# Do Investors Value Dividend Smoothing Stocks Differently?

by

Yelena Larkin
*York University*

Mark T. Leary
*Washington University in St. Louis and NBER*

and

Roni Michaely
*Cornell University and IDC*

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## Abstract

It is widely documented that managers strive to maintain smooth dividends. Yet, it is not clear if this behavior 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' investor clientele, stock prices and cost of capital. We find that retail investors are less likely to hold dividend smoothing stocks, while institutional investors, and especially mutual funds, are more likely. However, this preference does not result in any detectable relation between the smoothness of a firm's dividends and the expected return, or market value, of its stock. Together, the evidence suggests that firms adjust the supply of smoothed dividends to match investors' demand. Dividend smoothing affects the composition of a firm's shareholders but has little impact on its stock price.

*Larkin is from York University (ylarkin@schulich.yorku.ca), Leary is from Washington University in St. Louis and NBER (leary@wustl.edu), and Michaely is from Cornell University and IDC (rm34@cornell.edu). We thank Alon Brav, Harry DeAngelo, Alan Crane, George Gao, John Graham, Gustavo Grullon, Bruce Grundy, Kristine Hankins, and seminar participants at Penn State University, University of Virginia, University of Minnesota, the Finance Down Under Conference at the University of Melbourne, the FIRS Conference, and the WFA annual meeting for very helpful discussions and suggestions. The remaining errors are our own.

## Introduction

Since the seminal study by Lintner (1956), the phenomenon of dividend smoothing has been widely documented.[1] Dividend changes respond slowly to earnings changes, and managers are willing to bear significant costs to avoid dividend cuts. Survey evidence suggests that managers pursue this policy because they believe investors prefer to receive a smooth dividend stream. Lintner (1956) observes that dividend smoothing behavior was motivated by "the belief on the part of many managements that most stockholders prefer a reasonably stable rate and that the market puts a premium on stability or gradual growth in rate." Brav, Graham, Harvey, and Michaely (2005) demonstrate that even today managers recognize a substantial asymmetry between dividend increases and decreases: there is perceived to be minimal reward for increasing dividends but a large penalty for reducing dividends. Yet, there is little (if any) empirical evidence that investors have a preference for smooth dividends and are willing to pay a premium to hold such shares. 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. In particular, we examine two related questions. First, we ask which types of investors are attracted to stocks that pay smooth dividends. Second, we explore whether any such investor preference has implications for firms' cost of equity capital and market valuation.

Our first question is important for several reasons. It first indicates which investors prefer most to receive smooth dividends and helps us understand the implications of dividend smoothing for the composition of a firm's equity holders. In addition, it provides evidence on the potential source of an investor preference for smooth dividends. Prior literature offers several reasons for a dividend smoothing preference. One set of studies suggests retail investors may have a behavioral preference for receiving smoothed dividends, based either on prospect theory type of utility (Baker and Wurgler (2012)) or a desire to smooth consumption and as a self-control device (Shefrin and Statman (1984); Baker, Nagel, and Wurgler (2007)). A second class of models suggests that dividend smoothing may help reduce the costs of agency conflicts between managers and outside shareholders by exposing the firm to the discipline of monitoring investors (Easterbrook (1984); Allen, Bernardo, and Welch (2000)) or by establishing a reputation in the equity markets for fair treatment of dispersed shareholders (e.g., Shleifer and Vishny (1997), Gomes (2000), DeAngelo and DeAngelo (2007)).

Using several different empirical measures of smoothing, we find that institutional investors are significantly more likely to hold dividend smoothing stocks, while retail investors are less likely to do so. This is

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[1] For evidence from observed dividend decisions, see studies by Lintner (1956), Fama and Babiak (1968), Choe (1990), Brav et al. (2005), and Skinner (2008). For evidence from manager surveys, see Lintner (1956), Baker, Farrelly, and Edelman (1985), and Brav et al. (2005).

particularly surprising in light of the facts that: (1) dividend smoothing is associated with high dividend yields, and institutions shy away from stocks that pay high levels of dividends (Grinstein and Michaely (2005)); and (2) 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." Our findings also cast doubt on the behavioral explanations, as such preferences are more likely to be prevalent among retail investors.

To further understand the nature of this 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 dividends. There are several potential reasons why a mutual fund clientele might arise for stocks that pay smooth dividends. For example, mutual funds might be attracted to smooth dividend, because receiving a consistent stream of cash flows may minimize the portfolio sales required to meet fund outflows. Alternatively, since 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 and maintain a mutual fund clientele, as in the model of Allen, Bernardo and Welch (2000). To further explore this idea, we examine the investment style of the institutions, using the classification suggested by Bushee (1998; 2001) and Bushee and Noe (2001). We find that "transient" investors (i.e., those with the weakest monitoring incentives) do not display a preference for dividend smoothing stocks. By contrast, institutions characterized as "quasi-indexers" (i.e., diversified, low-turnover investors) are significantly more likely to hold dividend smoothing stocks. These findings are consistent with recent research by Mullins (2014) and Appel, Gormley, and Keim (2015) that suggests these investors are particularly effective monitors. Finally, our results support the findings by Leary and Michaely (2011) that firms that smooth dividends more are those that appear to be most exposed to agency conflicts.

Our evidence further suggests that dividend smoothing attracts institutions, but institutional investors do not seem to influence the smoothness of firms' dividends. To explore the causal effect of dividend smoothing on institutional composition, we use the introduction of the safe harbor provision of SEC Rule 10b-18 in 1982 as a shock to the cost of smoothing dividends. This provision made it easier for firms to repurchase their own shares, providing a flexible mechanism for paying out temporary cash flows (Grullon and Michaely (2002)), and making dividend smoothing easier. We first verify that dividends indeed became significantly smoother following the introduction of these provisions. We then show that, relative to non-dividend paying firms, institutional holdings of dividend payers were more likely to increase following the rule's introduction.

We then use the discontinuity around the Russell 2000 index cutoff to explore whether a change in institutional holdings impacts firms' smoothing policies. As shown by earlier studies (Chang, Hong, and Liskovich (2015)), there is a discontinuous jump in institutional holdings for firms at the top of the Russell 2000 relative to those at the bottom of the Russell 1000, primarily among the quasi-indexers who are also most likely to hold dividend smoothing stocks. Using the instrumental variables approach of Appel et al. (2015), we find no evidence that dividend smoothing is impacted by an exogenous change in institutional holdings. Thus, the direction of causation appears to go from dividend smoothing to institutional holdings, not vice versa.

The second question of this paper centers on whether this preference for smooth dividends on the part of institutional investors has implications for firms' cost of equity capital and market valuation. Answering this question is complicated by several empirical challenges. For one, because dividend smoothing is a time-series phenomenon, it is hard to identify discrete within-firm changes in the degree of smoothing. Related, cross-sectional variation in valuation is likely affected by many unobservable or hard to measure factors. To minimize the impact of these confounding effects, we employ a variety of empirical strategies and different measures of smoothing to investigate whether there is a premium associated with dividend smoothing. Perhaps surprisingly, the results of all of these tests point to the same conclusion: We find no discernable relation between a firm's dividend smoothing policy and its valuation or cost of equity capital.

The empirical strategies we implement are as follows. In the first approach, we examine the validity of the managerial perception that the market reacts more severely to dividend cuts than increases by examining the asymmetry of the cumulative abnormal returns (CAR) around announcements of dividend cuts versus increases. We present two pieces of evidence that cast doubt on this view. First, while 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), this relationship is driven almost entirely by the firm's first dividend cut. After the first cut, there is no asymmetry in market reaction to dividend cuts and increases, suggesting that the market does not penalize firms with volatile dividend streams. Second, when we cumulate the market reactions to dividend announcements within a given firm over a ten-year period, we find no relation between the smoothness of those dividend paths, or the prevalence of dividend cuts, and the cumulative impact on stock price. Thus, for the firms that choose not to smooth, and cut their dividend multiple times, there seems to be little adverse stock price impact stemming from an asymmetric reaction to dividend changes.

In a related set of tests, we ask whether investors value an extra dollar of dividends more if it comes from a dividend smoothing firm. That is, does smoothing affect market values by enhancing the credibility of a firm's announcements about the dividend level? We use several measures of smoothing, including those based on past realizations of dividends and earnings as well as the introduction of Rule 10b-18. For each measure, we find no evidence that the market reaction to dividend announcements is increasing in the smoothness of the firm's dividend policy.

Black and Scholes (1974) point out that given the difficulty in interpreting cross-sectional tests of dividend policy on firm value, testing for the effect of dividend policy on returns is the best method for testing the effects of dividend policy on stock prices.[2] Therefore, in our third approach, we examine the relation between dividend smoothing and expected returns. If investors place a premium on a smooth dividend stream, we would expect them to be willing to accept lower expected returns (for a given amount of systematic risk) to hold such stocks. To this end, we use standard asset pricing tests (Fama and French (1993), Daniel and Titman (1997)) to study the relation between dividend smoothing and the cost of equity capital. We allocate stocks into portfolios based on estimated measures of past dividend smoothing, and find no discernible difference in average returns across portfolios. Differences in portfolios' expected returns (formed on dividend smoothing levels) remain insignificant after controlling for common asset pricing risk factors. Using characteristics rather than factors yields similar results. 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 our fourth and final experiment, we test for investor preferences by estimating the relation 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. If smooth dividends increase investors' expectations of future cash flows, and these expectations are largely idiosyncratic, they may affect firms' values even if there is no effect on its cost of capital.

Empirically, we test whether valuation, as proxied by market-to-book, is related to the extent of dividend smoothing. To reduce the extent of omitted variable bias, for every firm we calculate changes in market-to-book from the year the firm first pays dividends to ten years after, and relate this change to the smoothness of the firm's dividend stream over that period. We also control for other observable measures of firms' investment opportunities. This approach has two advantages. First, it controls for unobserved firm-specific differences, such as differences in growth opportunities, which, in turn, are reflected in firm value. Second, by measuring smoothing and value changes over the first decade that a firm pays dividends, we compare firms at similar stages in their growth cycles, alleviating concerns of heterogeneity in their growth rates. 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.

To summarize, we find that there is a clientele of quasi-indexer type and mutual funds that displays a preference for dividend smoothing stocks. Yet, across multiple tests, we consistently find no discernable evidence that firms are able to enhance their stock price or reduce their cost of equity capital by smoothing their

[2] While one might consider the possibility that certain policies can increase the current stock price without affecting future expected returns, Black and Scholes (1974) point out that for dividend paying stocks a price change must be accompanied by a change in expected returns. Otherwise, the ratio of price to earnings would need to continually increase in an unsustainable way. This argument applies in our case since, in order to calculate smoothing, our sample is restricted to dividend paying stocks.

dividend streams. This combination of results is consistent with the equilibrium arguments in Miller and Modigliani (1961), Black and Scholes (1974), and Miller (1977). That is, as long as not all investors prefer smooth dividends, and firms are willing to adjust their payout policies in response to investor demands, the supply of shares paying smooth dividends will adjust to the demand such that there is no price impact in equilibrium. In that case, those firms that value the institutional investor clientele will pay a smooth dividend to attract them, but this may not lower their cost of capital.

While the equilibrium argument of Miller and Modigliani (1961) is consistent with the sum of our results, it may have implications for the potential mechanisms behind the clientele effects we document. Under their argument, once the supply of dividend smoothing shares adjusts to demand, the preferences of a particular subset of investors will not lead to a differential in market values between dividend smoothing and non-smoothing stocks. In their words, (p. 431) "one clientele would be entirely as good as another in terms of the valuation it would imply for the firm." On the other hand, if the matching between firms and investors is driven by the monitoring ability of mutual funds, then a smoothing firm may not be able to switch to a non-smoothing policy without an adverse effect on firm value. However, this would not be attributable to investor preferences directly, but to an increase in agency costs. Ultimately, we appeal to future research to determine the exact mechanism behind the matching of quasi-indexing mutual funds to dividend smoothing firms.

