Dividend Stickiness, Debt Covenants, and Earnings Management*

JAEWOO KIM, *University of Rochester*†

KYEONG HUN LEE, *Norwegian School of Economics*

ERIK LIE, *University of Iowa*

ABSTRACT

Consistent with the notion that dividends are very sticky, Daniel, Denis, and Naveen (2008) report evidence that firms manage earnings upward when pre-managed earnings are expected to fall short of dividend payments. However, we find that this evidence is not robust when controlling for firms' tendency to manage earnings upward to avoid reporting earnings declines; only firms with high leverage exhibit a statistically weak tendency to manage earnings to close deficits of pre-managed earnings relative to dividends. We further report that the decision to cut dividends depends on whether reported earnings fall short of past dividends, but not on earnings management that eliminates a shortfall in pre-managed earnings relative to dividend payments. Overall, our evidence suggests that firms that face dividend constraints are more likely to cut dividends than to manage earnings to avoid dividend cuts.

Persistance des dividendes, clauses restrictives et gestion du résultat

RÉSUMÉ

Conformément à la notion selon laquelle les dividendes sont très persistants, Daniel, Denis et Naveen (2008) font état de données indiquant que les sociétés gèrent le résultat à la hausse lorsqu'elles s'attendent à ce que le résultat, préalablement géré, soit inférieur aux versements de dividendes. Or, les auteurs constatent que ces données ne résistent pas au contrôle de la tendance des sociétés à gérer le résultat à la hausse pour éviter d'avoir à annoncer un fléchissement des bénéfices; seules les sociétés qui ont un levier financier élevé affichent une tendance statistiquement faible à gérer le résultat afin de combler le déficit entre le résultat préalablement géré et les dividendes. Les auteurs constatent en outre que la décision de réduire les dividendes dépend de l'existence d'un déficit du résultat publié par rapport aux dividendes passés, mais non du choix de gérer le résultat de manière à éliminer l'insuffisance du résultat préalablement géré par rapport aux versements de dividendes. Dans l'ensemble, les données recueillies par les auteurs permettent de croire que les sociétés qui sont aux prises avec des contraintes en matière de dividendes sont davantage susceptibles de réduire les dividendes que de gérer le résultat pour éviter les réductions de dividendes.

1. Introduction

In his seminal study, Lintner (1956) concludes that firms' dividend payments are sticky, in that managers tie dividends to long-term sustainable dividends and avoid increasing

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† Corresponding author.

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dividends that might have to be cut later. Subsequent studies support this view, but it is not clear how sticky dividends are or whether dividends are less sticky than they used to be. Brav, Graham, Harvey, and Michaely (2005, 499) "find that dividend decisions are still made conservatively but that the importance of targeting the payout ratio has declined." Based on a survey of financial executives, 23 percent of firms did not really have a dividend target. Moreover, results from estimating a partial adjustment model of dividend policy indicate that "the target payout ratio is no longer the central focus of dividend policy at many firms" (Brav et al. 2005, 506). In addition, Guttman, Kadan, and Kandel (2010, 4472) "calculated that 38 percent of all firms that ever paid dividends two years in a row between 1966 and 2005 never show a sticky dividend even once during those 40 years." Some studies also report evidence of a secular change toward more flexible payout policies. Fama and French (2001) document a steady decline in the propensity to pay dividends, and Grullon and Michaely (2002) show that repurchases have gradually substituted dividends as a result of safe harbor regulations.

Even if dividends are sticky, Lintner (1956, 101) concedes that "stockholders would understand and accept the cut" in dividends in the face of "any substantial or continued decline in earnings." Indeed, Grullon, Michaely, and Swaminathan (2002) and Lie (2005a, b) report that earnings declines foreshadow dividend cuts. There are two possible reasons for this. First, declining earnings can deplete resources needed for continued operations and a healthy balance sheet. Cutting dividends naturally offsets this depletion. Second, low earnings can trigger violations of dividend covenant restrictions, which would require a cut in dividends. However, in these cases, managers have a different way out: manipulate the earnings upward to dodge the dividend covenant. The downside is that earnings management is hazardous, because it can result in shareholder lawsuits, SEC enforcement actions, and executive turnover (Feroz, Park, and Pastena 1991; Dechow, Sloan, and Sweeney 1996; DuCharme, Malatesta, and Sefcik 2004; Desai, Hogan, and Wilkins 2006; Gong, Louis, and Sun 2008). Whether managers resort to earnings management presumably depends on whether the perceived benefits exceed the perceived costs. Whereas the benefits to earnings management designed to, for example, inflate the stock price before equity issues or deflate the stock price before management buyouts are obvious (Marquardt and Wiedman 2004), the benefits of earnings management to avoid dividends cuts are more tenuous and hinge on the stickiness of dividends.

Healy and Palepu (1990) find that firms that are close to violating dividend covenant restrictions often cut dividends, but do not manage earnings to avoid violations. Furthermore, DeAngelo, DeAngelo, and Skinner (1994) find that for a sample of financially distressed firms that decrease dividends, those with binding debt covenants are no more likely to make income-increasing accounting changes than other firms. In contrast, Daniel et al. (2008) (henceforth DDN), argue that the samples in the studies mentioned above are small and prone to selection bias. Thus, they revisit the issue using a large sample of S&P 1500 firms between 1992 and 2005. They posit that firms manage earnings upward when pre-managed earnings are expected to fall short of dividend payments, in part because debt covenants often include some form of dividend restriction. To test their hypothesis, DDN relate discretionary accruals (their measure of earnings managements) to the dividend deficit *D_Deficit*, defined as Max (0, previous year's dividends – pre-managed earnings). They find that discretionary accruals are positively related to *D_Deficit* for dividend payers, especially before the passing of the Sarbanes-Oxley Act (SOX), after the 2003 dividend tax cut, and for firms with positive debt. They also report evidence that earnings management that eliminates *D_Deficit* significantly reduces the probability of dividend cuts. In sum, DDN interpret their results to mean 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" (DDN, 4).

By construction, DDN's primary variable of interest, *D_Deficit*, is correlated with pre-managed earnings' shortfall relative to the previous year's earnings, because dividend levels are highly correlated with earnings levels. That is, firm-years with positive *D_Deficit* are likely to have pre-managed earnings below the previous year's earnings. The earnings management literature shows that firms manage earnings upward to avoid reporting earnings decreases (Burgstahler and Dichev 1997; Graham, Harvey, and Rajgopal 2005). Accordingly, it is critical to control for firms' incentive to manage earnings upward to meet or beat the previous year's earnings in testing whether firms manage earnings toward expected dividends (i.e., the previous year's dividends). DDN (10) "include the prior year's earnings and current year's forecasted earnings (obtained from I/B/E/S) to control for the tendency of firms to manage earnings to meet prior year's earnings levels (Burgstahler and Dichev 1997)...." However, firms' incentive to engage in earnings management is not a function of prior year's earnings *levels* but whether pre-managed earnings *fall short of* prior year's earnings levels. Therefore, the findings of DDN are potentially subject to bias arising from an omitted variable.

We examine whether the findings reported in DDN are robust to controlling for firms' tendency to manage earnings to avoid reporting earnings decreases. To address this omitted variable problem, we construct a variable that captures firms' incentive to engage in earnings management to avoid reporting earnings decreases. Similar in spirit to DDN's *D_Deficit* measure, we define *E_Deficit* as Max (0, previous year's earnings – pre-managed earnings). That is, *E_Deficit* measures the distance between pre-managed earnings and the prior year's earnings conditional on the distance being positive. Then we explore whether the association between discretionary accruals and *D_Deficit* documented by DDN is robust to controlling for *E_Deficit*. When we include *E_Deficit* in regressions of discretionary accruals on *D_Deficit* and a set of control variables, we find that the coefficient estimate on *D_Deficit* diminishes in magnitude and becomes statistically insignificant. Overall, our multivariate analyses indicate that discretionary accruals are not associated with *D_Deficit* after controlling for firms' tendency to manage accruals to avoid reporting earnings decreases.

Next, we investigate firms' dividend cut decisions. DDN find that eliminating *D_Deficit* decreases the probability of cutting dividends. But this result seems inconsistent with our result that firms do not manage earnings to avoid cutting dividends when expected earnings fall short of dividend payments. Instead, we expect that firms are more likely to cut dividends when reported earnings fall short of expected dividends. We begin by replicating DDN's findings. DDN estimate a logit model in which the dependent variable is an indicator variable equal to one for dividend cuts, and the independent variables include an indicator variable equal to one if there is a shortfall before discretionary accruals are added (i.e., *D_Deficit* is positive), an indicator variable equal to one if there is a shortfall before but a surplus after discretionary accruals are added, and continuous control variables. Consistent with their conjecture that earnings management that eliminates *D_Deficit* helps firms avoid dividend cuts, DDN find that the coefficients on their two indicator variables are positive and negative, respectively, and both are statistically different from zero. We find the same results when we replicate their logit specification.

To investigate whether firms tend to cut dividends when reported earnings fall short of expected dividends, we construct an indicator variable equal to one if there is a shortfall after discretionary accruals are added and then estimate the above logit model along with this new indicator variable. Consistent with our prediction that firms cut dividends when reported earnings fall short of past dividends, we find that the coefficient of this new indicator variable is positively significant. Furthermore, we find that DDN's results are not robust to controlling for the level of reported earnings. The indicator variable for

when there is a shortfall before but a surplus after discretionary accruals are added (i.e., DDN's proxy for earnings management) becomes insignificant after controlling for the new indicator variable that captures reported earnings' shortfall relative to past dividend levels. Thus, what appears to matter to the decision to cut dividends is whether reported earnings fall short of past dividends, whereas earnings management has no discernible effect, consistent with the findings and arguments of Healy and Palepu (1990).

We also conduct several additional analyses. First, we investigate whether *D_Deficit* is related to discretionary accruals during firm-years in which the propensity to manage earnings to meet dividend thresholds is predicted to be most pronounced. Following DDN, we conduct regression analyses for multiple subsamples: the pre-SOX period versus the post-SOX period, the pre-2003 dividend tax cut period versus the post-2003 dividend tax cut period, and firm-years with positive debt versus firm-years with zero debt. DDN find that the propensity to manage earnings to meet or beat dividend thresholds is more pronounced for the pre-SOX subsample, the post-2003 dividend tax cut subsample, and the positive debt subsample. Our analyses, however, reveal that after controlling for *E_Deficit*, the coefficient estimates on *D_Deficit* become insignificant even for these three subsamples.

