Do Investors Value Dividend Smoothing Stocks Differently?

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Abstract

It is almost an article of faith that managers have a preference for smooth dividends. Yet, it is not clear if this reflects investors' preferences. In this paper, we study whether investors indeed value dividend smoothing stocks differently by exploring the implications of dividend smoothing for firms' stock prices and cost of capital. Using over 80 years of data, we find no robust relationship between the smoothness of a firm's dividends and the expected return or market value of its stock. Similarly, we find no association between the path of dividend changes and changes in firm value. The asymmetric reaction to dividend increases and decreases is largely attributable to the first time the firm cuts its dividend. Finally, we find that retail investors are less likely to hold dividend smoothing stocks, while institutional investors, and especially mutual funds, are more likely. This evidence for a smoothing clientele offers a potential explanation for the prevalent use of dividend smoothing.

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Introduction

Since the pivotal study by Lintner (1956), the phenomenon of dividend smoothing has been documented in a number of empirical studies. Dividend changes respond only slowly to earnings changes, and managers are willing to bear significant costs to avoid dividend cuts. When evaluating the motives behind managerial decisions to smooth dividends, Lintner (1956, p. 104) points out that "management's views of its stockholders' preference between reasonably stable or fluctuating dividend rates, and its judgment of the size and importance of any premium the market might put on stability or stable growth in the dividend rate" is one of the important considerations. His view is supported by recent survey evidence. Brav, Graham, Harvey, and Michaely (2005) demonstrate that even today managers recognize a substantial asymmetry between dividend increases and decreases: there is not much reward in increasing dividends but there is perceived to be a large penalty for reducing dividends. Yet, as noted by Berk and DeMarzo (2013) more than fifty years after Lintner's study, "there is no clear reason why firms *should* smooth their dividends, nor convincing evidence that investors prefer this practice." In this paper, we address this gap by asking whether investors prefer smooth dividends.

If investors have a preference for a smooth dividend stream, they may be willing to pay more for the equity of a firm that smoothes its dividends than for the equity of an equivalent firm that does not smooth. Therefore, we examine whether there is any relationship between the smoothness of a firm's dividend stream and its market value or expected returns. Prior studies offer several possible reasons for the relationship. First, retail investors may have a behavioral preference for receiving smoothed dividends, based either on prospect theory type of utility (Baker and Wurgler (2011)) or a desire to smooth consumption (Shefrin and Statman (1984), Baker, Nagel and Wurgler (2007)). Second, a consistent dividend stream could play a role in mitigating agency problems between investors and potentially entrenched management (Myers (2000) and Fluck (1999)). Finally, firms may avoid dividend cuts in order to establish reputation in the equity markets for fair treatment of dispersed shareholders (e.g., Shleifer and Vishny (1997), Gomes (2000), DeAngelo and DeAngelo (2007)).

According to these theories, *all else equal*, smoothed dividends reduce the cost of capital and make access to equity capital markets easier, which, in turn, is associated with higher valuation. Said differently, firms that fail to smooth need to compensate investors (who prefer smoothed dividends) with a higher expected return. Our empirical analysis tests whether this is, indeed, the case. We implement several distinct approaches to evaluate the potential impact of smoothing on expected returns and firms' valuation and use several different measures of smoothing. In the first and most simple approach, we examine the validity of the managerial perception that the market reacts more severely to dividend cuts than increases, using the past avoidance of cuts as an indicator of dividend smoothing. In our second approach, we look at the path of dividend changes over time and ask whether investors value a series of small increases more than a volatile dividend stream (when a firm cuts and increases dividends multiple times throughout the period). In our last approach, we study the relation between continuous measures of dividend smoothing and both expected returns and market valuation. The methodology and results of each approach are as follows.

In our first method, we study the market reactions to dividend cuts and increases. Brav et al. (2005) report that the majority of managers perceive a much larger penalty for cutting dividends relative to the gain from an increase, implying a link between dividend smoothness and equity valuation. Consistent with previous studies, we find that on average, the negative market reaction to dividend cuts is greater in magnitude than the positive reaction to increases, even after controlling for the size of the dividend change. However, we show further that this relationship is driven largely by the firm's first event of a dividend cut. After the first cut, there is no asymmetry in market reaction to dividend cuts and increases. Thus, for the firms that choose not to smooth, and therefore cut their dividend multiple times in our sample period, there seems to be little penalty stemming from announcement returns.

Our second approach extends the first by comparing the cumulative market impact of volatile and smooth dividend streams within firms. Specifically, for each firm, we sum up all the abnormal returns associated with all dividend change announcements that occurred in a given decade. We then test whether this cumulative value effect depends on the smoothness of dividends over and above the total change in dividends. If market reactions are larger to dividend cuts than to dividend increases, then firms with more volatile dividend streams should end up with lower stock prices, even if the overall change in the *level* of dividend has been the same. We find that the cumulative announcement return is unrelated to the number of dividend cuts or to continuous measures of dividend smoothing. This suggests that the stock price impact of a firm's dividend announcements over a given decade depends on the total increase or decrease in dividends, but bears little relation to the smoothness of its dividend path over that period.

In our third approach, we examine investors' preferences for smooth dividends by asking whether the value investors place on a dividend increase of a given size is related to the smoothing policy of the firm. We construct two continuous measures of dividend smoothing following Leary and Michaely (2012). The first one measures dividend smoothing as the speed of adjustment (*SOA*), derived from a modified adjustment model of Lintner (1956). The second measure, which is model-free, defines smoothing as the volatility of dividends relative to the volatility of earnings (*RelVol*). We also look at the introduction of the safe harbor provision of Rule 10b-18 as a source of quasi-exogenous variation in dividend smoothing (Grullon and Michaely (2002), Skinner (2008)), and use the post-reform indicator as an alternative proxy for dividend smoothing. For each measure, we find no evidence that investors value an extra dollar of dividends more highly when it comes from a firm that smoothes dividends more.

Next, we use standard asset pricing tests (Fama and French (1993), Daniel and Titman (1997)) to study the relation between dividend smoothing and expected equity returns. We allocate stocks into portfolios based on estimated measures of past dividend smoothing, and find no discernible difference in average returns across portfolios. The differences between expected returns of portfolios formed on dividend smoothing remain insignificant after controlling for common asset pricing risk factors, as well as in characteristic-based regressions. Finally, the results are invariant to our choice of sample period, and remain the same even when we extend the sample period back to 1926, before Lintner's (1956) seminal study.

In addition to the asset pricing tests of dividend smoothing and returns, we test for investor preferences by estimating the relationship between smoothing and firm value, as measured by the market-to-book ratio. The advantage of this method is that it allows for smoothing to relate to firm value either through the cost of capital or through expected cash flows. For example, several studies argue that dividend smoothing limits agency conflicts between managers and outside investors (Allen, Bernardo and Welch (2000), DeAngelo and DeAngelo (2007)). Allen, Bernardo and Welch (2000) suggest that a high and stable dividend stream serves to attract and retain institutional investors, who provide valuable monitoring and information production. In this case, smooth dividends may increase investors' expectations of future cash flows.

Empirically, we test whether valuation, as proxied by market-to-book, is related to the extent of dividend smoothing measured by *SOA* and *RelVol*. Since the valuation measure and smoothing policies both arguably depend on firms' investment opportunities, we calculate within-firm changes in market-to-book from the year of dividend initiation to ten years after and relate this change to the smoothness of the firm's dividend stream over that period. The advantage of this approach is that it controls for unobserved firm-specific differences and limits heterogeneity in changes in growth opportunities by comparing firms at similar stages in their growth cycles. When we estimate the ten-year difference in market-to-book of each dividend-initiating firm as a function of dividend smoothing throughout the same period, we find no effect of dividend smoothing on changes in value. These results are consistent with our previous set of findings that demonstrates little association between dividend smoothing and expected returns.

Overall, we find little evidence that firms are able to enhance their stock price or reduce their cost of equity capital by smoothing their dividend streams. Still, our results beg the question of why this practice is so prevalent and why firms are willing to go to a considerable length and bear significant costs to maintain a smooth dividend (Brav et al, 2005), a commitment that seems to be absent from other corporate policies. One possibility is that cross-sectional variation in observed dividend smoothing simply reflects variation in the marginal value of smoothing, when dividend smoothing is more valuable for some firms than others. In this case, in equilibrium we may not see a relation between smoothing and market value in the data unless a firm is prevented from achieving its optimal smoothing level. Prior studies, such as those that examine the relation between governance mechanisms and firm value (e.g. Gompers, Ishii, and Metrick (2001)), implicitly assume that some firms fail to implement value-maximizing policies due, for example, to managerial entrenchment. Our test of the relation between market-to-book and smoothing relies on a similar assumption.

Alternatively, if investors' preferences toward dividend smoothing are heterogeneous, so that some investors value smooth dividends more than others, this could result in smoothing clienteles in equilibrium. Indeed, Modigliani and Miller (1961), Black and Scholes (1974), and Miller (1977), have already suggested that a firm's dividend level can affect its investor clientele without affecting prices in equilibrium, as long as enough firms provide the appropriate dividend stream to satisfy each clientele's demands.

To explore this possibility, in the last part of our study, we examine whether there exists an investor clientele for smooth dividends. We find that there is. Institutional investors are significantly more likely to hold dividend smoothing stocks, while retail investors are less likely, even controlling for other factors that could potentially affect clientele (Gompers and Metrick (2001), Grullon, Kanatas, Weston (2004)). This is particularly surprising in light of the fact that institutions shy away from stocks that pay high levels of dividends (Grinstein and Michaely (2005)), and dividend smoothing is associated with high dividend yields. Moreover, managerial surveys, summarized in Brav et al. (2005), show that "executives believed that if there was any class of investors that preferred dividends as the form of payout, it was retail investors."

To further understand why firms may want to attract an institutional clientele, we examine which *types* of institutions exhibit a preference for dividend smoothing stocks. We find that only mutual funds display a significant and robust tendency to hold shares of firms that smooth. Previous studies document the monitoring ability of large mutual funds (e.g., Brickley, Lease and Smith (1988), Almazan, Hartzell and Starks (2005), and Chen, Harford and Li (2007)). This monitoring benefit may create an incentive for firms to use smooth dividends as a mechanism to attract a mutual fund clientele. The existence of the mutual fund clientele along with the absence of ultimate effect on firm value offers several interpretations. It is possible that smoothing is used more by firms for which this monitoring is more valuable (such that we observe no value differential in equilibrium). Alternatively, the costs firms bear to smooth their dividends could be offset by the benefits of smoothing.

To summarize, despite the prevalence of dividend smoothing, and the apparent view among managers that investors prefer a smooth dividend stream, we find little evidence that smoothing dividends has any significant effect on market values or expected returns. On the other hand, smoothing does impact the clientele of investors holding a firm's stock. This clientele effect may explain why there is no robust relation between smoothing and returns in equilibrium. The desire to attract mutual fund investors may also provide an alternative motivation behind managers' efforts to maintain smooth dividends.

The remainder of the paper is organized as follows. The next section explains our measures of dividend smoothing and describes the sample and its properties. Section II provides evidence on the market reactions to dividend changes. Section III examines whether dividend smoothing is priced in stock returns, while section IV investigates the relation between smoothing and market value. Section V studies the relation between dividend smoothing and a firm's investor clientele and Section VI concludes.

I. Data and Summary Statistics

In this section we describe the methodology behind the construction of the dividend smoothing measures and the data used for the calculations of those variables. Since we implement a battery of different tests throughout the paper, we will elaborate on the empirical analysis, the sample used and the construction of the other variables in the corresponding sections.

a. Measures of Dividend Smoothing

For the estimation of smoothing, we use all firms listed in both the Compustat and CRSP databases, excluding financial firms (SIC codes 6000-6999), for the period 1970-2011. We also supplement this data with firm-level data from Moody's Industrial Manuals for all industrial NYSE firms going back to 1926 (see Graham, Leary, and Roberts (2013) for a description of this data source).

We construct our measures of smoothing as suggested by Leary and Michaely (2011). The first measure of dividend smoothing, the speed of adjustment (*SOA*), is derived from a modified partial adjustment model of Lintner (1956). We use a two-step procedure to compute it. First, we estimate target payout ratio ($TPR_{i,t}$) for firm *i* as the median payout over a 10-year period (that is, period (*t-9*) through *t*). Next, at every period *t* we obtain the deviation from the target payout (dev_i) using the following formula:

$$(1) \qquad dev_{i,t} = TPR_{i,t} * E_{i,t} - D_{i,t-1},$$

where $E_{i,t}$ is the earning per share, and $D_{i,t-1}$ is the level of dividends per share (*DPS*) in the previous period. Finally, to estimate the speed of adjustment, we regress the changes in dividends on the deviation from the target payout (dev_i):

$$(2) \qquad \Delta D_{i,t} = \alpha + \beta_i * dev_{i,t} + \epsilon_{i,t}$$

SOA is the coefficient of the deviation variable (β). The higher its magnitude, the more the firm changes its dividend level to adjust for changes in earnings, and the less smooth its dividend, relative to earnings.

While this methodology is closely related to the one originally proposed by Lintner (1956), it has several important differences. First, as suggested by Fama and Babiak (1968), and later verified in the survey study by Brav et al. (2005), the level of dividend per share is the key metric for payout policy. Therefore, we divide both dividends and earnings by the number of shares outstanding, adjusted for stock splits.

Second, Leary and Michaely (2011) show that estimating dividend smoothing based on a relatively short sample generates small-sample bias, which varies with the true level of SOA and could potentially mask cross-sectional differences among stocks within the sample. Employing the two-step procedure, described above, helps mitigate this concern. Using a simulation exercise, Leary and Michaely (2011) demonstrate that estimating the speed adjustment from an explicit deviation from the target payout ratio mitigates the small-sample bias, and also reduces the dependence of the bias on the true SOA.