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

## 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 Center for Research in Security Prices (CRSP) databases for the period 1970-2012. We also supplement this data with firm-level data from Moody's Industrial Manuals for all unregulated industrial NYSE firms going back to 1926 (see Graham, Leary, and Roberts (2014) 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 ten-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 ($dev_{i,t}$):

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

*SOA* is the coefficient on the deviation variable ($\beta$). 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), there are 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 of 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 (1956) model assumes that the firm has a target payout ratio and gradually converges toward it. This assumption is less plausible today, given the survey by Brav et al. (2005) that demonstrates that almost 40% of the surveyed CFOs target the level of dividends 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 ten-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 the 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 ten-year rolling window period. As a result, we obtain a time-series of estimated speed of adjustment (*SOA*) and relative volatility (*RelVol*) for each firm for the period of 1979-2010 (1935-2010 for the extended time period). For each rolling time period we require ten 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 Thomson Financial's 13F filing 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 mitigate the impact of outliers, we follow the literature and impose an upper bound of 20 to market-to-book ratio (*M/B*), and an upper bound of one to leverage, ratios of R&D and advertising to assets, and the proportion of institutional holdings. *EBITDA*, *Stddev(EBITDA)*, and *Price* are winsorized at 1 and 99 percent level. The final sample consists of about 29,000 firm-year observations for the *SOA* measure and about 27,000 firm-year observations for *RelVol*. The number of firms each year is 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 CRSP-Compustat universe.[3] However, in 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 (those with lower *SOA* or *RelVol*) are larger, older, and more leveraged compared to

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[3] 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 and recognize that our conclusions apply to the dividend-paying population.

the low-smoothing firms. Firms that smooth more also tend to pay higher dividends. An average firm in the bottom *RelVol* quintile has a dividend yield of 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 definitions of dividend smoothing. All the differences in the control variables between the lowest and the highest quintiles of *SOA* and of *RelVol* are significant at the 1% level. We also note that, while dividend smoothing is a prevalent practice, there is substantial heterogeneity in the degree to which different firms smooth their dividends. *SOA* (*RelVol*) ranges from an average of 0.005 (0.118) in the lowest quintile to 0.629 (1.636) in the highest quintile. We exploit this heterogeneity in our empirical tests below.

## II. Dividend Smoothing and Investor Clientele

In this section, we examine whether there exists a particular clientele that prefers to hold shares of firms that smooth their dividends. We begin by contrasting the propensity to hold such shares across institutional and retail investors. We then examine in more detail the types of institutions that hold more dividend smoothing stocks. Finally, we provide evidence on the direction of causation between dividend smoothing and investor clientele.

### a. Dividend Smoothing and Institutional Ownership

We first perform an empirical analysis to distinguish between two broad groups of investors: institutional versus retail. For each firm we 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 holdings to account for potential differences in stock holdings of large versus small institutions. We also 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.[4] 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 a host of control variables. We employ a set of commonly used firm characteristics that were found to be correlated with institutional holdings 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. We use asset tangibility, the ratio of market-to-book assets, and leverage to control for additional factors that are

[4] 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.

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.[5] All the clientele variables are converted into natural logarithms (the dependent variables become *Log(#Invest)*, *Log(InstNum)*, and *Log(InstHold)*) to mitigate the impact of positive skewness in the distribution of individual and institutional holding on the estimation parameters.[6]

Table 2 summarizes the estimation results. Similar to previous findings, institutions prefer holding profitable and liquid (in terms of turnover) firms and, in contrast to retail investors, do not base their investment decisions on leverage and R&D expenses of the firm. Regarding payout policy, institutions do not like high dividend payouts, but they do like dividend smoothing firms. The coefficient on *SOA* is negative and significant for both the proportion of institutional holding and the number of institutions (-0.033 and -0.247, 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 (*Log(#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 retail investors' negative attitude towards dividend smoothing: In contrast to institutions, retail investors exhibit a preference towards a volatile stream of dividends, as suggested by the 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 *Total yield* 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. We also perform a univariate analysis to ensure that our results hold in a non-parametric setting (see the Internet Appendix). Every year we independently sort all the stocks in the sample into quintiles of smoothing and dividend yield, and find that within each dividend yield group, institutions exhibit a clear preference for dividend smoothing firms.

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[5] For robustness, we replace *Dividend yield* with *Total yield* (which includes repurchases) as alternative measures, and find that the results are close to the ones reported in Table 2.

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

The differences across investor types in the tendency to hold dividend smoothing stocks suggests the existence of a smoothing clientele. It also presents a challenge to the behavioral explanations for dividend smoothing, since such biased preferences are more likely to be present among retail investors than sophisticated institutional investors. On the other hand, it is consistent with several agency-based models of smoothing. For example, in Allen et al. (2000), a high and steady dividend may attract and retain informed institutional investors, who prefer dividend payouts for tax purposes. These institutions in turn reduce a firm's agency costs through their monitoring and information gathering roles. Leary and Michaely (2011) provide empirical evidence that firms that are more exposed to agency conflicts between managers and outside shareholders smooth their dividends more.

To explore the relation between institutional holdings and reduction in agency costs, we next explore which types of institutions are most likely to hold stocks with smooth dividends. While the literature has examined various types of institutional investors, a large group of papers has demonstrated the strong monitoring ability of mutual funds. For example, Almazan et al. (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 et al. (1988) show that mutual funds and independent investment advisors are more likely to vote their proxies against management, and Morgan, Poulsen, Wolf, and Yang (2011) find that mutual funds vote in favor of proposals that increase shareholder wealth. To explore the validity of the agency channel through institutional clientele, we ask whether holdings of dividend smoothing stocks are concentrated among types of institutions with stronger monitoring abilities.

We first break the overall institutional holdings into groups by investment type, as defined in Thomson Financial's 13F database. There are five major types of institutions: bank trusts, insurance companies, investment companies (primarily mutual funds), investment advisors (mostly large brokerage firms), and all the other institutions (mainly pension funds and endowments).[7] We then estimate the specification of Table 2 separately for each institutional type and report the results in Table 3. To account for clustering of observations around zero, the estimation is performed using a Tobit model.

We find that only mutual funds robustly hold a greater concentration in dividend smoothing firms. The coefficient on *SOA* is -0.008, 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 for bank trusts) are similar in their avoidance of high dividend levels. It suggests that dividend level and the degree of dividend smoothing are dissimilar characteristics in their impacts on investors' decisions to hold a stock.

[7] Due to a structural break in the Thomson database in 1998, we limit the sample period to 1980-1997 for the next part of our analysis, but also use the full time period in a robustness test.

Because our proxies for smoothing are measured with error, we perform a robustness test in which we convert our continuous smoothing measures into a vector of four indicator variables that take a value of one if *SOA [RelVol]* belongs to a certain quartile, and zero otherwise. Using the alternative discrete measures of smoothing in all the regressions produces similar results (see Internet Appendix). Additionally, we perform a matched sample analysis to ensure that our main results hold when we relax the assumption of linear relations between the control and the outcome variables. Similar to the regression results, we find that mutual funds are the only category that exhibits consistently significant differences in holdings across the smoothing and non-smoothing firms

**b. Characteristics of Institutions that Prefer Dividend Smoothing Behavior**

In this subsection we further explore characteristics of institutions that are attracted to dividend smoothing stocks, while focusing on their monitoring abilities. We classify institutions based on their preference for dividend smoothing firms, and examine the characteristics of the two groups. To better evaluate cross-sectional variation across institutions, we perform the analysis at the institutional portfolio level, as opposed to aggregating all the holdings across institutions for a given stock, as we did in the previous subsection.

We start by defining the preference towards dividend smoothing firms. Every year, we split the overall universe of firms into high (below median *SOA* [*RelVol*]) and low (above median *SOA* [*RelVol*]) dividend smoothing groups. For each institutional investor we then calculate the proportion of its total equity portfolio that is allocated to high dividend smoothing firms. Finally, we assign all institutional investors into high [low] smoothing preference groups based on whether their investment in high dividend smoothing stocks is above [below] median in a given year. Table 4 summarizes the major characteristics of institutions with high and low dividend smoothing preference.

We start by examining investment style characteristics, as defined by Bushee (1998; 2001) and Bushee and Noe (2001). There are three types of institutions based on their investment strategy. Transient investors are characterized by high levels of portfolio turnover and diversification. Dedicated institutions have large and stable holdings in a small number of firms, while quasi-indexers hold large and diversified portfolios, but also trade infrequently. The table summarizes the proportion (in percent) of each institution's type in each dividend smoothing preference group.

First, we find a smaller proportion of transient investors among institutions with a strong preference for dividend smoothing behavior. Transient institutions are characterized by short-term focus with little interest in long-term capital appreciation or dividends (Porter (1992)), and thus can be viewed as non-monitors. Our results indicate that there are fewer non-monitoring investors among institutions that exhibit strong preferences for dividend-smoothing firms. Only 21% of institutions that like smoothing are transient investors, compared to over 33% among institutions with low preference for smoothing policy.

Second, we find that institutions that prefer dividend smoothing stocks are more likely to be quasi-indexers. While both dedicated and quasi-indexers are considered long-term investors, only quasi-indexers consistently exhibit good monitoring abilities. For example, Bushee and Noe (2000) show that quasi-indexers are the only institutional type that is sensitive to changes in disclosure policy that affects their ability to monitor effectively. Appel et al. (2015) demonstrate that although index funds are considered passive investors, they seek to improve firms' governance choices through voting, as well as indirect support of activist investors. Financial press lends further support for this idea. A recent article in *The Wall Street Journal* (March 4, 2015) suggests that traditionally passive investors such as large mutual fund managers are increasingly more assertive with their investments. For example, Vanguard has announced that "it won't sit idly by on corporate-governance issues". Our results indicate that there is a higher proportion of investors with good monitoring abilities, and a lower proportion of investors with little monitoring incentive among institutions that prefer dividend smoothing stocks, consistent with the agency costs explanation.

We also look at other institutional characteristics, such as size, which we obtain by summing up the values of all the stocks in the investor portfolio. Perhaps unsurprisingly, we find that funds with stronger preferences for smooth dividends are larger. We also examine investment style classification (value versus growth), and style-size (small versus large, value versus growth) classification, as suggested by Abarbanell, Bushee, and Raedy (2003). We find that investors with preferences for dividend smoothing firms are biased towards value style and away from growth, consistent with the characteristics of dividend smoothing firms documented in Leary and Michaely (2011).

**c. Institutional Investors and Dividends Smoothing – Causality Tests**

In this subsection, we tackle the question of whether mutual funds are attracted to firms that first smooth their dividends or whether the funds themselves pressure firms to smooth their dividends. To disentangle these alternatives, we examine two quasi-experiments representing shocks to dividend smoothing and mutual fund holdings, respectively.

*c.1. Does smoothing impact a firm's investor clientele?*

To examine whether smoothing impacts the clientele of stock investors, 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. Rule 10b-18 provides a safe harbor for repurchasing firms against the anti-manipulative provisions of the Securities Exchange Act of 1934, and facilitated the increased use of repurchases (Grullon and Michaely (2002)). As opposed to dividends, repurchases do not exhibit a smoothed pattern. Moreover, they are often used to absorb positive earnings shocks without having to commit to a higher level of dividends (e.g., Skinner (2008)). As such, we view the introduction of the safe harbor provisions as an exogenous reduction in the cost of dividend smoothing.

