A Direct Test of the Dividend Catering Hypothesis*

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Abstract – This paper uses a *direct* measure of investors' time-varying preference for dividends to test the dividend catering hypothesis proposed in Baker and Wurgler (2004a, 2004b). Specifically, we use Internet search volume for dividend-related keywords as a direct measure of investor preference for dividends (i.e., dividend sentiment). We validate this measure by showing that mutual funds that pay high dividends receive more inflows when the dividend sentiment is stronger. Further, we find that firms initiate or increase dividends when the dividend sentiment is stronger. These effects are concentrated among firms located in states with high dividend sentiment. Differences in risk or other firm characteristics do not explain our findings. Collectively, these results provide support for the catering theory and show that managers cater to investors' time-varying demand for dividends.

JEL classification: G32; G35.

Keywords: Dividend catering; investor attention; Internet search volume; dividend sentiment; fund flows.

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1. Introduction

This paper uses a new and direct measure of dividend sentiment to examine whether the time-variation in investor demand for dividends affects corporate dividend policies. Baker and Wurgler (2004a, 2004b) posit that firms cater to investors' time-varying demand for dividend-paying stocks. Several studies provide empirical support for the catering theory by studying dividend changes (Li and Lie, 2006) and share repurchases (Jiang, Kim, Lie, and Yang, 2013; Kulchania, 2013). Further, Manconi and Massa (2013) show that market participants like catering because it increases firm value.

The recent empirical research on dividend catering has typically used market-based dividend premium measure to capture investor demand. Since dividend premium is computed using the market-to-book ratios of firms with differential dividend policy, it may also capture changes in, for example, growth opportunities and firm risk. Hoberg and Prabhala (2009) show that the observed correlation between the propensity to pay dividends and the dividend premium can be largely explained by differences in firm risk.

In this study, we develop a more *direct* test of the catering theory of dividends. Our key innovation is to use Internet search volume for dividend-related keywords to measure investors' preference for dividends. The search volume index (*SVI*) measure does not use market based measures such as stock price and market-to-book ratio to infer investor sentiment. Therefore, it is likely to capture the time-variation in investors' preference for dividends (i.e., dividend sentiment) more accurately. Our assumption is that investors would use dividend-related keywords more often when they are thinking more actively about dividends. Therefore, time-variation in Internet search intensity for dividend-related keywords would reflect investors' time-varying preference for dividends.

Our key conjecture is that investors' attention to dividends would motivate managers to adjust their payout policy consequently. In particular, we posit that managers would initiate or increase (decrease) dividends when investors search for dividends more (less) using the Google search engine. Further, we expect the managerial sensitivity to time-varying investor preferences to be stronger in geographical areas where investors are known to exhibit a stronger preference for dividends.

We first validate the dividend sentiment measure by examining whether the time-variation in dividend sentiment predicts mutual fund flows. Our conjecture is that mutual funds that pay high dividends are more likely to be favored by investors when the dividend sentiment is stronger. Consistent with our conjecture, we find that our Internet search-based dividend sentiment measure is positively associated with subsequent fund inflows. In particular, a one-standard-deviation increase in dividend sentiment is associated with a 3.9% increase in the fund flow for high-dividend paying mutual funds in the following quarter.

Using the new dividend sentiment measure, we show that when the dividend sentiment of investors becomes stronger (weaker), managers exhibit a stronger propensity to initiate or increase (decrease) dividends in the next quarter. In economic terms, a one-standard-deviation increase in investors' dividend sentiment is associated with a 0.4% higher dividend initiation rate in the following quarter. These results are economically significant as this increase is 9.1% of the average dividend initiation rate in our sample.

We next examine whether our dividend sentiment measure explains the residual variation in dividend policies after accounting for various firm characteristics and risk measures. We calculate the propensity to pay dividends (*PTP*) using a logit model and find that the dividend sentiment effect is consistent with the catering hypothesis. When dividends attract more (less) investors, firms exhibit a greater propensity to pay, initiate or increase (decrease) dividends. Our evidence is incremental over the effects of known determinants of dividend policies.

We also investigate the extent to which geographical differences in dividend sentiment influence a firm's dividend policy. As local investors' dividend sentiment varies across regions, we conjecture that the effects of dividend sentiment on a firm's dividend policy would be stronger among U.S. states with stronger dividend sentiment. In these states, investors pay more attention to dividends and hold more local stocks (Becker, Ivkovic, and Weisbenner, 2011). To test our prediction, we use each firm's headquarters state to define its location and use the average state-level *SVI* to measure the dividend sentiment of local investors.

We find that managers cater to investors' dividend sentiment only in states with strong dividend sentiment. In economic terms, a one-standard-deviation increase in investors' dividend sentiment in states with strong dividend sentiment is associated with 0.5% increase in the propensity to pay dividends in the following quarter. These results are economically significant, as the increase is 32.7% of the average propensity to pay dividends in states with strong dividend sentiment. In contrast, in weak dividend sentiment states, managers do not engage in dividend catering.

We conduct several additional tests to ensure our findings are robust. First, as an alternative measure of dividend sentiment, we construct a topic index that includes searches in different languages and various text strings that are dividend-related. We find similar results, with an exception of the case of dividend decrease. Second, we include five commonly used macroeconomic variables in our baseline analysis to account for the business cycle effects and find that they do not affect our results. Third, we include the Baker and Wurgler's (2006) investor sentiment measure as a control variable and find that our results remain qualitatively similar. This evidence suggests that our dividend sentiment measure is distinct from other proxies for investor sentiment. In additional tests, we also demonstrate that our main results are not driven by the financial crisis and the public availability of Google Trends.

Last, we examine the relation between dividend sentiment and dividend premium and find that the correlation is low (=0.04). This finding suggests that our dividend sentiment measure does not simply repackage the dividend premium measure. Further, our results are similar when we control for the dividend premium measure proposed in Baker and Wurgler (2004b).

Taken together, these findings suggest that changes in investors' dividend attitudes affect firm's dividend policy and provide direct support for the dividend catering hypothesis. These results contribute to several different strands of finance literature. First, it relates to papers that examine the catering theory of dividends. Baker and Wurgler (2004b) and Li and Lie (2006) find that when investors exhibit a stronger preference for dividend-paying firms, managers initiate or increase dividends to capture the dividend premium. Hoberg and Prabhala (2009) argue that the relation can be explained by differences in firm risk. Jiang, Kim, Lie, and Yang (2013) and Kulchania (2013) extend the catering theory to share repurchases and demonstrate that managers cater to investor demand for share repurchases. More recently, Hartzmark and Solomon (2013) observe that companies have positive abnormal returns in months when a dividend is predicted and this premium is likely to reflect price pressure from dividend-seeking investors.

This growing literature in finance has typically used the dividend/repurchase premium to measure investor demand. In contrast, we develop a more direct measure of investors' dividend sentiment and show that shifts in investors' dividend attitudes over time affect dividend policies of firms.

More broadly, our paper is related to catering theory in other corporate decisions. Baker, Greenwood, and Wurgler (2009) propose a catering theory of nominal share prices and show that when investors place a premium on low-price firms, managers respond by supplying shares at lower prices through stock splits. Polk and Sapienza (2009) suggest that the stock market might misprice firms based on their investment level and that managers cater to this mispricing by inflating stock prices through their investment decisions. Aghion and Stein (2008) find that managers either maximize sales growth or improve profit margins, depending on which is preferred by the stock market. Extending this literature, we directly examine the dividend catering hypothesis using the Internet search volume for dividend-related keywords as a direct measure of dividend sentiment.

Beyond the catering literature, our paper provides new evidence on the economic effects of investor attention. A large finance literature uses indirect proxies for investor attention such as news and headlines (Barber and Odean, 2008), extreme returns (Barber and Odean, 2008), advertising expenses (Grullon, Kanatas, and Weston, 2004) and trading volume (Gervais, Kaniel, and Mingelgrin, 2001). Da, Engelberg, and Gao (2011) propose a direct measure of investor attention using Google Trends and report that it measures the attention of retail investors and captures investor attention in a timely manner. In a similar manner, we show that managers initiate or increase dividends when investors pay more attention to dividends.

The rest of the paper is organized in the following manner. Section 2 describes the data and our new sentiment measure. Section 3 presents our main results. Section 4 examines the robustness of our findings. Section 5 concludes with a brief discussion.

2. Data and Sample Construction

We collect data from various sources to test our conjectures. In this section, we describe these data sets and the new dividend sentiment measure.

2.1. Dividend sentiment data

Google provides data on search term frequency via the product Google Trends starting in January 2004. [1] The search data from Google Trends are normalized and scaled to a range of 0 to 100. [2] We use the search volume index (*SVI*) of dividend-related searches at both national-

[1] Google Trends is available at https://www.google.com/trends/.

[2] Da, Engelberg, and Gao (2011) report that Google accounted for 72.1% of all search queries in the U.S. The search volume data are thus representative of the search behavior of the general population.

and state-levels in the U.S. to capture investors' dividend sentiment.[3] *SVI* indicates the popularity of a search term relative to all other terms from the same location at the same time. An increase in *SVI* indicates that individual investors pay more attention to the search than they normally do. Weekly *SVI* for a search term is the number of searches for that term scaled by its time series average. We aggregate weekly *SVI* to monthly *SVI* by linear interpolation, as in Da, Engelberg, and Gao (2011).

Google Trends provides top searches that are most frequently searched with the term we enter (for instance, "*dividend*") in the same search session within the chosen category, country, or region. We then identify dividend-related searches with available data and construct a keyword-based index *SVI_Div*, to capture investors' dividend sentiment (Da, Engelberg, and Gao, 2011, 2015).[4] *SVI_Div* is the search volume index if the search term in Google Trends includes *"dividend"* or *"dividends"* or *"payout"* or *"dividend stocks"* or *"dividend yield"* or *"dividend payout"*. We also use *SVI_DT* as an alternative measure of dividend sentiment. *SVI_DT* is the search volume index for the topic *"dividend"* from Google Trends and includes searches in different languages and various text strings that are dividend-related. Additional details about this measure are discussed in Section 4.

To study the geographical variation in investors' attitudes towards dividend, we collect the monthly Internet search volume from Google Trends for each U.S. state from 2004 to 2013. We define a state as a zero dividend sentiment state if the median value of *SVI_Div* is zero within the sample period. We rank the remaining non-zero states by averaging *SVI_Div* from 2004 to 2013. The top 10 dividend sentiment states are those with the highest average *SVI_Div*,

[3] The Internet search volume is appropriate to test the dividend catering theory as it captures the time variation of dividend sentiment. Hoberg and Prabhala (2009) show that the dividend catering hypothesis relies on the assumption that the time-varying demands for dividends are driven by individual investors. Da, Engelberg, and Gao (2011) find that the Internet search volume in Google captures the attention of retail investors.