Finally, the original Lintner (1967) model assumes that the firm has a target payout ratio and gradually converges towards it. This assumption is less plausible today, given the survey by Brav et al. (2005) that demonstrates that almost 40% of the CFOs target dividend per share rather than the payout ratio. To incorporate this finding, we also construct an alternative measure of dividend smoothing, which is model-free. Our second measure of dividend smoothing is relative volatility *(RelVol)*, and it captures the ratio of dividend volatility to earnings volatility without imposing the partial adjustment structure. To obtain it, for every stock during a 10-year period we fit a quadratic trend to both the split-adjusted dividend and the scaled, split-adjusted earnings series:

$$(3) \qquad AdjDPS_{i,t} = \alpha_1 + \beta_1 * t + \beta_2 * t^2 + \epsilon_{i,t}$$

$$(4) \qquad TPR_i * AdjEPS_{i,t} = \alpha_2 + \gamma_1 * t + \gamma_2 * t^2 + \eta_{i,t}$$

The final measure *RelVol* is computed by dividing the root mean square errors from the regression of adjusted dividends per share by the root mean square errors from the regression of the split-adjusted earnings series. High *RelVol* implies that the volatility of dividends is high relative to the volatility of earnings, and the firm's dividend smoothing is low. Thus, relative volatility reflects variation in volatility of dividend payments regardless of the correlation between changes in dividends and distance from optimal target payout. Leary and Michaely (2011) implement a simulation analysis to validate this model-free measure against true smoothing behavior, and show that RelVol varies monotonically with the degree of smoothing.

Both measures are estimated by firm for each 10-year rolling window period. As a result, we obtain a time-series of speed of adjustment (*SOA)* and relative volatility (*RelVol*) for each firm for the period of 1979-2011. For each rolling time period we require 10 non-missing observations and one positive dividend observation to calculate each smoothing measure. We also remove observations before each firm's first positive value for DPS and after each firm's last positive DPS. To mitigate the effect of outliers, we trim the top and bottom 2.5% of the resulting distribution of *SOA* and *RelVol*.

b. Control Variables

For our control variables we use Compustat, CRSP, and 13F databases at the annual frequency. Variable definitions are described in Appendix A. We lag all the Compustat variables by one year to avoid the problem of reports being released during the following year. To be included in the sample, we require that a firm have non-missing values for the following variables: *SOA* or *RelVol*, *Assets* and share price. To mitigate the impact of outliers, we impose an upper bound of 20 to M/B ratio, and an upper bound of one to leverage, ratios of R&D and advertising to assets, and the proportion of institutional holdings. Finally, we remove observations with dividend yield higher than one. The final sample consists of about 29,000 firm-year observations for the *SOA* measure and about 27,000 for *RelVol*. The number of firms each year ranges between 510 and 1,244.

Since the methodology of computing the speed of adjustment is applicable only to dividend paying firms, our final sample is a subgroup of the Compustat universe.[1] However, in

[1] A potential concern arises as a result of limiting our sample to dividend paying firms only. However, while in a study of dividend *levels* it is important to examine firms that pay zero dividends, this is not the case in the research of dividend *smoothing* behavior. Firms that do not pay dividends have a constant dividend stream of zero, which mechanically assigns them to the top smoothing group. The behavior of those firms is fundamentally different from the behavior of firms that pay constant and positive dividends. We therefore, exclude firms that do not pay dividends from our analysis.

terms of market capitalization the final sample captures a substantial proportion of the overall Compustat firms, and represents almost 47% of the overall equity traded.

c. Summary Statistics

Table 1 shows the distribution of the main control variables across smoothing quintiles. Panel A presents the results based on the speed of adjustment as a proxy for smoothing, and Panel B is based on relative volatility. The distribution of control variables across smoothing quintiles is very similar for both measures. High dividend smoothing firms are larger, older, and more leveraged compared to the low-smoothing firms. Firms that smooth more also tend to pay higher dividend. Thus a firm in the bottom RelVol quintile pays 3% compared to 2.5% for firms in the top RelVol quintile. Finally, institutional ownership is significantly higher for the high-smoothing firms than for the low-smoothing ones across both definition of dividend smoothing.

II. Market Reaction to Dividend Changes

a. Asymmetric reaction to cuts and increases

Survey evidence in Brav et al. (2005) shows that managers feel strongly that the penalty for reducing dividends is substantially greater than the reward for increasing them. This provides a natural motivation to smooth dividends and avoid dividend increases that may subsequently need to be reversed. To explore the asymmetry in the market's reaction to dividend changes, we first compare announcement returns associated with dividend increases to those for decreases. To identify the sample, we start with all dividend change announcements of stocks traded on NYSE, AMEX or NASDAQ for the period of 1970-2011.[2] To eliminate cases of small changes due to rounding and recording of stock splits, as well as extreme observations, we limit the dividend announcements to those with absolute value of changes in quarterly common dividends per share (DPS) between 12.5% and 500% (see for example, Grullon, Michaely and Swaminathan, 2002).[3] Next, we restrict the sample to distribution events in which the declaration date is a non-missing trading date, and there is no more than one dividend announcement made

[2] We focus on quarterly taxable cash dividends (distribution code 1232), and eliminate stocks of closed-end funds, certificates, and REITs, as well as announcements of dividend initiation or omission. We also require that the previous dividend was paid within 20-90 trading days window, and that financial data is available on CRSP and Compustat.

[3] While removing the lower bound reduces the average abnormal announcement return, it does not affect any of the relationships we document.

per event. For every dividend change, we calculate 3-day CAR as the cumulative return of the stock of the announcing firm around the event ((-1; +1) trading days) minus the CRSP value-weighted market return.

Table 2 presents summary statistics for dividend cuts (Panel A) and increases (Panel B). A comparison of the first row in each panel reveals that the mean and median absolute market reaction is about twice as large for dividend cuts as for increases. The differences are highly significant (unreported). However, the magnitudes of dividend cuts are also larger (median of -49% for cuts compared to 20% for increases).

Therefore, in Panel A of Table 3, we compare the average market reactions for cuts and increases of comparable size. While small dividend increases evoke a slightly stronger response than small cuts (see the bottom row of Panel A), for every dividend-change size category greater than 20% the CAR is larger in magnitude for cuts than increases, and the differences are statistically significant. This seems consistent with managers' views that they are penalized more for cutting dividends than they are rewarded for an equivalent increase. However, the results in Panel B show that this is driven largely by the first time a firm cuts its dividend. In Panel B, we repeat the analysis of Panel A only for those firms that have cut their dividend in the past. [4] Here we see that the asymmetry largely disappears, and the differences (in absolute value) in the market responses to increases and decreases are insignificant. This suggests that among firms for which investors are not expecting a smooth dividend because those firms have already cut their dividends in the past, there is not a significant penalty for dividend cuts relative to equivalent increases.

Table 4 extends the previous analysis to a multivariate setting, allowing us to control for other firm characteristics that may affect the market reaction to dividend changes. The market response to dividend changes is regressed on an indicator for the direction of the cut (*Dummy for dividend cut*), the magnitude of the dividend change, and the magnitude interacted with an indicator for whether the firm has cut its dividend previously, along with a vector of firm-level controls. The results are consistent with our previous findings. Unconditionally, market reactions to cuts are greater than for increases. Thus, the results in columns (1) and (2) demonstrate that while the intercept is greater for dividend increases (0.02 for increases versus -

[4] Since the sample used in the analysis of this section starts in 1970, firms that have cut their dividends before 1970 can be potentially omitted from inclusion in Panel B. However, the bias due to imperfect classification works against our findings that the asymmetry is driven primarily by the first time dividend cutters.

0.002 (0.02-0.022) for decreases, as reported in column (2)), cuts have a slope with respect to the magnitude of the change almost four times that of increases (0.041 vs. 0.01). However, the negative coefficient on the interaction between the past cuts indicator and the magnitude of the dividend cut reveals that the asymmetry is eliminated when a firm has previously reduced its dividend. To test for the impact of previous history of dividend cuts, we add an additional dummy variable that takes on a value of 1 if a firm has cut dividends before (*Dummy for past cuts*), as well as its interaction with the other variables of dividend changes (column 3). For a firm that has cut its dividend previously, the sensitivity of CAR to dividend changes is 0.012 (0.065 - 0.053) for cuts and 0.011 (0.013 - 0.002) for increases, consistent with the univariate findings in Table 3.

b. Cumulative impact of dividend changes

One implication of a preference for dividend smoothing is that the dividends path matters: Investors put a higher value on firms with smoother dividend paths. The previous analyses compares stand-alone announcements of dividend changes of comparable size, and does not completely facilitate comparison of firms that implement the same overall change in dividends with a series of small (smooth) changes versus larger, more volatile changes. In Table 5 we address this issue by examining the cumulative effect of the market reaction to all dividend changes announcements for a given firm. To do so, we partition our data into four 10-year periods: 1970-1979, 1980-1989, 1990-1999, and 2000-2009. We then calculate the 3-day CAR surrounding each dividend change in that period, as described above, and sum those market reactions for every firm over each 10-year period. Finally, we regress the decade-long cumulative CAR on the total dividend change, the total magnitude of dividend cuts over the decade, along with control variables for initial dividend level and average firm performance over the decade, as well as a decade fixed effect.[5] Intuitively, this compares the cumulative stock price impact during dividend announcement periods for a firm that increases its dividend by 10 cents per share via five 2-cent increases to an equivalent firm that achieves the same 10 cent increase with three 5-cent increases and one 5-cent cut. A significant coefficient on the total decreases

[5] Both the total dividend change and the sum of dividend cuts are scaled by the dividend per share at the end of the previous decade.

variable would indicate that the path of dividends matters for a firm's stock price, over and above the total change in dividend per share.

The results indicate that the path of dividends matters little for cumulative announcement returns over and above the total dividend change. The coefficient on the *Sum of all dividend changes* has a positive sign, as expected. However, the coefficient on the *Sum of decreases* in columns (1) and (2), by contrast, is economically tiny and statistically insignificant. This suggests that while the total change in dividends is relevant for cumulative announcement returns, the path by which a firm arrives at their new level has little relation.

In columns (3) through (6) we measure the smoothness of the dividend path using our two proxies for smoothing, *SOA* and *Relative Volatility*, rather than the amount of dividend cuts. We again find no evidence that smooth dividend changes are associated with higher total cumulative returns around dividend announcements. The coefficients on *SOA* and *RelVol* are marginally significant, and have the opposite sign (columns (3) and (5)), and becomes insignificant once we control for firm characteristics (columns (4) and (6)).

To summarize, when comparing the total change in dividends over a longer period (decade), the cumulative market response to a given amount of change in dividends is independent of the path. Moreover, we find that the market reacts more severely to only the first dividend cut relative to an increase of similar size. All subsequent dividend cuts are greeted with similar reaction (in absolute value) to dividend increases of the same magnitude. Thus, we find no evidence that differential responses to dividend cuts and increases generate an association between dividend smoothing and stock prices.

c. Does smoothing enhance the credibility of dividend increases?

We conclude this section by considering the possibility that even if smoothing policy does not affect value directly, it may influence the market's reaction to dividend changes. In particular, one reason managers may have an incentive to smooth dividends is that smoothing affects firm's reputation and credibility. If investors believe a firm is committed to maintaining a smooth dividend, a positive dividend change is more likely to be perceived as permanent, and therefore should have a larger effect on valuation. In this case, firms may limit dividend increases and avoid dividend cuts in order to enhance the credibility of their dividend announcements. This also provides an additional test of the relation between smoothing and value. That is, we ask here whether investors value a dollar of dividends more if it comes from a firm that smoothes its dividend.

To test the association between smoothing and the market reaction to dividend increases, we examine the impact of a firm's smoothing policy on the market's reaction to dividend increases. Since we are interested in the "bang-for-the-buck" effect of dividend changes, we use the total dollar change in dividends, rather than the percentage change in dividend per share. Specifically, we calculate the total dollar change in dividends by scaling the difference between the product of the number of shares outstanding and the dividend per share in quarter *t* versus (*t-1*), by firm assets.[6] To mitigate potential effect of outliers, we winsorize the total change in dividends scaled by assets, as well as the total dividends scaled by assets, at a 1% level (for robustness, we repeat the estimations using non-winsorized variables, and our findings remain similar). The results are presented in Table 6. The main variables of interest are the cross-terms of the dividend changes and smoothing (*SOA* in Panel A and *RelVol* in Panel B), measured over the ten-year period prior to each dividend change. If smoothing increases the value to investors of a dividend, then the coefficient on the interaction of positive dividend changes and smoothing (*Dividend change (if>0)*SOA[RelVol]*) should be negative and significant. The coefficients on dividend smoothing, as well as their interactions with the magnitudes and the directions of dividend changes, indicate that past dividend smoothing behavior does not seem to be related to the market reaction to dividend increases. In columns (1) and (2), we also interact negative changes in dividends with our dividend smoothing measures SOA and RelVol to be consistent with specifications in Table 4. Column (3) focuses on dividend increases only. In all three cases, we do not find any significant relationship.

One concern with the analysis here is that if the market's reaction to dividend changes is correlated with some firm characteristics, which, in turn, are also correlated with smoothing policies (e.g., agency conflicts), then our parameter estimates may be biased. To mitigate these concerns, in column (4) we utilize the introduction of the "safe harbor" provision of rule 10b-18 in 1982 as a source of plausibly exogenous variation in dividend smoothing. Grullon and

[6] In some cases the nature of dividend change event according to the total dollar change definition may be different from the nature of dividend change according to the DPS definition. For example, an event may be considered a dividend increase according to the DPS percentage change definition, but a dividend cut according to total dividend approach, which happens due to small changes in the number of shares outstanding, not captured by the share adjustment factor. We omit the cases of cross-definition inconsistency from the analysis of this subsection. We also repeat all the estimations using DPS-based definition of dividend changes, and our main conclusions remain unchanged.