Before implementing the analysis, we validate that Rule 10b-18 is, indeed, related to the degree of dividend smoothing by individual firms, and verify that dividend smoothing policy has become more prevalent following its passage. 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 ten 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 also test the significance of this pattern more formally by regressing each smoothing measure on a post-1982 indicator (*After*) along with several firm characteristics that may be associated with variation in smoothing. The coefficients on *After* indicate a large and highly significant increase in dividend smoothing (i.e., reduction in SOA/RelVol) following the introduction of Rule 10b-18 (the results are included in the Internet Appendix).

If dividend smoothing is an attractive feature for institutional investors, we would expect institutions to increase their holdings of dividend paying stocks following the reform with the anticipation that dividend smoothing behavior will increase. To empirically test this hypothesis, we perform a difference-in-differences analysis. We compare changes in institutional holdings of dividend paying firms before and after the reform (treated group) with their holdings of non-dividend payers, which we use as our control group. The treated group consists of all firms that were dividend payers as of the end of 1981 and have sufficient time-series to calculate the *SOA* or *RelVol* measures. Our control group consists of all firms that have never paid dividends as of the end of 1981.[8] For every non-dividend-paying firm, we find a matching firm from the paying group from the same quartile of sales, *M/B*, and EBITDA. If several matches are found, we keep the observations with the closest value of sales. We then compare the difference in institutional holdings of dividend payers between years 1981 and 1983 with the difference across non-dividend paying firms. Since the distribution of the differences is not normal, we turn to non-parametric analysis to compare the differences in holdings while accounting for the non-normal distribution of our variable of interest.

We consider the most intuitive measure of changes in holdings, and look at the number of instances where institutional holdings increased versus the number of instances where institutional holdings decreased after the reform. The results are presented in Table 5. For the overall clientele of institutions, holdings of

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[8] Non-payers are a natural control group because they are subject to any common trends in institutional ownership over this time period, but would not be expected to increase the smoothness of their dividend payout. Our difference in differences approach relies on the assumption that there are no omitted interactions between time and dividend paying status. While there may be unobserved difference between payers and non-payers, it is not clear why these differences should differentially affect the change in institutional ownership over this 2-year period.

dividend-paying stocks increased following the reform relative to those of non-paying firms. Dividend payers saw an increase in institutional holdings in 71% of the cases, compared to only 54% of the cases among non-payers. This difference is statistically significant. Consistent with this finding, there also were fewer instances of institutional holdings decreases among dividend paying versus non-paying firms (23% and 16%, respectively). These findings help identify a causal impact of dividend smoothing on institutional holdings. When we decompose institutional holdings by type, we find that mutual funds and investment advisors are the only types of institutions that display a significantly higher tendency to increase holdings of dividend payers (relative to non-payers), and lower tendency to decrease holdings, following the reform. To ensure that our results remain robust when we account for the magnitudes of the changes, we perform a two-sample Kolmogorov-Smirnov test for the equality of two distributions, and find that the results presented in the table remain statistically significant (unreported).

*c.2. Do changes in investor composition affect smoothing behavior?*

We next use the discontinuity around the Russell 2000 index cutoff to explore whether a change in institutional holdings impacts firms' smoothing policies. As shown by earlier studies (Crane, Michenaud, and Weston (2014); Appel et al. (2015)), there is a discontinuous jump in institutional holdings of quasi-indexers right at the ranking cutoff that determines which firms are in the Russell 1000 versus 2000 index, which we use to capture an arguably exogenous change to institutional holdings. The experiment is especially suitable for our analysis given our findings that a large proportion of institutions that prefer dividend smoothing firms are quasi-indexers.

We follow the IV methodology of Appel et al. (2015) to test whether the shock to institutional ownership influences dividend smoothing. In our first stage regression we estimate the percentage of shares owned by the quasi-indexers in a given year as a function of firm size (log of market cap of polynomial orders 1 through 3), year fixed effects and an indicator for Russell 2000 inclusion for the sample of top 500 firms in the Russell 2000 index and the bottom 500 firms of the Russell 1000 index. We then use the instrumented proportion of quasi-indexers to examine the impact of quasi-indexers on firms' dividend smoothing policies. Since the IV analysis is based on annual updates to the Russell 1000 and 2000 index composition, we cannot use *SOA* and *RelVol* measures calculated based on a ten-year window. Instead, we look at a dummy variable that takes on a value of one if a firm has cut[increased] its dividend between July of year $t$ and June of year $t$+1. The results are presented in Table 6. We find that an increase in quasi-indexers does not have any impact on the number of cuts or increases, indicating that institutional investors do not direct the firm's dividend policy towards a smoother one. Thus, in concert, these two experiments suggest that the direction of causality runs from dividend smoothing to institutional holdings rather than from institutional holdings to smoothing.

## III. Market Reaction to Dividend Changes

In the previous section we established that a clientele of largely quasi-indexer mutual funds exhibits a preference for holding dividend smoothing stocks. We now turn to the question of whether this investor preference results in a premium for smooth dividend streams. Answering this question is important, given the evidence from managerial surveys indicating that a major factor driving the decision to keep dividends smoothed is the perception that such a premium exists. We take several approaches to addressing this question, starting with an analysis of the market's reaction to dividend announcements and the apparent unequal treatment of dividend cuts and increases.

### 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.[9] 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.[10] 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)).[11] 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 per event. For every dividend change, we calculate three-day CAR as the sum of daily returns of the stock of the announcing firm around the event ((-1; +1) trading days) minus the CRSP value-weighted market return.

Figure 2 shows the absolute value of the average CAR for dividend cuts and increases, conditioning on the size of the dividend change. Panel A includes all dividend changing firms and shows evidence consistent with managers' perceptions. Except for among small changes (for which there are relatively few dividend cuts),

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[9] Note that we do not attempt here to disentangle what portion of the announcement return is attributable to news about a firm's smoothing policy. Rather, we simply assess whether the asymmetric reaction to dividend cuts and increases generates a motive for smoothing out dividend changes.

[10] 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, and that financial data is available on CRSP and Compustat.

[11] While removing the lower bound reduces the average abnormal announcement return, it does not affect any of the relationships we document in a material way.

the magnitude of the market's reaction to dividend cuts is substantially larger than that for similar size increases. In Panel B, we repeat the exercise, but include only firms that have cut their dividend at least once in the past. Here we see that the asymmetry disappears. The differences in the absolute market responses to increases and decreases in this sample are all statistically insignificant (see the Internet Appendix). This suggests that among firms for which investors are not expecting a smooth dividend stream (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 7 examines the potential asymmetry more formally. The market response to dividend changes (*CAR*) is regressed on an indicator for the direction of the change (*Cut*) and the magnitude of the dividend change ($\Delta Div$), which is split into positive and negative changes to capture potential asymmetric reaction, along with a vector of firm-level controls (such as dividend per share, market cap, and market-to-book ratio). The estimated equation is:

$$(5a) \qquad CAR_{i,t} = \beta_1 + \beta_2 * Cut_{i,t} + \beta_3 * \Delta Div(<0)_{i,t} + \beta_4 * \Delta Div(>0)_{i,t} + [\mu * controls_{i,t}] + \eta_{i,t}$$

The results of the estimation (with and without a vector of control variables) are presented in columns (1) and (2) of Table 10, and are consistent with our univariate findings. While the intercept is slightly larger for dividend increases (0.022 for increases versus -0.002 ($\beta_1 + \beta_2$ =0.022-0.024) for decreases, as reported in column (2)), cuts have a slope with respect to the magnitude of the change almost three times that of increases ($\beta_3$ of 0.053 vs. $\beta_4$ of 0.02).

We then test for the impact of previous history of dividend cuts by adding an additional dummy variable that takes on a value of 1 if a firm has cut dividends before (*PastCut*), as well as its interaction with the direction and magnitude of dividend changes (column (3)). The alternative specification becomes:

$$(5b) \qquad CAR_{i,t} = \beta_1 + \beta_2 * Cut_{i,t} + \beta_3 * PastCut_{i,t} + \beta_4 * Cut_{i,t} * PastCut_{i,t} + \beta_5 * \Delta Div(<0)_{i,t} + \beta_6 * \Delta Div(<0)_{i,t} * PastCut_{i,t} + \beta_7 * \Delta Div(>0)_{i,t} + \beta_8 * \Delta Div(>0)_{i,t} * PastCut_{i,t} + \mu * controls_{i,t} + \eta_{i,t}$$

In this estimation, we are interested in comparing the announcement effect of negative versus positive dividend changes among firms that have cut their dividends in the past. Therefore, we compare the magnitudes of the sum of coefficients ($\beta_5 + \beta_6$) versus the sum of coefficients ($\beta_7 + \beta_8$). The results show that for a firm that has cut its dividend previously, the total price sensitivity to dividend changes is 0.014 (0.059 - 0.045), which is essentially the same magnitude as the one for increases (the sensitivity for increases is 0.014 (0.021 - 0.007)). These results suggest that the accumulation of market reactions to dividend increases and subsequent cuts may not in fact lead to a lower share price, especially for firms that abandon a smooth dividend policy and establish a history of dividend cuts. We explore this implication in more depth in the next section.

### b. Cumulative Impact of Dividend Changes

One implication of a preference for dividend smoothing is that dividend paths matter: Investors put a higher value on firms with a smoother dividend sequence. The previous analyses compare stand-alone announcements of significant dividend changes of comparable magnitude. However, this does not directly compare the cumulative stock price impact of a smooth dividend path (i.e., a series of small increases) to an equivalent, but more volatile path (i.e., larger increases with offsetting cuts). In Table 8 we address this issue by examining the cumulative market reaction to all dividend change announcements for a given firm. Intuitively, we compare the cumulative stock price impact during dividend announcement periods for a firm that increases its dividend by ten cents per share via five sequential increases of two cents each to an equivalent firm that achieves the same ten cent increase with three five-cent increases and one five-cent cut.

To do so, we partition our data into four ten-year periods: 1970-1979, 1980-1989, 1990-1999, and 2000-2009. We then calculate the three-day CARs surrounding each dividend change in that period, as described above, and sum those market reactions for every firm over each ten-year period. Finally, we regress the decade-long cumulative CARs on the total dividend change and 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.[12] A significant coefficient on the total decreases 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.

As expected, the coefficient on the *Sum of all dividend changes* has a positive sign, and the coefficients are highly significant. 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 its new level has little relation.

In columns (3) through (6) we measure the smoothness of the dividend path using our two direct proxies for smoothing, *SOA* and *RelVol*, 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 coefficient on smoothing is marginally significant only in column (3), and the positive sign of the *SOA* and *RelVol* coefficients is inconsistent with the idea that firms can enhance their stock price by pursuing a smoother dividend path.

### c. Does Smoothing Enhance the Credibility of Dividend Increases?

Managers may have an incentive to smooth dividends to build reputation and credibility among investors. If the market believes a firm is committed to maintaining smooth dividends, 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

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[12] 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.

dividend announcements. That is, we ask here whether investors value a dollar of dividends more if it comes from a firm that smoothes its dividends.