[4] Google Trends does not return a valid search volume index if the dividend-related term is rarely searched. Instead, Google Trends returns a zero value for that search.

while the bottom 10 states with non-zero dividend sentiment are those with the lowest but positive average *SVI_Div*. [5]

Similar to Da, Engelberg, and Gao (2011), our key variable of interest is the change in *SVI*, i.e., the abnormal search volume index (*ASVI*).[6] We define *ASVI* for search term *j* at time *t* as:

$$ASVI_{j,t} = \log\left(SVI_{j,t}\right) - \log\left(SVI_{j,t-1}\right), \qquad (1)$$

where log ($SVI_{j,t}$) and log ($SVI_{j,t-1}$) represent the natural logarithm of *SVIs* during month *t* and month *t-1*, respectively.[7] The time series of *ASVI* starts from February 2004 and it measures changes in dividend sentiment.

Da, Engelberg, and Gao (2015) show that one of important features of the search data in Google Trends is seasonality. To eliminate seasonality from $ASVI_{j,t}$, we regress $ASVI_{j,t}$ on month dummies and use the residual (Da, Engelberg, and Gao, 2015). Quarterly $ASVI_{j,t}$ is the median value of the monthly $ASVI_{j,t}$ within each quarter.

2.2. Validation tests

Before using the dividend sentiment measure in our main empirical tests, we conduct two validation tests to ensure that our measure of dividend sentiment is reasonable. Table 1 reports the median value of the state-level search volume index of dividend-related searches from Google Trends. Panel A lists the top 10 dividend sentiment states. Florida, with the largest fraction of seniors (Becker, Ivkovic, and Weisbenner, 2011), exhibits the strongest dividend sentiment (i.e., with the highest *SVI_Div*) across all U.S. states. This evidence is consistent

[5] The top 10 dividend sentiment states are Florida, Texas, Colorado, Maryland, Missouri, North Carolina, Illinois, Arizona, Georgia, and Massachusetts. The bottom 10 states with non-zero dividend sentiment are Virginia, Kansas, Nevada, Oklahoma, Kentucky, Utah, Arkansas, Louisiana, Iowa and South Carolina.
[6] *ASVI* has the advantage that low-frequency seasonality and time trends are removed.
[7] We also define *ASVI* as the natural logarithm of *SVI* during month *t* minus the average natural logarithm of *SVI* in month *t-1* and *t-2.* Our results are similar.

with the findings of Graham and Kumar (2006) who show that older investors like dividend-paying stocks.[8]

We also visually examine the time-series variation of the Internet search volume for the 2004 to 2013 period. Investors are more likely to prefer dividend-paying stocks when the economy does poorly. Figure 1 shows the natural log of *SVI_Div* and *SVI_DT* from 2004 to 2013. To eliminate seasonality from this measure, we regress the ratios on month dummies and keep the residual. We follow the National Bureau of Economic Research (NBER) and define a recession period from December 2007 to June 2009. [9] We find that individual investors search more on dividends during the financial crisis period than the pre-crisis period. The search volume spikes in October 2008, shortly after stock prices of U.S. investment banks drop sharply and two American banks collapse. This evidence further validates our conjecture that the Internet search volume captures investors' attention to dividends and represents a reasonable measure of dividend sentiment.

2.3. Sample construction

We analyze the dividend policy of firms from 2004 to 2013. We use quarterly dividend data rather than annual dividends to increase the number of observations. The Compustat sample for quarter *t* includes those firms that have the following data (Compustat data items in parentheses): total assets (44), stock price (12), and shares outstanding (61) at the end of each quarter, income before extraordinary items (8), interest expenses (22), dividends per share by ex date (16), preferred dividends (24), and preferred stock carrying value (55). Firms must also have (i) stockholder's equity (60), (ii) liabilities (54), or (iii) common equity (59) and preferred

[8] Similarly, Alaska is one of the zero dividend sentiment states with the smallest fraction of seniors (Becker, Ivkovic, and Weisbenner, 2011). This is consistent with the findings of Graham and Kumar (2006) who report that younger investors prefer dividend nonpayers.

[9] Business cycle dates are available at http://www.nber.org/cycles/cyclesmain.html.

stock par value (55). Total assets must be available in quarters *t* and *t-1*. The other items must be available in quarter *t*.

We also use, but do not require, balance sheet deferred taxes and investment tax credits (52), income statement deferred taxes (35), purchases of common and preferred stock (93), sales of common and preferred stock (84), and common treasury stock (98). We exclude firms with book equity below $250,000 or assets below $500,000.

The Compustat sample includes only firms with CRSP share codes of 10 or 11. The CRSP sample includes NYSE, AMEX, and NASDAQ securities. We exclude utilities (SIC codes 4900 to 4949) and financial firms (SCI codes 6000 to 6999).

2.4. Mutual fund data

Our mutual fund data are from the Center for Research on Security Prices (CRSP) survivorship bias-free mutual fund database from 2004 to 2013. Following Spiegel and Zhang (2013), we only include non-specialty domestic equity funds in the final sample (Lipper Objectives EI, EIEI, ELCC, EMN, G, GI, I, LCCE, LCGE, LCVE, LSE, MC, MCCE, MCGE, CMVE, MLCE, MLGE, MLVE, MR, SCCE, SCGE, SCVE, and SG). Our main variable of interest is the net fund flow for fund *i* in quarter *t*:

$$Fund\ Flow = \frac{TNA_{i,t} - TNA_{i,t-1}}{TNA_{i,t-1}} - r_{i,t} \qquad (2)$$

where $TNA_{i,t}$ denotes fund *i*'s total net assets at the end of quarter *t* and $r_{i,t}$ denotes fund *i*'s return in quarter *t* as reported in CRSP. To eliminate the impact of outliers, we winsorize fund flows at the 1^{st} and 99^{th} percentiles.

2.5. Macroeconomic variables

We use five commonly used macroeconomic variables to capture the effects of business cycles. Unexpected inflation (*UEI*) is the difference between the current month inflation and the average of the past 12 realizations. Monthly growth in industrial production (*MP*) is obtained from the Federal Reserve website. Monthly default risk premium (*RP*) is the difference between Moody's Baa-rated and Aaa-rated corporate bond yields. The term spread (*TS*) is the difference between the yields of a constant maturity 10-year Treasury bond and 3-month Treasury bill. U.S. monthly unemployment rate (*UNEMP*) is obtained from the Bureau of Labor Statistics website. Quarterly macroeconomic variables are obtained by averaging the monthly data within each quarter.

2.6. Summary statistics

Panel A of Table 2 reports the summary statistics for our main variables. The average dividend initiation rate is 4.3% during the 2004 to 2013 period. Our dividend sentiment measure, *ASVI_Div*, has significant variation as the 90^{th} percentile value is 0.045 and the 10^{th} percentile is -0.067. Firm and risk controls are similar to those previously reported in the literature (Fama and French, 2001; Hoberg and Prabhala, 2009).

Panel B of Table 2 reports the correlation matrix for our key variables. The correlation between the dividend premium and the dividend sentiment is low. Specifically, the correlation between *ASVI_Div* and the dividend premium is around 0.04. Such low correlation suggests that *ASVI_Div* might capture a component of investors' dividend sentiment that is not included in the dividend premium.

Examining the firm and risk controls, we find that both risk variables have absolute correlations of less than 0.20 with the four firm characteristics proposed in Fama and French (2001). However, there are two exceptions. First, idiosyncratic risk has a correlation of -0.41 with *NYP*, which is in line with the observation that smaller firms are more risky. Second, idiosyncratic risk has a correlation of -0.32 with Earnings/Assets, consistent with the observation that less profitable firms are more risky. Overall, the correlations among these firms and risk controls are similar to those reported in the literature and indicate that multicollinearity is not an issue in our analysis.

3. Estimation Method and Main Results

3.1. Dividend sentiment and dividend payment decisions: estimation framework

We follow Baker and Wurgler (2004b) and define a firm-quarter observation as a dividend payer if it has positive dividends per share by ex date; otherwise, it is a dividend nonpayer. We then define *Payers* and *Old Payers* as follows:

$$Payers_t = New\ Payers_t + Old\ Payers_t + List\ Payers_t\ , \tag{3}$$

$$Old\ Payers_t = Payers_{t-1} - New\ Nonpayers_t - Delist\ Payers_t\ . \tag{4}$$

Here, *Payers* is the total number of dividend payers in quarter *t*, *New Payers* is the number of firms that initiate dividends among last quarter's dividend nonpayers, *Old Payers* is the number of dividend payers among last quarter's payers, *List Payers* is the number of dividend payers in the current quarter that were not in the sample last quarter, *New Nonpayers* is the number of firms that omitted dividend in the current quarter but paid dividends in the previous quarter, and *Delist Payers* is the number of last quarter's dividend payers not in the sample this quarter.

We then define three measures to capture the dividend payment decisions:

$$Initiate_t = \frac{New\ Payers_t}{Nonpayers_{t-1} - Delist\ Nonpayers_t}\ , \tag{5}$$

$$Increase_t = \frac{Increase\ Payers_t}{Payers_{t-1} - Delist\ Payers_t}\ , \text{ and} \tag{6}$$

$$Decrease_t = \frac{Decrease\ Payers_t}{Payers_{t-1} - Delist\ Payers_t}\ . \tag{7}$$

Here, *Increase Payers (Decrease Payers)* is the number of firms that increase (decrease) their dividends in the current quarter among last quarter's dividend payers. We count a firm-quarter observation as an increase (decrease) payer if the current quarter's dividend per share by ex date is higher (lower) than that in last quarter. *Initiate* is the fraction of surviving nonpayers that starts paying dividends. *Increase (Decrease)* is the fraction of surviving payers that increase (decrease) dividends. These variables capture the decision to pay dividends rather than how much to pay as dividends.[10]

Unlike annual dividends that are typically used in the previous literature (Baker and Wurgler, 2004b; Li and Lie, 2006; Hoberg and Prabhala, 2009), quarterly dividend payments are seasonal (Verdelhan, 2010). To eliminate seasonality from dividend payment measures, we regress *Initiate*, *Increase*, and *Decrease* on quarter dummies respectively and obtain the residual (Da, Engelberg, and Gao, 2015).