Michaely (2002) argue that Rule 10b-18 provides a safe harbor for repurchasing firms against the anti-manipulative provisions of the Securities Exchange Act of 1934, and facilitates the increased use of repurchases. Skinner (2008) provides further evidence that this increased use of repurchases facilitated dividend smoothing. As Skinner (2008) states: “repurchases increasingly absorb variation in earnings…while the relation between earnings and dividends becomes weak.”

Figure 1 shows that our smoothing measures indeed declined following the passage of Rule 10b-18. The figure plots the time trend in both *SOA* and *RelVol* over the 1972 to 1992 period. Each point represents the cross-sectional average of each smoothing measure, calculated for each firm using the trailing 10 years of data. While there is little evidence of any trend over the decade prior to the passage of the rule, both series begin a marked decline after 1982. We test the significance of this pattern more formally in Table 7. The table presents the results of panel regressions, using data from 1972 – 1992, of each smoothing measure on a post-1982 indicator (*after*) along with several firm characteristics that may be associated with variation in smoothing. For each firm we include two observations, one in which smoothing is measured over 1972 – 1981 and the other 1983 – 1992. The specifications in columns (2) and (4) include firm fixed effects to capture any unmeasured persistent firm characteristics. The coefficients on *after* indicate a large and highly significant increase in dividend smoothing following the introduction of Rule 10b-18.

In column (4) of Panels A and B of Table 6, we limit the sample to include only dividend increases that occur between 1972 and 1992 and use the post-1982 indicator as our measure of dividend smoothing. If smoothing increases the value investors place on a dividend increase, we would expect a positive coefficient on the interaction between the size of the dividend change and the *after* indicator. Instead, we find a negative and insignificant coefficient.

Taken together, the results in Tables 4 and 6 suggest that once the market incorporates the first dividend cut into the stock prices, it no longer has a memory for the path of dividend changes when evaluating the implications of a new dividend change announcement.

III. Is Smoothing Priced?

So far, our examinations of the market’s responses to dividend changes conditional on various measures of smoothing show that beyond the first cut, investors react similarly to dividend cuts and increases, and the cumulative response to dividend changes is unrelated to the smoothness of those changes. Thus, there is no evidence that market reactions to dividend changes create a link between smoothing policies and stock prices. However, if investors value a smooth dividend stream, and are willing to pay a premium to hold shares of a firm that provides it, dividend smoothing may reduce the firm's overall cost of equity capital. Focusing only on dividend announcement periods may be too narrow to detect the value relevance of dividend smoothing. Therefore, in this section, we study the relationship between dividend smoothing and expected stock returns more generally.

Prior studies suggest several reasons why investors may be willing to pay a premium for smooth dividends, including behavioral preferences (Baker and Wurgler (2011)), assurance of management's commitment not to expropriate cash (Myers (2000) and Fluck (1999)) and establishment of a reputation for fair treatment of dispersed shareholders (e.g., Shleifer and Vishny (1997), Gomes (2000), DeAngelo and DeAngelo (2007)). If investors are willing to pay more for these shares, we would expect lower subsequent returns, all else equal, reflecting the lower cost of capital.

We start with a simple univariate analysis of firm equity returns as a function of smoothing. In each year *t*, we divide all the firms in the sample into deciles based on our two measures of dividend smoothing estimated over the 10 year period from t-10 through t-1. We then calculate the mean and median monthly returns from *t* to *t+1* of all firms within each smoothing decile portfolio. We examine this relationship over our main sample period of 1970 – 2011 as well as an extended period that includes returns back to the beginning of CRSP coverage in 1926.

The results are presented in Table 8. For both sample periods and both smoothing measures, there is no discernible pattern in average returns across smoothing deciles. Statistically, there is no significant difference in either mean or median returns between the highest and lowest deciles.

In Table 9 we examine whether the lack of a relationship in the univariate analysis reflects differences in risk across firms with different smoothing policies that mask the impact of smoothing on returns ceteris paribus. To do so, we estimate factor model regressions similar to those in Fama and French (1993) and test whether firms with different degrees of smoothing have different expected returns after controlling for different loadings on the market return, Size, Book-to-Market, and momentum factors.

In June of every year *t*, we sort all the firms in our sample into smoothing deciles as of *t*-1. The smoothing measure in year *t*-1 is obtained from the estimation of *SOA* [*RelVol]* from the stream of dividends and earnings during the period (*t*-10) through *t*-1. We use the three bottom deciles of the speed of adjustment variable to construct the portfolio of high-smoothing firms, and the top three to construct the portfolio of the low-smoothing firms. We then create equal- and value-weighted portfolios of firms in the top smoothing (Low SOA[RelVol]), bottom smoothing (High SOA[RelVol]) and medium smoothing groups (Medium SOA[RelVol]) and calculate their monthly returns starting from July, t and ending in June, t+1. At the end of the period portfolios are re-formed and the return calculations are repeated. As a result, we obtain a time-series of returns for each of the three smoothing portfolios. We also use the difference between the top and the bottom smoothing groups to create a strategy that is long low-smoothing firms and short high-smoothing firms. We regress the time-series of excess monthly returns of each portfolio on the Fama and French (1993) three factors plus the momentum factor (Carhart (1997)):

$$(5) \quad R_{p,t} - R_{f,t} = \alpha + \beta^{Mkt}(R_{m,t} - R_{f,t}) + \beta^{SMB} SMB_t + \beta^{HML} HML_t + \beta^{MOM} MOM_t + \varepsilon_t$$

Table 9 presents the intercept estimates of regressing the returns of each one of the portfolios on four factors. Panel A summarizes the results using the 1926-2011 sample period, and in Panel B we focus on the more recent period from 1970 – 2011. There appears to be no consistent pattern in the estimated alphas across dividend smoothing portfolios. Further, the alpha on the high minus low smoothing portfolio is statistically insignificant in all specification and is of inconsistent signs.

Daniel and Titman (1997) argue that returns differentials based on size and book-to-market are better explained by firm characteristics themselves than by their associated risk factors. Therefore, as further robustness, we also examine the relation between smoothing and returns in a specification that controls for firm characteristics associated with returns differentials.

We first estimate Fama-MacBeth (1973) cross-sectional regressions of returns as a function of standard firm characteristics, such as size, Book-to-Market, and beta, and ask whether dividend smoothing explains returns beyond those variables. To construct the explanatory variables, we closely follow the methodology of Fama and French (1992) in matching the timing of variable measurement. Thus, we measure firm size (log of market value of the firm, *ln(ME)*), as of June, *t* and log of Book-to-Market equity (*ln(BE/ME)*) as of December, *t-1*.

Post-ranking beta is computed in two steps. First, we estimate "pre-ranking beta" for each stock based on contemporaneous and one-month lagged market returns for the CRSP value-weighted index. The sampling window is 60 months, and we require at least 24 months of non-missing return observations. The estimates are updated every June of year *t*, so that in June of every year we estimate beta over the past 5 years.

To estimate post-ranking beta, we first sort stocks into size deciles each month using NYSE breakpoints, as in Fama and French (1993).[7] We further divide each size decile into 10 deciles based on pre-ranking beta. For each of the resulting 100 size-beta portfolios we calculate equally-weighted monthly returns over the sample period. Finally, we regress the obtained monthly returns of each portfolio on the contemporaneous and lagged returns of the CRSP value-weighted index. The sum of the coefficients is the post-ranking beta, which is assigned to each stock in the specific size-beta group for use in the analysis.

In addition to post-ranking beta, size and Book-to-Market ratio, in an alternative specification we also include dividend yield (common dividend scaled by market value, as of *(t-1)*) as an additional characteristic variable, since it is important to separate the impact of smoothing on returns from the impact of dividend *level* on returns. Using these variables, every month we estimate the following specification:

$$(6)\ r_{i,t} = \alpha + \gamma_1\beta_{i,t} + \gamma_2 ln(ME)_{i,t} + \gamma_3 ln(BE/ME)_{i,t} + \gamma_4 DivYield_{i,t} + \gamma_5 Smooth_{i,t} + \varepsilon_t$$

Table 10 presents the results of the monthly cross-sectional estimation of stock returns as a function of the risk-proxying variables and smoothing measures. The estimates of the alternative specification that includes dividend yield are reported in columns (2) and (4). The

[7] Obtained from Kenneth French's website at
http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

sign of the coefficients on control variables are largely in line with previous studies: smaller firms and higher book-to-market firms earn higher expected returns. More important for our purposes, the coefficients on the smoothing measures are consistent with the univariate findings. Both proxies for smoothing have statistically insignificant and economically small coefficients, and do not change much after controlling for dividend yield. The results suggest that firms that smooth their dividends do not achieve a lower cost of equity capital than those that do not.

For robustness, we perform several additional tests. First, we verify that the results of Tables 8 - 10 are not influenced by an omitted risk factor. Novy-Marx (2013) demonstrates that profitability factor generates the same power as book-to-market in explaining cross-section of returns. Since more profitable firms can more easily commit to a constant stream of dividends, the factor could affect out findings. We repeat the Fama-French analysis including the profitability factor and find that alphas of portfolios with various degrees of divided smoothing remain insignificant.[8] Next, we test whether dividend smoothing could be more pronounced during the periods of economic recessions, when the investors' reliance on dividend payouts could be stronger. We use the NBER Business cycle expansion and contraction periods to identify periods of recession starting from 1926, and repeat the univariate and multivariate analyses for periods of recession only. Again, we find that dividend smoothing firms do not enjoy higher returns during economic slowdowns.

IV. Dividend smoothing and firm value

In this section, we take an alternative approach to testing for an investor preference for smooth dividends by examining the association between smoothing and firm value. Following earlier studies relating corporate policies to value (e.g., Gompers, Ishii and Metrick (2003), Rountree, Weston and Allayannis (2008)), we use the market-to-book assets ratio to proxy for firm value and test for a relation with dividend smoothing.

This approach has the advantage that it allows for smoothing to relate to firm value either through the cost of capital (the focus of the previous section) or through expected cash flows. For example, some authors have argued that a commitment to smooth dividends may limit the agency costs of free cash flow (Easterbrook (1984), Allen et al. (2000)). In that case, a history of

[8] The profitability factor was obtained from Novy-Marx website at http://rnm.simon.rochester.edu/data_lib/index.html.

smooth dividends may increase investors' expectations of future cash flows. However, a significant caveat of using M/B in the analysis is that it inevitably captures future growth opportunities of the firm, which are impounded into market value. Since previous studies provide evidence that firms with higher growth opportunities smooth less (e.g., Leary and Michaely, 2011), the task of comparing the market values of two firms with different dividend smoothing policies, while keeping the growth opportunities constant, becomes challenging. We partially address this issue by i) controlling for other proxies for investment opportunities, ii) studying within-firm changes in value, and iii) comparing firms at similar points in their life cycles. Focusing on within-firm changes in value removes any firm-specific time invariant differences in the level of investment opportunities not captured by the included controls. In order to compare firms at similar points in their life-cycles, we measure smoothing and value changes over the first decade that a firm pays a dividend. Previous literature (e.g., Grullon et al (2002), DeAngelo et al. (2006)) demonstrates that firms begin paying dividends when they reach a mature state in which profits from past investments are large relative to capital needs for investment opportunities. As a result, it is plausible to assume that firms start paying dividends when they reach a similar point on their growth curve. This reduces the scope for heterogeneity across firms in the rate of change of growth opportunities. Further, by focusing on the first 10 years of dividend payments, we study the period in which investors first learn about a firm's smoothing policy and thus the period in which valuation effects are most likely to be apparent.

We examine the changes in the market to book ratio of the firm over the first ten years after the first dividend payment as a function of its dividend smoothing behavior, estimated throughout the first decade of dividend payments. We start by identifying the first year of dividend payment (*t*) for each firm. For firms that are dividend payers by the time they go public, we use the first available Compustat year data. We then calculate dividend smoothing starting from year (*t*+1) through year (*t*+10). We control for the initial level of dividends, as well as the size of the firm at the year of dividend initiation, since variation in firm size can initiate different growth paths. To control for changes in growth opportunities and other firm characteristics that affect firm value throughout the decade, we include sales growth and changes in profitability, asset tangibility, and leverage between *t* and (*t*+10). In Specification (2), we add changes in capital expenditures, R&D and advertising expenses as additional proxies for changes in investment opportunities of the firm. As a result, we estimate the decade-long changes in the market to book ratio of firms that initiated dividend payouts as a function of smoothing and control variables. To account for potential clustering of dividend initiations through time, year fixed effects are included in all the estimations.

The results are presented in Table 11. The coefficients on control variables have expected signs: profitable firms are valued higher by the market, while sales growth has a negative effect on M/B ratio, consistent with the idea that as firms mature, they exercise their growth opportunities and accumulate a higher proportion of tangible assets. At the same time, while the signs of the dividend smoothing variables are negative, suggesting that lower SOA [RelVol], or higher degree of smoothing, increases firm's market value, the proxies for smoothing have statistically insignificant coefficients in all the four specifications, and the coefficients are economically small. For example, the coefficient of -0.134 on SOA in column (2) implies that a one standard deviation decrease in SOA, which equals 0.29 in this sample, is associated with a decade-long change in M/B of less than 0.04. Overall, the results suggest no significant difference in market valuation between firms that smooth their dividends and those that do not.