Table 9 examines the impact of a firm's smoothing policy on the market's reaction to dividend increases. We do not assume that the increase in dividend level represents news about the firm's smoothing policy. Rather, we test whether investors react more favorably to a given increase in the level if it comes from a firm known to smooth their dividends. Since we are now interested in the "bang-for-the-buck" effect of dividend changes, we focus on the market response to the dollar change in dividends. We calculate the total dollar change in dividends ($\Delta DDiv$) as the quarterly difference in the product of the number of shares outstanding and the dividend per share, scaled by firm assets.[13] The estimated equation becomes:

$$(5c) \qquad CAR_{i,t} = \beta_1 + \beta_2 * Smoothing_{i,t} + \beta_3 * \Delta DDiv(>0)_{i,t} + \beta_4 * \Delta DDiv(>0)_{i,t} * Smoothing_{i,t} + \mu * controls_{i,t} + \eta_{i,t}$$

If smoothing increases the value of a given dividend increase to investors, then the coefficient on the interaction of increases and smoothing ($\beta_4$) should be negative (recall that more smoothing is indicated by lower *SOA* or *RelVol*). The results are presented in columns (1) and (2) of Table 9. While the CAR is strongly positively related to the magnitude of the dividend changes, the coefficients on the interaction between dividend change and each smoothing proxy are actually positive and insignificant. This confirms once again that there is little, if any, relation between smoothing and the market's reaction to dividend changes. More broadly, there seem to be no reputational benefits to dividend smoothing.

One potential concern with our analysis 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 address this concern, we again use the introduction of the safe harbor provision of Rule 10b-18, discussed in Section II.c as a source of plausibly exogenous variation in dividend smoothing. In column (3) of Table 9, we replace the firm-specific measures of smoothing (*SOA* and *RelVol*) with an indicator for the period after the rule passage and repeat the estimation of equation (5). 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.

In this specification 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 (for robustness, we re-estimate the other columns using the 1972 – 1992 period and find no material changes). The coefficient on the interaction of the dollar dividend increase and *After* dummy is negative and statistically insignificant, confirming the findings

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[13] 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 the 1% level (for robustness, we repeat the estimations using non-winsorized variables, and our findings remain similar).

based on the firm-specific measures of dividend smoothing that investors do not seem to value dividends more highly from firms that smooth more.

To summarize, the results in this section suggest that once the market incorporates the first dividend cut into the stock price, it no longer has a memory for the path of dividend changes when evaluating the implications of a new dividend change announcement. Further, when comparing the total change in dividends over a longer period (decade), the cumulative market response to a given overall change in dividends is independent of the path, and responds solely to the dividend level. Taken together, we find no evidence that market responses to dividend changes, whether stand-alone or cumulative, generate an association between dividend smoothing and stock prices.

## IV. Smoothing and Cost of Capital

It is possible that the focus on dividend announcements in Section III 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. Survey evidence (Lintner (1956)) suggests managers' perception of the premium investors place on smooth dividends motivates this policy. Theoretical literature offers several potential sources for such a premium. For example, Baker and Wurgler (2012) argue that investors with prospect theory preferences will value smooth dividend streams more highly. Shleifer and Vishny (1997) and DeAngelo and DeAngelo (2007) suggest that paying a consistent dividend helps firms establish a reputation for fair treatment of dispersed shareholders. If investors value a smooth dividend stream, and are willing to pay a premium to hold shares of firms that provide it, dividend smoothing may reduce the firm's overall cost of equity capital.

As emphasized by Black and Scholes (1974), any impact of dividend policy on the stock price will be reflected in an opposite direction impact on the expected return of the stock. Thus, if investors are willing to pay more for the shares of firms that smooth their dividends, we would expect lower subsequent returns, all else equal, reflecting the lower cost of capital. In this section, we therefore examine the relationship between dividend smoothing policies and expected equity returns.

We start with a simple univariate analysis of firm equity returns as a function of smoothing. In June of each year $t$, we divide all the firms in the sample into deciles based on our two measures of dividend smoothing estimated over the ten year period from $t-10$ through $t$-1. We then calculate equally-weighted returns from July of year $t$ to June, of year $t$+1 of all firms within each smoothing decile portfolio. Finally, we calculate the mean and median monthly returns of the resulting time-series of each portfolio. We examine this relationship over our main sample period of 1970 – 2012, as well as the extended period of 1937 – 2012 that includes information back to the beginning of CRSP coverage. For each sample period and smoothing measure there is no discernible pattern in average returns across smoothing deciles (the results are presented in the Internet Appendix).

In Table 10 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, based on *SOA* [*RelVol]* estimated over the period (*t*-10) through *t*-1. We define high (low) smoothing firms as those in the bottom (top) three deciles of *SOA* or *RelVol*. We then create equal- and value-weighted portfolios of firms in the top, bottom and medium smoothing groups and calculate their monthly returns starting from July of year *t* and ending in June of year *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 then 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)):

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

Table 10 presents the intercept estimates of the regression in equation (6). Panel A summarizes the results using the extended 1936 – 2012 sample period, and in Panel B we focus on the more recent period from 1970 – 2012. There appears to be no consistent pattern in the estimated alphas across dividend smoothing portfolios. For example, while alphas decrease in magnitude from 0.07 for the portfolio of lowest *SOA* firms to 0.01 for the portfolio of highest *SOA* firms (Panel A, value-weighted portfolios), the declining pattern disappears when we use equally-weighted portfolio returns (the alpha coefficients of both *Low* and *High SOA* portfolios becomes 0.19). The pattern remains inconsistent when we measure smoothing using *RelVol*, and also when rely on the more recent period of 1970 – 2012 (we repeat the analysis for the early period of 1936 – 1969 and find no significant relationship as well). Further, the alpha on the high minus low smoothing portfolio is of inconsistent signs and is never statistically significant. In short, there is no consistent evidence that firms that smooth more earn lower expected returns.

Daniel and Titman (1997) argue that return 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 return differentials. Consistent with the previous analyses, we find no relation between dividend smoothing and expected returns.

We also perform several additional robustness tests (untabulated). First, Novy-Marx (2013) demonstrates that a profitability factor generates the same power as book-to-market in explaining the cross-section of returns. Since more profitable firms can more easily commit to a constant stream of dividends, omitting this factor could affect our 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.[14] Next, we test whether dividend smoothing is priced 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 1936, and repeat the univariate and multivariate analyses for periods of recession only. We again find no relation between dividend smoothing and expected returns, even during economic slowdowns. We also find no evidence that firms that smooth dividends are less likely to experience financial distress or that they maintain better access to external capital during recessionary periods. Thus, there does not appear to be a benefit to holding dividend smoothing stocks in terms of reduced sensitivity to economic downturns.

Finally, in unreported analysis, we examine whether investors might value firms with stable dividends when they anticipate a negative shock *in the future*. To explore this idea, we construct a time-series of the relative valuation of smoothing versus non-smoothing firms, and examine whether variation in this smoothing premium is systematically related to measures of economic conditions.

To compute the time-series of dividend smoothing premium, we follow the methodology of Baker and Wurgler (2004) who construct a dividend premium time-series for payers versus non-payers. First, we split our sample into high (below median *SOA* [*RelVol]*) and low (above median *SOA* [*RelVol*]) smoothing firms. We then construct equal and value-weighted averages of the market-to-book ratios for high and low smoothing groups in each year. The final dividend smoothing premium series (low-minus-high smoothing) is the difference of the logs of these averages. Next, we examine whether the time-series variation in the premium could be related to the market's anticipation of future shocks. To proxy for expectations of future shocks, we obtain historical information on forecasts of GDP level and growth from the Livingston Survey, and use the average GDP growth forecast over the next year as well as GDP forecast dispersion. We then compute the correlation between each measure of dividend smoothing premium on one side, and each of the proxies for expected economic conditions on the other side. We find no consistent pattern across the measures of smoothing premium and GDP forecasts (either in level, or the dispersion), rejecting the idea that investors' demands to hold dividend smoothing stocks are related to economic conditions.

## V. Dividend Smoothing and Firm Value

In this section, we take an alternative approach to testing whether investors put a premium on smooth dividends by examining the association between smoothing and firm value.  Following earlier studies relating

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

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 of allowing for smoothing to relate to firm value either by reducing the cost of capital (the focus of the previous section) or increasing 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 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 attempt to 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 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, DeAngelo, and Stulz (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 ten 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 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 data year. 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. We then 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 more highly by the market, while sales growth has a negative effect on *M/B*, consistent with the idea that as firms mature, they exercise their growth opportunities and accumulate a higher proportion of tangible assets. While the signs of the coefficients on the dividend smoothing variables are negative in three of the four specifications, suggesting that lower *SOA* [*RelVol*], or a higher degree of smoothing, increases firms' market values, none of these estimates are statistically significant, and the coefficients are economically tiny. For example, the coefficient of -0.16 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 0.05. Overall, the results suggest no significant difference in market valuation between firms that smooth their dividends and those that do not.

To ensure that our results are not driven by bias in the coefficient estimates due to measurement error in our smoothing proxies, we construct a non-parametric measure of dividend smoothing. Specifically, we convert our continuous smoothing measures into a vector of indicator variables. We allocate *SOA* and *RelVol* into quartiles of smoothing, and construct indicator variables that take on a value of one if *SOA* [*RelVol*] belongs to a certain quartile, and zero otherwise. Transforming the continuous smoothing measure into a categorical one does not affect the results reported in the paper in a material way.

## VI. Conclusion

Lintner (1956) found that managers smooth dividends largely because they perceive that investors put a premium on a stable or steadily growing dividend stream. Since that time, managers appear to have become even more committed to dividend stability, even when this is costly (Brav et al. (2005)). Yet, there is little, if any, extant evidence that investors indeed prefer this practice. In this paper we study the implications of dividend smoothing for a firm's investor clientele, pricing and expected returns. We find that the smoothness of a firm's dividends has implications for the composition of its shareholders. However, evidence based on the market reactions to dividend changes, expected equity returns, and valuation ratios all reveal no detectable relation between dividend smoothing and firms' stock prices or cost of equity capital. Thus, a corporate manager cannot be sure, based on the available evidence, whether a change in the firm's dividend smoothing policy will have any material effect on the price of its shares.

Our finding that smoothing is unrelated to prices and cost of capital is puzzling. These results suggest that despite management's strong convictions, investors are not willing to pay more for firms that smooth dividends. Why then do managers smooth dividends, despite the costs associated with it? 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. Miller and Modigliani (1961) argue that dividend policies can influence a firm's investor clientele even if it does not have implications for equity valuation. That is, if there exists a group of investors (but not all investors) with a preference for receiving smooth dividends, the supply of dividend smoothing stocks will adjust to meet their demand. Once this equilibrium is reached, firms with different payout policies will have different investor clienteles, but which policy (and associated clientele) the firm chooses will not affect their market valuation.

Taken together, the results in this study support this notion. We show in the first part of our analysis that there are significant differences across investors in their preferences for holding dividend smoothing stocks. Further, we find that it is indeed the smooth dividends that attract these investors, rather than the investors influencing smoothing policies. Since not all investors prefer smooth dividends equally, smoothing may not be associated with enhanced value as long as enough firms supply smooth dividends to satisfy this clientele.

We find that the clientele attracted to dividend smoothing stocks consists of institutional investors, largely quasi-indexer type mutual funds. This finding seems difficult to reconcile with behavioral explanations of why investors would prefer smooth dividends (e.g., Shefrin and Statman (1984); Baker and Wurgler (2012)). On the other hand, it offers a potential explanation for which firms choose to supply smoothed dividends. Recent research demonstrates the monitoring benefits of attracting such a clientele (Mullins (2014); Appel et al. (2015)). Consistent with the findings in Leary and Michaely (2011), smooth dividends are likely to be supplied by those firms who might benefit most from attracting this investor clientele (i.e., those facing a high degree of agency conflicts between managers and outside shareholders). On the other hand, we are not able to detect a valuation impact associated with this monitoring benefit. This may be because there are other mechanisms driving the matching between mutual funds and dividend smoothers, or because the impact of this monitoring on firm value is ultimately small. Alternatively, if all those firms that would benefit from this monitoring obtain it, there may be little detectable difference in valuations in equilibrium. We leave a fuller exploration of these issues to future research.