Second, we examine the frequency distribution of EPS (earnings per share) less DPS (dividends per share) for evidence of earnings management. DDN show that there are abnormally many observations with values equal to zero or just above zero, consistent with earnings management to meet dividend thresholds. But we find that this pattern disappears when we form the distribution on the basis of lagged DPS (i.e., $EPS_t - DPS_{t-1}$) instead of contemporaneous DPS (i.e., $EPS_t - DPS_t$) as DDN do. The pattern is absent even when we constrain the sample to firm-years before SOX or that have positive debt. This suggests that the pattern documented in DDN is a result of a tendency to set dividends relative to expected earnings rather than a tendency to manage earnings to meet dividend thresholds.

Third, we repeat our main analyses for a sample of restatement firms to alleviate concerns that the "backing-out" approach to measuring pre-managed earnings and managed earnings (i.e., discretionary accruals) leads to a spurious relation between discretionary accruals and *E_Deficit* or *D_Deficit* (Elgers, Pfeiffer, and Porter 2003). For the restatement sample, we redefine *E_Deficit* as Max (0, the previous year's earnings – restated earnings) and *D_Deficit* as Max (0, previous year's dividends – restated earnings). We also use the difference between originally reported earnings and restated earnings as a proxy for earnings management. For the restatement sample, we find that *E_Deficit* is positively associated with managed earnings (i.e., the difference between original earnings and restated earnings) but not *D_Deficit*.

Fourth, we examine the effect of debt renegotiation costs. To do so, we use a 1991 Delaware court ruling as an exogenous increase in creditor protection, and, presumably, debt renegotiation costs. In addition, we use the level of leverage, which we conjecture to be positively related to renegotiation costs. We find no evidence that the court ruling affects the extent to which firms manage earnings to close a deficit in pre-managed earnings related to dividends. But we find some evidence that *D_Deficit* affects earnings management for firm-years with high leverage. Because this is the only subsample in our study that suggests a positive relation between *D_Deficit* and earnings management, and because the relation is barely statistically significant at the 0.10 level, we are reluctant to conclude that firms manage earnings when facing a shortfall in pre-managed earnings relative to dividends. But we cannot rule out such a conclusion for firm-years with high leverage.

Fifth, we examine whether firms manage earnings when faced with a small deficit, defined as a deficit of two cents per share or less (consistent with the bin sizes used for the frequency distributions). We find that a small deficit in pre-managed earnings relative to

prior earnings tends to spur earnings management, but a small deficit in pre-managed earnings relative to dividends has no detectable effect on earnings management.

Finally, we replicate our analysis using real earnings management. This analysis yields similar results as the analysis of accrual earnings management. That is, the *D_Deficit* coefficient is positive and statistically significant when excluding *E_Deficit*, but statistically insignificant when we control for *E_Deficit*.

In summary, our analyses do not support the notion that firms manage earnings in order to avoid cutting dividends. Unlike DDN, we find scant evidence that firms manage earnings upward when expected earnings fall short of expected dividends. Instead, our findings suggest that firms cut dividends when reported earnings fall short of past dividend levels.

In a related study, Liu and Espahbodi (2014) conjecture that dividend-paying firms engage in earnings management to minimize fluctuations in the payout ratio. Consistent with their conjecture, they report that pre-managed earnings are negatively related to earnings management, and this is more pronounced for dividend-payers. However, unlike DDN and our study, Liu and Espahbodi do not consider the effect of dividend covenants from debt, and, thus, they disregard the *threshold* at which pre-managed earnings fall short of dividends. Consequently, Liu and Espahbodi do not disentangle the notion that firms manage earnings when pre-managed earnings are expected to fall short of dividends versus the notion that firms manage earnings when pre-managed earnings are expected to fall short of past earnings.[1]

Our paper contributes to the literature on the stickiness of dividends, which we summarized earlier. DDN find evidence that dividends are so sticky that, instead of cutting dividends, managers prefer to manage earnings, despite the associated risk of shareholder lawsuits, regulatory enforcement actions, and executive turnover. While we agree that managers are reluctant to cut dividends, our results suggest that they are not so reluctant that they prefer to manipulate earnings. As such, our study sheds light on how sticky dividends are.

Our paper also contributes to the literature that examines the debt covenant hypothesis that firms make accounting choices or manage earnings to avoid violating covenants (Watts and Zimmerman 1986). Prior work provides mixed evidence on this hypothesis. Healy and Palepu (1990) and DeAngelo et al. (1994) offer no supportive evidence when focusing on dividend constraints, whereas Sweeney (1994) and DeFond and Jiambalvo (1994) provide supportive evidence when examining a broader set of accounting-based restrictions. The combined evidence in these four studies supports the more nuanced view of Healy and Palepu (1990) and DeFond and Jiambalvo (1994) that violations of dividend constraints can be mitigated by cutting dividends and are therefore less likely to induce earnings manipulation than other debt covenants. On this backdrop, the evidence in DDN that firms materially manage earnings to avoid dividend covenants violations is puzzling. We contribute by showing that the analysis in DDN suffers from serious bias, and that correcting for this bias alters the interpretation and conclusion in DDN. Our conclusion is that firms that are close to binding dividend constraints often cut dividends but do not engage in any discernible earnings management.

Our paper is organized as follows. Section 2 discusses sample selection procedure and variable measurements. Section 3 presents main empirical results. Section 4 provides additional analyses results. Section 5 concludes.

1. Another subtle but critical difference between Liu and Espahbodi (2014) and our study is that they define dividend payers to be firms that paid dividend in both the past and current years, whereas we define dividend payers to be firms that paid dividends in the past year ($t - 1$). Thus, in Liu and Espahbodi's sample, no firm will omit dividends to comply with covenants, which we consider to be an alternative hypothesis. Hence, our research question is markedly distinct from that of Liu and Espahbodi (2014).

2. Sample selection and variable measurements

Sample selection

We duplicate DDN's sample selection as closely as possible. We begin with the S&P 1500 firms on the ExecuComp database for the period between 1992 and 2005. We delete firms that operate in financial ($6000 \leq SIC \leq 6999$) and utility ($4400 \leq SIC \leq 4999$) industries. We also exclude firms with a CRSP share code other than 10 and 11. Finally, we require observations to have sufficient information to estimate discretionary accruals.[2]

Variable measurements

Discretionary accruals

Like DDN, we employ a cross-sectional Jones (1991) model to estimate discretionary accruals by regressing total accruals on changes in sales, and gross property, plant, and equipment for each year and for each two-digit SIC.[3] All variables are deflated by lagged total assets. Following Hribar and Collins (2002), we compute total accruals as the difference between income before extraordinary items (COMPUSTAT: IB) and cash flows from operation (COMPUSTAT: OANCF). Discretionary and nondiscretionary accruals are the residuals and the fitted values from the above regressions, respectively. We then multiply the estimated discretionary and nondiscretionary accruals by lagged total assets to obtain the dollar values of discretionary and nondiscretionary accruals.

Deficits to expected dividends

To test the hypothesis that firms engage in upward earnings management to meet or beat dividend thresholds, DDN define a variable that captures firms' incentive to manage earnings upward toward dividend thresholds. Like DDN, we define *D_Deficit* as Max (0, expected dividends – pre-managed earnings), where expected dividends are proxied by the prior year's dividend and pre-managed earnings are proxied by nondiscretionary accruals plus cash flows from operation minus preferred dividends.[4] Consistent with DDN, we employ a nonlinear specification because DDN have no predictions for firm-years in which firms have pre-managed earnings that do not fall short of expected dividends. That is, *D_Deficit* is set to zero if pre-managed earnings exceed expected dividend levels (i.e., the prior year's dividends). However, *D_Deficit* is set to the difference between pre-managed earnings and expected dividends if pre-managed earnings fall short of the expected dividends.

Deficits to prior year's earnings

The earnings management literature provides evidence that firms manage earnings to avoid reporting earnings decreases. Burgstahler and Dichev (1997) examine the frequency distribution of earnings changes and find that there are too few observations in the bin just left to zero and too many observations in the bin just right to zero. They interpret this discontinuity in the distribution of earnings changes to mean that firms manage earnings to avoid reporting earnings decreases. Consistent with this empirical evidence, the survey conducted by Graham et al. (2005) reveals that CFOs view the prior year's earnings as a primary earnings target.

2. Observations are required to have income before extraordinary items (COMPUSTAT: IB), cash flows from operation (COMPUSTAT: OANCF), sales (COMPUSTAT: SALE), and gross property, plant, and equipment (COMPUSTAT: PPEGT).
3. We require at least five observations for each year and for each two-digit SIC as in DDN.
4. DDN refer to Max (0, expected dividends – pre-managed earnings) as *Deficit*. In this paper, we label this variable as *D_Deficit* in order to differentiate it from *E_Deficit*, a variable that is a proxy for firms' incentive to manage earnings to avoid reporting earnings decreases.

In order to measure the tendency to manage earnings to meet or beat the previous year's earnings, we define *E_Deficit* as Max (0, the previous year's earnings – pre-managed earnings). Thus, *E_Deficit* captures firms' incentive to manage earnings upward when they expect pre-managed earnings to be lower than the prior year's earnings. Just like DDN utilize a nonlinear specification in constructing *D_Deficit*, we use a nonlinear specification in constructing *E_Deficit*, because we have no predictions for discretionary accruals when firms have pre-managed earnings that exceed the previous year's earnings.

3. Main results

Profile analyses

To test whether firms manage earnings upward when they expect pre-managed earnings to fall short of expected dividends, DDN conduct two sets of univariate analyses. First, they examine whether firms that have a positive *D_Deficit* are more likely to report positive discretionary accruals than those that have *D_Deficit* equal to zero. DDN find that 81 percent of firms with positive *D_Deficit* exhibit positive discretionary accruals, whereas only 42 percent of firms with *D_Deficit* equal to zero exhibit positive discretionary accruals. Second, DDN investigate whether discretionary accruals are increasing with the level of *D_Deficit*. DDN document that discretionary accruals are positive and increasing with *D_Deficit* for firms with positive *D_Deficit*. In contrast, DDN find that discretionary accruals are, on average, negative for firms with *D_Deficit* equal to zero. DDN interpret these findings to mean that firms are more likely to manage accruals upward when pre-managed earnings fall short of expected dividend levels.