3.2. Graphical evidence

We begin our empirical analysis by graphically investigating whether time-varying dividend attitudes of investors affect dividend payment decisions of firms. Figure 2 relates investors' dividend sentiment to the dividend initiation (Panel A) and the dividend increase ratio (Panel B) in the following quarter. The dividend initiation and increase ratios reach the lowest level at the end of 2008 (i.e. Quarter 20) as managers are reluctant to initiate or increase dividends when the economy is under distress. Both Panels A and B reveal a strong positive relation between one-quarter lagged dividend sentiment (*ASVI_Div*) and the dividend initiation or increase ratio.

3.3. Propensity to pay dividends: estimation results

Next, we formally examine whether dividend sentiment predicts firm's dividend policy. If elevated dividend sentiment increases the demand for dividend-paying stocks, we expect *ASVI* to have a positive (negative) impact on the subsequent dividend initiation or increase (decrease) ratio. We regress dividend payment measures on one-quarter lagged *ASVI_Div*. All standard

[10] Baker and Wurgler (2004b) argue that the dividend payout ratio is sensitive to profitability while the decision to initiate dividend is always a policy decision.

errors are robust to heteroskedasticity and serial correlation. We consider four lags and use the procedure of Newey and West (1987) to account for serial correlation.

Panel A of Table 3 reports the results. The dependent variable in column (1) is the fraction of new dividend payers in quarter *t* as a percentage of surviving nonpayers from *t-1*. The coefficient on *ASVI_Div* is significantly positive at the 1% level. This evidence suggests that *ASVI_Div*, on a stand-alone basis, strongly predicts next quarter's dividend initiation ratio. The regression coefficient of 0.086 suggests that a one-standard-deviation increase in *ASVI_Div* is associated with a 0.39% (0.045*0.086) higher dividend initiation ratio in the following quarter. These results are economically significant as the increase is 9.1% of the average dividend initiation ratio in our sample (= 0.043).

Column (2) reports the regression estimates for the rate of dividend increase. The dependent variable is the fraction of payers that increase dividends in quarter *t*. We find that one-quarter lagged *ASVI_Div* is positively associated with the dividend increase rate. This evidence suggests that firms increase dividends when investors exhibit stronger dividend sentiment. In economic terms, a one-standard-deviation increase in *ASVI_Div* is associated with a 1.37% (0.045*0.305) increase in the dividend increase rate in the following quarter.

Column (3) shows that the dividend decrease rate is negatively associated with *ASVI_Div*. When investors exhibit weaker dividend sentiment, firms are more likely to decrease dividends. The regression coefficient of 0.314 indicates that a one-standard-deviation decrease in *ASVI_Div* is associated with a 1.41% (0.045*0.314) increase in the dividend decrease rate in the following quarter.

The dividend catering literature has typically used the dividend premium to measure investor demand for dividends. We next examine whether dividend sentiment predicts firm's dividend policy when we control for the dividend premium. The quarterly dividend premium is defined as the difference between the logs of the value-weighted market-to-book ratio for dividend payers and nonpayers each quarter.[11] We regress *ASVI_Div* on dividend premium and obtain the residual (*ASVI_Div_DP)*.

We repeat the analysis in Panel A using *ASVI_Div_DP* and report results in Panel B of Table 3. We find that *ASVI_Div_DP* is positively (negatively) associated with dividend initiation and increase (decrease) ratio. The economic significance remains similar in all specifications. This finding suggests that managers cater to investor demand by initiating or increasing (cutting) dividends when investors search more (less) about dividends on the Internet. These results are consistent with the dividend catering hypothesis and suggests that our dividend sentiment measure captures effects that are incremental over those captured by the dividend premium measure.

Overall, our baseline results indicate that dividend sentiment predicts firm's dividend policy. Managers initiate or increase (decrease) dividends when investors exhibit stronger (weaker) dividend sentiment. In addition, we find that our dividend sentiment measure captures incremental information over the dividend premium proposed in Baker and Wurgler (2004b).

3.4. Regression estimates using extended regression specifications

Although we find that our measure of dividend sentiment predicts a firm's dividend policy, one possibility is that dividend payment measures are related to the cross-sectional differences in firm characteristics associated with dividends. For instance, instead of indicating that managers are catering to the stronger sentiment of investors, an increase in the dividend initiation rate may suggest that firms do not need to retain internal cash.

We test for this possibility by including additional firm characteristics in the regression specification. Specifically, we examine whether dividend sentiment helps explain the residual

[11] To eliminate seasonality from quarterly dividend premium, we regress the ratio on quarter dummies and obtain the residual.

variation of dividend policies after controlling for various firm characteristics proposed in Fama and French (2001). We obtain Fama and MacBeth (1973) estimates using the following logit model with four control variables:

$$\Pr(Payer_{it}=1)=\log it(a+bNYP_{it}+c\frac{M}{B_{it}}+d\frac{dA}{A_{it}}+e\frac{E}{A_{it}})+u_{it}\,, \tag{8}$$

where size (*NYP)* is the NYSE market capitalization percentile, i.e., the percentage of NYSE firms with equal or smaller capitalization than firm *i* in quarter *t*. Market-to-book ratio (*M/B)* is book assets (item 44) minus book value of equity (item 60+item 52) plus market value of equity (item 12*item 61), all divided by book assets (item 44). Asset Growth (*dA/A)* is the difference between book assets (item 44) and lagged book assets, divided by lagged book assets. Profitability (*E/A)* is earnings before extraordinary items (item 8) plus interest expense (item 22) plus income statement deferred tax (item 35), divided by book assets (item 44).

Similar to Baker and Wurgler (2004b), the test is conducted in three stages. We first estimate a set of Fama-Macbeth logit regressions of dividend payment on firm characteristics. We obtain the average quarterly prediction errors (actual dividend policy minus predicted policy) from the logit regressions. To eliminate seasonality from the average quarterly prediction errors, following Da, Engelberg, and Gao (2015), we regress the prediction errors on quarter dummies and obtain the residual. In the final stage, we regress the seasonally-adjusted residual of average quarterly prediction errors on *ASVI_Div*.

We report the first and the final stage results in column (1) of Table 4. Consistent with Fama and French (2001) and Baker and Wurgler (2004b), we find that larger and more profitable firms are more likely to pay dividends while firms with more investment opportunities and greater asset growth are less likely to pay dividends. We construct the propensity to pay dividends in quarter *t* based on the first stage logit estimates in column (1) of Table 4, Panel A. The propensity to pay (*PTP*) is the difference between the actual percentage of firms that pay dividends in a given quarter and the expected percentage, which is the average predicted probability from the logit model. Panel A of Figure 3 shows that in the first half of the sample, *ASVI_Div* and the propensity to pay dividends move almost in lockstep. Subsequently, the average propensity to pay exhibits a pronounced downward trend during the financial crisis period, which is again captured by our dividend sentiment measure.

The dependent variable in the final stage regression is the change in the propensity to pay (*CPTP*) dividends between quarter *t-1* to *t*. The coefficient on *ASVI_Div* is significantly positive at the 1% level (see Panel B). This evidence suggests that *ASVI_Div* predicts a firm's propensity to pay dividends in the following quarter. This evidence is consistent with the catering prediction, even after controlling for firm characteristics: Managers cater to pay dividends when investors have stronger dividend sentiment.

In any given quarter, the supply of dividends comes from two sources: (i) firms that already pay dividends; or (ii) firms that newly initiate dividends. We next divide the sample into surviving nonpayers in column (2) and into surviving payers in columns (3) and (4). The dependent variable in the first-stage regression in column (2) is a binary variable that equals one if firm *i* pays dividend in quarter *t* and, zero otherwise. The average quarterly prediction errors in column (2) represent the propensity to initiate dividends (*PTI*). The propensity to initiate (*PTI*) is the difference between the actual percentage of previous nonpayers that initiate dividends in a given quarter and the expected percentage, which is the average predicted probability from the logit model.

The dependent variable in the first-stage regression in column (3)/(4) is a binary variable that equals one if firm *i* increases/decreases dividend in quarter *t* and, zero otherwise. The average quarterly prediction errors in columns (3)/(4) represent the propensity to increase/decrease dividends (*PTE/PTD*). The propensity to increase/decrease (*PTE/PTD*) is the difference between the actual percentage of firms that increase/decrease dividends in a given quarter and the expected percentage, which is the average predicted probability from the logit model.

As predicted by the dividend catering hypothesis, *ASVI_Div* is positively associated with the changes in the propensity to initiate (*CPTI*) or increase (*CPTE*) dividends, and negatively associated with the changes in the propensity to decrease dividends (*CPTD*). Specifically, firms are more (less) likely to initiate or increase dividends when investors search more (less) about dividends on the Internet. The regression coefficient of 0.125 in column (2) suggests that a one-standard-deviation increase in *ASVI_Div* is associated with 0.56% (0.045*0.125) increase in the propensity to initiate dividends in the following quarter. These results remain robust after we control for the effects captured by the dividend premium variable.

Collectively, the results in Table 4 are consistent with the predictions of the dividend catering hypothesis, even after we control for firm characteristics and the dividend premium. Using a direct measure of dividend sentiment, we show that firms exhibit greater propensity to initiate or increase (decrease) dividends when dividends attract more (less) investors.

3.5. Regression estimates with additional risk controls

Hoberg and Prabhala (2009) show that firm risk is a significant determinant of the propensity to pay dividends and that the dividend premium becomes an insignificant predictor once appropriate firm risk variables are accounted for. In this section, we examine whether our dividend sentiment measure predicts firm's dividend policy after we control for risk in the first-stage Fama-Macbeth logit regression. These tests also proceed in three stages. The only difference is that we obtain the Fama and MacBeth (1973) estimates using a logit model with two additional risk controls in the first stage:

$$\Pr(Payer_{it}=1)=\log it(a+bNYP_{it}+c\frac{M}{B_{it}}+d\frac{dA}{A_{it}}+e\frac{E}{A_{it}}+Systematic\_risk+Idiosyncratic\_risk)+u_{it}\,, \quad (9)$$

where *Systematic_risk* is the standard deviation of the predicted value from a regression of a firm's daily excess stock returns (raw returns less the risk-free rate) on the market factor (i.e., the value-weighted market return less the risk-free rate). The firm-quarter observation of systematic risk is calculated using firm-specific daily stock returns within a quarter. *Idiosyncratic_risk* is the standard deviation of residuals from the above regression used to define systematic risk.

We report first and final stage regression results in column (1) of Table 5. Consistent with Hoberg and Prabhala (2009), we find that both systematic risk and idiosyncratic risk measures are negatively associated with the propensity to pay dividends. The average quarterly prediction errors from the first stage logit estimates are the propensity to pay dividends (*PTP*) after controlling for both firm characteristics and firm risk. Panel B of Figure 3 shows the time variation in dividend sentiment and the propensity to pay dividends. We observe that the propensity to pay dividends spikes during the financial crisis period, even when we control for risk. The variations in *ASVI_Div* and the propensity to pay are similar except during the financial crisis period.