## Appendix A: Variable Definitions

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

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

A*fter dummy*: indicator variable that takes a value of 1 for 1983-1992 period, and zero otherwise.

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

*Assets*: net total assets (AT).

*Beta*: is computed in two steps. First, we estimate "pre-ranking beta" for each stock based on contemporaneous and 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 five years. To estimate post-ranking beta, we first sort stocks into size deciles each month using Fama and French (1993) size breakpoints[15]. Size breakpoints are based on allocating all the CRSP-Compustat data into deciles based on NYSE breakpoints. We further divide each size decile into beta 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 used in the analysis, which is assigned to each stock in the specific size-beta group.

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

*Capex*: capital expenditures (CAPX).

*CAR*: sum of daily returns of the stock of the announcing firm around the event ((-1; +1) trading days) minus the CRSP value-weighted market return.

*Cum CAR*: sum of three-day CARs surrounding dividend change announcements over each of the following ten-year periods: 1970-1979, 1980-1989, 1990-1999, and 2000-2009.

*Cut*: a dummy variable that takes a value of 1 if the dividend change is negative, and zero otherwise.

*ΔDDiv*: the difference between the total value of dividends (the product of the number of shares outstanding and *DPS*) announced in quarter *t* versus (*t-1*), scaled by total assets.

*ΔDiv*: the percentage change in cash dividend (dividend per share, adjusted to stock splits) from the previous dividend payment.

*Dividend*: common dividends (DVC).

*Dividend yield*: common dividends (DVC), scaled by the contemporaneous fiscal year-end market capitalization.

*DPS*: dividend per share (DVPSP_C).

*EBITDA*: operating income before depreciation (OIBDP), scaled by total assets. The variable is winsorized at 1 and 99 percent.

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[15] Obtained from Kenneth French website at

http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

*EPS*: earning per share (EPSPX).

*InstHold*: the sum of shares held by all the institutions, divided by the overall number of shares outstanding. We use the holdings as they are reported in 13F in December of each year. For firms that have no institutional reporting for the period we assign the value of zero.

*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). The ratio is winsorized at 1.

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

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

*Mcap:* market capitalization (PRCC_F*CSHO), in millions, at the end of the fiscal year.

*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 winsorized at 20.

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

*PastCut:* an indicator that takes a value of 1 if the firm has cut its dividend at least once prior to the current announcement, and zero otherwise.

*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).

*Price*: stock price at the end of fiscal year. The variable is winsorized at the $1^{st}$ and $99^{th}$ percentiles.

*R&D*: research and development expenses (XRD), scaled by book assets. Values of zero are assigned to missing observations. The ratio is winsorized at 1.

*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).

*Return:* average monthly stock return over a calendar year.

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

*Sale:* total net revenues (SALE).

*Stddev(EBITDA)*: standard deviation of earnings (OIBDP), scales by assets (AT), calculated over a ten-year period. The variable is winsorized at the $1^{st}$ and $99^{th}$ percentiles.

*Stddev(Return)*: standard deviation of a firm's monthly stock returns over a calendar year.

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

*Total dividend change:* the difference between the total value of dividends (the product of the number of shares outstanding and *DPS*) announced in quarter *t* versus (*t-1*), scaled by total assets.

*Total yield*: 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.

**References:**

Abarbanell, Jeffrey S., Brian J. Bushee, and Jana Smith Raedy, 2003, Institutional investor preferences and price pressure: The case of corporate spin-offs, *The Journal of Business*, 76, 233-261.
Allen, Franklin, Antonio E. Bernardo, and Ivo Welch, 2000, A Theory of Dividends Based on Tax Clienteles, *Journal of Finance*, 55, 2499-2536.
Almazan, Andres, Jay C. Hartzell, and Laura T. Starks, 2005, Active Institutional Shareholders and Costs of Monitoring: Evidence from Executive Compensation, *Financial Management*, 34, 5-34.
Appel, Ian, Todd A. Gormley, and Donald B. Keim, 2015, Passive Investors, Not Passive Owners, *Working paper*, University of Pennsylvania.
Baker, H. Kent, Gail E. Farrelly, and Richard B. Edelman, 1985, A Survey of Management Views on Dividend Policy, *Financial Management*, 14, 78– 84.
Baker, Malcolm, S. Nagel, and J. Wurgler, 2007, The Effect of Dividends on Consumption. *Brookings Papers on Economic Activity,* 1, 231– 91.
Baker, Malcolm, and Jeffrey Wurgler, 2004, A catering theory of dividends, *Journal of Finance*, 59, 1125-1165.
Baker, Malcolm, and Jeffrey Wurgler, 2012, Signaling with Reference Points: Behavioral Foundations for the Lintner Model of Dividends, *Working Paper*, Harvard University and NBER.
Berk, Jonathan, and Peter DeMarzo, 2013, *Corporate Finance*, Boston, MA: Prentice Hall.
Black, Fischer, and Myron Scholes, 1974, The Effect of Dividend Yield and Dividend Policy on Common Stock Prices and Returns, *Journal of Financial Economics*, 1, 1-22.
Brav, Alon, John Graham, Campbell Harvey, and Roni Michaely, 2005, Payout Policy in the 21st Century, *Journal of Financial Economics*, 77, 483-527.
Brickley, James A., Ronald C. Lease, and Clifford W. Smith Jr., 1988, Ownership Structure and Voting on Antitakeover Amendments, *Journal of Financial Economics*, 20, 267-291.
Bushee, Brian J., 1998, The influence of institutional investors on myopic R&D investment behavior, *The Accounting Review*, 73, 305-333.
Bushee, Brian J., 2001, Do institutional investors prefer near-term earnings over long-run value?, *Contemporary Accounting Research*, 18, 207-246.
Bushee, Brian J., and Christopher F. Noe, 2000, Corporate disclosure practices, institutional investors, and stock return volatility, *Journal of Accounting Research*, 38, 171-202.
Carhart, Mark M., 1997, On Persistence of Mutual Fund Performance, *Journal of Finance*, 52, 57-82.
Chang, Yen-Cheng, Harrison Hong, and Inessa Liskovich, 2015, Regression Discontinuity and the Price Effects of Stock Market Indexing, *Review of Financial Studies*, 28, 212-246.
Chen, Xia, Jarrad Harford, and Kai Li, 2007, Monitoring: Which Institutions Matter?, *Journal of Financial Economics*, 86, 279-305.
Choe, Hyuk, 1990, Intertemporal and Cross-Sectional Variation of Corporate Dividend Policy, *Ph.D. Dissertation*, University of Chicago.
Crane, Alan, Sebastien Michenaud, and James P. Weston, 2014, The Effect of Institutional Ownership on Payout Policy: A Regression Discontinuity Design Approach, *Working Paper, Rice University*.
Daniel, Kent, and Sheridan Titman, 1997, Evidence on the Characteristics of Cross Sectional Variation in Stock Returns, *Journal of Finance*, 52, 1-33.
DeAngelo, Harry, and Linda DeAngelo, 2007, Capital Structure, Payout Policy, and Financial Flexibility. Working paper, University of Southern California.
DeAngelo, Harry, Linda DeAngelo, and René M. Stulz, 2006, Dividend policy and the earned/contributed capital mix: a test of the life-cycle theory, *Journal of Financial Economics*, 81, 227-254.
Easterbrook, Frank H., 1984, Two Agency-Cost Explanations of Dividends, *American Economic Review*, 74, 650-659.
Fama, Eugene F., and Harvey Babiak, 1968, Dividend Policy: An Empirical Analysis, *Journal of the American Statistical Association*, 63, 1132-1161.
Fama, Eugene F., and Kenneth R. French, 1993, Common Risk Factors in the Returns of Stocks and Bonds, *Journal of Financial Economics*, 33, 3-56.

Fama, Eugene F., and James D. MacBeth, 1973, Risk, Return, and Equilibrium: Empirical Tests, *Journal of Political Economy*, 81(3), 607-636.
Gomes, Armando, 2000, Going Public without Governance: Managerial Reputation Effects, *Journal of Finance*, 55: 615—646.
Gompers, Paul A., Ishii, Jay, and Andrew Metrick, 2003, Corporate Governance and Equity Prices, *Quarterly Journal of Economics*, 118, 107-155.
Gompers, Paul A. and Andrew Metrick, 2001, Institutional Investors and Equity Prices, *Quarterly Journal of Economics*, 116, 229-259.
Graham, John R., Mark T. Leary, and Michael R. Roberts, 2014, A Century of Capital Structure: the Leveraging of Corporate America, *Journal of Financial Economics*, forthcoming.
Grind, Kirsten, and Joann S. Lublin, 2015, Vanguard and BlackRock plan to get more assertive with their investments, *Wall Street Journal*, March 4.
Grinstein, Yaniv, and Roni Michaely, 2005, Institutional Holdings and Payout Policy, *Journal of Finance*, 60, 1389-1426.
Grullon, Gustavo, George Kanatas, and James P. Weston, 2004, Advertising, Breadth of Ownership and Liquidity, *Review of Financial Studies*, 17, 439-461.
Grullon, Gustavo, and Roni Michaely, 2002, Dividends, Share Repurchases, and the Substitution Hypothesis, *Journal of Finance*, 57, 1649-1684.
Grullon, Gustavo, Roni Michaely, and Bhaskaran Swaminathan, 2002, Are Dividend Changes a Sign of Firm Maturity? *Journal of Business*, 75, 387-424.
Lambrecht, Bart, and Stewart Myers, 2012, A Lintner Model of Payout and Managerial Rents, *Journal of Finance*, 67, 1761-1810.
Leary, Mark T. and Roni Michaely, 2011, Determinants of Dividend Smoothing: Empirical Evidence, *Review of Financial Studies*, 24, 3197-3249.
Lintner, John, 1956, Distribution of Incomes of Corporations among Dividends, Retained Earnings, and Taxes, *American Economic Review*, 46(2), 97-113.
Miller, Merton H., 1977, Debt and Taxes, *Journal of Finance*, 32, 261–275.
Miller, Merton H., and Franco Modigliani, 1961, Dividend Policy, Growth, and the Valuation of Shares, *Journal of Business*, 34, 411–433.
Mullins, William, 2014, The Governance Impact of Index Funds: Evidence from Regression Discontinuity, *Working paper*, University of Maryland.
Morgan, Angela, Poulsen, Annette, Wolf, Jack, and Tina Yang, 2011, Mutual Funds as Monitors: Evidence from Mutual Fund Voting, *Journal of Corporate Finance*, 17, 914—928.
Novy-Marx, 2013, The other side of value: The gross profitability premium, *Journal of Financial Economics*, 108, 1-28.
Porter, Michael E., 1992, Capital Choices: Changing the Way America Invests in Industry, *Journal of Applied Corporate Finance*, 5, 4-16.
Rogers, Willard L., 1993, Regression Standard Errors in Clustered Samples. *Stata Technical Bulletin*, 13, 19–23.
Rountree, Brian, Weston, James P., and George Allayannis, 2008, Do Investors Value Smooth Performance?, *Journal of Financial Economics*, 90(3), 237-251.
Shefrin, Hersh M., and Meir Statman, 1984, Explaining Investor Preference for Cash Dividends, *Journal of Financial Economics*, 13(2), 253-282.
Shleifer, Andrei, and Robert Vishny, 1997, A Survey of Corporate Governance, *Journal of Finance*, 52, 737-783.
Skinner, Douglas J., 2008, The Evolving Relation between Earnings, Dividends, and Stock Repurchases, *Journal of Financial Economics*, 87(3), 582-609.