We replicate DDN's analyses and provide the results in Table 1. In panel A, we bifurcate the observations into groups of firm-years with *D_Deficit* equal to zero and firm-years with positive *D_Deficit*. We further partition each group into observations with non-positive discretionary accruals and observations with positive discretionary accruals. The results in panel A reveal that the proportion of firm-years with positive discretionary accruals is 83 percent for the positive *D_Deficit* group, whereas the fraction of firm-years with positive discretionary accruals is 46 percent for the zero *D_Deficit* group. In panel B, we sort observations in the positive *D_Deficit* group into quintiles on the basis of *D_Deficit*. We then compute the average discretionary accruals separately for each quintile and for the zero *D_Deficit* group. The results displayed in panel B show that average discretionary accruals are monotonically increasing with the level of *D_Deficit*. In addition, we find that average discretionary accruals are negative for the zero *D_Deficit* group and positive for the positive *D_Deficit* group. Overall, our findings in Table 1 are consistent with the evidence in DDN.

Next, we conduct the same sets of analyses to examine how *E_Deficit* is associated with discretionary accruals. Because *E_Deficit* measures firms' incentives to engage in earnings management when they anticipate that pre-managed earnings fall short of the prior year's earnings, we expect *E_Deficit* to have a positive relation with discretionary accruals. The results presented in Table 2 indicate that this is indeed the case. In panel A, we partition observations into one group consisting of firm-years with *E_Deficit* equal to zero and another group consisting of firm-years with positive *E_Deficit*. We further decompose each group into firm-years with non-positive discretionary accruals and firm-years with positive discretionary accruals. We find that the fraction of firm-years with positive discretionary accruals is 83 percent for the positive *E_Deficit* group, whereas the proportion of firm-years with positive discretionary accruals is 29 percent for the zero *E_Deficit* group. In panel B, we form quintiles on the basis of *E_Deficit* for firm-years in the positive *E_Deficit* sample and report average discretionary accruals for each quintile along with average discretionary accruals for the zero *E_Deficit* sample. The average discretionary accruals are negative for the zero *E_Deficit* sample and positive and

TABLE 1
Deficit to the expected dividends (*D_Deficit*) and discretionary accruals

Panel A: Frequency of firm-years with positive and non-positive discretionary accruals

	Discretionary accruals ≤ 0	Discretionary accruals > 0	Total
Firm-years with *D_Deficit* = 0	3,061	2,631	5,692
	(54%)	(46%)	(100%)
Firm-years with *D_Deficit* > 0	355	1,724	2,079
	(17%)	(83%)	(100%)
Total	3,416	4,355	7,771
	(44%)	(56%)	(100%)

Panel B: Discretionary accruals across quintiles formed on positive *D_Deficit* and a sample of firm-years with *D_Deficit* = 0

	N	Average *D_Deficit*	Average discretionary accruals
D_Deficit = 0	5,692	0	−25.1
All firm-years with *D_Deficit* > 0	2,079	141.5	137.6
Low = 1	415	4.4	16.8
2	416	17.1	28.7
3	416	43.9	65.5
4	416	124.0	111.9
High = 5	416	518.0	464.8

Notes: Panel A presents the frequency of observations that have either non-positive or positive discretionary accruals for a sample of firm-years with *D_Deficit* = 0 and *D_Deficit* > 0, respectively. Panel B presents average *D_Deficit* and average discretionary accruals across quintile portfolios formed on positive *D_Deficit* and a set of firm-years with *D_Deficit* = 0. *D_Deficit* is measured as Max (0, Expected dividends – Pre-managed earnings).

monotonically increasing with the level of *E_Deficit* for the positive *E_Deficit* sample. Collectively, our findings to this point suggest that *E_Deficit* and *D_Deficit* are associated with discretionary accruals in strikingly similar ways.

Finally, we investigate the extent to which *D_Deficit* and *E_Deficit* are correlated with each other and provide results in Table 3. We expect *D_Deficit* to be highly correlated with *E_Deficit*, because dividend levels likely have a high correlation with earnings levels. Consistent with our expectation, panel A reports that the Pearson (Spearman) correlation between *D_Deficit* and *E_Deficit* is as high as 0.73 (0.55) for firms that pay dividends. In order to shed more light on the relation between *D_Deficit* and *E_Deficit*, we independently sort firm-years into five groups based on *D_Deficit* and *E_Deficit* to construct 25 portfolios. Because *D_Deficit* and *E_Deficit* are positively correlated with discretionary accruals and each other, we expect firm-year observations to cluster in a diagonal. Consistent with our prediction, in panel B, we find that the number of observations in diagonal cells is much higher than the number of observations in the other cells. Taken together, the results reported in this section indicate that *E_Deficit* is an omitted correlated variable in DDN's study.

Multivariate analyses

DDN conduct multivariate analyses to examine whether *D_Deficit* is significantly associated with discretionary accruals after controlling for factors known to be associated with discretionary accruals. Specifically, DDN run several sets of pooled cross-sectional

TABLE 2
Deficit to the previous year's earnings (*E_Deficit*) and discretionary accruals

Panel A: Frequency of firm-years with positive and non-positive discretionary accruals

	Discretionary accruals ≤ 0	Discretionary accruals > 0	Total
Firm-years with *E_Deficit* = 0	2,748	1,130	3,878
	(71%)	(29%)	(100%)
Firm-years with *E_Deficit* > 0	669	3,229	3,898
	(17%)	(83%)	(100%)
Total	3,417	4,359	7,776
	(44%)	(56%)	(100%)

Panel B: Discretionary accruals across quintiles formed on positive *E_Deficit* and a sample of firm-years with *E_Deficit* = 0

	N	Average *E_Deficit*	Average discretionary accruals
E_Deficit = 0	3,878	0	−70.6
All firm-years with *E_Deficit* > 0	3,893	149.9	107.1
Low = 1	778	4.9	8.0
2	779	18.6	15.9
3	779	45.5	38.3
4	779	115.5	85.0
High = 5	779	565.2	388.5

Notes: Panel A presents frequencies of observations that have either non-positive or positive discretionary accruals for a sample of firm-years with *E_Deficit* = 0 and *E_Deficit* > 0, respectively. Panel B presents average *E_Deficit* and average discretionary accruals across quintile portfolios formed on positive *E_Deficit* and a set of firm-years with *E_Deficit* = 0. *E_Deficit* is measured as Max (0, Prior year's earnings – Pre-managed earnings).

regressions of discretionary accruals on *D_Deficit* and a set of control variables. The control variables include an indicator variable that takes the value of one if a firm pays dividends in the prior year, retained earnings,[5] proxies for managerial incentives (i.e., CEO portfolio delta, CEO portfolio vega, and cash compensation[6]), firm size, firm leverage, and the ratio of market value of equity to book value of equity. DDN's main results (Model 2 of Table 3 (p. 9)), which are reprinted as our Model 1 in Table 4, show that the coefficient estimate on *D_Deficit* is positive and statistically significant. DDN interpret this finding as indicating that firms manage earnings to meet or beat dividends thresholds.[7]

We begin by replicating DDN's main results (for a sample of both dividends payers and nonpayers). The replication results are presented as Model 2 of Table 4. Our results correspond closely to DDN's results. The coefficient estimates on *D_Deficit* is positive and statistically significant both for our sample (coefficient = 0.958; *t*-statistic = 13.78) and for DDN's sample (coefficient = 0.937; *t*-statistic = 8.4). The estimation results for other

5. The results are similar if we use unrestricted retained earnings.
6. CEO portfolio delta is the expected dollar change in CEO wealth for a one percent change in stock price (Core and Guay 2002), CEO portfolio vega is the expected dollar change in CEO wealth for a 0.01 change in stock return volatility (Core and Guay 2002), cash compensation is equal to salary plus bonus, firm size is the log of total assets, and leverage is the ratio of short-term plus long-term debt to total assets.
7. DDN also run a pooled regression in which they include the prior year's earnings level and the current year's forecasted earnings level as additional control variables. They continue to find a significantly positive coefficient on *D_Deficit*.

TABLE 3
The relation between *D_Deficit* and *E_Deficit*

Panel A: Correlation between *D_Deficit* and *E_Deficit*

	Total	Payers	Nonpayers
Pearson	0.70	0.73	0.63
Spearman	0.51	0.55	0.50

Panel B: Distribution of firm-years across *D_Deficit* and *E_Deficit* quintile combinations

	E_Deficit	Low				High
D_Deficit		1	2	3	4	5
Low	1	213	114	24	8	4
	2	99	146	90	25	4
	3	33	73	175	74	8
	4	17	24	61	202	60
High	5	1	7	13	55	287

Notes: Panel A presents Pearson and Spearman correlations between *D_Deficit* and *E_Deficit*. Panel B presents distributions of firm-years across each *D_Deficit* and *E_Deficit* quintile combination. *D_Deficit* is measured as Max (0, Expected dividends – Pre-managed earnings). *E_Deficit* is measured as Max (0, Prior year's earnings – Pre-managed earnings).

variables are also similar to those of DDN. In particular, we find that the indicator variable that equals one if a firm pays dividends in the prior year, cash compensation, and firm size have statistically significant coefficient estimates and the same signs as in DDN. However, we find that the coefficients on *Delta* and *Vega* do not differ statistically from zero in our study, while they do (at the 0.05 level of significance) in DDN's study.

As shown in the previous section, DDN's primary variable of interest, *D_Deficit*, is highly correlated with *E_Deficit* (i.e., the shortfall in pre-managed earnings to the prior year's earnings). The earnings management literature finds that firms have incentives to manage earnings upward to avoid reporting earnings decreases (Burgstahler and Dichev 1997; Graham et al. 2005). Accordingly, it is critical to control for firms' propensity to manage earnings upward to meet the prior year's earnings when studying whether firms manage earnings upward to meet dividend thresholds. DDN include the prior year's earnings levels in order to control for firms' tendency to manage earnings to avoid reporting earnings decreases. However, what matters for firms to engage in earnings management is the *shortfall* in pre-managed earnings with respect to the previous year's earnings rather than the prior earnings *level*. Consequently, DDN's multivariate analyses results are subject to an omitted variable bias.