Examining the final stage results, we find that *ASVI_Div* is positively associated with the changes in the propensity to pay dividends.[12] A one-standard-deviation increase in *ASVI_Div* leads to 0.67% (0.045*0.148) increase in the propensity to pay dividends in the following quarter. This confirms that dividend sentiment has predictive power in capturing dividend catering behavior of managers.

We then study companies that newly initiate dividends in column (2) and firms that already pay dividends in columns (3) and (4). The coefficient on *ASVI_Div* is significantly positive in columns (2) and (3) and becomes significantly negative in column (4) after controlling for risk.

[12] Consistent with Hoberg and Prabhala (2009), we find that the coefficient estimate of the dividend premium variable becomes insignificant once we control for risk.

Results are robust after controlling for the dividend premium. This again confirms that our dividend sentiment measure might capture information not reflected in the market data.

Overall, we find that investors' dividend sentiment still strongly predicts firm's subsequent dividend policy after controlling for firm characteristics, risk and the dividend premium. Managers cater to investors' demand for dividends over time by adjusting firm's payout policy.

3.6. Dividend sentiment and dividend policy: cross-sectional evidence

We next examine whether cross-sectional differences in dividend sentiment shifts affect dividend policy. Since the dividend sentiment varies across different regions in the U.S., we conjecture that the impact of dividend sentiment on dividend policy would be stronger among U.S. states with stronger dividend sentiment. Investors in these states are more likely to exhibit a strong preference for dividend-paying stocks and they are likely to hold more local stocks (Becker, Ivkovic, and Weisbenner, 2011). Consequently, local corporate managers may be more motivated to cater to time-varying investor demands as catering increases firm value (Manconi and Massa, 2013). In contrast, for firms located in states with weak dividend attitudes, the relation between dividend sentiment and dividend policy should be weaker or non-existent.

To test our prediction, we use each firm's headquarters state to identify its location and use the average state-level *SVI_Div* to measure the dividend sentiment of local investors. We repeat our baseline analysis in Table 5. As before, the test is conducted in three stages. We first obtain Fama and MacBeth (1973) estimates using a logit model with firm and risk controls. We only consider firms whose headquarters are located in the top/bottom 10 states with non-zero dividend sentiment. We obtain the average quarterly prediction errors (actual dividend policy minus predicted policy) from the logit regressions separately for the top/bottom 10 states. To eliminate seasonality from the average quarterly prediction errors, we regress the prediction errors on quarter dummies and compute the residuals (Da, Engelberg, and Gao, 2015).

In the final stage, we regress the seasonally-adjusted residual of average quarterly prediction errors on *ASVI_Div*. Standard errors are robust to heteroskedasticity.[13] We have 390 observations for the top/bottom 10 states during the 2004 to 2013 period.

Table 6 reports the results. In Panel A, we find that *ASVI_Div* is positively associated with the change in the propensity to pay dividends (*CPTP*). A one-standard-deviation increase in *ASVI_Div* is associated with 0.48% (0.043*0.111) increase in the propensity to pay dividends in the following quarter for firms in top 10 dividend sentiment states. These results are economically significant as the increase is 32.7% of the average propensity to pay in top 10 dividend sentiment states (=1.47%). We then restrict the sample to surviving nonpayers in column (2) and to surviving payers in columns (3) and (4). As predicted by the catering hypothesis for dividend initiation and increase, the coefficients on *ASVI_Div* are significantly positive at the 5% level in columns (2) and (3).

We find insignificant results in column (4) where the dependent variable is the change in the propensity to decrease dividends (*CPTD*). Firms that cut dividends tend to experience poor prior, concurrent, and future stock returns. Hence, potential valuation gains from catering might not be reflected in stock prices. Another possible explanation is that many firms cut dividends due to low profitability rather than catering. Thus, it is not surprising that we find a weaker relation between investors' dividend sentiment and the propensity to decrease dividends. Our results remain similar after we control for the dividend premium in Panel B of Table 6.

Panel C of Table 6 repeats the regressions in Table 5 but restricts the sample to firms in the bottom 10 states with non-zero dividend sentiment. In the final stage regression, we find that the coefficients on *ASVI_Div* are insignificant in all specifications. This evidence suggests that dividend sentiment is unable to explain the dividend policy for firms that are located in states

[13] The results are similar if we cluster standard errors by state or use fixed effects.

with weak dividend sentiment. These results are robust when we account for the dividend premium in Panel D.

Collectively, the cross-sectional results are consistent with our conjecture. We find that in regions with strong dividend sentiment, local corporate managers cater to the dividend sentiment of investors. In contrast, in regions with weak dividend sentiment, catering incentives are weak and managers do not alter their dividend policies based on time-varying investor attitudes toward dividends.

4. Additional Evidence

4.1. Dividend sentiment and mutual fund flows

We begin this section with another validation test to better understand the dividend sentiment measure. The test examines whether the time-variation in dividend sentiment predicts mutual fund flows. Our conjecture is that mutual funds that pay high dividends are likely to be favored by investors when the dividend sentiment is strong.

In particular, we test whether our dividend sentiment measure can explain the residual variation in mutual fund flows, after controlling for the known effects of fund size, fund age, fund risk, past fund performance, expense ratio, turnover ratio, fund family size, fund family flow, segment flow, and lagged fund flows (Sirri and Tufano, 1998; Del Guercio and Tkac, 2002; Kumar, Niessen-Ruenzi, and Spalt, 2015; Kostovetsky, 2016). We lag all these control variables by one quarter. To eliminate the impact of outliers, we winsorize the control variables at the 1st and 99th percentile levels. The definitions of these control variables are provided in Appendix A.1.

We define a mutual fund as a high dividend fund if the fund name contains "*high dividend*" or "*super dividend*" or "*ultra dividend*".[14] 16 mutual funds are defined as high dividend mutual

[14] We find similar but weaker results when we define a mutual fund as a high dividend fund if the fund name includes "*dividend*" or when we restrict our sample to exchange-traded funds (ETFs).

funds in our sample. The *abnormal fund flow* is the average fund flow of these high dividend funds minus the average fund flow of all other conventional funds.

The test is conducted in two stages. We first estimate a set of Fama-Macbeth regressions of mutual fund flow on various fund characteristics. We obtain the average quarterly prediction errors (actual fund flow minus predicted fund flow) from the first-stage regressions. We then regress the residual of average quarterly prediction errors on *ASVI_Div* and *ASVI_DT* in the second stage.

Panel A of Table 7 presents the results of the first-stage regression. We estimate Fama-MacBeth (1973) regressions in columns (1) to (3), and use OLS regression as a robustness test in column (4). The standard errors in columns (1) to (3) are robust to heteroskedasticity and serial correlation. We consider four lags and use the Newey and West (1987) procedure to account for serial correlation in errors. We include quarter fixed effects in column (4) and standard errors are clustered at the fund level. Consistent with the evidence in Kumar, Niessen-Ruenzi, and Spalt (2015), the first-stage regression estimates indicate that smaller and younger mutual funds with better past fund performance, lower expense ratio, larger fund family and higher family flow have more subsequent fund inflow.

Panel B of Table 7 reports the second stage results. The dependent variable in columns (1) and (2) is the mutual fund flow of high dividend funds. We find that *ASVI_Div* and *ASVI_DT* are positively associated with subsequent fund inflows. In economic terms, a one-standard-deviation increase in *ASVI_Div* leads to a 3.9% (0.045*0.870) increase in the fund flow among high dividend funds in the following quarter. This evidence confirms our conjecture that investors are more likely to invest in high dividend mutual funds when the dividend sentiment is stronger.

The dependent variable in columns (3) and (4) is the *abnormal fund flow*, which is the difference between the average fund flow of high dividend funds and that of all other conventional funds. The coefficients on *ASVI_Div* and *ASVI_DT* in columns (3) and (4) are positive and statistically significant. A one-standard-deviation increase in *ASVI_Div* leads to a 3.6% (0.045*0.799) increase in the abnormal fund flow among high dividend mutual funds in the following quarter. This finding confirms our conjecture that high dividend funds receive more fund inflows when the dividend sentiment is stronger.

Overall, the fund flow results indicate that dividend sentiment predicts mutual fund flows even after we account for the known determinants of fund flow. Specifically, high-dividend mutual funds receive more fund inflows when the dividend sentiment is stronger. This evidence further suggests that our Internet search-based dividend sentiment measure is likely to be a good indicator of time-varying attitudes toward dividends.

4.2. Robustness checks and alternative explanations

In this section, we report results from several tests that examine the robustness of our findings. One potential concern is that our main results of the relation between dividend sentiment and firm's dividend policy could suffer from potential bias from reverse causality. Reverse causality implies that firm's dividend policy might cause investors to search more on dividends. In the first test, we conduct the Granger causality test to determine whether firm's dividend policy is Granger caused by investors' dividend sentiment or vice versa. The results reject the null hypothesis that investors' dividend sentiment does not cause firms to initiate dividends and fails to reject the null hypothesis that the initiation of dividends does not cause stronger dividend sentiment afterwards. Overall, we find that investors' dividend sentiment leads to changes in firm's dividend policy rather than the reverse direction.

In the next test, we examine the sensitivity of our results to the construction of the dividend sentiment measure. Our dividend sentiment measure thus far is *ASVI_Div*. One potential concern with this measure is that the selection of dividend-related keywords is somewhat arbitrary. To alleviate the potential selection bias, we use *ASVI_DT* as an alternative measure of dividend sentiment. *ASVI_DT* is the abnormal search volume index for topic *"dividend"* from Google Trends and includes searches in different languages and various text strings that are dividend-related.

We repeat our baseline analysis using *ASVI_DT* and report the results in Table 8. We find that dividend sentiment still strongly predicts dividend initiation and increase ratio. The relation holds after we control for firm characteristics, risk, and the dividend premium. We find insignificant results for dividend decrease. The catering incentives are likely to be weaker in this instance and the dividend sentiment measure loses statistical power.

To alleviate the concern that the search terms in *SVI_Div* are too broad, we construct another keyword-based index, *SVI_High_Div*, which is the search volume index if the search term in Google includes *"high dividend"* or *"high dividends"* or *"high payout"* or *"high dividend stocks"* or *"high dividend yield"* or *"high dividend payout"*. Searches related to these "high"-dividend keywords are more likely to be informative. If an investor is searching for *"high dividend stocks"* in Google, she is undoubtedly paying attention to high dividend-paying stocks. With this modified dividend sentiment measure, we find that investors' dividend sentiment explains dividend policy, even after we control for firm characteristics, risk and the dividend premium.