## Table 1

## Cross-sectional Distribution of Smoothing Measures

The sample consists of all firms in the intersection of CRSP and Compustat for the period 1970-2010. Dividend smoothing is constructed as described in Section I. See Appendix A for descriptions of the rest of the variables.

**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 | 6.810 | 6.731 | 6.593 | 6.407 |
| *Log(Age)* | 3.220 | 3.268 | 3.201 | 3.127 | 2.993 |
| *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 | 0.202 |
| *Stddev(Return)* | 0.099 | 0.098 | 0.100 | 0.100 | 0.100 |
| *Turnover* | 0.090 | 0.085 | 0.084 | 0.083 | 0.081 |
| *Dividend yield* | 0.027 | 0.029 | 0.026 | 0.024 | 0.024 |
| *InstHold* | 0.480 | 0.476 | 0.466 | 0.446 | 0.419 |

**Panel B: RelVol**

| | Low RelVol | 2 | 3 | 4 | High RelVol |
|---|---|---|---|---|---|
| *RelVol* | 0.118 | 0.245 | 0.406 | 0.676 | 1.636 |
| *Log(Sale)* | 6.840 | 6.816 | 6.749 | 6.661 | 6.403 |
| *Log(Age)* | 3.310 | 3.234 | 3.165 | 3.100 | 2.994 |
| *M/B* | 1.395 | 1.435 | 1.490 | 1.631 | 1.806 |
| *EBITDA* | 0.133 | 0.140 | 0.146 | 0.159 | 0.170 |
| *Tangibility* | 0.366 | 0.355 | 0.351 | 0.347 | 0.340 |
| *Leverage* | 0.249 | 0.242 | 0.229 | 0.216 | 0.201 |
| *Stddev(Return)* | 0.099 | 0.097 | 0.098 | 0.097 | 0.097 |
| *Turnover* | 0.086 | 0.084 | 0.081 | 0.081 | 0.080 |
| *Dividend yield* | 0.030 | 0.027 | 0.026 | 0.025 | 0.025 |
| *InstHold* | 0.483 | 0.465 | 0.458 | 0.448 | 0.426 |

## Table 2

### Multivariate Regression of Individual and Institutional Holdings

This table reports the results of estimating OLS regressions, where the dependent variables are the logarithms of 1 plus the number and the proportion of institutions invested in a stock (variables *Log(InstNum)* and *Log(InstHold)*, respectively) and the logarithm of shareholder base (*Log(#Invest)*). The sample consists of CRSP-Compustat firms for the period 1980-2010. See Section I and Appendix A for descriptions of the independent variables. All estimation models include year and industry (defined at 2-digit SIC code level) fixed effects. Heteroskedasticity-robust standard errors adjusted for clustering at the firm level (Rogers (1993)) are reported in parenthesis. The symbols ***, ** and * indicate p-values of 1%, 5%, and 10%, respectively.

| | Panel A: SOA | | | Panel B: RelVol | | |
|---|---|---|---|---|---|---|
| | *Log(InstHold)* | *Log(InstNum)* | *Log(#Invest)* | *Log(InstHold)* | *Log(InstNum)* | *Log(#Invest)* |
| *Intercept* | 0.127*** | -0.426* | -3.997*** | 0.13*** | -0.375 | -4.095*** |
| | *(0.033)* | *(0.242)* | *(0.336)* | *(0.034)* | *(0.23)* | *(0.329)* |
| *Smoothing* | -0.033*** | -0.247*** | 0.286*** | -0.01*** | -0.069*** | 0.089*** |
| | *(0.007)* | *(0.051)* | *(0.052)* | *(0.003)* | *(0.019)* | *(0.018)* |
| *Dividend yield* | -0.457*** | -1.924*** | 4.088*** | -0.473*** | -2.173*** | 4.035*** |
| | *(0.083)* | *(0.56)* | *(0.621)* | *(0.086)* | *(0.58)* | *(0.644)* |
| *Log(Sale)* | 0.03*** | 0.438*** | 0.586*** | 0.029*** | 0.437*** | 0.599*** |
| | *(0.002)* | *(0.016)* | *(0.015)* | *(0.002)* | *(0.017)* | *(0.015)* |
| *Log(Age)* | 0.02*** | 0.431*** | 0.263*** | 0.021*** | 0.436*** | 0.274*** |
| | *(0.004)* | *(0.032)* | *(0.034)* | *(0.004)* | *(0.032)* | *(0.034)* |
| *M/B* | 0.002 | 0.252*** | 0.219*** | 0.0004 | 0.242*** | 0.204*** |
| | *(0.002)* | *(0.022)* | *(0.022)* | *(0.002)* | *(0.022)* | *(0.023)* |
| *EBITDA* | 0.055** | 1.176*** | -0.995*** | 0.059** | 1.188*** | -0.937*** |
| | *(0.024)* | *(0.184)* | *(0.172)* | *(0.025)* | *(0.194)* | *(0.182)* |
| *Tangibility* | -0.009 | 0.295*** | 0.338*** | -0.008 | 0.303*** | 0.344*** |
| | *(0.015)* | *(0.093)* | *(0.105)* | *(0.016)* | *(0.095)* | *(0.107)* |
| *Leverage* | -0.011 | -0.361*** | -0.312*** | -0.017 | -0.377*** | -0.322*** |
| | *(0.013)* | *(0.09)* | *(0.089)* | *(0.013)* | *(0.094)* | *(0.091)* |
| *Advertising* | -0.046 | -0.204 | -0.008 | -0.069 | -0.316 | 0.068 |
| | *(0.042)* | *(0.247)* | *(0.268)* | *(0.043)* | *(0.245)* | *(0.278)* |
| *R&D* | -0.043 | 0.164 | 2.196*** | -0.055 | 0.251 | 2.144*** |
| | *(0.082)* | *(0.491)* | *(0.534)* | *(0.083)* | *(0.506)* | *(0.575)* |
| *Return* | -0.137*** | -0.669** | -0.296 | -0.137*** | -0.623** | -0.358* |
| | *(0.036)* | *(0.28)* | *(0.188)* | *(0.037)* | *(0.29)* | *(0.201)* |
| *Stddev(Return)* | -0.242*** | -0.665*** | -1.331*** | -0.248*** | -0.767*** | -1.29*** |
| | *(0.032)* | *(0.24)* | *(0.202)* | *(0.034)* | *(0.251)* | *(0.214)* |
| *Turnover* | 0.524*** | 0.531** | -0.126 | 0.536*** | 0.663*** | -0.268 |
| | *(0.03)* | *(0.207)* | *(0.231)* | *(0.032)* | *(0.223)* | *(0.242)* |
| *1/price* | -0.419*** | -2.105*** | 2.446*** | -0.421*** | -2.227*** | 2.545*** |
| | *(0.1)* | *(0.186)* | *(0.171)* | *(0.029)* | *(0.215)* | *(0.184)* |
| *Obs.* | *28679* | *28679* | *26593* | *27153* | *27153* | *25180* |
| *# of firms/clusters* | *2745* | *2745* | *2543* | *2635* | *2635* | *2440* |
| *R-squared* | 0.53 | 0.66 | 0.69 | 0.52 | 0.66 | 0.70 |

## Table3
## Multivariate Regression of Institutional Holdings by Institutional Type

This table reports the results of estimating Tobit regressions, where the dependent variable is the logarithm of 1 plus the weight of the institutional holding of each type of institution relative to the overall holdings of a stock. The sample consists of CRSP-Compustat firms for the period 1980-1997. All estimation models include year and industry (defined at 2-digit SIC code level) fixed effects, as well as the vector of control variables from Table 2 (Internet Appendix provides a full version of the table with all the coefficients reported). Heteroskedasticity-robust standard errors adjusted for clustering at the firm level (Rogers (1993)) are reported in parenthesis. ***, ** and * indicate p-values of 1%, 5%, and 10%, respectively.

Panel A: SOA

| | *Bank trusts* | *Insurance companies* | *Mutual funds* | *Investment advisors* | *Others* |
|---|---|---|---|---|---|
| | *(1)* | *(2)* | *(3)* | *(4)* | *(5)* |
| *Intercept* | -0.111*** | -0.044 | 0.031 | 0.123*** | -0.112*** |
| | *(0.015)* | *(0.034)* | *(0.02)* | *(0.027)* | *(0.016)* |
| *SOA* | -0.001 | -0.01*** | -0.008** | -0.012** | -0.004 |
| | *(0.005)* | *(0.003)* | *(0.003)* | *(0.005)* | *(0.003)* |
| *Dividend yield* | 0.177*** | -0.076* | -0.165*** | -0.21*** | -0.08** |
| | *(0.051)* | *(0.04)* | *(0.0347)* | *(0.057)* | *(0.0356)* |
| *Controls* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* |
| *Obs.* | *18054* | *18054* | *18054* | *18054* | *18054* |
| *# of firms/clusters* | *2178* | *2178* | *2178* | *2178* | *2178* |

Panel B: RelVol

| | *Bank trusts* | *Insurance companies* | *Mutual funds* | *Investment advisors* | *Others* |
|---|---|---|---|---|---|
| | *(1)* | *(2)* | *(3)* | *(4)* | *(5)* |
| *Intercept* | -0.112*** | -0.038 | 0.034* | 0.125*** | -0.114*** |
| | *(0.017)* | *(0.031)* | *(0.02)* | *(0.027)* | *(0.015)* |
| *RelVol* | -0.0011 | -0.0014 | -0.003*** | 0.0001 | -0.0002 |
| | *(0.002)* | *(0.001)* | *(0.001)* | *(0.002)* | *(0.001)* |
| *Dividend yield* | 0.144*** | -0.072** | -0.173*** | -0.183*** | -0.096*** |
| | *(0.053)* | *(0.034)* | *(0.0361)* | *(0.057)* | *(0.035)* |
| *Controls* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* |
| *Obs.* | *17373* | *17373* | *17373* | *17373* | *17373* |
| *# of firms/clusters* | *2099* | *2099* | *2099* | *2099* | *2099* |

## Table 4

### Characteristics of Institutional Holdings Based on Their Preference towards Dividend Smoothing Stocks

This table reports the characteristics of institutional investors with high[low] preference towards dividend smoothing stocks. The preference towards dividend smoothing firms is defined in the following way. Every year, we split the overall universe of firms into high (below median *SOA*[*RelVol*]) and low (above median *SOA*[*RelVol*]) dividend smoothing groups. For each institutional investor we calculate the proportion of its total equity portfolio that is allocated to high dividend smoothing firms. We then split the institutional investors into high [low] smoothing preference group based on whether their investment in high dividend smoothing stocks in above [below] median across institutions in a given year. The characteristics reported in the table are institutional size (as proxied by the total dollar value of the equity portfolio, as well as the number of different stocks included in the portfolio), and investment type, as defined by Bushee (1998; 2001) and Bushee and Noe (2000). *Transient* investors are characterized by high levels of portfolio turnover and diversification; *Dedicated* institutions have large and stable holdings in a small number of firms, while *Quasi-indexers* hold large and diversified portfolios, but also trade infrequently. We use investment style classification (value versus growth), and style-size (small versus large, value versus growth), as suggested by Abarbanell, Bushee, and Raedy (2003). The table shows the proportion (in percent) of each institution's type [style] in each dividend smoothing preference group. ***, ** and * indicate p-values of 1%, 5%, and 10%, respectively.