In order to assess whether the significant association between discretionary accruals and *D_Deficit* documented in DDN is attributable to an omitted variable bias, we run pooled cross-sectional regressions of discretionary accruals on *E_Deficit* and *D_Deficit* along with a set of previously mentioned control variables. When both *E_Deficit* and *D_Deficit* are included along with an array of control variables, the coefficient estimate on *D_Deficit* diminishes in magnitude and becomes marginally significant. In particular, the coefficient changes from 0.958 to 0.131 and the accompanying *t*-statistic changes from 13.78 to 1.76. This indicates that *D_Deficit* has only a marginally incremental effect on discretionary accruals after controlling for *E_Deficit* and a set of control variables.

TABLE 4
OLS regressions of discretionary accruals on *D_Deficit*, *E_Deficit*, and control variables

Panel A: Discretionary accruals, *D_Deficit*, and *E_Deficit*

	Model 1 Model 2 of Table 3 in DDN	Model 2 Replication	Model 3 Include *E_Deficit*	Model 4 Replication only for payers	Model 5 Include *E_Deficit*
D_Deficit for payers	0.937***	0.958***	0.131*	0.809***	−0.009
	[8.4]	[13.78]	[1.76]	[9.15]	[−0.09]
D_Deficit for nonpayers	−0.138	0.105	−0.501***		
	[0.9]	[0.84]	[−4.32]		
Payer	26.372***	10.891*	17.719***		
	[3.9]	[1.92]	[3.45]		
$Retained\ earnings_{t-1}$	−0.013**	0.002	−0.011**	−0.003	−0.014**
	[2.1]	[0.45]	[−2.20]	[−0.43]	[−2.18]
$Delta_{t-1}$	−0.015**	−0.004	−0.004	0.005	0.001
	[2.4]	[−1.00]	[−1.24]	[0.68]	[0.15]
$Vega_{t-1}$	−0.139**	0.028	0.014	0.091	0.051
	[2.1]	[0.66]	[0.40]	[1.36]	[1.01]
$Cash\ compensation_{t-1}$	0.040***	0.029***	0.016***	0.036***	0.020**
	[4.3]	[4.38]	[2.79]	[3.39]	[2.33]
$Firm\ size_{t-1}$	−27.135***	−28.330***	−31.370***	−31.350***	−31.160***
	[5.7]	[−7.05]	[−8.06]	[−4.36]	[−5.42]
$Leverage_{t-1}$	0.331	15.480	31.538	−17.372	5.542
	[0.0]	[0.70]	[1.56]	[−0.29]	[0.11]
$Market\text{-}to\text{-}book_{t-1}$	1.317	−2.543	−0.438	−3.198	3.146
	[0.7]	[−1.19]	[−1.25]	[−0.56]	[0.67]
E_Deficit			0.779***		0.764***
			[20.75]		[11.25]
Observations	13,425	12,701	12,701	6,176	6,176
R^2	0.143	0.150	0.264	0.132	0.274

Panel B: Further evidence on discretionary accruals, *D_Deficit*, and *E_Deficit*

	Model 1 Firm-years with *E_Deficit* = 0	Model 2 Firm-years *E_Deficit* = 0 and past dividends > past earnings	Model 3 Firm-years with *D_Deficit* = 0	Model 4 Nonpayers	Model 5 Payers
D_Deficit for payers	0.012	−0.060			
	[0.06]	[−0.30]			
Retained earnings$_{t-1}$	−0.018**	0.000	−0.016**	−0.014	−0.014**
	[−2.27]	[0.03]	[−2.18]	[−1.30]	[−2.16]
$Delta_{t-1}$	0.005	−1.014	0.005	−0.007	0.001
	[0.81]	[−1.03]	[0.99]	[−1.64]	[0.16]
$Vega_{t-1}$	0.043	0.095	0.026	0.027	0.051
	[0.78]	[0.57]	[0.52]	[0.75]	[1.01]
Cash compensation$_{t-1}$	0.023**	0.063**	0.026***	0.013*	0.020**
	[2.24]	[2.02]	[3.05]	[1.86]	[2.29]
$Firm\ size_{t-1}$	−46.377***	−56.108***	−38.390***	−27.262***	−31.313***
	[−5.97]	[−3.21]	[−5.68]	[−6.08]	[−5.04]

(The table is continued on the next page.)

TABLE 4 (continued)

Panel B: Further evidence on discretionary accruals, *D_Deficit*, and *E_Deficit*

	Model 1 Firm-years with *E_Deficit* = 0	Model 2 Firm-years *E_Deficit* = 0 and past dividends > past earnings	Model 3 Firm-years with *D_Deficit* = 0	Model 4 Nonpayers	Model 5 Payers
$Leverage_{t-1}$	−20.776	−23.714	−13.430	23.632	−5.449
	[−0.30]	[−0.26]	[−0.25]	[1.63]	[0.11]
$Market\text{-}to\text{-}book_{t-1}$	3.019	1.890	4.116	−3.508*	3.171
	[0.51]	[0.12]	[0.87]	[−1.85]	[0.67]
E_Deficit			0.832***	0.560***	0.761***
			[8.17]	[8.82]	[16.26]
Observations	3,281	668	4,727	5,703	6,176
R^2	0.158	0.162	0.192	0.134	0.274

Notes: The table presents the results of regressions of discretionary accruals on *D_Deficit, E_Deficit,* and a set of control variables. *D_Deficit* is measured as Max (0, Expected dividends – Pre-managed earnings). *E_Deficit* is measured as Max (0, Prior year's earnings – Pre-managed earnings). *Payer* is an indicator variable that is equal to one if a firm pays dividends in year $t-1$, and zero otherwise. *Delta* is the expected dollar change in CEO wealth for a 1 percent change in stock price, and *Vega* is the expected dollar change in CEO wealth for a 0.01 change in stock return volatility (Core and Guay 2002). *Cash compensation* equals salary plus bonus. *Firm size* is the log of total assets. *Leverage* is the ratio of short-term plus long-term debt to total assets. *Market-to-book* is the ratio of the market value of equity to the book value of equity. *t*-statistics are reported in brackets. (As in Daniel et al. (2008), we report unsigned *t*-statistics in panel A, Model 1). *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

DDN perform multivariate analyses for a sample of firm-years that include both dividend payers and nonpayers. However, there is naturally no incentive to manage earnings to meet or beat dividends thresholds for nonpayers. DDN also acknowledge that *D_Deficit* for nonpayers "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, 10)." Furthermore, DDN restrict their subsequent analyses to a sample of firms that pay dividends. Accordingly, we restrict our further analyses to a sample of firm-years in which firms pay dividends in the previous year.

To determine whether DDN's main results hold when the sample includes only payers, we run pooled cross-sectional regressions of discretionary accruals on *D_Deficit* and a set of previously mentioned control variables for the sample of payers. The results presented in the Model 4 column of Table 4, panel A indicate that DDN's main results are robust to this modification. We find that the coefficient estimate on *D_Deficit* is 0.809 and significantly different from zero (*t*-statistic = 9.15), and it is similar in magnitude to the corresponding coefficient in Model 2 of 0.958.

Next, we repeat the regressions of discretionary accruals on *E_Deficit* and *D_Deficit* along with a set of previously mentioned control variables only for payers. The estimation results presented in the Model 5 column of Table 4, panel A confirm our conjecture that *E_Deficit* is an omitted correlated variable. When both *E_Deficit* and *D_Deficit* are included along with an array of control variables, the coefficient estimate on *D_Deficit* diminishes in magnitude and becomes statistically insignificant. We find that the

coefficient changes from 0.809 to −0.009 and the corresponding *t*-statistic changes from 9.15 to −0.09. This suggests that *D_Deficit* has little incremental effect on discretionary accruals after controlling for *E_Deficit* and a set of control variables. That is, we fail to find evidence that firms manage accruals upward to meet or beat dividend thresholds after controlling for firms' tendency to manage earnings upward to avoid reporting earnings decreases.[8]

Although *D_Deficit* loses explanatory power for discretionary accruals after controlling for *E_Deficit* and a set of control variables, there are several issues that cloud our interpretation. First, the high correlation (Pearson correlation = 0.73) between *D_Deficit* and *E_Deficit* raises concerns of multicollinearity in regressions in which both variables are included. To address this concern, we conduct regression analyses for a sample of firm-years with *E_Deficit* equal to zero in which firms have little incentive to manage earnings upward to avoid reporting earnings decreases. Note that as we do not include *E_Deficit* as an independent variable, multicollinearity is not an issue. The results reported in the Model 1 column of Table 4, panel B reveal that the coefficient estimate on *D_Deficit* is statistically insignificant and trivial in magnitude. This finding suggests that the insignificant coefficient estimate on *D_Deficit* in the Model 5 column of Table 4, panel A is unlikely to be attributable to overestimated standard errors that can arise from multicollinearity. We also estimate the condition index as a measure of sensitivity of the estimates to small perturbations in the data. The condition index is about 26, less than the common benchmark of 30 to indicate significant multicollinearity.[9]

One might suspect that the insignificant coefficient estimate on *D_Deficit* for a sample of firm-years with *E_Deficit* equal to zero is because of the lack of explanatory power associated with *D_Deficit,* because it is often a subset of *E_Deficit*. It is indeed the case that *D_Deficit* is generally smaller than *E_Deficit* in our data set, because past earnings generally exceed past dividends. But this is not always so. In our data set, out of 3,281 firm-years with *E_Deficit* equal to zero, we identify 668 firm-years in which prior years' dividend levels are larger than earnings levels. And even using this subsample, we still find that the coefficient on *D_Deficit* is statistically indistinguishable from zero, as reported in the Model 2 column of Table 4, panel B.

Second, but related to the first, firms' propensity to manage earnings to avoid earnings declines that has been documented in prior studies (Burgstahler and Dichev 1997; Graham et al. 2005) might be due to the firms' incentive to manage earnings to avoid dividend cuts. In other words, the tendency to manage earnings to avoid earnings declines potentially captures firms' propensity to manage earnings to sustain dividend levels. Although earnings and dividends levels are identified as important thresholds, to the best of our knowledge it is unknown whether the zero earnings growth threshold is primitive compared to the dividend threshold, or vice versa.

To address this issue, we conduct several tests. We run regressions for a sample of firm-years with *D_Deficit* equal to zero in which firms have little incentive to manage earnings upward to avoid cutting dividends. If firms' tendency to manage earnings to avoid earnings decreases is attributable to firms' incentive to manage earnings to avoid dividend cuts, we

8. The R^2 more than doubles when *E_Deficit* is included, which suggests that *E_Deficit* explains a substantial portion of cross-sectional variation in discretionary accruals.