In the next test, we include five commonly used macroeconomic variables in the regression specification to account for potential business cycle effects. The results are reported in Panel A of Table 9. We find that the relation between the dividend sentiment and dividend policy remains similar. This evidence suggests that U.S. business cycles cannot fully explain the predictive power of our dividend sentiment measure.

We also test whether our findings can be explained by other investor sentiment proxies. Specifically, Baker and Wurgler (2006, 2007) construct an investor sentiment index which is based on the first principle component of five sentiment proxies where each of the proxies has been orthogonalized with respect to a set of six macroeconomic indicators.[15] We repeat our baseline analysis in Table 3 with additional BW sentiment controls and report the results in Panel B of Table 9. We find that our results remain similar when we control for the BW investor sentiment index, which suggests that our dividend sentiment measure does not capture information contained in other investor sentiment proxies.

To examine whether our baseline results are driven by the financial crisis period and the public availability of Google Trends, we perform subsample tests. Panel C of Table 9 reports the results. In column (1), we restrict our sample to the pre-crisis period (prior to Dec 2007) and find that the results are robust. In column (2), we exclude the financial crisis period (Dec 2007 to June 2009) and the results remain unchanged. In column (3), we use the sub-period starting in June 2006 because the search volume index from Google was publicly available only after June 2006. Our results are robust as the predictive power of our dividend sentiment measure remains intact even after Google's *SVI* data are made public.

In the next test, we include dividend omissions in our analysis. We find that shifts in investors' dividend attitudes over time do not affect dividend omission decisions of firms. These findings are consistent with Hoberg and Prabhala (2009) who provide several reasons for why catering incentive are less likely to apply to dividend omissions.

In the last test, we examine the lead-lag relation between the dividend premium and the dividend sentiment. To eliminate seasonality from dividend premium (*SVI_Div*), we regress the ratio on quarter (month) dummies and obtain the residual. The standard errors are robust to heteroskedasticity and serial correlation. We consider four lags and use the Newey and West (1987) procedure to account for serial correlation in errors.

We first regress current *SVI_Div* on one-, two-, three-, and four-quarter lagged dividend premium measures. The results reported in Panel A of Table 10 show that the coefficients on

[15] These data are available at http://people.stern.nyu.edu/jwurgler/.

lagged dividend premium are all positive and are statistically significant at the 1% level. This confirms the expected positive relation between the dividend premium and the dividend sentiment. The regression R^2 ranges from 13% to 22%, suggesting that the dividend premium does not fully explain the changes in dividend sentiment.

We also regress the dividend premium on one-, two-, three-, and four-quarter lagged *SVI_Div*, respectively. The results are reported in Panel B of Table 10. We find a positive relation between the dividend premium and the dividend sentiment in most specifications but the coefficients are insignificant. These results indicate that while our dividend sentiment measure is correlated with the dividend premium measure, our search-based measure captures information that is not contained in the market-based measure.

5. Summary and Conclusion

This paper investigates how changes in investors' attitudes toward dividends affect corporate dividend policy. Specifically, our objective is to test the dividend catering hypothesis proposed in Baker and Wurgler (2004a, 2004b). We use Internet search volume for dividend-related keywords as a direct measure of investors' preference for dividends (i.e., dividend sentiment). We validate this measure by showing that mutual funds that pay high dividends receive more inflows when the dividend sentiment is stronger.

Using this new and direct measure of dividend sentiment, we provide direct evidence to support the view that managers cater to time-varying investor demand for dividends. In particular, we show that managers initiate or increase (decrease) dividends when retail investors have stronger (weaker) dividend sentiment. These effects are concentrated among firms located in states with high dividend sentiment. Our results are similar when we account for firm characteristics, firm risk estimates, the dividend premium, and business cycles.

Taken together, these findings contribute to the emerging finance literature that examines the role of investor attention in corporate decisions. We develop a new and direct measure of investor demand for dividends using Internet search volume for dividend-related keywords. Our test does not rely on valuation ratios that are typically used in the literature, and that may capture changes in growth opportunities and firm risk. In future work, it may be interesting to study Internet search volume related to other corporate decisions such as security issuance.

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Table 1: Top, bottom and zero dividend sentiment states

This table reports the search volume index for dividend-related searches from Google Trends. We calculate the median value of the search volume index from 2004 to 2013 for each state. *SVI_Div* is the search volume index if the search term in Google includes *"dividend" or "dividends" or "payout" or "dividend stocks" or "dividend yield" or "dividend payout"*. *SVI_DT* is the search volume index for the topic "dividend" from Google Trends. It includes searches in different text strings and various languages that are dividend-related. We rank all U.S. states by *SVI_Div* and define a state as a zero dividend sentiment state (Panel C) if the median value of *SVI_Div* is zero within the sample period. Panel A (B) lists the top (bottom) 10 non-zero states with the highest (lowest) *SVI_Div*.

Panel A. Top 10 states in dividend sentiment

State Name	*State*	*SVI_Div*	*SVI_DT*
Florida	FL	70	57
Texas	TX	68	58
Colorado	CO	66	54.5
Maryland	MD	66	55
Missouri	MO	65	55.5
North Carolina	NC	64	55
Illinois	IL	62.5	51
Arizona	AZ	61	53
Georgia	GA	61	49
Massachusetts	MA	60.5	54.5

Panel B. Bottom 10 states with non-zero dividend sentiment

State Name	*State*	*SVI_Div*	*SVI_DT*
Virginia	VA	42	38.5
Kansas	KS	45	32
Nevada	NV	48.5	28
Oklahoma	OK	50	37
Kentucky	KY	50.5	33.5
Utah	UT	51	30.5
Arkansas	AR	52	38
Louisiana	LA	53	34.5
Iowa	IA	53.5	37
South Carolina	SC	56	28

Panel C. States with zero dividend sentiment

State Name	*State*	*SVI_Div*	*SVI_DT*
Wyoming	WY	0	0
North Dakota	ND	0	0
West Virginia	WV	0	0
South Dakota	SD	0	0
Montana	MT	0	0
Vermont	VT	0	0
Idaho	ID	0	0
Delaware	DE	0	0
Alaska	AK	0	0
Maine	ME	0	0

Table 2: Summary statistics

This table reports the summary statistics for each variable in Panel A and the correlation matrix in Panel B. *Dividend Initiation Ratio* expresses new payers at quarter *t* as a percentage of surviving nonpayers from *t-1*. *Dividend Increase Ratio* expresses increase payers at quarter *t* as a percentage of surviving payers from *t-1*. *Dividend Decrease Ratio* expresses decrease payers at quarter *t* as a percentage of surviving payers from *t-1*. *ASVI_Div* is the abnormal search volume index if the search term in Google includes *"dividend" or "dividends" or "payout" or "dividend stocks" or "dividend yield" or "dividend payout"*. *Dividend Premium* is the difference between the logs of the value-weighted market-to-book ratio for dividend payers and nonpayers. We regress *ASVI_Div* on the dividend premium and compute the residual (*ASVI_Div_DP)*. *ASVI_DT* is the abnormal search volume index for topic *"dividend"* from Google Trends and includes searches in different languages and various text strings that are dividend-related. To eliminate seasonality from our *ASVI* measures (*Dividend Premium*), we regress the ratio on month (quarter) dummies and calculate the residual. Market-to-book ratio (*M/B)* is book assets (item 44) minus book value of equity (item 60+item 52) plus market value of equity (item 12*item 61), all divided by book assets (item 44). Asset Growth (*dA/A)* is the difference between book assets (item 44) and lagged book assets, divided by lagged book assets. Profitability (*E/A)* is earnings before extraordinary items (item 8) plus interest expense (item 22) plus income statement deferred tax (item 35), divided by book assets (item 44). Size (*NYP)* is the NYSE market capitalization percentile, i.e., the percentage of NYSE firms having equal or smaller capitalization than firm *i* in year *t*. *Systematic Risk* is the standard deviation of the predicted value from a regression of a firm's daily excess stock returns (raw returns less the riskless rate) on the market factor (i.e., the value-weighted market return less the riskless rate). One firm-quarter observation of systematic risk is calculated using firm-specific daily stock returns within a quarter. *Idiosyncratic Risk* is the standard deviation of residuals from the above regression used to define systematic risk.

Panel A. Summary statistics

Variables	**Mean**	**10th Perc.**	**Median**	**90th Perc.**	**Std. Dev**
Dividend Initiation Ratio	0.043	0.019	0.038	0.071	0.021
Dividend Increase Ratio	0.297	0.185	0.295	0.404	0.082
Dividend Decrease Ratio	0.155	0.121	0.150	0.192	0.033
ASVI_Div	-0.006	-0.067	0.002	0.045	0.045
Dividend Premium	0.000	-0.082	0.013	0.062	0.056
ASVI_Div_DP	0.000	-0.060	0.006	0.051	0.045
ASVI_DT	-0.002	-0.054	-0.003	0.050	0.041
M/B	2.134	0.867	1.475	3.839	2.118
dA/A	0.027	-0.084	0.008	0.117	0.155
E/A	-0.011	-0.087	0.012	0.041	0.083
NYP	0.256	0.001	0.114	0.770	0.299
Systematic Risk	0.012	0.002	0.009	0.024	0.011
Idiosyncratic Risk	0.028	0.011	0.023	0.049	0.023

Panel B. Correlation matrix

	ASVI_Div	*Dividend Premium*	*ASVI_DT*	*M/B*	*dA/A*	*E/A*	*NYP*	*Systematic Risk*	*Idiosyncratic Risk*
ASVI_Div	1.0000								
Dividend Premium	0.0386	1.0000							
ASVI_DT	0.6211	0.0778	1.0000						
M/B	0.0261	-0.0873	0.0261	1.0000					
dA/A	0.0360	-0.0519	0.0408	0.0851	1.0000				
E/A	0.0543	-0.0322	0.0518	-0.1837	0.1948	1.0000			
NYP	0.0053	0.0075	0.0084	0.0961	0.0451	0.2712	1.0000		
Systematic Risk	-0.2128	0.2013	-0.2739	-0.0634	-0.0534	-0.0528	0.0621	1.0000	
Idiosyncratic Risk	-0.1446	0.1324	-0.1745	-0.0046	-0.0578	-0.3230	-0.4060	0.2998	1.0000

Table 3: Dividend payment and dividend sentiment: baseline results

This table presents OLS regression estimates of dividend initiation, increase, and decrease rates on one-quarter lagged dividend sentiment. The sample period is from 2004 to 2013. The initiation rate expresses new payers at quarter *t* as a percentage of surviving nonpayers from *t-1*. The rate at which firms increase dividends expresses increase payers at quarter *t* as a percentage of surviving payers from *t-1*. The rate at which firms decrease dividends expresses decrease payers at quarter *t* as a percentage of surviving payers from *t-1*. *ASVI_Div* is the abnormal search volume index if the search term in Google includes *"dividend" or "dividends" or "payout" or "dividend stocks" or "dividend yield" or "dividend payout".* The dividend premium is the difference between the logs of the value-weighted market-to-book ratio for dividend payers and nonpayers. To eliminate seasonality from dividend initiations, dividend increases, dividend decreases, and the dividend premium (*ASVI_Div*), we regress the ratio on quarter (month) dummies and compute the residual. We regress *ASVI_Div* on the dividend premium in Panel B and keep the residual (*ASVI_Div_DP)*. Standard errors are robust to heteroskedasticity and serial correlation. We consider four lags and use the procedure of Newey and West (1987) to account for serial correlation. ***, **and *represent 1%, 5% and 10% significance level, respectively.