| | Panel A: SOA | | | | Panel B: RelVol | | | |
|---|---|---|---|---|---|---|---|---|
| | Smoothing preference | | Diff. | p-values | Smoothing preference | | Diff. | p-values |
| | Low | High | | (diff.) | Low | High | | (diff.) |
| ***Size characteristics*** | | | | | | | | |
| Portfolio size, $million | 2,986.3 | 4,753.9 | 1,767.6 | *** | 2,698.2 | 5,083.2 | 2,385.0 | *** |
| Number of assets | 254.5 | 308.6 | 54.1 | *** | 245.4 | 320.8 | 75.4 | *** |
| ***Institutional investment type*** | | | | | | | | |
| Transient | 33.5 | 21.0 | -12.5 | *** | 33.0 | 21.6 | -11.4 | *** |
| Dedicated | 5.9 | 2.5 | -3.4 | *** | 5.7 | 2.7 | -3.0 | *** |
| Quasi-indexers | 45.7 | 64.0 | 18.3 | *** | 46.4 | 63.3 | 16.9 | *** |
| ***Institutional investment style*** | | | | | | | | |
| Growth | 32.7 | 21.8 | -11.0 | *** | 33.8 | 20.3 | -13.5 | *** |
| Value | 28.3 | 28.3 | 0.0 | | 27.1 | 29.8 | 2.7 | *** |
| Large growth | 17.0 | 32.5 | 15.6 | *** | 18.4 | 30.9 | 12.5 | *** |
| Large value | 14.3 | 38.3 | 24.0 | *** | 13.4 | 39.4 | 26.0 | *** |
| Small growth | 32.8 | 8.7 | -24.1 | *** | 32.5 | 8.8 | -23.7 | *** |
| Small value | 27.1 | 12.8 | -14.2 | *** | 26.7 | 13.4 | -13.3 | *** |

## Table 5

### Safe harbor reform – difference-in-differences analysis of institutional holdings

This table presents the results of a difference-in-difference analysis, where the dependent variable is the weight of institutional holding of each type relative to 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. We compare changes in institutional holdings of dividend paying firms before (as of the end of 1981) and after (as of the end of 1983) the safe harbor Rule 10b-18 reform with the holdings of non-dividend payers, which we use as our control group. The treated group consists of all firms that were dividend payers as of the end of 1981 and have sufficient time-series to calculate *SOA* or *RelVol*. The control group consists of all the firms that have never paid dividends as of the end of 1981. For every non-dividend paying firm we find a matching firm from the paying group in the same quartile of sales, *M/B*, and *EBITDA*. If several matches are found, we keep the observations with the closest value of sales. We then calculate the differences in institutional holdings of dividend payers between years 1981 and 1983 with the difference across non-dividend paying firms, and construct two measures of changes. *Pos_change* [*Neg_change*], takes on a value of 1 in the change in institutional holdings between years 1981 and 1983 has been strictly positive [negative], and zero otherwise. The table shows the proportion of positive and negative changes across the treated (payers) and control (non-payers) groups; *t*-statistics of the differences, as well as the *p*-value of the Wilcoxon test of the equality of distributions.

**Panel A: Proportion of increases in institutional holdings**

| | *N* | *InstHold* | *Bank trusts* | *Insurance companies* | *Mutual funds* | *Investment advisors* | *Others* |
|---|---|---|---|---|---|---|---|
| *Non-payers* | 886 | 53.5% | 40.1% | 15.0% | 20.2% | 43.1% | 11.2% |
| *Payers* | 963 | 71.2% | 54.1% | 18.2% | 38.2% | 69.8% | 8.5% |
| diff (Payers - Non-payers) | | 17.7% | 14.0% | 3.2% | 18.0% | 26.7% | -2.7% |
| *t* -stat (diff) | | 7.98 | 6.09 | 1.83 | 8.64 | 11.97 | -1.92 |
| Wilc. *p* -value | | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 | 0.60 |

**Panel B: Proportion of decreases in institutional holdings**

| | *N* | *InstHold* | *Bank trusts* | *Insurance companies* | *Mutual funds* | *Investment advisors* | *Others* |
|---|---|---|---|---|---|---|---|
| *Non-payers* | 886 | 23.1% | 22.0% | 12.5% | 11.7% | 15.9% | 9.1% |
| *Payers* | 963 | 15.7% | 21.0% | 32.3% | 8.7% | 5.6% | 37.1% |
| diff (Payers - Non-payers) | | -7.5% | -1.0% | 19.8% | -3.0% | -10.3% | 27.9% |
| t-stat (diff) | | -4.05 | -0.54 | 10.55 | -2.13 | -7.18 | 15.23 |
| Wilc. *p* -value | | 0.00 | 0.60 | 0.00 | 0.03 | 0.00 | 0.00 |

## Table 6

## Impact of Institutional Holdings on Dividend Changes

This table reports the results of estimating the second-stage logit regression of the instrumental variable analysis used to identify the effect of quasi-indexers' ownership on dividend policy. The dependent variable takes on a value of 1 if the firm has increased (column 1), cut (column 2) or either increased or cut (column 3) dividends during the period of July *t* and June *t*+1. The sample period is 1998 – 2006, and includes the bandwidth of 500 firms around the Russell 1000/2000 threshold. *Quasi-index* is the proportion of firm's shares owned by quasi-index institutions (Bushee (1998; 2001), Bushee and Noe (2000)). It is instrumented using an indicator that takes a value of 1 if the firm belongs to the Russell 2000 index in year *t*. The regression also includes market cap of equity (converted into logs) of polynomial orders 1, 2, and 3 and year fixed effects. Heteroskedasticity-robust standard errors adjusted for clustering at the firm level (Rogers (1993)) are reported in parenthesis. The symbols ***, ** and * indicate p-values of 1%, 5%, and 10%, respectively.

| | dividend increase (Dummy=1) | dividend cut (Dummy=1) | dividend cut or increase (Dummy=1) |
|---|---|---|---|
| Quasi-index | -5.00 | 5.76 | -3.54 |
| | (6.64) | (13.98) | (6.29) |
| Bandwidth | 500 | 500 | 500 |
| Polynomial order, N | 3 | 3 | 3 |
| Year fixed effect | Yes | Yes | Yes |
| Obs | 8812 | 8812 | 8812 |

## Table 7

### Market reaction to dividend change announcements: Multivariate analysis

The dependent variable is the market reaction to dividend change announcements. *Cut* is a dummy that takes a value of 1 if the dividend change is negative, and zero otherwise. *PastCut* is an indicator that takes a value of 1 if the firm has cut its dividend at least once prior to the current announcement, and zero otherwise. *ΔDiv(<0)* is the magnitude of dividend change for dividend cuts, and zero otherwise. *ΔDiv(>0)* is the magnitude of dividend change for dividend increases, and zero otherwise. *Dividend/Assets* are as of the most recent fiscal year-end. See Section III.a and Appendix A for the description of the sample and definitions of other control variables. All models are estimated using the methodology of Fama and MacBeth (1973). *t*-statistics are reported in parentheses. ***, **, and * indicate p-values of 1%, 5%, and 10%, respectively.

| | (1) | (2) | (3) |
|---|---|---|---|
| *Intercept* | 0.009*** | 0.022*** | 0.022*** |
| | *(9.15)* | *(7.56)* | *(7.73)* |
| *Cut* | -0.02*** | -0.024*** | -0.025** |
| | *(-4.09)* | *(-3.17)* | *(-2.08)* |
| *PastCut* | | | 0.002 |
| | | | *(0.78)* |
| *Cut*PastCut* | | | -0.015 |
| | | | *(-0.78)* |
| *ΔDiv(<0)* | 0.047*** | 0.053*** | 0.059** |
| | *(4.56)* | *(3.33)* | *(2.47)* |
| *ΔDiv(<0)*PastCut* | | | -0.045 |
| | | | *(-1.15)* |
| *ΔDiv(>0)* | 0.012*** | 0.02*** | 0.021*** |
| | *(5.64)* | *(5)* | *(4.31)* |
| *ΔDiv(>0)*PastCut* | | | -0.007 |
| | | | *(-0.85)* |
| *Dividend/Assets* | 0.0239** | 0.117*** | 0.124*** |
| | *(2.07)* | *(3.95)* | *(4.86)* |
| *Log(Mcap)* | | -0.002*** | -0.002*** |
| | | *(-7.23)* | *(-6.83)* |
| *M/B* | | -0.003*** | -0.003*** |
| | | *(-3.42)* | *(-3.65)* |
| *EBITDA* | | 0.003 | 0.003 |
| | | *(0.31)* | *(0.28)* |
| *Stddev(EBITDA)* | | 0.035 | 0.031 |
| | | *(1.26)* | *(1.06)* |

## Table 8

### Cumulative market reaction to dividend change announcements: Multivariate analysis

The dependent variable is the cumulative market reaction to dividend change announcements. See Section III.a for the description of sample construction. To construct the dependent variable, we use 3-day CARs, which is the 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: 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 numerator 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. *DPS* is the last quarterly dividend payout of the previous decade. *EBITDA* is operating income before depreciation, scaled by assets. *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*. *Mcap, 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.

| | Panel A | | Panel B: SOA | | Panel C: RelVol | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *Intercept* | 2.97*** | 9.63*** | 2.12*** | 8.62*** | 2.27*** | 8.91*** |
| | *(0.44)* | *(1.929)* | *(0.69)* | *(2.043)* | *(0.734)* | *(2.13)* |
| *Sum of all dividend changes* $_{t-(t+10)}$ | 0.624*** | 0.703*** | 0.635*** | 0.719*** | 0.61*** | 0.71*** |
| | *(0.06)* | *(0.083)* | *(0.073)* | *(0.082)* | *(0.075)* | *(0.084)* |
| *Sum of decreases* $_{t-(t+10)}$ | -0.04 | 0.008 | | | | |
| | *(0.042)* | *(0.05)* | | | | |
| *DPS* $_{(t-1)}$ | 0.016 | 0.013 | 0.014 | 0.014 | 0.014 | 0.013 |
| | *(0.021)* | *(0.021)* | *(0.021)* | *(0.021)* | *(0.021)* | *(0.021)* |
| *SOA/RelVol* $_{t-(t+10)}$ | | | 2.697* | 1.793 | 0.678 | 0.234 |
| | | | *(1.383)* | *(1.384)* | *(0.49)* | *(0.492)* |
| *Mean change in EBITDA* $_{t-(t+10)}$ | | 101.17*** | | 83.02** | | 95.42** |
| | | *(24.95)* | | *(38.879)* | | *(40.44)* |
| *M/B* $_{(t-1)}$ | | 0.532** | | 0.415 | | 0.37 |
| | | *(0.267)* | | *(0.308)* | | *(0.298)* |
| *Log(Mcap)* $_{(t-1)}$ | | -1.163*** | | -1.074*** | | -1.078*** |
| | | *(0.199)* | | *(0.211)* | | *(0.216)* |
| *1/Price* $_{(t-1)}$ | | 13.73* | | 17.61 | | 19.82* |
| | | *(8.29)* | | *(9.063)* | | *(9.344)* |
| *Stddev(EBITDA)* $_{t-(t+10)}$ | | -2.06 | | -6.07 | | -4.32 |
| | | *(12.58)* | | *(12.74)* | | *(13.24)* |
| *Obs.* | 3762 | 2186 | 2111 | 2068 | 2067 | 2024 |
| *R-square adj.* | 0.05 | 0.09 | 0.06 | 0.09 | 0.06 | 0.09 |