9. In addition, we run sensitivity tests in which the variables *D_Deficit* and *E_Deficit* are orthogonalized. First, we run a regression that includes the variable *Res_D_Deficit*, the residual from a regression of *D_Deficit* on *E_Deficit*, and *E_Deficit*. The coefficient of *Res_D_Deficit* is not significant, suggesting that the dividend deficit does not provide incremental explanatory power beyond the earnings deficit. Second, we run a regression that includes the variable *Res_E_Deficit*, the residual from a regression of *E_Deficit* on *D_Deficit*, and *D_Deficit*. The coefficient of *Res_E_Deficit* is highly statistically significant, suggesting that the earnings deficit has incremental explanatory power beyond the dividend deficit.

expect *E_Deficit* to be insignificant. The estimation results are reported in the Model 3 column of Table 4, panel B. The coefficient estimate on *E_Deficit* is positive and statistically significant (*t*-statistics = 8.17). This indicates that firms' incentive to manage earnings to avoid earnings declines is not simply firms' incentive to avoid dividend cuts. We also conduct regressions analyses for a sample of payers and nonpayers, respectively. If firms' propensity to manage earnings to avoid reporting earnings declines is attributable to firms' tendency to manage earnings to sustain dividend levels, we expect the coefficient estimate on *E_Deficit* to be insignificant for nonpayers but significant for payers because nonpayers have no incentive to manage earnings upward to avoid cutting dividends. The estimation results presented in the Model 4 and Model 5 columns of Table 4, panel B show that the coefficient estimates on *E_Deficit* are significantly positive for both payers and nonpayers. This finding contradicts the notion that firms' tendency to manage earnings in order to avoid earnings declines is primarily because of a binding constraint on dividends.

Taken as a whole, our results reported in Table 4 firmly indicate that the significant association between discretionary accruals and *D_Deficit* reported by DDN is not robust to controlling for firms' propensity to manage accruals to ensure that earnings do not drop. More importantly, the findings documented in Table 4 suggest that firms do not manage earnings to avoid cutting dividends after controlling for firms' tendency to manage earnings to avoid earnings decreases.

Dividend cut analysis

In contrast to DDN's findings, the results reported in the previous section suggest that firms do not manage earnings to avoid dividend cuts after controlling for firms' propensity to manage earnings in order to avoid earnings declines. In this section, we examine determinants of the decision to cut dividends. If firms do not engage in earnings management to avoid dividend cuts, we expect firms to cut dividends when reported earnings fall short of past dividends. Alternatively, if firms manage earnings to sustain dividend levels as DDN argue, eliminating a shortfall in pre-managed earnings should reduce the probability of dividend cuts. Indeed, DDN find evidence of the latter effect.

We begin by replicating DDN's dividend cut analyses. DDN posit that if firms engage in earnings management to meet or beat dividend thresholds, firms that eliminate a shortfall in pre-managed earnings are less likely to cut dividends. To address this question, DDN estimate a logit model in which an indicator variable that equals one if a firm cuts its dividend is regressed on an indicator variable equal to one if there is a shortfall before discretionary accruals are added (i.e., *D_Deficit* is positive), an indicator variable equal to one if there is a shortfall before but a surplus after discretionary accruals are added, and a set of control variables. The control variables include dividend per share, earnings per share, contemporaneous and lagged annual stock returns, and a cash flow shock measure (the average cash flow deflated by lagged total assets over years t and $t-1$ minus the average cash flows deflated by lagged total assets over years $t-2$ and $t-4$).

DDN find that the coefficient estimates on the two indicator variables are positive and negative, respectively, and both are significantly different from zero. DDN interpret these findings to mean that firms are more likely to cut dividends if their pre-managed earnings fall short of the expected dividend payments, but managing earnings in these cases such that reported earnings exceed expected dividend payments reduces the likelihood of dividend cuts.

We replicate DDN's main analysis (Column 2 of Table 7, p. 21) and display the results in the Model 1 column of Table 5. Consistent with DDN, we find that the coefficient on the indicator variable equal to one if there is a shortfall before discretionary accruals are added is significantly positive (coefficient = 1.102; p-value < 0.001), whereas the coefficient on the indicator variable equal to one if there is a shortfall before but

TABLE 5
Logit regressions of dividend cuts

	Model 1	Model 2
DPS_{t-1}	0.877***	0.753***
	[0.000]	[0.000]
EPS_t	−0.276***	−0.158**
	[0.000]	[0.014]
Stock return$_t$	0.263	0.350
	[0.302]	[0.152]
Stock return$_{t-1}$	0.024	0.122
	[0.921]	[0.605]
Cash flow shock$_t$	−1.114	−0.831
	[0.418]	[0.542]
Dummy = 1 if shortfall before discretionary accruals are added	1.102***	0.413*
	[0.000]	[0.079]
Dummy = 1 if shortfall before but surplus after discretionary accruals are added	−1.327***	−0.399
	[0.000]	[0.221]
Dummy = 1 if shortfall after discretionary accruals are added		1.263***
		[0.000]
Observations	6,182	6,182
Pseudo R^2	0.164	0.175

Notes: The table presents the results of logit regressions of dividend cuts on variables measuring whether firms meet dividend thresholds before and after discretionary accruals are added for all firm-years in which firms pay dividends in year $t-1$. A firm-year is classified as having a shortfall before discretionary accruals are added if dividends paid at $t-1$ > Pre-managed earnings at t. A firm-year is classified as having a surplus after discretionary accruals are added if dividends paid at $t-1$ < Discretionary accruals + Pre-managed earnings at t. *DPS* is dividend per share. *EPS* is earnings per share. *Stock return* is stock returns corresponding to the fiscal year. *Cash flow shock* is the average cash flow deflated by lagged total assets during years t and $t-1$ minus the average cash flows deflated by lagged total assets during years $t-4$ through $t-2$. *p*-values are given in brackets. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

surplus after discretionary accruals are added is significantly negative (coefficient = −1.327; *p*-value < 0.001).

DDN do not, however, control for the relation between reported earnings and expected dividend payments. Firms are more (less) likely to cut dividends when reported earnings fall short of (exceed) expected dividends. Thus, it is critical to control for the level of reported earnings to assess whether earnings management affects a likelihood of dividend cuts.

To test our conjecture, we run a logit regression of dividend cuts against an indicator variable equal to one if firms exhibit an earnings shortfall after discretionary accruals are added in addition to all of the variables used by DDN. The results reported in the Model 2 column of Table 5 reveal that the coefficient estimate on the new indicator variable is 1.263 with a *p*-value less than 0.001. This suggests that firms tend to cut dividends when reported earnings fall short of past dividend levels. Importantly, the coefficient estimate on an indicator variable that captures earnings management to eliminate a shortfall in pre-managed earnings relative to expected dividend payments (i.e., an indicator variable equal to one if there is a shortfall before but surplus after discretionary accruals are added) becomes statistically insignificant (*p*-value = 0.221). These findings suggest that earnings management that closes the gap between reported earnings and expected dividends has no

discernible effect on the dividend cut decision, whereas when reported earnings fall short of expected dividends, firms are more likely to cut dividends.[10]

Collectively, the results reported thus far indicate that firms do not manage earnings in order to avoid dividend cuts in response to an increase in dividend constraints. Instead, we find that firms are more likely to cut dividends when reported earnings fall short of expected dividends. While our findings contrast those of DDN, they are consistent with Healy and Palepu's (1990) findings that firms close to dividend covenant violations do not make income-increasing accounting choices but often cut dividends.

4. Additional analyses

Subsample analyses

DDN conduct several triangulation analyses to examine intertemporal and cross-sectional variations in the effect of *D_Deficit* on discretionary accruals. They hypothesize that firms are more likely to manage earnings to meet or beat dividend thresholds before the passing of SOX, after the 2003 dividend tax cut, and when they have positive debt. DDN argue that SOX makes it more difficult and costly for firms to engage in accruals management, thereby decreasing firms' incentives to engage in earnings management to avoid cutting dividends (Cohen, Dey, and Lys 2008). They further argue that the 2003 dividend tax cut makes it more attractive for firms to pay dividends, thereby increasing the incentives to manage earnings to meet or beat dividend thresholds (Chetty and Saez 2005). DDN provide evidence consistent with their hypotheses. Specifically, they find that the coefficient estimates on *D_Deficit* obtained from the regressions of discretionary accruals on *D_Deficit* and a set of control variables are larger for the pre-SOX period than for the post-SOX period. They also show that the coefficient estimates on *D_Deficit* are larger after than before the 2003 dividend tax cut.[11] In addition, DDN document that the coefficient estimates on *D_Deficit* are positive and statistically significant for firms with debt, but statistically insignificant for firms without debt. They interpret these results as evidence that the regulatory environment (i.e., SOX and the 2003 dividend tax cut) and the existence of debt-related dividend constraints affect the extent of earnings management to meet or beat dividend thresholds.[12]

10. DDN also estimate a logit model in which the independent variables include an indicator variable equal to one if there is a surplus both before and after discretionary accruals are added, an indicator variable equal to one if there is a shortfall both before and after discretionary accruals are added, and an indicator variable equal to one if there is a surplus before but shortfall after discretionary accruals are added. The coefficient on the first of these indicator variables is statistically indistinguishable from zero, while the coefficients on the other indicator variables are both positive and statistically different from zero. This suggests that whether the firm has a surplus after discretionary accruals are added (i.e., reported earnings) has a significant impact on the dividend cut decisions, but among firms that have a surplus in reported earnings, it does not seem to matter whether they also had a surplus in pre-managed earnings. Finally, DDN estimate a logit model in which the independent variables include an indicator variable equal to one if there is a shortfall after discretionary accruals are added and an indicator variable equal to one if the earnings exceed the previous year's dividends but fall short of the previous year's earnings. The coefficient on the former indicator variable is positive and statistically significant, consistent with our results. The coefficient on the latter indicator variable is statistically indistinguishable from zero. They interpret this to mean that firms do not cut dividends primarily because of reductions in earnings, but rather because they cannot meet the dividend thresholds. Of course, this does not mean that firms manage earnings to meet those thresholds or that doing so affects the dividend cut decision.

11. DDN also find that the coefficient estimates on *D_Deficit* are positive and statistically significant for the pre-SOX period (but not for the post-SOX period) and after the 2003 dividend tax cut (but not before).

12. DDN state that "*tightness* of debt-related covenants has an important influence on the likelihood of the firm engaging in earnings management to meet a dividend threshold" [emphasis added] (18). The choice of tightness is somewhat misleading because firms without debt have no debt covenants which possibly include some form of dividend restriction.