Panel A. Abnormal search volume index

	Initiate	*Increase*	*Decrease*
ASVI_Div	**0.086**	**0.305**	**-0.314**
	[4.46]***	[1.80]*	[2.94]***
Constant	**0.000**	**0.002**	**–0.000**
	[0.20]	[0.17]	[0.09]
R^2	0.18	0.09	0.25
N	39	39	39

Panel B. Residual abnormal search volume index

	Initiate	*Increase*	*Decrease*
ASVI_Div_DP	**0.083**	**0.298**	**-0.320**
	[4.03]***	[1.65]*	[3.03]***
Constant	**–0.000**	**0.000**	**0.001**
	[0.00]	[0.02]	[0.30]
R^2	0.16	0.08	0.26
N	39	39	39

Table 4: Dividend payment and dividend sentiment: firm characteristic controls

This table reports results from three-stage regressions of dividend payment on firm characteristics and dividend sentiment. We first perform a set of Fama-Macbeth logit regression of dividend payment on firm characteristics suggested in Fama and French (2001) and Baker and Wurgler (2004b). We restrict the sample into surviving nonpayers in column (2) and restrict the sample into surviving payers in columns (3) and (4). The dependent variable is a dummy variable that equals one if firm *i* pays dividend in quarter *t* and zero otherwise in columns (1) and (2). The dependent variable in column (3) ((4)) is a binary variable that equals one if firm *i* increases (decreases) dividend in quarter *t* and zero otherwise:

$$\Pr(Payer_{it}=1)=\log it(a+bNYP_{it}+c\frac{M}{B_{it}}+d\frac{dA}{A_{it}}+e\frac{E}{A_{it}})+u_{it}$$

We obtain the average quarterly prediction errors (actual dividend policy minus predicted policy) from the first-stage logit regressions. To eliminate seasonality from the average quarterly prediction errors, we regress the prediction errors on quarter dummies and compute the residual (the propensity to pay/initiate/increase/decrease dividends). The propensity to pay/initiate/increase/decrease (*PTP/PTI/PTE/PTD*) is the difference between the actual percentage of firms that pay/initiate/increase/decrease dividends in a given quarter and the expected percentage, which is the average predicted probability from the logit model. We regress the seasonally-adjusted residual of average quarterly prediction error on *ASVI_Div* in the final stage. We also regress *ASVI_Div* on the dividend premium and obtain the residual (*ASVI_Div_DP)*. The dependent variable in the final stage is the change in the propensity to pay/initiate/increase/decrease dividends (*CPTP/CPTI/CPTE/CPTD*). The definitions of other financial variables are presented in Appendix A.1. Standard errors in the final stage are robust to heteroskedasticity and serial correlation. We consider four lags and use the procedure of Newey and West (1987) to account for serial correlation. ***, **and *represent 1%, 5% and 10% significance level, respectively.

Panel A. First stage regressions

	PTP	*PTI*	*PTE*	*PTD*
M/B	**-0.013**	**-0.002**	**0.014**	**0.005**
	[21.94]***	[5.14]***	[5.32]***	[3.70]***
dA/A	**-0.132**	**-0.038**	**0.128**	**-0.001**
	[13.86]***	[7.13]***	[4.37]***	[0.09]
E/A	**0.466**	**0.062**	**1.077**	**0.228**
	[28.01]***	[6.56]***	[8.94]***	[2.52]**
NYP	**0.608**	**0.161**	**0.059**	**-0.032**
	[78.96]***	[11.05]***	[5.67]***	[7.18]***
Constant	**0.137**	**0.015**	**0.094**	**0.047**
	[30.84]***	[9.19]***	[14.53]***	[11.88]***
R^2	0.21	0.05	0.02	0.01
N	135,982	101,623	34,359	34,359

Panel B. Final stage regressions: raw *ASVI*

	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_Div	**0.164**	**0.125**	**0.243**	**-0.120**
	[7.07]***	[4.40]***	[2.00]**	[2.56]***
Constant	**0.002**	**0.001**	**0.003**	**-0.000**
	[2.16]**	[0.57]	[1.09]	[0.17]
R^2	0.42	0.25	0.17	0.10
N	39	39	39	39

Panel C. Final stage regressions: residual *ASVI*

Final Stage:	*CPTP*	*CPTI*	*CPTE*	*CPTD*
ASVI_Div_DP	**0.160**	**0.118**	**0.236**	**-0.115**
	[6.76]***	[4.12]***	[1.95]*	[2.41]***
Constant	**0.001**	**-0.000**	**0.001**	**0.000**
	[1.21]	[0.10]	[0.52]	[0.22]
R^2	0.40	0.22	0.16	0.10
N	39	39	39	39

Table 5: Dividend payment and dividend sentiment: risk controls

This table reports results from three-stage regressions of dividend payment on firm characteristics, risk and dividend sentiment. We first perform a set of Fama-Macbeth logit regression of dividend payment on firm characteristics and risk suggested in Fama and French (2001) and Hoberg and Prabhala (2009). We restrict the sample into surviving nonpayers in column (2) and restrict the sample into surviving payers in columns (3) and (4). The dependent variable is a dummy variable that equals one if firm i pays dividend in quarter t and zero otherwise in columns (1) and (2). The dependent variable in column (3) ((4)) is a binary variable that equals one if firm i increases (decreases) dividend in quarter t and zero otherwise:

$$\Pr(Payer_{it}=1)=\log it(a+bNYP_{it}+c\frac{M}{B_{it}}+d\frac{dA}{A_{it}}+e\frac{E}{A_{it}}+Systematic\_risk+Idiosyncratic\_risk)+u_{it}$$

We obtain the average quarterly prediction errors (actual dividend policy minus predicted policy) from the first-stage logit regressions. To eliminate seasonality from the average quarterly prediction errors, we regress the prediction errors on quarter dummies and obtain the residual (propensity to pay/initiate/increase/decrease). The propensity to pay/initiate/increase/decrease (*PTP/PTI/PTE/PTD*) is the difference between the actual percentage of firms that pay/initiate/increase/decrease dividends in a given quarter and the expected percentage, which is the average predicted probability from the logit model. We regress the seasonally-adjusted residual of average quarterly prediction error on *ASVI_Div* in the final stage. We also regress *ASVI_Div* on the dividend premium and keep the residual (*ASVI_Div_DP*). The dependent variable in the final stage is the change in the propensity to pay/initiate/increase/decrease dividends (*CPTP/CPTI/CPTE/CPTD*). The definitions of other financial and risk variables are presented in Appendix A.1. Standard errors in the final stage are robust to heteroskedasticity and serial correlation. We consider four lags and use the procedure of Newey and West (1987) to account for serial correlation. ***, **and *represent 1%, 5% and 10% significance level, respectively.

Panel A. First stage regressions

	PTP	*PTI*	*PTE*	*PTD*
M/B	**-0.026**	**-0.004**	**0.008**	**0.004**
	[35.05]***	[5.10]***	[2.72]***	[2.53]**
dA/A	**-0.149**	**-0.048**	**0.132**	**-0.009**
	[9.21]***	[7.07]***	[4.34]***	[0.59]
E/A	**0.496**	**0.112**	**1.145**	**0.337**
	[16.86]***	[10.63]***	[7.73]***	[3.40]***
NYP	**0.498**	**0.138**	**0.044**	**-0.014**
	[64.17]***	[12.41]***	[3.69]***	[3.02]***
Systematic Risk	**-2.111**	**-1.467**	**-5.940**	**-0.499**
	[4.08]***	[7.75]***	[8.37]***	[1.45]
Idiosyncratic Risk	**-4.169**	**-0.157**	**-1.999**	**1.435**
	[16.34]***	[2.87]***	[4.86]***	[5.61]***
Constant	**0.339**	**0.039**	**0.203**	**0.015**
	[33.26]***	[10.56]***	[15.03]***	[2.70]**
R^2	0.21	0.04	0.03	0.02
N	99,065	68,975	30,090	30,090

Panel B. Final stage regressions: raw *ASVI*

	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_Div	**0.148**	**0.097**	**0.350**	**-0.114**
	[2.00]**	[4.74]***	[1.83]*	[2.56]**
Constant	**0.001**	**0.000**	**0.000**	**-0.000**
	[0.29]	[0.23]	[0.07]	[0.11]
R^2	0.04	0.13	0.07	0.10
N	39	39	39	39

Panel C. Final stage regressions: residual *ASVI*

	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_Div_DP	**0.145**	**0.092**	**0.346**	**-0.109**
	[1.87]*	[4.22]***	[1.80]*	[2.47]**
Constant	**0.000**	**-0.000**	**0.001**	**0.000**
	[0.07]	[0.21]	[0.12]	[0.31]
R^2	0.04	0.12	0.07	0.09
N	39	39	39	39

Table 6: Dividend payment and dividend sentiment: top/bottom 10 dividend sentiment states

This table reports the final stage results of three-stage regressions of dividend payment on firm characteristics, risk and dividend sentiment for top/bottom 10 states with non-zero dividend sentiment. We collect *SVI* for each U.S. state and rank all states by averaging the *SVI* for the 2004 to 2013 period. The top 10 states with the highest dividend sentiment (highest average *SVI*) are Florida, Texas, Colorado, Maryland, Missouri, North Carolina, Illinois, Arizona, Georgia, and Massachusetts. We only include firms whose headquarters are located in these states in Panel A and B. The bottom 10 non-zero states with the lowest dividend sentiment (lowest average *SVI*) are Virginia, Kansas, Nevada, Oklahoma, Kentucky, Utah, Arkansas, Louisiana, Iowa and South Carolina. We only include firms whose headquarters are located in these states in Panel C and D. We first perform a set of Fama-Macbeth logit regression of dividend payment on firm characteristics and risk suggested in Fama and French (2001) and Hoberg and Prabhala (2009). We restrict the sample into surviving nonpayers in column (2) and restrict the sample into surviving payers in columns (3) and (4):

$$\Pr(Payer_{it}=1)=\log it(a+bNYP_{it}+c\frac{M}{B_{it}}+d\frac{dA}{A_{it}}+e\frac{E}{A_{it}}+Systematic\_risk+Idiosyncratic\_risk)+u_{it}$$

We obtain the average quarterly prediction errors (actual dividend policy minus predicted policy) for each state from the logit regressions. To eliminate seasonality from the average quarterly prediction errors, we regress the prediction errors on quarter dummies and compute the residual (the propensity to pay/initiate/increase/decrease dividends). The propensity to pay/initiate/increase/decrease (*PTP/PTI/PTE/PTD*) is the difference between the actual percentage of firms that pay/initiate/increase/decrease dividends in a given quarter and the expected percentage, which is the average predicted probability from the logit model. We regress the seasonally-adjusted residual of average quarterly prediction error on *ASVI_Div* in the final stage. We also regress *ASVI_Div* on the dividend premium and compute the residual (*ASVI_Div_DP*). The dependent variable in the final stage is the change in the propensity to pay/initiate/increase/decrease dividend (*CPTP/CPTI/CPTE/CPTD*). The definitions of other financial and risk variables are presented in Appendix A.1. Standard errors in the final stage regression are robust to heteroskedasticity. ***, **and *represent 1%, 5% and 10% significance level, respectively.