V. Dividend smoothing and investor clientele

The results in the previous sections suggest that there is little if any relationship between dividend smoothing and firm value. This leaves as a puzzle the question of why firms seem willing to bear costs in order to maintain a smooth dividend over time. One possibility suggested by Lambrecht and Myers (2012) is that firms smooth dividends because of managers' desire to smooth their rent extraction rather than investors' desire to receive a smooth cash flow. Alternatively, differences across investors in their preference for smooth dividends may lead to a clientele effect. Modigliani and Miller (1961) argue that dividend policies can influence a firm's investor clientele even if it does not have implications for equity valuation. In their words:

> "If, for example, the frequency distribution of corporate payout ratios happened to correspond exactly with the distribution of investor preferences…each corporation would tend to attract to itself a 'clientele' consisting of those preferring its particular payout ratio, but one clientele would be entirely as good as another in terms of the valuation it would imply for the firm." (p. 431)

Thus, if some (but not all) investors have a preference for smooth dividends, then enough firms will supply smooth dividend streams such that in equilibrium there is no effect on prices.

To determine whether there is a dividend smoothing clientele, we start by examining whether the propensity to hold dividend smoothing stocks varies across investor types. We first perform a simple non-parametric analysis to distinguish between two broad groups of investors: institutional versus retail. For each firm in the sample we calculate the overall number of common shareholders (*#Invest*), in thousands. The size of the investor base proxies for the number of retail investors holding the stock.[9] We also obtain the overall number of institutions (*InstNum*) and the percentage of shares held by institutional investors (*InstHold*) from Thomson Financial's 13F filings. We use both the number and the percentage of institutional holding to account for potential differences in stock holdings of large versus small institutions. Every year we independently sort all the stocks in the sample into quintiles of smoothing and quintiles of dividend yield. We then average the investor and institutional holdings across each of the resulting 25 dividend yield-smoothing portfolios and report our results in Table 12.

Two clear trends emerge from the table. First, except for the lowest quintile of dividend yield, both the number and the weight of institutional ownership decrease with the dividend level, consistent with Grinstein and Michaely (2005). While institutional investors tend to hold firms that pay dividends as opposed to those that do not, within the dividend paying sample institutions seem to avoid high levels of dividends. Second, within each dividend yield group, institutions exhibit a clear preference for dividend smoothing firms. Among the firms in the low yield quintile, institutions hold only 39% of the shares of low dividend smoothing firms (as measured by *SOA*), but they own almost half of the equity (46%) of high-smoothing firms (Panel C). The pattern remains robust, although somewhat less significant, when we look at the overall number of institutions, rather than their relative weight, and suggests that the preference for dividend smoothing firms is not driven by institutions of a particular size. At the same time, we do not observe a clear preference of retail investors toward dividend smoothing firms (Panel A). While the number of shareholders is higher for high- smoothing versus low-smoothing firms

[9] While the overall number of investors includes both the retail and the institutional investors, the number of institutions constitutes a very small portion of the overall shareholder base. The ratio of the number of institutions to the number of overall investors for a given stock has a median of 1.3% and does not exceed 6.3% for 90% of our sample firms.

within the top dividend yield quintile, there is no pattern for the rest of the sample. As also reported in the table, using relative volatility instead of *SOA* to measure smoothing yields very similar results.

To ensure that this relation between dividend smoothing and investor clientele is not an artifact of correlation between dividend smoothing and other variables, such as age and turnover, which are also correlated with institutional holding, we turn in Table 13 to a multivariate analysis. We estimate the number of the overall investors, the number of institutions and the percentage of institutional holding for each firm as a function of dividend smoothing and control variables. We employ a set of commonly used firm characteristics that were found to be correlated with institutional holding by previous studies (Gompers and Metrick (2001), Grullon, Kanatas, Weston (2004)) as our control variables. We use a firm's size, age, and price reciprocal to control for the size and maturity of the firm. Since some institutions, such as pension and mutual funds, have a number of restrictions on the types of firms they can invest in, they usually prefer larger and more stable firms. We use stock returns and EBITDA as the performance measures of the firm. Asset tangibility, the ratio of Market-to-Book assets (*M/B*), and leverage control for additional factors that are correlated with smoothing and may affect investor composition as well. We also include advertising and R&D expenses to account for investment in intangible assets, such as technology and brand. Finally, we use turnover to capture the liquidity of a firm's stock and the standard deviation of stock returns to proxy for its risk. To distinguish the effect of dividend smoothing from the impact of dividend level, we include the dividend yield. All the clientele variables are converted into natural logarithms (the dependent variables become *ln(#Invest), ln(InstNum), and ln(InstHold)*) to mitigate the impact of positive skewness in the distribution of individual and institutional holding on the estimation parameters.[10]

Table 13 summarizes the estimation results with the overall number of shareholders, number of institutions and institutional holdings as the dependent variables. Similar to the previous findings, institutions prefer holding profitable and liquid (in terms of turnover) firms, and as opposed to individuals, do not base their investment decisions on leverage and R&D expenses of the firm. Consistent with the non-parametric analysis above, institutions do not like

[10] To incorporate values of zero into our analysis, we add 1 to the number and percentage of institutional holdings, before converting it to logarithms.

high dividend payouts. However, they do like dividend smoothing firms. The coefficient on *SOA* is negative and significant for both the number of institutions and the proportion of institutional holding (-0.252 and -0.039, respectively). Similar results are obtained for *RelVol* (Panel B), confirming that the findings are robust to using different measures of smoothing. The implications remain similar whether we use the number or the proportion of institutional holding, suggesting that the results are not driven by a few large institutions, but rather hold for the overall universe of institutional investors. The relation between the number of shareholders (*ln(#Invest))* and firms' characteristics are quite different from the institutional picks. Overall, retail investors prefer firms with lower profitability, as well as firms that pay high dividends. Another striking difference is their negative attitude towards dividend smoothing: As opposed to institutions, retail investors not only do not like dividend smoothing, but also exhibit a certain preference towards a volatile stream of dividends, as suggested by positive and significant coefficients on *SOA* and *RelVol*.

To confirm the robustness of our results, we consider alternative specifications, which include *log(ME)*, *log(Assets)*, *Payout* and *TotYield* as control variables. The main conclusions are unchanged. The significance of the results also holds when we re-estimate the results for the subsample of firms with positive institutional holdings only.

The differences across investor types in the tendency to hold dividend smoothing stocks suggests the existence of a smoothing clientele, which may offer an explanation for the lack of relationship between smoothing and expected returns. In addition, it may provide an alternative motivation for firms to smooth their dividends: to attract a particular investor base. For example, in Allen, Bernardo, and Welch (2000), a high and steady dividend may attract informed institutional investors, who prefer dividend payouts for tax purposes. These institutions in turn reduce a firm's agency and asymmetric information costs through their monitoring and information gathering roles. Alternatively, as discussed by LaPorta et al. (2000), investors may reduce agency conflicts by directly influencing firms' payout policies. Crane, Michenaud and Weston (2012) provide recent evidence that institutional investors in particular influence firms' dividend payouts.

To explore this possibility, we next ask which types of institutions are most likely to hold stocks with smooth dividends. We first break the overall institutional holding into groups by investment types, as defined in Thomson Financial's 13F database. There are five major types of institutions. Type 1 is bank trusts, Type 2 is insurance companies, Type 3 consists of investment companies (primarily mutual funds), Type 4 is investment advisors (mostly large brokerage firms), and all the other institutions are classified as Type 5, which is mainly pension funds and endowments. The classification of institutions has changed at the end of 1998 as a result of Thomson database integration. While the aggregate institutional holding remains the same, the decomposition of holdings by type has a structural break, impossible to correct. As a result of this mapping error, starting from 1999 some portion of institutions classified as Types 1 through 4 are wrongly labeled as Type 5. To rely on the accurate classification, for the next part of our analysis we use the period of 1980-1998 as our main time period, but we still address the full time period in the robustness test.

We start by re-running the estimation of the overall number of shareholders, the number of institutions and their relative weight in the overall stock holding for the sub-sample of 1980-1998.[11] The results are very similar to the ones reported in Table 13 and are not presented here. We then estimate the specification of Table 13 separately for each institutional type and report the results in Table 14. To account for clustering of observations around zero, the estimation is performed using a Tobit model.

There is substantial variation in the firm characteristics to which different types of institutions are attracted. For example, Panel A shows that while Types 3 (mutual funds) and 4 (investment advisors) prefer to invest in large and profitable firms, mutual funds care about low return volatility, as well as moderate expenses on advertising and R&D, which seem to matter less to investment advisors. At the same time, Type 4 is the only group that prefers firms with low, rather than high, M/B ratios. Institutional groups also seem to exhibit different preferences towards dividend policy. While Type 1 (bank trusts) likes higher payouts, types 2 through 5 prefer lower levels of dividends. Similar patterns emerge when relative volatility is used as the smoothing measure (Panel B).

Interestingly, only mutual funds robustly hold a greater concentration in dividend smoothing firms. The coefficient on *SOA* is -0.009, the only one that is statistically significant in both panels. It also has the highest (absolute) value among all the types in Panel B. The heterogeneity of institutional preferences for dividend smoothing stocks is especially noteworthy given that most types of institutions (except Type 1) are similar in their avoidance of high

[11] This subperiod (except for year 1985) is also characterized by consistent dividend tax rates for investors.

dividend levels. It suggests that dividend level and the degree of dividend smoothing are dissimilar characteristics in their impacts on the investor decision whether or not to hold a stock.

For robustness, we re-estimate the specification using assets and market value as alternative measures of size, and obtain similar results. We also replace *Dividend Yield* with total *Payout* (which includes repurchases) as alternative measures of a firm's distribution of cash, and find that the results are close to the ones reported in Tables 13 and 14. Finally, we rerun all the regressions above using the overall sample of 1980-2010, keeping in mind that the results should be interpreted with caution due to the mapping error in institutional types.[12] Including year dummy variables accounts for the time-series break in the proportion of institutions at the end of 1998 as a result of misclassification. Despite type coding inaccuracy, we still find that the dividend smoothing impact on institutional holding is pronounced mainly for Type 3 (mutual funds) investors. The results for Type 5 (others) are also significant, which is consistent with inclusion some of the mutual funds in the Type 5 category starting from 1999. For the sake of brevity, the results of the robustness tests are not presented here and are available upon request.

The finding that share holdings of stocks with smooth dividends are concentrated among mutual funds is potentially supportive of an agency cost explanation. Several authors document the monitoring ability of mutual funds. For example, Almazan, Hartzell and Starks (2005) present empirical evidence that independent advisors and investment company managers, who have skilled employees and low costs of information gathering, have advantages in monitoring of corporate management. Brickley, Lease and Smith (1988) show that mutual funds and independent investment advisors are more likely to vote their proxies against management. Our methodology does not enable us to separate whether firms use smooth dividends to attract a mutual fund clientele or whether the mutual fund clientele causes firms to provide a smooth dividend. In either case, this evidence is consistent with Leary and Michaely (2011) who find that dividend smoothing is most pronounced among firms most exposed to potential agency conflicts. However, our earlier results (Section IV) show no evidence that smoothing is associated with increased firm value. If smoothing indeed attracts stronger monitors, this suggests that either smoothing is only pursued by those firms facing the greatest agency costs, or

[12] Brian Bushee (http://acct3.wharton.upenn.edu/faculty/bushee/IIclass.html) overcomes the problem of institutional misclassification by carrying the reliable type codes forward in time after 1998 and manually assigning types to new institutions, emerged after 1998. Unfortunately, his classification is not applicable in our study as it does not distinguish between types 3 and 4.

that the costs of maintaining a smooth dividend offset the benefits. In either case, we may not see a relation between smoothing and value in equilibrium, despite the monitoring benefits.

VI. Conclusion

This paper explores why managers care about dividend smoothing. To address this question, we ask whether dividend smoothing by managers reflects investors' preferences and examine whether investors value stocks of dividend smoothing firms differently. We employ several distinct empirical strategies. First we examine the extent of the asymmetric reaction to dividend increases and decreases and their long-run cumulative effect on firms' value. We find much of the perceived asymmetry in the market's reaction to dividend cuts and increases is driven by a firm's first dividend cut. For firms that have cut their dividend in the past (i.e. those not following a dividend smoothing policy), there is little remaining asymmetry. Further, when we examine the cumulative stock price effect of dividend announcements within firms, we find that only the cumulative change in dividends matters. The smoothness of the path by which the firm reaches its new dividend level is insignificant.

Second we explicitly test the effect of smoothing on cost of capital in a series of more formal asset pricing tests. In univariate tests, factor model regressions, and characteristic regressions, we find no evidence that more or less dividend smoothing is associated with differences in expected returns. We also find no significant association between the market-to-book ratio and smoothing policies. This suggests that investors are not willing to pay a premium for a smooth dividend stream.

The lack of evidence that smoothing dividends enhances stock price or reduces the cost of equity capital makes the prevalence of this policy somewhat puzzling. However, these results are consistent with Lambrecht and Myers (2012) who argue that firms smooth dividends not because investors prefer this policy, but because of managers' desire to smooth their rent extraction. Another potential explanation comes from clientele effects. We show evidence consistent with the existence of a dividend smoothing clientele. Institutional investors, in particular mutual funds, are substantially more likely to hold dividend smoothing stocks, while retail investors tend to hold stocks of firms that smooth less. If such clienteles exist, and enough firms provide smooth dividends to satisfy their demands, we may not find a pricing impact in equilibrium despite the popularity of the policy. In addition, this finding suggests that firms may use dividend smoothing to attract a mutual fund investor base, particularly in light of their previously documented monitoring benefits. Finally, it may be that dividend smoothing reflects the preferences not of investors, but of managers, as suggested by Lambrecht and Myers (2012). We hope that future research can help more fully resolve this puzzle.