We first replicate DDN's key results by regressing discretionary accruals on *D_Deficit* and a set of control variables for six subsamples: the pre-SOX period versus the post-SOX period, the pre-2003 dividend tax cut period versus the post-2003 dividend tax cut period, and firm-years with positive debt versus firm-years with zero debt. Following DDN, we define the pre-SOX period as years between 1992 and 2001 and the post-SOX period as 2002. We also designate 2002 as the pre-2003 dividend tax cut period and years between 2003 and 2005 as the post-2003 dividend tax cut period. Consequently, the pre-2003 dividend tax cut period is effectively the same as the post-SOX period.[13] The replication results are presented in panel A of Table 6. For the sake of brevity, we only provide coefficient estimates on *D_Deficit*. Consistent with DDN, we find that the coefficient estimates on *D_Deficit* are greater in magnitude and more significant for the pre-SOX period, the post-2003 dividend tax cut period, and firm-years with positive debt.

TABLE 6
Inter-temporal and cross-sectional associations between discretionary accruals and *D_Deficit*

Panel A: Coefficients on *D_Deficit* from the regression without *E_Deficit*

	Post-regulation (or positive debt)	Pre-regulation (or zero debt)	Difference
Sarbanes-Oxley	0.488*	0.928***	−0.440**
	[0.056]	[0.000]	[0.050]
Tax reform act	0.695***	0.488*	0.207
	[0.001]	[0.056]	[0.262]
Debt (*t*)	0.827***	0.222	0.605***
	[0.000]	[0.254]	[0.002]

Panel B: Coefficients on *D_Deficit* from the regression with *E_Deficit*

	Post-regulation (or positive debt)	Pre-regulation (or zero debt)	Difference
Sarbanes-Oxley	−0.260	0.086	−0.346*
	[0.201]	[0.447]	[0.068]
Tax reform act	0.004	−0.260	0.264
	[0.984]	[0.201]	[0.194]
Debt (*t*)	0.020	0.067	−0.047
	[0.834]	[0.631]	[0.609]

Notes: Panel A presents coefficient estimates on *D_Deficit* from the regressions of discretionary accruals on *D_Deficit* along with a set of control variables for a sample of firm-years in which firms pay dividends in year $t-1$. Panel B presents coefficient estimates on *D_Deficit* from the regressions of discretionary accruals on *D_Deficit, E_Deficit*, and a set of control variables for the same sample. The pre-SOX period corresponds to years between 1992 and 2001. The post-SOX period corresponds to 2002. The pre-tax reform act corresponds to 2002. The post-tax reform act corresponds to years between 2003 and 2005. Positive (zero) debt refers to firm-years in which a firm has positive (no) short-term and long-term debt. *D_Deficit* is measured as Max (0, Expected dividends – Pre-managed earnings). *E_Deficit* is measured as Max (0, Prior year's earnings – Pre-managed earnings). *p*-values are given in brackets. *p*-values for the *Difference* column are based on one-tailed tests. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

13. DDN do so "[t]o ensure we isolate the effects of these two regulations" (16).

Next, we examine how robust these subsample results are to controlling for firms' incentive to manage earnings to meet or beat the prior year's earnings. Specifically, we conduct the regressions in which discretionary accruals are regressed on *D_Deficit* and *E_Deficit* along with control variables for the six subsamples. If, as DDN argue, firms manage accruals to meet or beat dividend thresholds and such propensity varies intertemporally and cross-sectionally, we expect that even after controlling for *E_Deficit*, the coefficients on *D_Deficit* continue to be greater and more significant for the pre-SOX period, for the pre-2003 dividend tax cut period, and for firm-years with positive debt.

We display the results in panel B of Table 6. The results reveal that the coefficient estimates on *D_Deficit* diminish in magnitude and become statistically insignificant even for the pre-SOX period, the post-2003 dividend tax cut period, and firm-years with positive debt. The coefficient estimates on *D_Deficit* are 0.086 (p-value = 0.447), 0.004 (p-value = 0.984), and 0.020 (p-value = 0.834) for the pre-SOX period, the post-2003 dividend tax cut period, and firm-years with positive debt, respectively.[14] Thus, there is no evidence that firms manage earnings to meet or beat dividend thresholds even in the subsamples where such behavior should be most pronounced. Overall, the results reported in Table 6 corroborate our argument that DDN's findings are attributable to the failure to control for firms' incentive to manage earnings to avoid reporting earnings decreases.

Alternate earnings management measures

In our analysis above we use the same measure of discretionary accruals as DDN to facilitate comparison of the results. This measure is based on Jones (1991). But many refinements have subsequently been developed to improve the precision of the estimate and to remove various sources of bias, including those of Dechow, Sloan, and Sweeney (1995), Kothari, Leone, and Wasley (2005), and Collins, Pungaliya, and Vijh (2016). To test the robustness of our results, we rerun the regressions from Table 4 with alternate discretionary accrual measures.

Table 7 presents the major coefficients from regressions using discretionary accruals based on the Jones (1991), just like Table 4, as well as Dechow et al. (1995), Kothari et al. (2005), and Collins et al. (2016), respectively. The results for dividend payers are qualitatively the same across the measures. That is, for all measures, the coefficient on *D_Deficit* is positive and statistically significant for dividend payers when *E_Deficit* is excluded, but it becomes statistically indistinguishable from zero when *E_Deficit* is included as a control variable. Thus, our primary conclusion is robust to the choice of discretionary accrual measure.[15]

14. The coefficient on *D_Deficit* is greater for pre-regulation period than for post-regulation period (p-value = 0.068). However, the significant difference between two subsamples appears to be attributable to a negative coefficient on *D_Deficit* for the post-regulation period. Because the predicted sign on *D_Deficit* is positive, it is impossible to interpret this difference as suggesting that firms' incentive to manage earnings to avoid cutting dividends changes from pre- to post-regulation period.

15. For comparison purposes, we also ran the same regressions for nonpayers. The coefficient on *D_Deficit* for nonpayers is positive and statistically different from zero when *E_Deficit* is excluded from the regressions, irrespective of the discretionary accrual measure. Naturally, this cannot be attributable to DDN's conjecture that firms manage earnings to meet dividend thresholds, because nonpayers have no such incentives. The positive coefficient on *D_Deficit* vanishes when *E_Deficit* is included as a control variable. But, surprisingly, it turns negative and statistically different from zero when we use the measures in Jones (1991) or Dechow et al. (1995). This puzzling result is not robust, however, as the same coefficient is statistically indistinguishable from zero when we use the measures in Kothari et al. (2005), and Collins et al. (2016).

TABLE 7
Alternative measures of discretionary accruals

	Jones (1991)		Dechow et al. (1995)		Kothari et al. (2005)		Collins et al. (2016)	
D_Deficit	0.809***	−0.009	0.716***	−0.053	1.143***	0.085	0.921***	−0.076
	[9.15]	[−0.09]	[7.59]	[0.49]	[17.50]	[0.84]	[9.09]	[0.65]
E_Deficit		0.764***		0.761***		0.969***		1.098***
		[11.25]		[10.30]		[11.57]		[13.57]
Observations	6,176	6,176	6,134	6,134	6,164	6,164	2,437	2,437
R^2	0.132	0.274	0.117	0.263	0.287	0.429	0.242	0.408

Notes: The table presents the results of regressions of alternative measures of discretionary accruals on *D_Deficit, E_Deficit,* and a set of control variables for a sample of firm-years in which firms pay dividends in year $t-1$. For the sake of brevity, we only display coefficient estimates on *D_Deficit* and *E_Deficit*. In the Jones (1991) column, discretionary accruals are estimated by regressing total accruals on changes in revenues and property, plant, and equipment. In the Dechow et al. (1995) column, discretionary accruals are estimated by subtracting changes in receivables from the Jones (1991) discretionary accruals. In the Kothari et al. (2005), discretionary accruals are estimated by subtracting discretionary accruals of a ROA-matched firm from the Jones (1991) discretionary accruals. In the Collins et al. (2016) column, discretionary accruals are estimated by subtracting discretionary accruals of a ROA- and sales growth-matched firm from the Jones (1991) discretionary accruals. *D_Deficit* is measured as Max (0, Expected dividends – Pre-managed earnings). *E_Deficit* is measured as Max (0, Prior year's earnings – Pre-managed earnings). *t*-statistics are reported in brackets. *** indicates significance at the 0.01 level (two-tailed).

Measuring earnings management based on earnings restatements

A concern with the previous analyses is that the approach of "backing-out" pre-managed earnings gives rise to a mechanical association between discretionary accruals and earnings deficit (*E_Deficit*).[16] For example, Elgers et al. (2003) argue that the backing-out approach is not capable of testing the anticipatory income-smoothing hypothesis that firms manage earnings upward (downward) in anticipation of future earnings.

To mitigate this concern, we repeat our main analyses by using a sample of firms that restated originally reported earnings. A sample of restatement firms is obtained from a General Accounting Office (GAO) report (GAO-38-138) (Badertscher, Collins, and Lys 2012).[17] For the restatement sample, we redefine *E_Deficit* as Max (0, the previous year's earnings – restated earnings) and *D_Deficit* as Max (0, the previous year's dividends – restated earnings). We also construct a proxy for earnings management as the difference between originally reported earnings and restated earnings. Note that both the dependent (managed earnings = originally reported earnings – restated earnings) and independent variables (*D_Deficit* and *E_Deficit*) are measured without errors for the restatement sample. Consequently, there should not be a spurious positive association between a proxy for earnings management (i.e., originally reported earnings minus restated earnings) and *E_Deficit* (i.e., the extent to which restated earnings fall short of the previous year's earnings) for this sample.

The estimation results for a sample of 295 restatement firm-years presented in Table 8 support our earlier results that firms manage earnings to avoid reporting decreases in earnings, but not to avoid dividend cuts. Model 1 of Table 8 shows the results from replicating DDN for the restatement sample. The coefficient on *D_Deficit* is positive and statistically different from zero ($\beta_1 = 0.236$; t-statistic = 1.70). However, as shown in Model 2, the coefficient on *D_Deficit* becomes statistically insignificant when *E_Deficit* is included, whereas the coefficient on *E_Deficit* is positive and statistically different from zero ($\beta_1 = 0.149$; t-statistic = 3.36). The results are similar when we restrict our analyses to dividend payers, as reported in Model 3 and Model 4. Model 4 reveals that the coefficient on *E_Deficit* is significantly positive ($\beta_1 = 0.117$; t-statistic = 3.54), even though the sample size shrinks substantially from 295 to 98. In sum, the restatement sample results corroborate our earlier results and interpretations.