Panel A. Top 10 dividend sentiment states: raw *ASVI*				
	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_Div	**0.043**	**0.042**	**0.145**	**-0.019**
	[1.92]*	[2.15]**	[2.01]**	[0.52]
Constant	**-0.000**	**-0.001**	**-0.001**	**0.001**
	[0.12]	[0.26]	[0.07]	[0.19]
N	390	390	390	390
Panel B. Top 10 dividend sentiment states: residual *ASVI*				
	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_Div_DP	**0.042**	**0.042**	**0.146**	**-0.020**
	[1.92]*	[2.14]**	[2.01]**	[0.54]
Constant	**-0.000**	**-0.000**	**-0.000**	**0.001**
	[0.08]	[0.22]	[0.03]	[0.18]
N	390	390	390	390
Panel C. Bottom 10 states with non-zero dividend sentiment: raw *ASVI*				
	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_Div	**0.015**	**-0.136**	**0.025**	**0.011**
	[0.29]	[1.34]	[0.24]	[0.22]
Constant	**-0.000**	**-0.000**	**-0.006**	**0.000**
	[0.04]	[0.01]	[0.46]	[0.01]
N	390	390	390	390
Panel D. Bottom 10 states with non-zero dividend sentiment: residual *ASVI*				
	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_Div_DP	**0.015**	**-0.137**	**0.026**	**0.010**
	[0.29]	[1.34]	[0.25]	[0.22]
Constant	**-0.000**	**0.001**	**-0.006**	**-0.000**
	[0.06]	[0.11]	[0.47]	[0.00]
N	390	390	390	390

Table 7: Mutual fund flows and dividend sentiment

This table reports estimates from two-stage regressions of mutual fund flows on fund characteristics and the dividend sentiment. We first perform a set of Fama-Macbeth regression of mutual fund flow on fund characteristics from columns (1) to (3) and OLS regression in column (4). The dependent variable is the quarter net fund flow. Our set of control variables includes *fund size, fund age, fund risk, past fund return, the squared past fund return, expense ratio, turnover ratio, fund family size, family flow, segment flow,* and one-quarter *lagged fund flow*. The definitions of these control variables are presented in the Appendix A.1. We obtain the average quarterly prediction errors (actual fund flow minus predicted fund flow) from the first-stage regressions. The second stage regresses the residual of average quarterly prediction errors on *ASVI_Div* and *ASVI_DT*. *Abnormal Fund Flow* is the average fund flow of high dividend funds minus the average fund flow of all other conventional funds. We define a mutual fund as a high dividend paying fund if the fund name contains "*high dividend*" or "*super dividend*" or "*ultra dividend*". Standard errors in the second stage are robust to heteroskedasticity and serial correlation. We consider four lags and use the procedure of Newey and West (1987) to account for serial correlation. ***, **and *represent 1%, 5% and 10% significance level, respectively.

Panel A. First stage regressions

	FMB	*FMB*	*FMB*	*OLS*
Fund Size	**-0.013**	**-0.013**	**-0.013**	**-0.012**
	[11.38]***	[12.95]***	[13.22]***	[27.22]***
Fund Age	**-0.058**	**-0.044**	**-0.043**	**-0.045**
	[21.10]***	[20.19]***	[20.35]***	[37.98]***
Fund Risk	**-0.045**	**-0.007**	**-0.113**	**0.127**
	[0.25]	[0.04]	[0.68]	[2.44]**
Past Fund Return	**2.759**	**2.208**	**2.059**	**1.432**
	[5.60]***	[4.99]***	[3.11]***	[21.82]***
Past Fund Return^2			**28.902**	**5.354**
			[3.43]***	[6.43]***
Expense Ratio	**-4.463**	**-3.999**	**-4.031**	**-3.955**
	[11.29]***	[12.07]***	[12.03]***	[27.55]***
Turnover Ratio	**0.004**	**0.003**	**0.003**	**0.003**
	[1.37]	[1.25]	[1.06]	[2.40]**
Fund Family Size	**0.004**	**0.004**	**0.004**	**0.004**
	[4.02]***	[4.49]***	[4.61]***	[9.13]***
Family Flow	**0.105**	**0.076**	**0.076**	**0.055**
	[7.85]***	[6.45]***	[6.42]***	[12.15]***
Segment Flow	**-0.034**	**-0.057**	**-0.076**	**-0.128**
	[0.92]	[1.64]	[2.19]**	[5.74]***
Lagged Fund Flow		**0.163**	**0.163**	**0.161**
		[21.48]***	[21.45]***	[29.94]***
Constant	**0.201**	**0.167**	**0.173**	**0.148**
	[27.37]***	[26.93]***	[24.71]***	[26.27]***
Quarter FE	No	No	No	Yes
Adjusted R^2	0.07	0.10	0.10	0.12
N	274,124	274,124	274,124	274,124

Panel B. Second stage regressions

	Fund Flow	*Fund Flow*	*Abnormal Fund Flow*	*Abnormal Fund Flow*
ASVI_Div	**0.870**		**0.799**	
	[2.48]***		[2.10]**	
ASVI_DT		**1.068**		**1.007**
		[2.50]***		[2.47]***
Constant	**0.044**	**0.044**	**0.075**	**0.075**
	[1.41]	[1.51]	[2.53]***	[2.66]***
Adjusted R^2	0.04	0.06	0.04	0.07
N	38	38	38	38

Table 8: Dividend payment and dividend sentiment: alternative measures

This table reports our baseline results using *ASVI_DT*. *ASVI_DT* is the abnormal search volume index for the topic *"dividend"* from Google Trends. It includes searches in different text strings and various languages that are dividend-related. To eliminate seasonality from *ASVI_DT*, we regress the ratio on month dummies and compute the residual. We also regress *ASVI_DT* on the dividend premium proposed in Baker and Wurgler (2004b) and obtain the residual (*ASVI_DT_DP)*. Panel A shows results before controlling for firm characteristics and risk. Panel B to C list the final stage results of the three-stage regressions. Standard errors are robust to heteroskedasticity and serial correlation. We consider four lags and use the procedure of Newey and West (1987) to account for serial correlation. ***, **and * represent 1%, 5% and 10% significance level, respectively.

Panel A. ASVI

	Initiate	*Increase*	*Decrease*
ASVI_DT	**0.068**	**0.358**	**-0.195**
	[2.83]***	[1.90]*	[1.34]
ASVI_DT_DP	**0.064**	**0.351**	**-0.205**
	[2.61]**	[1.76]*	[1.43]

Panel B. ASVI controlling for firm characteristics

	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_DT	**0.161**	**0.119**	**0.348**	**-0.009**
	[4.86]***	[3.77]***	[2.66]***	[0.19]
ASVI_DT_DP	**0.156**	**0.111**	**0.342**	**-0.000**
	[4.64]***	[3.45]***	[2.66]***	[0.01]

Panel C. ASVI controlling for firm characteristics and risk

	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_DT	**0.184**	**0.100**	**0.452**	**-0.002**
	[1.95]*	[3.43]***	[2.26]**	[0.05]
ASVI_DT_DP	**0.182**	**0.093**	**0.451**	**0.004**
	[1.86]*	[3.05]***	[2.28]**	[0.08]

Table 9: Dividend payment and dividend sentiment: robustness checks

This table reports the coefficient and t-statistic of *ASVI_Div* for various robustness tests. We repeat analysis in Table 3 with additional macroeconomic controls in Panel A. *UEI* (Unexpected inflation) is the current quarter inflation minus the average of the past 12 realizations. *MP* is the quarterly growth in industrial production. *RP* (quarterly default risk premium) is the difference between Moody's Baa-rated and Aaa-rated corporate bond yields. *TS* (term spread) is the difference between the yields of a constant maturity 10-year Treasury bond and 3-month Treasury bill. *UNEMP* is the quarterly unemployment rate. We redo analysis in Table 3 with additional investor sentiment controls in Panel B. SENT^ (mean) is the average of the monthly sentiment index within each quarter in Baker and Wurgler (2006) which is based on first principal component of FIVE (standardized) sentiment proxies where each of the proxies has first been orthogonalized with respect to a set of six macroeconomic indicators. SENT (mean) is the average of the monthly sentiment index within each quarter in Baker and Wurgler (2006) which is based on first principal component of FIVE (standardized) sentiment proxies. SENT (median) is the median of the monthly sentiment index in Baker and Wurgler (2006) within each quarter. We include the pre-crisis period in column (1) of Panel C and exclude the financial crisis period in column (2) of Panel C. We include periods after June 2006 in column (3) of Panel C when the search volume intensity from Google was publicly available. Standard errors are robust to heteroskedasticity and serial correlation. We consider four lags and use the procedure of Newey and West (1987) to account for serial correlation. ***, **and * represent 1%, 5% and 10% significance level, respectively.