Appendix A: Variable definitions

 # Invest: total number of common shareholders (CSHR), in thousands.

Age: the number of years since the firm first appeared in the CRSP database

Adver: advertising expenses (XAD), scaled by book assets. Values of zero are assigned to missing observations.

Beta: is computed in two steps. First, we estimate "pre-ranking beta" for each stock based on contemporaneous and market returns for CRSP value-weighted index. The sampling window is 60 month, when we require at least 24 month of non-missing return observations. The estimates are updated every June of year t, so that in June of every year we estimate beta over the past 5 years. To estimate post-ranking beta, we first sort stocks into size deciles each month using Fama and French (1993) size breakpoints[13]. Size breakpoints are based on allocating all the CRSP-Compustat data into deciles based on NYSE breakpoints. We further divide each size decile into 10 deciles, based on pre-ranking beta. For each of the resulting 100 size-beta portfolios we calculate equally-weighted monthly returns over the sample period. Finally, we regress the obtained monthly returns of each portfolio on the contemporaneous and lagged returns of the CRSP value-weighted index. The sum of the coefficient is the post-ranking beta used in the analysis, which is assigned to each stock in the specific size-postbeta group.

Book value of equity: book assets minus book liabilities (LT) minus preferred stock plus deferred taxes (TXDITC).

Cash: cash and short-term investments (CHE), scaled by book assets.

Dividend: common dividends (DVC), scaled by the year-end market assets.

DivYield: common dividends (DVC), scaled by the contemporaneous year-end market capitalization.

DPS: dividend per share (DVPSP_C).

EPS: earning per share (EPSPX).

InstHold: we pick the holdings as they are reported in 13F in December of each year. It is defined as the sum of shares held by all the institutions, divided by the overall number of shares outstanding. If the data for institutional holdings is missing, we use the last available quarter of the year as a proxy for the end-of the year holdings. For firms that have no institutional reporting for the period we assign the value of zero. The variable is defined as the sum of shares held by all the institutions, divided by the overall number of shares outstanding.

[13] Obtained from Kenneth French website at
http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

InstNum: the overall number of institutions that hold shares of a firm, as reported in 13F.

Leverage: the sum of short-term (DLC) and long-term (DLTT) debt divided by total assets (AT).

ln(ME): the log of market value of the firm as of June, *t*.

ln(BE/ME): the log of the ratio of book equity to market equity, as of December, *t-1*.

M/B: the market value of equity, plus the book value of assets (AT) minus the book value of equity, all divided by the book value of assets. The ratio is trimmed at 20.

Payout: common dividends (DVC) divided by net income (IB).

Preferred stock: equals the liquidation value (PSTKL) if not missing; otherwise we use the redemption value (PSTKRV) if not missing; otherwise the carrying value (PSTK).

R&D: expenses on research and development (XRD), scaled by book assets. Values of zero are assigned to missing observations.

Repurchases: total expenditure on the purchase of common and preferred stocks (PRSTKC) plus any reduction in the value of the net number of preferred stocks outstanding (PSTKRV).

RetVol: standard deviation of a firm's daily stock returns over a calendar year.

ROA: operating income before depreciation (OIBDP), scaled by total assets.

Size: the natural log of book assets (AT) in constant 1993 dollars.

Stddev(EBITDA): standard deviation of earnings (OIBDP), scales by assets (AT), calculated over a ten-year period.

Tangibility: the ratio of net property, plant and equipment (PPENT) to total assets.

TotYield: common dividends (DVC) plus repurchases, scaled by the contemporaneous year-end market capitalization.

Turnover: the annual average ratio of monthly traded volume of shares to total shares.

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Table 1
Cross-sectional Distribution of Smoothing Measures

The sample consists of Compustat firms for the period 1970-2010, excluding financial firms (SIC codes 6000-6999). The speed of adjustment SOA is estimates as $\tilde{\beta}$ from a modified partial adjustment model of Lintner (1956): $\Delta DPS_{i,t} = \alpha + \beta * dev_{i,t-1} + \epsilon_{i,t}$, where $dev_{i,t} = TPR_{i,t} * EPS_{i,t} - DPS_{i,t-1}$ and $TPR_{i,t}$ is defined as the firm-median payout ratio (common dividends divided by net earnings) during the period (*t-9*) through *t*. *DPS* and *EPS* are common dividends and earnings per share, respectively. *RelVol* is defined as the ratio of root mean square errors from the following two regressions: $AdjDPS_{i,t} = \alpha_1 + \beta_1 * t + \beta_2 * t^2 + +\epsilon_{i,t}$ and $TPR_i * AdjEPS_{i,t} = \alpha_2 + \gamma_1 * t + \gamma_2 * t^2 + +\eta_{i,t}$ where $AdjDPS_{i,t}$ and $AdjEPS_{i,t}$ are split-adjusted DPS and EPS series, and $TPR_{i,t}$ is as defined previously. The split adjusted *DPS* (*EPS*) series is constructed by first calculating the split-adjusted change in *DPS* (*EPS*) each year. The split adjusted series for year *t* is then defined as $AdjDPS_{i,t} = DPS_{i,1} + \sum_{i=2}^{t} \Delta\, DPS_{i,t}$. Both measures are estimated for each of the 10-year rolling widow periods. As a result, we obtain a time-series of speed of adjustment (*SOA)* and relative volatility (*RelVol*) for the period of 1979-2010. We remove observations before each firm's first positive value for dividend per share and after each firm's last positive *DPS*. To mitigate the effect of outliers, we trim the top and bottom 2.5% of the resulting distribution of *SOA* and *RelVol*, and remove negative *SOA* values. To construct quintiles of smoothing, every year all the sample firms are sorted into quintiles based on their *SOA* (Panel A) and *RelVol* (Panel B) and the means of the firm characteristics are reported. Firms in Quintile 1 are firms that smooth the most, while Quintile 5 consists of non-smoothing firms. *Sale* is the total net sales; *Age* is the number of years since the firm first appeared in the CRSP database; *M/B* is the market value of equity plus the book value of assets minus the book value of equity, all divided by the book value of assets; *EBITDA* is the ratio of earnings before interest and tax to total sales; *Tangibility* is the ratio of net property, plant and equipment to total assets; Leverage is the sum of short-term (DLC) and long-term (DLTT) debt divided by total assets. *St.Dev(Returns)* is the deviation of a firm's daily stock returns over a calendar year; *Turnover* is the annual average ratio of monthly traded volume of shares to total shares; *Dividend Yield* is the ratio of common dividends scaled by the product of the number of shares outstanding and stock price as of the end of the fiscal year. *InstHold* are obtained from 13F reports, as of December of each year. It is defined as the sum of shares held by all the institutions, divided by the overall number of shares outstanding.

Table 1 (cont.)

Panel A: SOA

	Low SOA	2	3	4	High SOA
SOA	0.005	0.090	0.173	0.293	0.629
log(Sale)	6.727	6.811	6.730	6.593	6.406
log(Age)	3.239	3.287	3.220	3.148	3.015
M/B	1.476	1.436	1.456	1.555	1.785
EBITDA	0.142	0.137	0.142	0.149	0.167
Tangibility	0.351	0.359	0.350	0.351	0.337
Leverage	0.243	0.241	0.234	0.225	0.203
St. Dev (Returns)	0.100	0.099	0.101	0.101	0.101
Turnover	0.093	0.087	0.086	0.085	0.094
Dividend Yield	0.027	0.029	0.026	0.024	0.024
Inst. Holding	0.479	0.475	0.464	0.443	0.417

Panel B: RelVol

	Low RelVol	2	3	4	High RelVol
RelVol	0.118	0.245	0.406	0.676	1.636
log(Sale)	6.843	6.816	6.749	6.659	6.404
log(Age)	3.329	3.253	3.186	3.120	3.017
M/B	1.395	1.435	1.490	1.630	1.805
EBITDA	0.133	0.140	0.146	0.159	0.170
Tangibility	0.367	0.355	0.351	0.347	0.340
Leverage	0.249	0.242	0.229	0.216	0.201
St. Dev (Returns)	0.100	0.098	0.099	0.098	0.098
Turnover	0.088	0.087	0.084	0.087	0.087
Dividend Yield	0.030	0.027	0.026	0.025	0.025
Inst. Holding	0.482	0.464	0.457	0.446	0.424

Table 2
Dividend change announcements: Summary statistics

This table reports firm and dividend payout characteristics around dividend change announcements. The sample consists of all dividend change with non-missing announcement dates falling on trading days for the period of 1970-2011 that: (1) are quarterly taxable cash dividends; (2) are not an initiation or omission; (3) the absolute value of the dividend change falls in the 12.5% - 500% range; (4) the previous dividend was paid within 20-90 trading days window; (5) financial data is available on CRSP and Compustat; (6) stock is traded on NYSE, AMEX or NASDAQ; (7) excluding stocks of closed-end funds, certificates, and REITs. Three-day CAR is cumulative return of the stock of the announcing firm around the event ((-1; +1) trading days) minus CRSP value-weighted market return. *Change in dividends* is the percentage change in cash dividend (dividend per share, adjusted to stock splits) from the previous dividend payment. *Dividend yield* is the ratio of dividend per share at the time of announcement to the price the day before the announcement. *Market cap* (in millions) is measured at the end of the previous fiscal year. *M/B* is the market value of assets, scaled by the book value of assets. *EBITDA* is operation income before depreciation, scaled by total assets; change in EBITDA is the difference in EBITDA ratios between fiscal years t and t-1. *Price* is the stock price at the end of the most recent fiscal year.

Panel A: Dividend cuts

Variable	N	Mean	Std Dev	Min	5th Pctl	Median	95th Pctl	Max
3-day CAR	2,902	-2.8%	8.8%	-96.1%	-17.9%	-1.6%	8.1%	66.7%
Change in dividends	2,903	-47.2%	20.4%	-100.0%	-86.5%	-48.8%	-16.7%	-12.5%
Dividend yield	2,902	4.8%	5.2%	0.02%	0.6%	3.4%	13.3%	109.2%
change in EBITDA	2,710	0.06	3.61	-45.79	-0.11	-0.01	0.10	178.56
M/A	2,863	1.82	3.09	0.14	0.73	1.02	4.78	20.00
Market Cap	2,871	2,010	10,011	1.9	12.4	208	6,765	183,107
Price	2,892	21.3	18.7	1.3	4.8	16.8	51.0	367.5

Panel B: Dividend increases

Variable	N	Mean	Std Dev	Min	5th Pctl	Median	95th Pctl	Max
3-day CAR	18,071	1.4%	4.6%	-38.2%	-4.9%	0.9%	9.2%	85.4%
Change in dividends	18,075	31.4%	35.5%	12.5%	13.0%	20.0%	100.0%	500.0%
Dividend yield	18,061	3.2%	3.5%	0.1%	0.7%	2.5%	7.4%	247.9%
change in EBITDA	16,893	0.02	1.45	-45.79	-0.05	0.00	0.08	178.56
M/A	17,969	1.68	1.77	0.14	0.79	1.17	3.72	20.00
Market Cap	18,002	3,073	14,954	1.0	13	242	11,916	504,240
Price	18,030	29.1	24.4	0.9	7.4	23.9	68.0	791.4

Table 3

Dividend change announcements: Summary statistics by ranges of dividend changes

This table reports dividend payout characteristics around dividend change announcements. The reported results are averaged within each range of dividend changes. Three-day *CAR* is cumulative return of the stock of the announcing firm around the event ((-1; +1) trading days) minus CRSP value-weighted market return. *Dividend change* is the percentage change in cash dividend (dividend per share, adjusted to stock splits) from the previous dividend payment. The difference is between the absolute values of 3-day CARs of dividend cuts and dividend increases. Panel A is based on the entire sample, constructed as describes in Table 2. Panel B includes only dividend change announcements in which firms have announced at last one dividend cut prior to this announcement.