Frequency distribution of earnings less dividends

DDN also examine the frequency distribution of EPS (earnings per share) minus DPS (dividends per share) for the sample of dividend payers. Their distribution ranges from −\$1 to \$3 and is based on two cent bin sizes. If firms frequently manage earnings to meet dividend thresholds, the distribution should reveal an unusually high frequency of observations immediately to the right of zero. Burgstahler and Dichev (1997) use a similar methodology to show a tendency to manage earnings upward if they otherwise would be slightly negative or if they otherwise would fall short of the previous year's earnings.

DDN report that the bin immediately to the right of zero contains 52 observations, which is about twice the average number of observations in adjacent bins of 25 observations. We replicate this in Part (a) of Figure 1, and find similar numbers. The excess of about 27 observations is not very large (it represents only 0.3 percent of the total

16. The "backing-out" approach refers to a research design that estimates pre-managed earnings from running regressions of total accruals on a set of determinants. The fitted values of these regressions serve as a proxy for pre-managed earnings, whereas the residuals (i.e., discretionary accruals) serve as a proxy for earnings management.

17. We thank Brad Badertscher for sharing his restatement data.

TABLE 8
Restatement firms

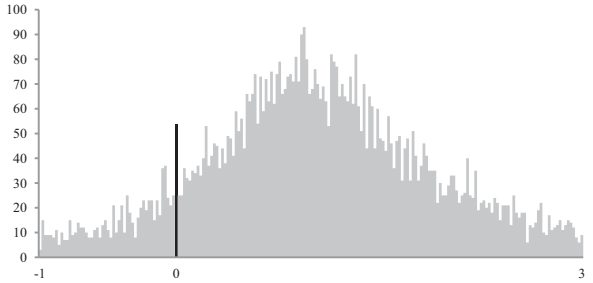
	Model 1	Model 2	Model 3	Model 4
	Both payers and nonpayers		Only payers	
D_Deficit for payers	0.236*	0.122	0.241	0.155
	[1.70]	[1.11]	[1.33]	[0.97]
D_Deficit for nonpayers	0.430	0.330		
	[1.47]	[1.23]		
Payer	5.896	8.162		
	[0.70]	[1.03]		
Retained earnings$_{t-1}$	0.002	−0.001	0.004	−0.002
	[0.66]	[−0.56]	[0.61]	[−0.29]
Firm size$_{t-1}$	0.140	−1.320	−0.698	−1.709
	[0.07]	[−0.67]	[−0.15]	[−0.36]
Leverage$_{t-1}$	12.375	13.757	105.149*	97.032
	[1.30]	[1.19]	[1.81]	[1.66]
Market-to-book$_{t-1}$	−0.048	−0.087	2.130	0.995
	[−0.29]	[−0.53]	[1.28]	[0.50]
E_Deficit		0.149***		0.117***
		[3.36]		[3.54]
Observations	295	295	98	98
R^2	0.432	0.478	0.545	0.575

Notes: The table presents the results of regressions of the difference between originally reported earnings and restated earnings on *D_Deficit, E_Deficit,* and a set of control variables for firms that restate their originally reported earnings. *D_Deficit* is measured as Max (0, Expected dividends – Restated Earnings). *E_Deficit* is measured as Max (0, Prior year's earnings – Restated Earnings). See the notes of Table 4 for the definitions of other variables. *t*-statistics are reported in brackets. * and *** indicate significance at the 0.10 and 0.01 levels, respectively (two-tailed).

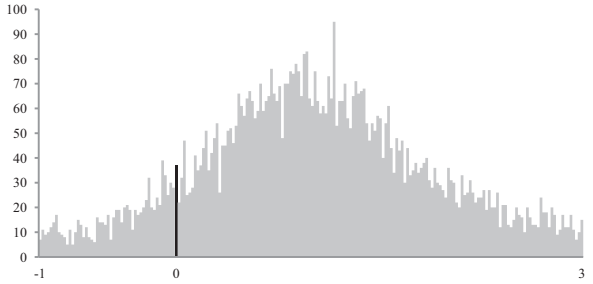
observations), but it is nevertheless statistically different from zero at the 0.01 level. The frequency distribution reveals no other pattern of earnings management to meet dividend thresholds.

In other tests of earnings management to meet dividend thresholds, DDN use the previous year's dividends as a proxy for expected dividends. But in their analysis of the frequency distribution they use realized dividends for the current year. As a result, any abnormality in frequency distribution could be attributable to a tendency to manage earnings relative to expected dividends or a tendency to set the dividends relative to expected earnings. An example of the latter would be that managers decide to hold back on a dividend increase in a period due to expectations of poor earnings. To remove the tendency to set dividends relative to expected earnings from the frequency distribution, we use the lagged value of DPS instead. That is, we form the distribution for the difference between EPS in the current year and DPS in the previous year. Our revised distribution is given in Part (b) of Figure 1. The number of observations in the bin immediately to the right of zero is no longer abnormally high. In fact, there is no clear pattern in any of the bins around zero that would suggest earnings management to meet dividend thresholds. In Parts (c) and (d) of Figure 1, we replicate the distribution in Part (b) for the subsamples of firm-years before SOX and firm-years with positive debt, respectively. Any earnings management should be more pronounced for these subsamples, but there is no clear pattern suggestive of earnings management even in those distributions. Thus, the abnormal

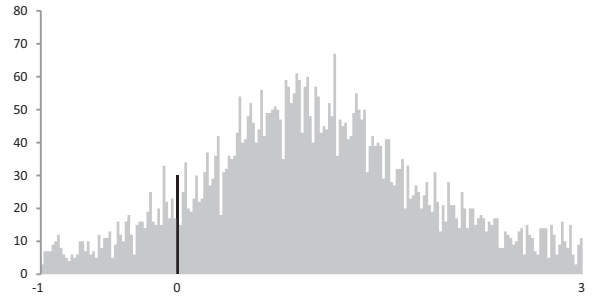
Figure 1 Frequency distribution of EPS minus DPS. (a) $EPS_t - DPS_t$. (b) $EPS_t - DPS_{t-1}$. (c) $EPS_t - DPS_{t-1}$ (Firms in the pre-SOX period). (d) $EPS_t - DPS_{t-1}$ (Firms with positive debt)



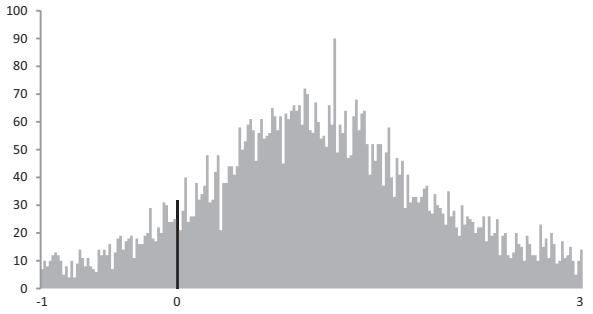
(a) $EPS_t - DPS_t$



(b) $EPS_t - DPS_{t-1}$



(c) $EPS_t - DPS_{t-1}$ (Firms in the pre-SOX period)



(d) $EPS_t - DPS_{t-1}$ (Firms with positive debt)

Notes: Frequency distribution of EPS (income before extraordinary items divided by number of shares) minus DPS (dividends divided by number of shares) from −$1 to $3 using 2 cent bin sizes. The column for the bin size from 0 to 2 cents is black.

pattern in the frequency distribution reported in DDN seems to be because of a tendency to set dividends relative to expected earnings rather than earnings management to meet dividend thresholds.

The effect of debt renegotiation costs

The costs of renegotiating with debtholders might affect the role of *D_Deficit*. In particular, high renegotiation costs might induce greater earnings management to close dividend deficits. To examine this possibility, we use two measures of debt renegotiation costs. First, we use a Delaware court ruling from the 1991 *Credit Lyonnais v. Pathe Communications* bankruptcy case. The ruling shifted the fiduciary duties of directors toward bondholders when firms are in the "zone of insolvency" (see Becker and Strömberg 2012, for a detailed discussion). The resulting increase in creditor protection should make creditors more willing to renegotiate, and, thus, reduce debt renegotiation costs. Second, we use the level of leverage, because we expect that debt renegotiation costs increase with leverage.

Panel A of Table 9 presents the analysis of the Delaware court ruling. To test the effect of the ruling on the *D_Deficit* coefficient in the earnings management regression, we use a triple interaction effect between *D_Deficit*, an indicator for whether a firm is incorporated in Delaware, and an indicator for whether the year is after 1991. The triple interaction coefficient is not statistically different from zero, suggesting that the court ruling does not materially affect the extent to which firms manage earnings to cover a dividend deficit.

Panel B presents separate earnings management regressions for firm-years with leverage above and below the sample median. The *D_Deficit* coefficient is positive and marginally significant at the 0.10 level for firm-years with high leverage, while it is negative for firm-years with low leverage. This offers some evidence, albeit weak, that high-leverage firms facing a shortfall in pre-managed earnings relative to dividends resort to earnings management to reduce the shortfall.

Overall, there is scant evidence that debt renegotiation costs affect the role of *D_Deficit*. We only find some evidence when using the leverage level as the proxy for renegotiation costs, and even this is tenuous. In any event, the results here cannot rule out DDN's conclusion that firms manage earnings when they face a shortfall in pre-managed earnings relative to dividends.

Small deficits

The incentives to manage earnings might be strongest in the narrow band where pre-managed earnings fall just below the benchmark, and not linearly increasing in the deficit. To test this, we form two new indicator variables, *D_Small* and *E_Small*, which, respectively, equal one if *D_Deficit* and *E_Deficit* are less than two cents multiplied by the number of outstanding shares (consistent with the bin sizes used for the frequency distributions). Table 10 presents earnings management regressions in which the new indicator variables are included, both by themselves and interacted with either *D_Deficit* or *E_Deficit*. In Model 2, the coefficient of *E_Small*×*E_Deficit* is positive and statistically significant, suggesting that firms are more likely to engage in earnings management when their pre-managed earnings fall just short of the prior year's earnings. More importantly for the purpose of this study, the coefficient of *D_Small*×*D_Deficit* is positive and statistically significant in Model 1, but actually turns negative when we control for *E_Deficit* in Model 2. This is inconsistent with the notion that firms manage earnings to close small deficits in pre-managed earnings relative to expected dividends.