## Table 9

### Dividend smoothing and market reaction to dividend increase announcements (total dividend change)

The dependent variable is the market reaction (3-day CAR) to announcements of dividend increases. See Section III.a and Appendix A for descriptions of the sample and main variables' construction. The smoothing measure is *SOA* in column (1), *RelVol* in column (2), and *After*, an indicator for the post-1982 period, in column (3). Columns (1) and (2) use Fama-MacBeth estimation; column (3) is estimated via OLS with year fixed effects and standard errors clustered by year. *ΔDDiv* is defined as the difference between the total value of dividends (the product of the number of shares outstanding and *DPS*) announced in quarter *t* versus (*t-1*), scaled by total assets. *ΔDDiv (>0)* is the magnitude of dividend change for dividend increases, and zero otherwise. *Dividend/Assets* is the ratio of the total dividend value announced in the most recent fiscal year-end to the total asset value. In column (3) we restrict the sample period to 1972 – 1992. *t*-statistics are reported in parentheses. ***, **, and * indicate *p*-values of 1%, 5%, and 10%, respectively.

| | *SOA*<br>(1) | *RelVol*<br>(2) | *After*<br>(3) |
|---|---|---|---|
| *Intercept* | 0.033*** | 0.034*** | 0.042*** |
| | *(8.04)* | *(9.83)* | *(12.28)* |
| *Smoothing* | -0.0008 | -0.002 | 0.002 |
| | *(-0.16)* | *(-1.013)* | *(1.26)* |
| *ΔDDiv (>0)* | 3.21** | 3.085** | 4.035*** |
| | *(2.7)* | *(2.686)* | *(4.14)* |
| *ΔDDiv(>0)*Smoothing* | 1.291 | 0.494 | -1.26 |
| | *(0.54)* | *(0.63)* | *(-1.07)* |
| *Dividend/Assets* | 0.144 | 0.035 | 0.314 |
| | *(0.47)* | *(0.114)* | *(0.96)* |
| *Log(Mcap)* | -0.003*** | -0.003*** | -0.003*** |
| | *(-5.59)* | *(-6.617)* | *(-6.87)* |
| *M/B* | -0.004*** | -0.003** | -0.005*** |
| | *(-3.3)* | *(-2.116)* | *(-3.42)* |
| *EBITDA* | -0.025** | -0.027** | -0.006 |
| | *(-1.98)* | *(-2.473)* | *(-0.53)* |
| *Stddev(EBITDA)* | 0.039 | *0.04* | *-0.005* |
| | *(1.03)* | *(1.224)* | *(-0.18)* |

## Table 10

## Dividend Smoothing and Monthly Stock Returns – Fama-French Analysis

The table presents the intercepts of Fama and French (1993) three-factor (plus the momentum factor) regressions of monthly returns of portfolios that are formed based on the degree of a firm's dividend smoothing. The stock returns data is obtained for the period of July, 1936 to June, 2012. The table presents the values, standard errors and *t*-values of the intercept (α) of each regression. See Section IV for the description of the methodology.

**Panel A: July, 1936 - June, 2012**

**SOA**

| | Value-Weighted | | | Equally-Weighted | | |
|---|---|---|---|---|---|---|
| Portfolios | **Parameter Estimate** | **Standard Error** | **t Value** | **Parameter Estimate** | **Standard Error** | **t Value** |
| Low SOA | 0.07 | 0.04 | 1.66 | 0.19 | 0.04 | 4.18 |
| Medium SOA | 0.02 | 0.04 | 0.50 | 0.17 | 0.04 | 3.77 |
| High SOA | 0.01 | 0.05 | 0.21 | 0.19 | 0.04 | 4.47 |
| High minus Low | -0.06 | 0.06 | -0.99 | 0.00 | 0.04 | 0.06 |

**RelVol**

| | Value-Weighted | | | Equally-Weighted | | |
|---|---|---|---|---|---|---|
| Portfolios | **Parameter Estimate** | **Standard Error** | **t Value** | **Parameter Estimate** | **Standard Error** | **t Value** |
| Low RelVol | 0.03 | 0.05 | 0.63 | 0.16 | 0.04 | 3.59 |
| Medium RelVol | 0.04 | 0.04 | 1.07 | 0.20 | 0.04 | 4.88 |
| High RelVol | 0.04 | 0.05 | 0.84 | 0.20 | 0.04 | 4.39 |
| High minus Low | 0.01 | 0.07 | 0.16 | 0.04 | 0.04 | 0.98 |

**Panel B: Jan, 1970 - June, 2012**

**SOA**

| | Value-Weighted | | | Equally-Weighted | | |
|---|---|---|---|---|---|---|
| Portfolios | **Parameter Estimate** | **Standard Error** | **t Value** | **Parameter Estimate** | **Standard Error** | **t Value** |
| Low SOA | 0.06 | 0.07 | 0.97 | 0.19 | 0.07 | 2.93 |
| Medium SOA | 0.04 | 0.06 | 0.69 | 0.19 | 0.07 | 2.88 |
| High SOA | 0.02 | 0.07 | 0.24 | 0.19 | 0.06 | 3.00 |
| High minus Low | -0.05 | 0.09 | -0.53 | 0.00 | 0.05 | 0.05 |

**RelVol**

| | Value-Weighted | | | Equally-Weighted | | |
|---|---|---|---|---|---|---|
| Portfolios | **Parameter Estimate** | **Standard Error** | **t Value** | **Parameter Estimate** | **Standard Error** | **t Value** |
| Low RelVol | 0.04 | 0.07 | 0.55 | 0.14 | 0.07 | 2.14 |
| Medium RelVol | 0.05 | 0.05 | 0.89 | 0.24 | 0.06 | 3.77 |
| High RelVol | 0.08 | 0.07 | 1.05 | 0.20 | 0.06 | 3.07 |
| High minus Low | 0.04 | 0.10 | 0.38 | 0.05 | 0.05 | 1.04 |

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

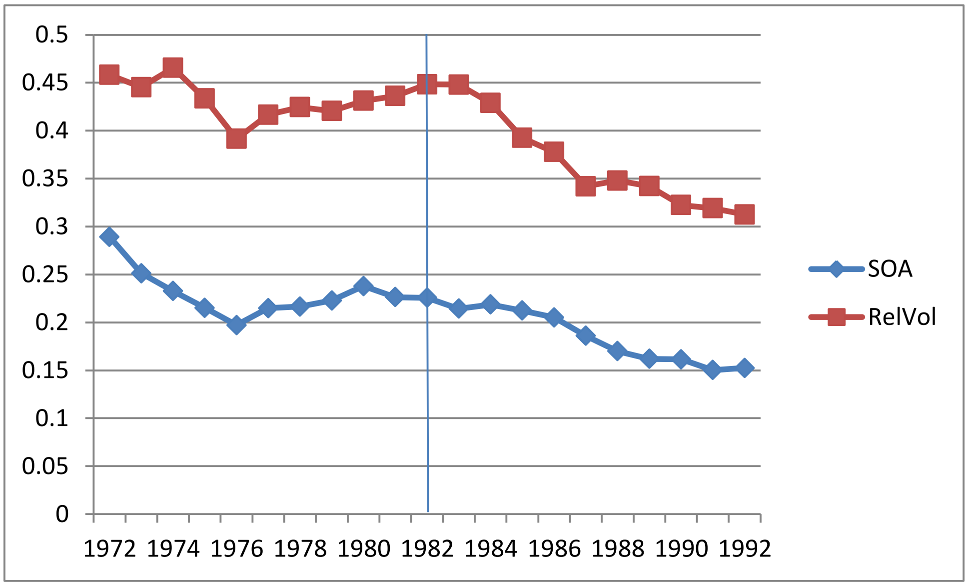
This table reports the results of estimating OLS regressions, where the dependent variable is the change in M/B value of the firm from the year of dividend initiation (*t**) ten years forward. The sample consists of Compustat firms for the period 1970-2010. See Section I and Appendix A for descriptions of the independent variables. All estimation models include year fixed effects. Heteroskedasticity-robust standard errors adjusted for clustering at the year level (Rogers (1993)) are reported in parenthesis. The symbols ***, ** and * indicate p-values of 1%, 5%, and 10%, respectively.

| | Panel A: SOA | | Panel B: RelVol | |
|---|---|---|---|---|
| | *(1)* | *(2)* | *(1)* | *(2)* |
| *Intercept* | 0.113 | -0.223 | 0.088 | -0.142 |
| | *(0.334)* | *(0.219)* | *(0.356)* | *(0.244)* |
| $SOA_{t^*+10}/RelVol_{t^*+10}$ | -0.066 | -0.16 | 0.025 | -0.02 |
| | *(0.223)* | *(0.205)* | *(0.09)* | *(0.083)* |
| $Log(Sale)_{t^*}$ | 0.01 | 0.035 | -0.011 | 0.007 |
| | *(0.029)* | *(0.026)* | *(0.029)* | *(0.025)* |
| $Log(Sale)_{t^*+10}$ - $Log(Sale)_{t^*}$ | -0.478*** | -0.294** | -0.389** | -0.191* |
| | *(0.167)* | *(0.107)* | *(0.171)* | *(0.105)* |
| $EBITDA_{t^*+10}$ -$EBITDA_{t^*}$ | 6.458*** | 5.33*** | 6.353*** | 5.288*** |
| | *(0.969)* | *(0.582)* | *(1.024)* | *(0.562)* |
| $Tangibility_{t^*+10}$ -$Tangibility_{t^*}$ | -0.626 | -1.214*** | -0.431 | -0.977** |
| | *(0.416)* | *(0.43)* | *(0.408)* | *(0.409)* |
| $Leverage_{t^*+10}$ -$Leverage_{t^*}$ | 0.099 | -0.05 | 0.013 | -0.142 |
| | *(0.289)* | *(0.272)* | *(0.321)* | *(0.291)* |
| $Stddev(EBITDA)_{t^*+10}$ | -0.611 | -1.041 | -0.414 | -0.69 |
| | *(2.027)* | *(2.115)* | *(2.157)* | *(2.027)* |
| $(Dividend/Assets)_{t^*}$ | -2.538 | -1.051 | -0.648 | -0.872 |
| | *(3.557)* | *(3.761)* | *(3.761)* | *(2.789)* |
| $(Dividend/Assets)_{t^*+10}$ -$(Dividend/Assets)_{t^*}$ | | 2.926 | | 0.782 |
| | | *(3.31)* | | *(2.809)* |
| $Capex_{t^*+10}$ -$Capex_{t^*}$ | | 2.631** | | 2.081** |
| | | *(1.027)* | | *(0.886)* |
| $R\&D_{t^*+10}$ -$R\&D_{t^*}$ | | -3.91 | | -5.12 |
| | | *(6.732)* | | *(6.465)* |
| $Advertising_{t^*+10}$ -$Advertising_{t^*}$ | | 0.488 | | 0.802 |
| | | *(0.766)* | | *(1.006)* |
| *Obs.* | *933* | *906* | *881* | *853* |
| *# of years/clusters* | *31* | *31* | *31* | *31* |
| *R-squared* | 0.28 | 0.30 | 0.25 | 0.27 |

**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 1992. The vertical line is at 1982, the year of the passage of the safe harbor provision of Rule 10b-18.



## Figure 2

## Market Reaction to Dividend Changes

Dividend changes are grouped by the direction (cuts and increases) and magnitude (% change in dividend per share) of the change. The figure shows the average cumulative abnormal return (*CAR*) for dividend cuts and increases within each change size group. *CAR* is the cumulative return of the stock of the announcing firm around the event ((-1; +1) trading days) minus the CRSP value-weighted market return. Panel A is based on the entire sample, while Panel B includes only dividend change announcements in which firms have announced at last one dividend cut prior to this announcement.