Panel A: All sample

Dividend cuts				Dividend increases				Diff.	t-stat.
Range of dividend change (%)	**N**	**3-day CAR (%)**	**Dividend change (%)**	**Range of dividend change (%)**	**N**	**3-day CAR (%)**	**Dividend change (%)**	**(abs(CAR_{cuts})-$CAR_{incr.}$)**	
<=-60	708	-3.66	-75.8	>=60	1421	2.46	121.1	1.20	2.69
(-60; -50]	692	-3.54	-51.6	[50; 60]	951	2.02	51.6	1.52	4.08
[-50; -40]	383	-3.17	-45.0	[40; 50]	621	2.30	46.5	0.86	1.76
[-40; -30]	462	-2.41	-34.8	[30; 40]	1990	1.67	34.6	0.74	2.04
[-30; -20]	381	-1.93	-25.0	[20; 30]	5021	1.39	23.8	0.53	1.50
[-20; -12.5]	276	-0.54	-16.8	[12.5; 20]	8073	0.99	16.1	-0.45	-1.31

Panel B: Firms that have cut dividends before

Dividend cuts				Dividend increases				Diff.	t-stat.
Range of dividend change (%)	**N**	**3-day CAR (%)**	**Dividend change (%)**	**Range of dividend change (%)**	**N**	**3-day CAR (%)**	**Dividend change (%)**	**(abs(CAR_{cuts})-$CAR_{incr.}$)**	
<=-60	292	-2.20	-76.9	>=60	549	2.36	130.4	-0.16	-0.24
(-60; -50]	270	-2.83	-51.6	[50; 60]	272	2.28	51.8	0.56	0.94
[-50; -40]	158	-2.50	-44.7	[40; 50]	164	2.58	46.0	-0.09	-0.11
[-40; -30]	206	-1.70	-34.8	[30; 40]	488	1.73	34.8	-0.03	-0.06
[-30; -20]	182	-1.11	-25.2	[20; 30]	1137	1.52	23.7	-0.41	-0.85
[-20; -12.5]	145	0.19	-16.5	[12.5; 20]	1552	1.07	16.0	-0.88	-2.46

Table 4
Market reaction to dividend change announcements: Multivariate analysis

This table reports the results of the Fama-McBeth estimation of market reaction to dividend change announcements. See Table 2 for the description of the sample and main variables' construction. *Dummy for dividend cut* takes a value of 1 if the dividend change is negative, and zero otherwise. *Dummy for past cuts* takes a value of 1 if the firm has cut its dividend at least once prior to the current announcement, and zero otherwise. *Dividend change (<0)* is the magnitude of dividend change for dividend cuts, and zero otherwise. *Dividend change (>0)* is the magnitude of dividend change for dividend increases, and zero otherwise. *Dividend yield* is the ratio of dividend per share at the time of announcement to the price the day before the announcement. The values of t-stat are reported in parentheses. ***, **, and * indicate p-values of 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)
Intercept	0.007***	0.02***	0.018***
	(6.82)	*(8.39)*	*(7.54)*
Dummy for dividend cut	-0.021***	-0.022***	-0.014
	(-4.01)	*(-3.7)*	*(-1.45)*
Dummy for past cuts			0.0012
			(0.87)
*Dummy for dividend cut*Dummy for past cuts*			-0.014
			(-1.51)
Dividend change (if <0)	0.041***	0.041***	0.065***
	(3.67)	*(3.4)*	*(3.19)*
*Dividend change (if <0)*Dummy for past cuts*			-0.053**
			(-2.48)
Dividend change (if >0)	0.01***	0.01***	0.013***
	(5.99)	*(5.41)*	*(4.6)*
*Dividend change (if >0)*Dummy for past cuts*			-0.002
			(-0.47)
Dividend yield	0.081***	0.047	0.055*
	(3.32)	*(1.52)*	*(1.78)*
Log(Mcap)		-0.002***	-0.002***
		(-7.77)	*(-7.84)*
M/B		-0.001	-0.001*
		(-1.67)	*(-1.87)*
EBITDA		0.011**	0.012**
		(2.18)	*(2.59)*
change in EBITDA		0.017	0.012
		(1.33)	*(0.94)*

Table 5

Cumulative market reaction to dividend change announcements: Multivariate analysis

This table reports the results of the OLS estimation of cumulative market reaction to dividend change announcements. The sample consists of all dividend changes with non-missing announcement dates (falling on trading days) for the period of 1970-2011 that: (1) are quarterly taxable cash dividends; (2) are not an initiation or omission; (3) the previous dividend was paid within 20-90 trading days window; (4) financial data is available on CRSP and Compustat; (5) stock is traded on NYSE, AMEX or NASDAQ; (6) are not stocks of closed-end funds, certificates, and REITs. To construct the dependent variable, we use 3-day CARs, which is the cumulative return of the stock of the announcing firm around the event of dividend increases or decreases ((-1; +1) trading days minus CRSP value-weighted market return). We next aggregate the CARs over each of the four decades denoted as *d*: 1970-1979, 1980-1989, 1990-1999, and 2000-2009. The dependent variable, *Cum CAR* (measured in percent) is the sum of CARs around all the events of dividend changes that occurred throughout the decade (no boundaries are imposed on the magnitudes of the dividend changes). *Sum of all dividend changes* is the sum of scaled dividend increases and decreases during the decade. Scaled dividend increase is defined as the dollar change in dividend, scaled by dividend per share as of the last quarterly dividend payout in the previous decade. Thus, the nominator for dividend increases is scaled by the same dividend per share throughout the decade. *Sum of decreases* is the sum of scaled dividend decreases, calculated in a similar manner. *Dividend per share* is the last quarterly dividend payout of the previous decade. EBITDA is operating income before depreciation. Change in EBITDA is the annual difference in ratios ($EBITDA_t/Assets_t$ - $EBITDA_{t-1}/Assets_{t-1}$), averaged within each decade to construct *mean change in EBITDA*. *Market Cap*, *M/B* (the market value of assets, scaled by the book value of assets) and stock *Price* are measured as of the end of the last fiscal year-end of the previous decade (for example, for the decade 1970-1979 we use the variables as of the fiscal year 1969). All specifications include decade fixed effects. Standard errors are reported in parentheses. ***, **, and * indicate p-values of 1%, 5%, and 10%, respectively.

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Table 5 (cont.)

	Panel A		Panel B: SOA		Panel C: RelVol	
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	2.75***	10.26***	2.22***	9.89***	2.18***	10.08***
	(0.46)	*(1.941)*	*(0.689)*	*(2.003)*	*(0.735)*	*(2.076)*
Sum of all dividend changes	0.46***	0.436***	0.441***	0.462***	0.42***	0.44***
	(0.053)	*(0.065)*	*(0.06)*	*(0.064)*	*(0.061)*	*(0.065)*
Sum of decreases	0.015	0.069				
	(0.042)	*(0.043)*				
Dividend per share	0.006	0.003	0.004	0.004	0.004	0.004
	(0.021)	*(0.021)*	*(0.021)*	*(0.021)*	*(0.021)*	*(0.021)*
SOA/RelVol			2.447*	1.538	0.91*	0.45
			(1.393)	*(1.394)*	*(0.494)*	*(0.493)*
mean change in EBITDA		110.22***		94.08**		105.52***
		(25.11)		*(37.95)*		*(27)*
M/B $_{(d-1)}$		0.678**		0.555*		0.404
		(0.267)		*(0.31)*		*(0.289)*
Market Cap $_{(d-1)}$		-1.265***		-1.23***		-1.229***
		(0.201)		*(0.208)*		*(0.212)*
1/Price $_{(d-1)}$		11.81		10.96		11.59
		(8.337)		*(8.513)*		*(8.711)*
stddev(EBITDA)		2.87		-2.93		0.82
		(12.5)		*(12.64)*		*(13.11)*
N ob obs	3597	2172	2099	2060	2055	2015
R-square adj.	0.04	0.09	0.05	0.09	0.05	0.09

Table 6

Dividend smoothing and market reaction to dividend change announcements

The dependent variable is the market reaction (3-day CAR) to dividend change announcements. See Table 2 and Appendix for the description of the sample and main variables' construction. Columns (1) through (3) use Fama-MacBeth estimation; column (4) is estimated via OLS with year fixed effects and standard errors clustered by year. *Dividend change* is defined as the difference between the total value of dividends announced in period *t* versus (*t-1*), scaled by total assets. *Dividend change (<0)* is the magnitude of dividend change for dividend cuts, and zero otherwise. *Dividend change (>0)* is the magnitude of dividend change for dividend increases, and zero otherwise. *Dividend(t-1)/Assets* is the ratio of the total dividend value announced in the previous quarter to the total asset value. The sample in Columns (1) and (2) use all dividend changes, while columns (3) and (4) are based on increases only. In column (4) we also restrict the sample period to 1972 – 1992 and *after* is an indicator for the period post-1982. The values of t-*stat* values are reported in parentheses. ***, **, and * indicate p-values of 1%, 5%, and 10%, respectively.

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Table 6 (cont.)

	Panel A: SOA			
	(1)	(2)	(3)	(4)
Intercept	0.012***	0.026***	0.032***	0.042***
	(7.63)	*(6.99)*	*(7.81)*	*(12.46)*
Dummy for dividend cut	-0.028*	-0.201		
	(-1.85)	*(-1.25)*		
SOA	0.001	0.00003	0.00006	
	(0.13)	*(0.006)*	*(0.01)*	
after dummy				0.003
				(1.36)
*Dummy for dividend cut*SOA*	-0.089	1.681		
	(-1.07)	*(0.98)*		
Dividend change (if <0)	12.16	-63.05		
	(1.41)	*(-0.84)*		
*Dividend change (if <0)*SOA*	-35.2	845.2		
	(-0.92)	*(0.98)*		
Dividend change (if >0)	3.581***	3.301**	3.845***	3.984***
	(3.36)	*(2.67)*	*(3.19)*	*(3.95)*
*Dividend change (if >0)*SOA*	-0.522	0.642	-0.036	
	(-0.25)	*(0.3)*	*(-0.01)*	
*Dividend change (if >0)*after dummy*				-1.292
				(-1.1)
Dividend (t-1)/Assets	-0.471*	0.179	0.136	0.34
	(-1.997)	*(0.57)*	*(0.43)*	*(1.03)*
Log(Mcap)		-0.001***	-0.003***	-0.003
		(-3.25)	*(-5.74)*	*(-7)*
M/B		-0.006***	-0.004***	-0.005***
		(-4.18)	*(-3.38)*	*(-3.32)*
EBITDA		-0.008	-0.02	-0.009
		(-0.63)	*(-1.59)*	*(-0.71)*
change in EBITDA		-0.001	-0.008	0.012
		(-0.06)	*(-0.31)*	*(0.8)*
stddev(EBITDA)		*0.02*	*0.034*	*-0.007*
		(0.49)	*(0.87)*	*(-0.24)*

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Table 6 (cont.)

	Panel B: RelVol			
	(1)	(2)	(3)	(4)
Intercept	0.013***	0.027***	0.034***	0.042***
	(8.787)	*(8.812)*	*(9.986)*	*(13.35)*
Dummy for dividend cut	-0.004	-0.008		
	(-0.073)	*(-0.13)*		
RelVol[after dummy for (5)]	-0.001	-0.0008	-0.002	
	(-0.645)	*(-0.599)*	*(-1.121)*	
after dummy				0.003
				(1.3)
*Dummy for dividend cut*RelVol*	-0.676	-0.718		
	(-0.967)	*(-0.968)*		
Dividend change (if <0)	24.71	26.67		
	(1.076)	*(1.121)*		
*Dividend change (if <0)*RelVol*	-225.95	-243.4		
	(-0.989)	*(-1.005)*		
Dividend change (if >0)	2.781***	2.932**	3.511***	3.934***
	(3.229)	*(2.695)*	*(3.368)*	*(3.97)*
*Dividend change (if >0)*RelVol*	-0.2	0.194	0.562	
	(-0.286)	*(0.251)*	*(0.757)*	
*Dividend change (if >0)*after dummy*				-1.276
				(-1.07)
Dividend (t-1)/Assets	-0.332	0.13	-0.032	0.349
	(-1.577)	*(0.505)*	*(-0.105)*	*(1.09)*
Log(Mcap)		-0.002***	-0.003***	-0.003***
		(-3.559)	*(-6.303)*	*(-6.66)*
M/B		-0.005***	-0.004***	-0.005***
		(-3.534)	*(-2.988)*	*(-3.33)*
EBITDA		-0.01	-0.01	-0.009
		(-0.833)	*(-0.99)*	*(-0.77)*
change in EBITDA		-0.005	-0.027	0.012
		(-0.28)	*(-1.26)*	*(0.79)*

Table 7
Dividend Smoothing and Rule 10b-18

This table reports the results of OLS estimation of smoothing (SOA in Panel A, and RelVol in Panel B). The sample consists of all Compustat firms, excluding financial firms (SIC codes 6000-6999) with non-missing smoothing values. In each regression, each firm has two observations, in which smoothing is measured over the 1972-1981 (1983-1992) period. *after* is a dummy variable that takes a value of 1 for 1983-1992 period, and zero otherwise. See Table 1 and the Appendix for the description of control variables. The specification in columns (2) and (4) is based on the subsample of firms for which smoothing measures are non-missing in both periods, and includes firm fixed effects. Standard errors are reported in parenthesis and are based on heteroskedasticity-consistent errors adjusted for clustering at the firm level (Rogers (1993)). ***, ** and * indicate p-values of 1%, 5%, and 10%, respectively.

	Panel A: SOA		Panel B: RelVol	
	(1)	*(2)*	*(1)*	*(2)*
Intercept	0.201***	0.103	0.715***	0.217
	(0.025)	*(0.13)*	*(0.073)*	*(0.401)*
after	-0.032***	-0.081***	-0.121***	-0.209***
	(0.011)	*(0.023)*	*(0.038)*	*(0.06)*
$Div_t/Assets_t$	0.025	-1.266	0.029	3.405
	(0.335)	*(0.889)*	*(1.025)*	*(3.367)*
$log(Sale)_t$	-0.007**	0.019	-0.041***	0.029
	(0.003)	*(0.019)*	*(0.008)*	*(0.062)*
M/B_t	0.032***	0.044*	0.129***	0.142**
	(0.008)	*(0.026)*	*(0.049)*	*(0.069)*
$EBITDA_t$	0.257***	0.278	0.691***	0.479
	(0.072)	*(0.203)*	*(0.262)*	*(0.558)*
$stddev(EBITDA)_t$	0.523***	-0.203	-1.162**	-1.431
	(0.198)	*(0.547)*	*(0.59)*	*(1.721)*
Firm FE		*Yes*		*Yes*
Obs.	*2230*	*1195*	*2171*	*1155*
# ofclusters	*1639*	*604*	*1599*	*583*
R-squared	0.04	0.06	0.07	0.09

Table 8
Dividend Smoothing and Monthly Stock Returns – Univariate Analysis

The table presents the distribution of monthly stock returns across deciles of dividend smoothing measures (SOA and RelVol) over time. The sample consists of firms in period (1926-2011) in Panel A and period (1970-2011) in Panel B. To calculate the returns, in the June of year t the overall sample is divided into deciles based on the smoothing measure estimated based on the fiscal years (t-9) through (t-1). Then for each portfolio of smoothing mean and median monthly returns are calculated for the period July, t through June, t+1. After that the portfolios are reformed, and the procedure is repeated. Firms in the Low SOA [RelVol] group are firms the smooth the most, while High SOA [RelVol] consists of non-smoothing firms.