Real earnings management

Firms can use both accrual and real earnings management to close a deficit in earnings relative to benchmarks. Thus, we also examine whether firms that face a deficit in pre-

TABLE 9
The effect of proxies for debt renegotiation costs

Panel A: The effect of a 1991 Delaware court ruling

	Model 1	Model 2
Delaware×*POST1991*×*D_Deficit*	0.434	0.397
	[1.39]	[1.56]
Delaware×*D_Deficit*	−0.438**	−0.334**
	[−2.00]	[−1.99]
Delaware×*POST1991*	1.970	0.825
	[0.44]	[0.21]
POST1991×*D_Deficit*	−0.083	−0.017
	[−0.31]	[−0.08]
Delaware	−12.023	−10.455
	[−1.14]	[−1.18]
POST1991	−3.827	1.095
	[−1.12]	[0.36]
D_Deficit	1.121***	0.189
	[7.02]	[1.24]
Retained earnings$_{t-1}$	−0.008	−0.021***
	[−1.26]	[−4.23]
Firm size$_{t-1}$	−5.745***	−9.139***
	[−2.71]	[−5.35]
Leverage$_{t-1}$	−50.819***	−23.248**
	[−3.76]	[−2.32]
Market-to-book$_{t-1}$	4.478***	6.065***
	[2.88]	[3.96]
E_Deficit		0.871***
		[9.37]
Observations	7,377	7,377
R^2	0.203	0.350

Panel B: The effect of the leverage level

	Model 1 High leverage	Model 2 Low leverage
D_Deficit for payers	0.187*	−0.273*
	[1.71]	[−1.66]
Retained earnings$_{t-1}$	−0.012	−0.018**
	[−1.22]	[−2.08]
Delta$_{t-1}$	0.000	−0.003
	[0.03]	[−0.57]
Vega$_{t-1}$	0.110	0.040
	[1.64]	[0.47]
Cash compensation$_{t-1}$	0.011	0.028**
	[1.27]	[1.97]
Firm size$_{t-1}$	−40.844***	−28.975***
	[−5.48]	[−3.42]
Leverage$_{t-1}$	−153.753	37.904
	[−1.05]	[0.45]
Market-to-book$_{t-1}$	14.973	3.406
	[1.09]	[0.55]

(The table is continued on the next page.)

TABLE 9 (continued)

Panel B: The effect of the leverage level

	Model 1 High leverage	Model 2 Low leverage
E_Deficit	0.763***	0.778***
	[9.10]	[8.35]
Observations	2,892	2,890
R^2	0.357	0.231

Notes: Panel A presents the results of regressions of discretionary accruals on *D_Deficit, E_Deficit,* and a set of control variables for a sample of dividend payers. Panel B displays the results of regressions of discretionary accruals on *D_Deficit, E_Deficit,* and a set of control variables for the above- and below-median leverage subsamples. *Delaware* takes the value of one for firms that are incorporated in Delaware. *POST1991* is an indicator variable that equals one (zero) for 1992–1995 (1988–1991). See the notes of Table 4 for the definitions of other variables. *t*-statistics are reported in brackets. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

managed earnings relative to dividends resort to real earnings management. Following prior research (e.g., Roychowdhury 2006; Liu and Espahbodi 2014), we use abnormal discretionary expenditures and abnormal cash flows from operations as a proxy for real earnings management.[18] Table 11 shows the regressions based on real earnings management, both when we exclude *E_Deficit* (Model 1) and control for *E_Deficit* (Model 2). Consistent with our results for accrual earnings management, we find that the *D_Deficit* coefficient is positive and statistically significant when excluding *E_Deficit*, but statistically insignificant when we control for *E_Deficit*.

We also replicate the earlier analysis on the effect of renegotiation costs (based on the 1991 Delaware court ruling and the level of leverage) and small deficits using real earnings management in place of accrual earnings management. In short, there is no evidence that the documented results in Table 11 differ for firms with high renegotiation costs or with small deficits (not tabulated).

5. Conclusion

DDN hypothesize that firms manage earnings upward when pre-managed earnings fall short of expected dividends, perhaps because of debt covenants that constrain dividend payments, and that such earnings management helps preserve the dividend level. These hypotheses seem reasonable given past evidence of opportunistic earnings management and a resistance to cutting dividends. DDN report results that they interpret as consistent with their hypotheses. In this study, we question the interpretation of the results in DDN. In particular, we conjecture that their multivariate specifications omit variables that are correlated with the independent variables of interest. This omission induces bias and makes the interpretation of their results difficult.

DDN regress discretionary accruals against the dividend deficit, *D_Deficit*, defined as Max (0, expected dividends – pre-managed earnings), and control variables. They find a positive coefficient on *D_Deficit* for firms that pay dividends, and the coefficient is larger before the passing of the Sarbanes-Oxley Act (SOX), after the 2003 dividend tax cut, and

18. We do not use abnormal production as a proxy for real earnings management because it is potentially related to accruals through changes in inventory.

TABLE 10
The effect of small deficits

	Model 1	Model 2
D_Small×*D_Deficit*	44.236***	−11.724**
	[5.12]	[−2.03]
D_Deficit	0.810***	−0.012
	[9.17]	[−0.12]
D_Small	3.410	26.700*
	[0.26]	[1.87]
Retained earnings$_{t-1}$	−0.003	−0.014**
	[−0.41]	[−2.20]
Delta$_{t-1}$	0.004	0.001
	[0.65]	[0.16]
Vega$_{t-1}$	0.088	0.051
	[1.32]	[1.01]
Cash compensation$_{t-1}$	0.037***	0.020**
	[3.44]	[2.32]
Firm size$_{t-1}$	−31.802***	−31.171***
	[−4.43]	[−5.46]
Leverage$_{t-1}$	−17.467	5.919
	[−0.29]	[0.12]
Market-to-book$_{t-1}$	−3.173	2.812
	[−0.55]	[0.60]
E_Small×*E_Deficit*		16.886***
		[6.74]
E_Deficit		0.768***
		[11.14]
E_Small		31.034**
		[2.20]
Observations	6,176	6,176
R^2	0.134	0.276

Notes: The table presents the results of regressions of discretionary accruals on *D_Deficit, D_Small, E_Deficit, E_Small*, and a set of control variables based on a sample of dividend payers. *D_Small* is an indicator variable that equals one if *D_Deficit* is lower than 2 cents time the number of outstanding shares. *E_Small* is an indicator variable that equals one if *E_Deficit* is lower than 2 cents time the number of outstanding shares. See the notes of Table 4 for the definitions of other variables. *t*-statistics are reported in brackets. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

for firms with positive debt. We find, however, that the coefficient on *D_Deficit* for firms that pay dividends become insignificant when we control for firm's tendency to manage earnings to avoid declines in reported earnings relative to those in the prior year. This holds even for the subsamples in which DDN argue the tendency to manage earnings to eliminate shortfalls in the dividend deficit is most pronounced. A slight caveat is that the subsample of firm-years with high leverage yields a marginally statistically significant relation between *D_Deficit* and earnings management. Our results are robust to alternative earnings management measures, including a measure based on ex post restatements, and the use of real earnings management in place of accrual earnings management. As an alternative approach, DDN report an abnormality in the frequency distribution of earnings less dividends in support of their view, but we present evidence that the abnormality is attributable to measurement error.

TABLE 11
Real earnings management

	Model 1	Model 2
D_Deficit for payers	1.272***	−0.035
	[34.23]	[−0.37]
Retained earnings$_{t-1}$	0.051*	−0.033*
	[1.69]	[−1.91]
Delta$_{t-1}$	−0.081	−0.021
	[−0.82]	[−1.28]
Vega$_{t-1}$	−0.167	−0.164
	[−0.93]	[−1.16]
Cash compensation$_{t-1}$	0.041	−0.018
	[1.19]	[−0.79]
Firm size$_{t-1}$	−144.315***	−90.345***
	[−5.05]	[−5.00]
Leverage$_{t-1}$	34.349	81.218
	[0.29]	[0.98]
Market-to-book$_{t-1}$	−26.632	−36.930**
	[−1.07]	[−2.11]
E_Deficit		1.178***
		[13.48]
Observations	6,165	6,165
R^2	0.758	0.851

Notes: The table presents the results of regressions of abnormal discretionary expenditures (*ADISX*) plus abnormal cash flows from operations (*ACFO*) on *D_Deficit, E_Deficit,* and a set of control variables based on a sample of dividend payers. *ADISX* is measured as negative one multiplied by the residuals from estimating regressions of discretionary expenditures (R&D plus advertising expenses plus SG&A) on the reciprocal of total assets and sales. *ACFO* is measured as the residuals from estimating regressions of cash flows from operation on the reciprocal of total assets, sales, and changes in sales. See the notes of Table 4 for the definitions of other variables. *t*-statistics are reported in brackets. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

DDN further regress the dividend cut on an indicator variable for whether firms eliminate the dividend deficit and control variables. They find a positive coefficient on the indicator variable, which they interpret as evidence that managing earnings upward to close a dividend deficit helps preserve the dividend level. However, we find that this coefficient becomes insignificant when we control for whether the reported earnings fall short of expected dividends. Importantly, we find that an indicator variable equals one if reported earnings fall short of expected dividends is positively associated with dividend cuts. These findings suggest that the level of earnings relative to dividends matter for the decision to cut dividends, but any earnings management designed to close a shortfall in earnings relative to dividends has no significant impact.

Our study resolves some inconsistencies in the past literature. Numerous studies dating back to Watts and Zimmerman (1986) conjecture that when firms are close to violating debt covenant violations, they are likely to engage in earnings management. However, Healy and Palepu (1990) and DeFond and Jiambalvo (1994) argue that debt covenants covering dividend payments are different, because the firms can simply cut the dividends to comply, and their evidence supports this argument. More recently, DDN present large sample evidence that challenges both the arguments and empirical evidence

in Healy and Palepu (1990) and DeFond and Jiambalvo (1994), and leaves the literature in limbo. This study shows that the results in DDN are attributable to methodological errors. Once we correct the errors, we return to the earlier conclusion in the literature that firms do not materially manage earnings to dodge dividend restrictions, but rather cut the dividends. Our findings also shed light on a long-standing debate over how sticky dividends are.

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