend increases versus repurchases. Journal of Financial Economics 57, 385–415.
Healy, P., 1985. The effect of bonus schemes on accounting decisions. Journal of Accounting and Economics 7, 85–107.
Healy, P., Palepu, K., 1990. Effectiveness of accounting-based dividend covenants. Journal of Accounting and Economics 12, 97–123.
Healy, P., Wahlen, J., 1999. A review of the earnings management literature and its implications for standard setting. Accounting Horizons 13, 365–383.
Hribar, P., Collins, D., 2002. Errors in estimating accruals: implications for empirical research. Journal of Accounting Research 40, 105–134.
Jones, J., 1991. Earnings management during import relief investigation. Journal of Accounting Research 29, 193–228.
Kahneman, D., Tversky, A., 1979. Prospect theory: an analysis of decision under risk. Econometrica 47, 263–291.
Kalay, A., 1982. Stockholder-bondholder conflict and dividend constraints. Journal of Financial Economics 10, 211–233.
Kasanen, E., Kinnunen, J., Niskanen, J., 1996. Dividend-based earnings management: empirical evidence from Finland. Journal of Accounting and Economics 22, 283–312.
Koh, K., Matsumoto, D., Rajgopal, S., 2006. Meeting analysts forecasts in the post-Enron world: early evidence on stock market rewards and managerial actions. Working Paper, University of Washington.
Kothari, S., Leone, A., Wasley, C., 2005. Performance matched discretionary accrual measures. Journal of Accounting and Economics 39, 163–197.
Lie, E., 2005. Operating performance following dividend decreases and omissions. Journal of Corporate Finance 12, 27–53.
Lim, S., Lustgartern, S., 2002. Testing for income smoothing using the backing out method: a review of specification issues. Review of Quantitative Finance and Accounting 19, 273–290.
Lintner, J., 1956. Distribution of incomes of corporations among dividends, retained earnings, and taxes. American Economic Review 46, 97–113.
Louis, H., 2004. Earnings management and market performance of acquiring firms. Journal of Financial Economics 74, 121–148.
McNichols, M., 2002. Discussion of the quality of accruals and earnings: the role of accrual estimation errors. Accounting Review 77, 61–69.
Menon, K., Williams, D., 2004. Former audit partners and abnormal accruals. Accounting Review 79, 1095–1118.
Michaely, R., Thaler, R., Womack, K., 1995. Price reactions to dividend initiations and omissions: overreaction or drift? Journal of Finance 50, 573–608.
Murphy, K., Zimmerman, J., 1993. Financial performance surrounding CEO turnover. Journal of Accounting and Economics 16, 273–315.
Nissim, D., Ziv, A., 2001. Dividend changes and future profitability. Journal of Finance 56, 2111–2133.
Petersen, M., 2006. Estimating standard errors in finance panel data sets: comparing approaches. Working Paper, Northwestern University.
Pettit, R., 1972. Dividend announcements, security performance, and capital market efficiency. Journal of Finance 27, 993–1007.
Press, E., Weintrop, J., 1990. Debt covenants, leverage, and accounting choice. Journal of Accounting and Economics 12, 65–95.
Rajgopal, S., Shevlin, T., 2002. Empirical evidence on the relation between stock option compensation and risk taking. Journal of Accounting and Economics 33, 145–171.
Reynolds, J., Francis, J., 2001. Does size matter? The influence of large clients on office-level auditor reporting decisions. Journal of Accounting and Economics 30, 375–400.
Shivakumar, L., 2000. Do firms mislead investors by overstating earnings before seasoned equity offerings? Journal of Accounting and Economics 29, 339–371.
Skinner, D., 2004. What do dividends tell us about earnings quality? Working Paper, University of Michigan.
Smith, C., Warner, J., 1979. On financial contracting: an analysis of bond covenants. Journal of Financial Economics 7, 117–161.
Subramanyam, K., 1996. The pricing of discretionary accruals. Journal of Accounting and Economics 22, 249–281.
Teoh, S., Welch, I., Wong, T., 1998a. Earnings management and the long run market performance of initial public offerings. Journal of Finance 53, 1935–1974.
Teoh, S., Welch, I., Wong, T., 1998b. Earnings management and the underperformance of seasoned equity offerings. Journal of Financial Economics 50, 63–99.
Watts, R., Zimmerman, J., 1986. Positive Accounting Theory. Prentice Hall, Englewood Cliffs, NJ.