Panel A: 1926-2011

Rank for SOA	Mean	Median	Rank for RelVol	Mean	Median
Low SOA	1.21%	1.53%	Low RelVol	1.24%	1.57%
2	1.26%	1.51%	2	1.22%	1.34%
3	1.23%	1.50%	3	1.26%	1.55%
4	1.24%	1.37%	4	1.24%	1.50%
5	1.26%	1.52%	5	1.26%	1.42%
6	1.26%	1.53%	6	1.28%	1.40%
7	1.22%	1.44%	7	1.23%	1.37%
8	1.34%	1.52%	8	1.24%	1.40%
9	1.23%	1.47%	9	1.23%	1.40%
High SOA	1.20%	1.39%	High RelVol	1.22%	1.37%
diff (High-Low)	**-0.01%**	**-0.14%**	**diff (High-Low)**	**-0.01%**	**-0.20%**
t-stat (High-Low)	**(0.04)**		**t-stat (High-Low)**	**(0.05)**	
Pr > Chi-square		**0.51**	**Pr > Chi-square**		**0.40**

Panel B: 1970-2011

Panel A			Panel B		
Rank for SOA	**Mean**	**Median**	**Rank for RelVol**	**Mean**	**Median**
Low SOA	1.29%	1.41%	Low RelVol	1.30%	1.32%
2	1.31%	1.41%	2	1.21%	1.25%
3	1.25%	1.38%	3	1.25%	1.33%
4	1.22%	1.15%	4	1.30%	1.41%
5	1.33%	1.15%	5	1.33%	1.27%
6	1.38%	1.50%	6	1.33%	1.34%
7	1.22%	1.26%	7	1.25%	1.21%
8	1.33%	1.47%	8	1.23%	1.34%
9	1.24%	1.39%	9	1.26%	1.20%
High SOA	1.25%	1.17%	High RelVol	1.27%	1.36%
diff (High-Low)	**-0.04%**	**-0.24%**	**diff (High-Low)**	**-0.03%**	**0.04%**
t-stat (High-Low)	**(0.13)**		**t-stat (High-Low)**	**(0.10)**	
Pr > Chi-square		**0.45**	**Pr > Chi-square**		**1.00**

Table 9
Dividend Smoothing and Monthly Stock Returns – Fama-French Analysis

The table presents the intercepts of factor regressions of monthly returns of portfolios, formed based on the degree of a firm's dividend smoothing, as a function of Fama and French (1993) three risk factors plus the momentum factor. The sample consists of firms that appear both in Compustat and CRSP during the period 1926-2011, in Panel A, and 1970-2011 in Panel B. The dependent variable is monthly stock returns of portfolios of different levels of dividend smoothing. In June of every year *t* we assign the sample firms into deciles based on *SOA* [RelVol] as of fiscal year t-1 and form three portfolios: Low, Medium, and High *SOA* [*RelVol*] portfolios consists of all the firms that belong to deciles 1 – 3, 4 – 7, and 8 – 10, respectively. Firms in the Low SOA [RelVol] portfolio are firms the smooth the most, while High SOA [RelVol] portfolio consists of non-smoothing firms. See Table 1 for the description of the estimation methodology of *SOA* and *RelVol*. We then compute equally or value weighted (by *Market cap*) returns on the portfolio starting from July, t till June, t+1. The resulting time-series returns of each portfolio ($R_{p,t}$) are then regressed on four risk factors. The equation is $R_{p,t} - R_{f,t} = \alpha + \beta_1[R_{m,t} - R_{f,t}] + \beta_2 * SMB_t + \beta_3 * HML_t + \beta_4 * MOM_t + \varepsilon_t$, where ($R_{f,t}$) is the risk-free rate; ($R_{m,t}$) is the market portfolio, based on all NYSE, AMEX and NASDAQ stocks; SMB_t is the small minus big factor return; HML_t is the High-minus-Low factor return; and MOM_t is the momentum factor. The table presents the values, standard errors and *t*-value of the intercept (α) of each regression.

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Table 9 (cont.)

Panel A: 1926-2011

SOA

Portfolios	Value-Weighted Parameter Estimate	Value-Weighted Standard Error	Value-Weighted t Value	Equally-Weighted Parameter Estimate	Equally-Weighted Standard Error	Equally-Weighted t Value
Low SOA	0.08	0.04	1.76	0.19	0.04	4.19
Medium SOA	0.02	0.04	0.59	0.17	0.04	3.78
High SOA	0.01	0.05	0.28	0.19	0.04	4.51
High minus Low	-0.06	0.06	-1.00	0.00	0.04	0.09

RelVol

Portfolios	Value-Weighted Parameter Estimate	Value-Weighted Standard Error	Value-Weighted t Value	Equally-Weighted Parameter Estimate	Equally-Weighted Standard Error	Equally-Weighted t Value
Low RelVol	0.04	0.05	0.78	0.16	0.04	3.61
Medium RelVol	0.04	0.04	1.19	0.20	0.04	4.90
High RelVol	0.04	0.05	0.89	0.20	0.04	4.39
High minus Low	0.01	0.07	0.09	0.04	0.04	0.94

Panel B: 1970-2011

SOA

Portfolios	Value-Weighted Parameter Estimate	Value-Weighted Standard Error	Value-Weighted t Value	Equally-Weighted Parameter Estimate	Equally-Weighted Standard Error	Equally-Weighted t Value
Low SOA	0.07	0.07	1.06	0.20	0.07	2.99
Medium SOA	0.05	0.06	0.82	0.19	0.07	2.94
High SOA	0.02	0.07	0.31	0.20	0.06	3.12
High minus Low	-0.05	0.09	-0.54	0.01	0.05	0.11

RelVol

Portfolios	Value-Weighted Parameter Estimate	Value-Weighted Standard Error	Value-Weighted t Value	Equally-Weighted Parameter Estimate	Equally-Weighted Standard Error	Equally-Weighted t Value
High RelVol	0.05	0.07	0.70	0.15	0.07	2.22
Medium RelVol	0.05	0.05	1.03	0.25	0.06	3.85
Low RelVol	0.08	0.07	1.06	0.20	0.07	3.12
High minus Low	0.03	0.10	0.28	0.05	0.05	1.02

Table 10
Dividend Smoothing and Monthly Stock Returns – Characteristics Regression

This table presents the results of a Fama-MacBeth (1973) estimation of monthly stock returns as a function of firm characteristics The sample consists of firms in period (1926-2011) in Panel A and period (1970-2011) in Panel B. Cross-sectional regressions of raw monthly stock returns are estimated every month, and the distribution of the coefficients (mean and standard deviation) is reported in the table. *ln(ME)* is the log of market value of the firm as of June, *t*. *ln(BE/ME)* is the ratio of book equity to market equity, as of December, *t-1*; Beta is the post-ranking beta, as estimated in Fama and French (1992). Post-ranking beta is estimated based on period 1926-2011 in Panel A, and period 1970-2011 in Panel B. *ln(DivYield)* is the logarithm of 0.01 plus *DivYield*, where *DivYield* is common dividend divided by market value, *ME*, as of year *t-1*. The values of *t*-statistics are reported in parenthesis. ***, ** and * indicate p-values of 1%, 5%, and 10%, respectively.

Panel A: 1926 - 2011

	(1)	(2)	(3)	(4)
Intercept	1.586***	1.669***	1.494***	1.693***
	(7.23)	*(5.88)*	*(6.74)*	*(5.91)*
SOA	0.01	-0.009		
	(0.17)	*(-0.15)*		
RelVol			-0.00003	-0.0004
			(0)	*(-0.02)*
Beta	0.025	-0.026	0.072	-0.001
	(0.15)	*(-0.17)*	*(0.41)*	*(-0.01)*
ln(ME)	-0.067***	-0.063**	-0.06**	-0.058**
	(-2.58)	*(-2.53)*	*(-2.35)*	*(-2.35)*
ln(BE/ME)	0.163***	0.13***	0.16***	0.122***
	(4.33)	*(3.71)*	*(4.11)*	*(3.43)*
ln(DivYield)		0.026		0.055
		(0.37)		*(0.79)*

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Table 10 (cont.)

Panel B: 1970 - 2011

	(1)	(2)	(3)	(4)
Intercept	1.905***	2.18***	1.714***	2.069***
	(6.01)	*(5.72)*	*(5.41)*	*(5.34)*
SOA	-0.1	-0.09		
	(-1.24)	*(-1.08)*		
RelVol			-0.01	-0.006
			(-0.33)	*(-0.19)*
Beta	-0.049	-0.011	0.018	0.042
	(-0.25)	*(-0.06)*	*(0.09)*	*(0.22)*
ln(ME)	-0.094***	-0.07*	-0.081**	-0.065*
	(-2.59)	*(-1.94)*	*(-2.24)*	*(-1.83)*
ln(BE/ME)	0.047	0.017	0.042	0.007
	(1.13)	*(0.45)*	*(0.97)*	*(0.16)*
ln(DivYield)		0.153*		0.156**
		(1.94)		*(1.97)*

Table 11
Dividend smoothing and firm value: Changes since dividend initiation

This table reports the results of estimating OLS regressions, where the dependent variables are the changes in M/B value of the firm from the year of dividend initiation (*t**) ten years forward. The sample consists of Compustat firms for the period 1970-2010, excluding financial firms (SIC codes 6000-6999). See Table 1 and the Appendix for the description of the independent variables. All estimation models include year fixed effects. Standard errors are reported in parenthesis and are based on heteroskedasticity-consistent errors adjusted for clustering at the year level (Rogers (1993)). The symbols ***, ** and * indicate p-values of 1%, 5%, and 10%, respectively.

	Panel A: SOA		Panel B: RelVol	
	(1)	*(2)*	*(1)*	*(2)*
Intercept	0.084	-0.17	0.118	-0.022
	(0.284)	*(0.203)*	*(0.304)*	*(0.222)*
$SOA_{t*+10}/RelVol_{t*+10}$	-0.058	-0.134	-0.018	-0.05
	(0.2)	*(0.186)*	*(0.082)*	*(0.077)*
$log(Sale)_{t*}$	0.019	0.039	-0.001	0.013
	(0.025)	*(0.024)*	*(0.025)*	*(0.023)*
$log(Sale)_{t*+10}$ - $log(Sale)_{t*}$	-0.469***	-0.311***	-0.396***	-0.235***
	(0.136)	*(0.084)*	*(0.14)*	*(0.084)*
$EBITDA_{t*+10}$ -$EBITDA_{t*}$	6.119***	5.012***	5.98***	5.093***
	(0.848)	*(0.523)*	*(0.911)*	*(0.529)*
$Tang_{t*+10}$ -$Tang_{t*}$	-0.458	-1.034***	-0.331	-0.871**
	(0.363)	*(0.371)*	*(0.354)*	*(0.354)*
Lev_{t*+10} -Lev_{t*}	-0.015	-0.146	-0.046	-0.19
	(0.274)	*(0.257)*	*(0.29)*	*(0.269)*
$vol(EBITDA)_{t*+10}$	-1.567	-1.86	-1.147	-1.205
	(1.887)	*(1.93)*	*(1.984)*	*(1.85)*
$(Dividend)_{t*}$	-3.161	-2.549	-2.169	-3.596
	(3.402)	*(3.687)*	*(3.598)*	*(2.981)*
$(Dividend)_{t*+10}$ -$(Dividend)_{t*}$		2.046		-0.727
		(3.263)		*(2.934)*
$Capex_{t*+10}$ -$Capex_{t*}$		2.635***		2.271***
		(0.895)		*(0.788)*
$R\&D_{t*+10}$ -$R\&D_{t*}$		-3.592		-4.005
		(5.773)		*(5.839)*
$Adver_{t*+10}$ -$Adver_{t*}$		0.297		0.217
		(0.774)		*(0.96)*
Obs.	*1162*	*1120*	*1104*	*1061*
# of years/clusters	*39*	*39*	*39*	*39*
R-squared	0.31	0.32	0.28	0.31

Table 12
Investor composition by dividend yield and smoothing

This table presents the overall number of common shareholders, in thousands *(# Invest*), the overall number of institutions (*InstNum*) and the proportion of institutional holdings (*InstHold*) out of the overall investor holdings by quintiles of dividend smoothing and dividend level, defined as common dividends scaled by assets. The sample consists of Compustat firms for the period 1980-2010, excluding financial firms (SIC codes 6000-6999). The number of retail investors and the number of institutions are converted to natural logarithms (a value of one is added before the conversion). The groups are formed by independently partitioning the sample by *SOA* in the left column [*RelVol* in the right column] and also partitioning the sample by *Dividend Yield* quintiles as of year (*t*-1). The quintiles are re-formed every year. *Dividend Yield* is the ratio of common dividend to the product of the number of shares outstanding and the stock price at the end of the fiscal year. Reported averages are cross-sectional averages for firm-year observation in each of the resulting 25 smoothing-*Dividend Yield* groups. See Table 1 for the description of the estimation methodology of *SOA* and *RelVol*. *InstNum* and *InstHold* are obtained from 13F reports, as of December of each year. *InstHold* is defined as the sum of shares held by all the institutions, divided by the overall number of shares outstanding.

Panel A :*ln(#Invest)*

	Low	2	3	4	High
SOA	***Dividend Yield***				
Low	1.53	1.76	1.91	2.15	2.22
2	1.70	1.83	1.97	2.11	2.14
3	1.63	1.85	2.03	2.07	2.14
4	1.66	1.82	1.90	2.14	2.17
High	1.58	1.80	2.02	2.14	2.17
High-Low	0.05	0.04	0.11	-0.02	-0.06
t-stat(High-Low)					

	Low	2	3	4	High
RelVol	***Dividend Yield***				
Low	1.65	1.79	2.01	2.16	2.26
2	1.67	1.92	1.92	2.22	2.24
3	1.61	1.86	2.07	2.10	2.24
4	1.68	1.85	2.00	2.16	2.29
High	1.79	1.84	1.99	2.04	1.83
High-Low	0.14	0.05	-0.02	-0.12	-0.43
t-stat(High-Low)	**				***

Table 12 (cont.)

Panel B: *ln(InstNum)*

	Low	2	3	4	High
SOA			*Dividend Yield*		
Low	3.71	4.05	4.06	4.17	3.98
2	3.78	4.08	4.24	4.23	3.88
3	3.69	4.11	4.11	4.17	3.74
4	3.55	4.01	4.09	4.18	3.84
High	3.42	3.90	4.10	3.94	3.53
High-Low	-0.28	-0.15	0.04	-0.22	-0.45
t-stat(High-Low)	***	**		***	***

	Low	2	3	4	High
RelVol			*Dividend Yield*		
Low	3.79	4.06	4.22	4.23	3.98
2	3.68	4.20	4.12	4.24	3.86
3	3.58	4.07	4.22	4.14	3.79
4	3.77	4.03	4.09	4.13	3.91
High	3.70	4.00	4.01	3.81	3.37
High-Low	-0.08	-0.06	-0.20	-0.42	-0.61
t-stat(High-Low)			***	***	***

Panel C: *InstHold*

	Low	2	3	4	High
SOA			*Dividend Yield*		
Low	0.46	0.50	0.49	0.50	0.45
2	0.46	0.49	0.50	0.50	0.43
3	0.45	0.50	0.48	0.49	0.40
4	0.42	0.47	0.47	0.47	0.40
High	0.39	0.44	0.46	0.44	0.37
High-Low	-0.07	-0.05	-0.03	-0.06	-0.08
t-stat(High-Low)	***	***	***	***	***

	Low	2	3	4	High
RelVol			*Dividend Yield*		
Low	0.47	0.50	0.51	0.50	0.44
2	0.43	0.50	0.49	0.49	0.41
3	0.43	0.48	0.49	0.49	0.41
4	0.44	0.47	0.47	0.46	0.40
High	0.42	0.46	0.44	0.43	0.36
High-Low	-0.05	-0.04	-0.07	-0.07	-0.08
t-stat(High-Low)	***	***	***	***	***

Table 13
Multivariate Regression of Individual and Institutional Holding

This table reports the results of estimating OLS regressions, where the dependent variables are the logarithm of shareholder base (*ln(# Invest)*), and the logarithms of 1 plus the number and the proportion of institutions, invested in a stock (variables *ln(InstNum)* and *ln(InstHold)*, respectively. The sample consists of Compustat firms for the period 1980-2010, excluding financial firms (SIC codes 6000-6999). See Table 1 and the Appendix for the description of the independent variables. All estimation models include year and industry (defined at SIC 2-digit code level) fixed effects. Standard errors are reported in parenthesis and are based on heteroskedasticity-consistent errors adjusted for clustering at the firm level (Rogers (1993)). The symbols ***, ** and * indicate p-alues of 1%, 5%, and 10%, respectively.

Table 13 (cont.)

	Panel A: SOA			Panel B: RelVol		
	ln(#Invest)	*ln(InstNum)*	*ln(InstHold)*	*ln(#Invest)*	*ln(InstNum)*	*ln(InstHold)*
Intercept	-3.973***	-0.303	0.156***	-4.1***	-0.285	0.157***
	(0.309)	*(0.22)*	*(0.033)*	*(0.322)*	*(0.222)*	*(0.035)*
Smoothing	0.298***	-0.263***	-0.039***	0.091***	-0.078***	-0.011***
	(0.052)	*(0.051)*	*(0.007)*	*(0.018)*	*(0.02)*	*(0.003)*
Dividend yield	4.401***	-1.79***	-0.554***	4.379***	-2.088***	-0.569***
	(0.623)	*(0.567)*	*(0.09)*	*(0.645)*	*(0.586)*	*(0.093)*
log(Sale)	0.584***	0.449***	0.036***	0.596***	0.448***	0.034***
	(0.014)	*(0.016)*	*(0.002)*	*(0.015)*	*(0.016)*	*(0.002)*
log(Age)	0.271***	0.419***	0.015***	0.283***	0.423***	0.016***
	(0.035)	*(0.033)*	*(0.005)*	*(0.035)*	*(0.033)*	*(0.005)*
M/B	0.219***	0.256***	0.002	0.203***	0.244***	0.001
	(0.022)	*(0.022)*	*(0.002)*	*(0.023)*	*(0.022)*	*(0.002)*
EBITDA	-0.991***	1.138***	0.06**	-0.933***	1.167***	0.061**
	(0.17)	*(0.186)*	*(0.026)*	*(0.181)*	*(0.195)*	*(0.027)*
Tangibility	0.372***	0.244***	-0.019	0.389***	0.251***	-0.019
	(0.103)	*(0.091)*	*(0.016)*	*(0.105)*	*(0.093)*	*(0.016)*
Leverage	-0.301***	-0.384***	-0.008	-0.316***	-0.391***	-0.013
	(0.089)	*(0.09)*	*(0.014)*	*(0.091)*	*(0.094)*	*(0.014)*
Advertising	0.009	-0.211	-0.035	0.086	-0.27	-0.055
	(0.267)	*(0.249)*	*(0.043)*	*(0.278)*	*(0.251)*	*(0.044)*
R&D	2.314***	0.119	-0.029	2.259***	0.236	-0.019
	(0.535)	*(0.498)*	*(0.086)*	*(0.581)*	*(0.515)*	*(0.089)*
Return	-0.218	-0.573*	-0.069*	-0.313	-0.66**	-0.085**
	(0.182)	*(0.324)*	*(0.039)*	*(0.197)*	*(0.335)*	*(0.04)*
Return vol	-1.09***	-0.183	-0.028	-1.11***	-0.232	-0.029
	(0.17)	*(0.193)*	*(0.036)*	*(0.187)*	*(0.204)*	*(0.039)*
Turnover	-0.042	-0.035	0.109**	-0.107	0.016	0.11*
	(0.108)	*(0.072)*	*(0.051)*	*(0.126)*	*(0.079)*	*(0.056)*
1/price	2.42***	-2.138***	-0.457***	2.535***	-2.281***	-0.462***
	(0.173)	*(0.181)*	*(0.096)*	*(0.185)*	*(0.209)*	*(0.032)*
Obs.	*26595*	*28683*	*28683*	*25181*	*27155*	*27155*
# of firms/clusters	*2543*	*2745*	*2745*	*2440*	*2635*	*2635*
R-squared	0.69	0.66	0.51	0.70	0.66	0.50

Table 14
Multivariate Regression of Institutional Holding by Institutional Type

This table reports the results of estimating Tobit regressions, where the dependent variable is the logarithms of 1 plus the weight of the institutional holding of each type out of the overall holdings of a stock. *Type1* is bank trusts, *Type2* is insurance companies, *Type3* consists of investment companies (primarily mutual funds), *Type4* is investment advisors, and *Type5* is all the other institutions. The sample consists of Compustat firms for the period 1980-1998, excluding financial firms (SIC codes 6000-6999). See Table 1 and the Appendix for the description of the independent variables. All estimation models include year and industry (defined at 2-digit SIC code level) fixed effects. Standard errors are reported in parenthesis and are based on heteroskedasticity-consistent errors adjusted for clustering at the firm level (Rogers (1993)). ***, ** and * indicate p-values of 1%, 5%, and 10%, respectively.

Table 14 (cont.)

Panel A: SOA

	Type1	*Type2*	*Type3*	*Type4*	*Type5*
Intercept	-0.086***	-0.056***	-0.471***	0.149***	0.008
	(0.017)	*(0.015)*	*(0.001)*	*(0.027)*	*(0.011)*
SOA	-0.002	-0.009***	-0.009***	-0.01	-0.005
	(0.005)	*(0.003)*	*(0.001)*	*(0.006)*	*(0.003)*
Dividend yield	0.195***	-0.079**	-0.169***	-0.234***	-0.101***
	(0.051)	*(0.039)*	*(0.0132)*	*(0.062)*	*(0.037)*
log(Sale)	0.0202***	0.01***	0.008***	0.011***	0.013***
	(0.001)	*(0.001)*	*(0.0001)*	*(0.002)*	*(0.001)*
log(Age)	0.0001	0.002	0.00302***	0.004	0.008***
	(0.003)	*(0.002)*	*(0.0002)*	*(0.003)*	*(0.002)*
M/B	0.007***	0.003**	0.0007*	-0.008***	0.005***
	(0.002)	*(0.001)*	*(0.0004)*	*(0.002)*	*(0.001)*
EBITDA	0.058***	0.029**	0.017***	0.035*	0.008
	(0.015)	*(0.013)*	*(0.003)*	*(0.02)*	*(0.01)*
Tangibility	0.008	0.005	0.017***	-0.042***	0.003
	(0.009)	*(0.005)*	*(0.001)*	*(0.012)*	*(0.005)*
Leverage	-0.029***	-0.003	-0.002	-0.002	-0.011**
	(0.009)	*(0.006)*	*(0.002)*	*(0.01)*	*(0.0049)*
Advertising	-0.012	-0.027**	-0.044***	-0.047*	-0.023**
	(0.027)	*(0.012)*	*(0.004)*	*(0.028)*	*(0.011)*
R&D	0.008	-0.043	-0.024***	-0.008	0.027
	(0.049)	*(0.029)*	*(0.009)*	*(0.061)*	*(0.032)*
Return	-0.079***	-0.076***	-0.031***	-0.135***	-0.058***
	(0.02)	*(0.015)*	*(0.007)*	*(0.036)*	*(0.016)*
Return vol	-0.09***	-0.012	-0.026***	-0.083*	0.002
	(0.023)	*(0.014)*	*(0.006)*	*(0.046)*	*(0.016)*
Turnover	0.045*	0.075***	0.105***	0.315***	0.036
	(0.023)	*(0.02)*	*(0.003)*	*(0.119)*	*(0.027)*
1/price	-0.067**	-0.087***	-0.16***	-0.25***	-0.088***
	(0.029)	*(0.015)*	*(0.005)*	*(0.035)*	*(0.013)*
Obs.	*18967*	*18967*	*18967*	*18967*	*18967*
# of firms/clusters	*2227*	*2227*	*2227*	*2227*	*2227*
Prob. > Chi-squared	0.000	0.000	0.000	0.000	0.000

Table 14 (cont.)

Panel B: RelVol

Independent variable	*Type1*	*Type2*	*Type3*	*Type4*	*Type5*
Intercept	-0.09***	-0.049***	-0.519***	0.156***	0.008
	(0.018)	*(0.015)*	*(0.001)*	*(0.027)*	*(0.011)*
RelVol	-0.002	-0.0016	-0.003***	0.0003	-0.001
	(0.002)	*(0.001)*	*(0.0005)*	*(0.002)*	*(0.001)*
Dividend yield	0.168***	-0.079**	-0.172***	-0.194***	-0.118***
	(0.052)	*(0.035)*	*(0.0133)*	*(0.061)*	*(0.036)*
log(Sale)	0.02***	0.01***	0.007***	0.01***	0.013***
	(0.001)	*(0.001)*	*(0.0001)*	*(0.002)*	*(0.001)*
log(Age)	0.0007	0.0008	0.004***	0.005	0.009***
	(0.003)	*(0.002)*	*(0.0002)*	*(0.003)*	*(0.002)*
M/B	0.007***	0.003***	0.0008**	-0.008***	0.005***
	(0.002)	*(0.001)*	*(0.0004)*	*(0.002)*	*(0.001)*
EBITDA	0.064***	0.021*	0.008**	0.016	0.006
	(0.016)	*(0.012)*	*(0.003)*	*(0.019)*	*(0.01)*
Tangibility	0.009	0.005	0.017***	-0.034***	0.003
	(0.009)	*(0.005)*	*(0.001)*	*(0.011)*	*(0.006)*
Leverage	-0.03***	-0.003	-0.001	-0.004	-0.014***
	(0.009)	*(0.006)*	*(0.002)*	*(0.01)*	*(0.005)*
Advertising	-0.024	-0.03**	-0.042***	-0.039	-0.018
	(0.028)	*(0.013)*	*(0.004)*	*(0.028)*	*(0.011)*
R&D	-0.01	-0.02	-0.02**	0.01	0.026
	(0.054)	*(0.028)*	*(0.009)*	*(0.062)*	*(0.033)*
Return	-0.083***	-0.077***	-0.042***	-0.146***	-0.072***
	(0.022)	*(0.015)*	*(0.007)*	*(0.037)*	*(0.016)*
Return vol	-0.111***	-0.005	-0.04***	-0.102**	-0.009
	(0.025)	*(0.015)*	*(0.006)*	*(0.045)*	*(0.017)*
Turnover	0.065***	0.065**	0.164***	0.385***	0.057*
	(0.025)	*(0.027)*	*(0.004)*	*(0.122)*	*(0.03)*
1/price	-0.062*	-0.093***	-0.168***	-0.281***	-0.078***
	(0.037)	*(0.015)*	*(0.006)*	*(0.03)*	*(0.013)*
Obs.	*18222*	*18222*	*18222*	*18222*	*18222*
# of firms/clusters	*2154*	*2154*	*2154*	*2154*	*2154*
Prob. > Chi-squared	0.000	0.000	0.000	0.000	0.000

Figure 1
Dividend Smoothing and Rule 10b-18

The figure displays the time trend of the cross-sectional median SOA and RelVol from 1972 through 1991. The vertical line is at 1982, the year of the passage of the safe harbor provision of Rule 10b-18.