Panel A. Dividend payment and dividend sentiment with macroeconomic controls

	UEI	MP	RP	TS	UNEMP
Initiate	**0.087**	**0.071**	**0.080**	**0.084**	**0.073**
	[4.00]***	[3.40]***	[3.55]***	[4.35]***	[4.00]***
Increase	**0.268**	**0.139**	**0.177**	**0.331**	**0.267**
	[1.85]*	[1.69]*	[1.98]**	[1.83]*	[1.33]
Decrease	**-0.306**	**-0.253**	**-0.255**	**-0.350**	**-0.348**
	[2.90]***	[1.94]*	[2.04]**	[3.48]***	[3.53]***
N	39	39	39	39	39

Panel B: Dividend payment and dividend sentiment with investor sentiment controls

	SENT^ (mean)	SENT (mean)	SENT (median)
Initiate	**0.086**	**0.084**	**0.086**
	[4.51]***	[4.34]***	[4.46]***
Increase	**0.313**	**0.325**	**0.305**
	[2.07]**	[1.79]*	[2.11]**
Decrease	**-0.320**	**-0.342**	**-0.314**
	[3.12]***	[3.40]***	[3.08]***
N	39	39	39

Panel C: Dividend payment and dividend sentiment with subsamples

	Pre-Crisis	Exclude Crisis	After June 2006
Initiate	**0.056**	**0.077**	**0.108**
	[4.35]***	[2.87]***	[6.52]***
Increase	**0.143**	**0.114**	**0.381**
	[3.12]***	[0.95]	[1.90]*
Decrease	**-0.320**	**-0.312**	**-0.262**
	[3.55]***	[2.10]**	[1.92]*
N	14	33	31

Table 10: Lead-lag relation between the dividend premium and the dividend sentiment

This table shows the lead-lag relation between the dividend premium proposed in Baker and Wurgler (2004b) and the search volume index for dividend-related keywords from Google Trends. *SVI_Div* is the search volume index if the search term in Google includes *"dividend" or "dividends" or "payout" or "dividend stocks" or "dividend yield" or "dividend payout". Dividend Premium* is the difference between the logs of the value-weighted market-to-book ratio for dividend payers and nonpayers. To eliminate seasonality from the dividend premium (*SVI_Div*), we regress the ratio on quarter (month) dummies and compute the residual. All standard errors are robust to heteroskedasticity and serial correlation. We consider four lags and use the procedure of Newey and West (1987) to account for serial correlation. ***, **and *represent 1%, 5% and 10% significance level, respectively.

Panel A. Relation between lagged dividend premium and the current dividend sentiment

	Dividend Premium			
	One-Lag	Two-Lag	Three-Lag	Four-Lag
SVI_Div	**1.011**	**1.221**	**1.071**	**0.989**
	[2.65]***	[4.07]***	[2.57]***	[2.41]***
Constant	**-0.002**	**0.003**	**0.004**	**0.008**
	[0.05]	[0.07]	[0.10]	[0.18]
R^2	0.14	0.22	0.17	0.13
N	39	38	37	36

Panel B. Relation between lagged dividend sentiment and the current dividend premium

	SVI_Div			
	One-Lag	Two-Lag	Three-Lag	Four-Lag
Dividend Premium	**0.053**	**0.081**	**-0.006**	**0.006**
	[0.74]	[1.03]	[0.09]	[0.08]
Constant	**0.003**	**0.002**	**0.002**	**0.002**
	[0.23]	[0.16]	[0.15]	[0.11]
R^2	0.02	0.05	0.00	0.00
N	39	38	37	36

Figure 1: Search volume index time series

This figure shows the natural log of the search volume index (*SVI)* for the 2004 to 2013 period. We follow the National Bureau of Economic Research (NBER) and define recession period from December 2007 to June 2009. The financial crisis period is within the dashed lines. *SVI_Div* is the search volume index where the search term in Google includes *"dividend" or "dividends" or "payout" or "dividend stocks" or "dividend yield" or "dividend payout". SVI_DT* is the search volume index for the topic "dividend" from Google Trends. It includes searches in different text strings and various languages that are dividend-related. To eliminate seasonality from the natural log of the search volume index, we regress the ratio on month dummies and obtain the residual.

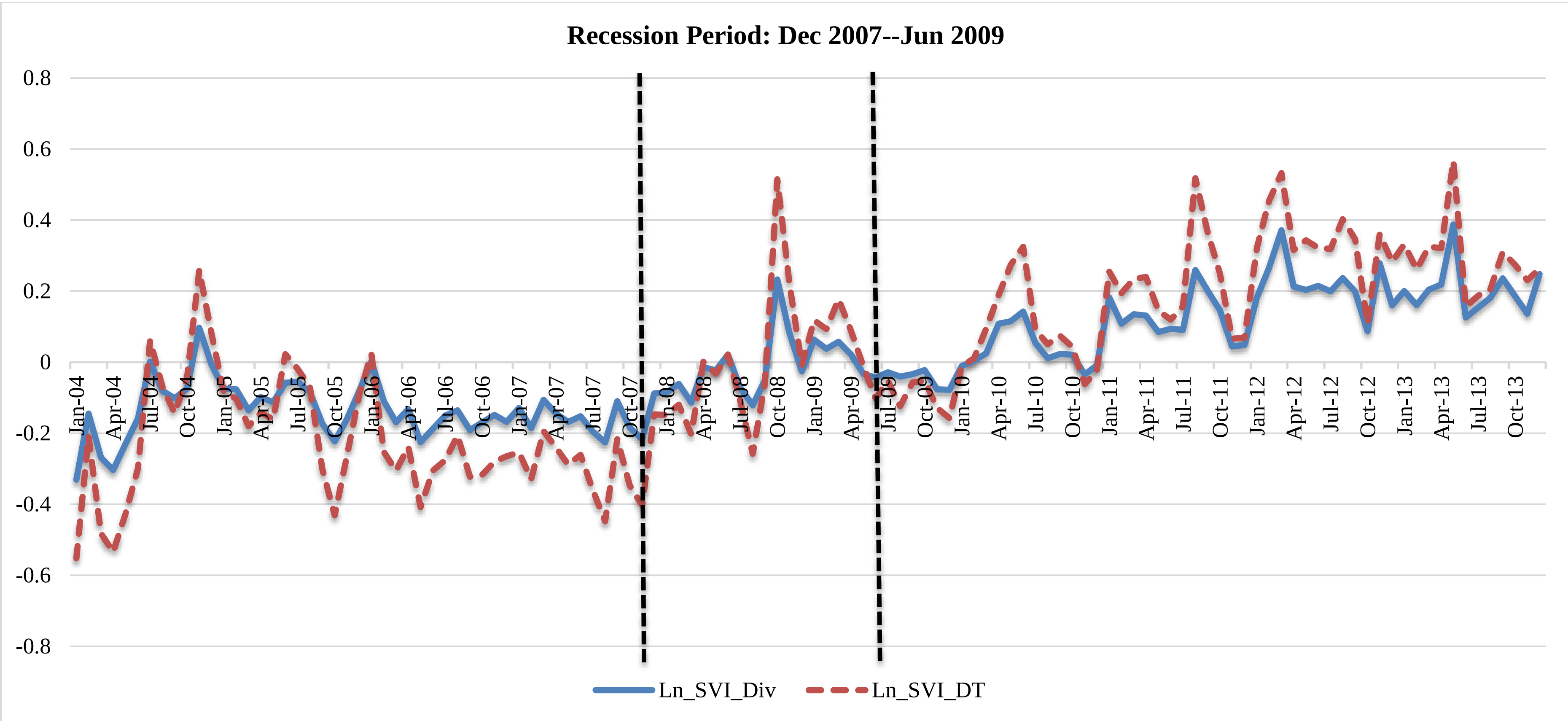
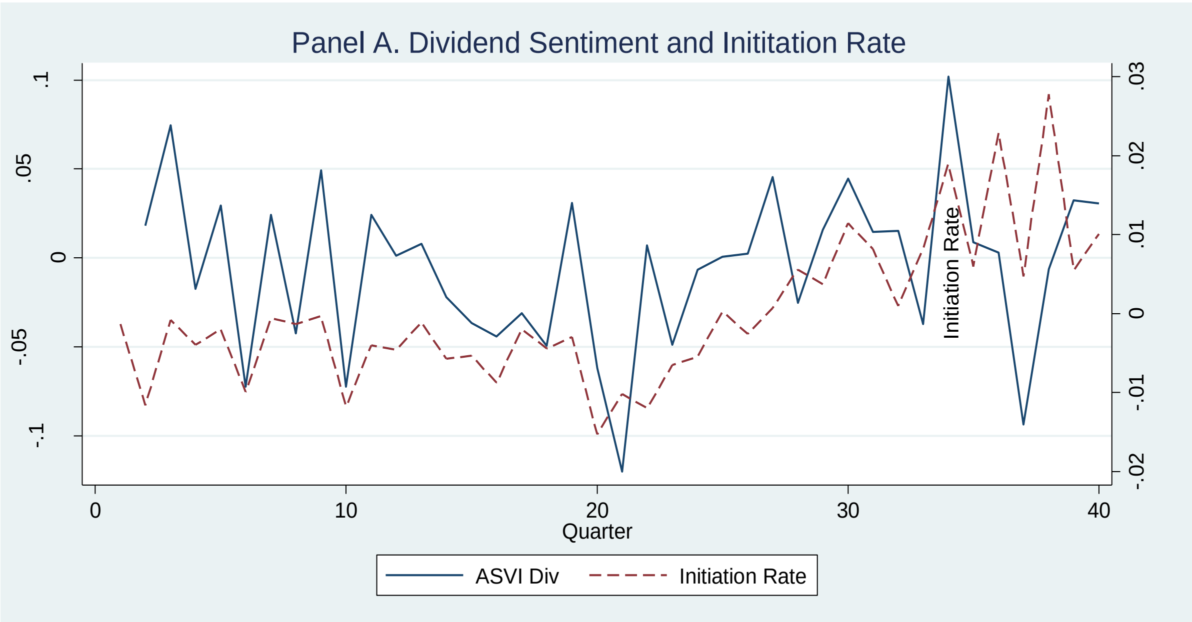


Figure 2: Dividend sentiment, dividend initiation, and increase rate

This figure shows the time-series relation between dividend sentiment, the dividend initiation rate, and the dividend increase rate from 2004 to 2013. *ASVI_Div* is the abnormal search volume index if the search term includes *"dividend"* or *"dividends"* or *"payout"* or *"dividend stocks"* or *"dividend yield"* or *"dividend payout"*. The initiation rate expresses new payers in quarter *t* as a percentage of surviving nonpayers from *t-1*. The rate at which firms increase dividends expresses increase payers at quarter *t* as a percentage of surviving payers from *t-1*. To eliminate seasonality from the dividend initiation rate and the dividend increase rate (*ASVI_Div*), we regress the ratio on quarter (month) dummies and obtain the residual.



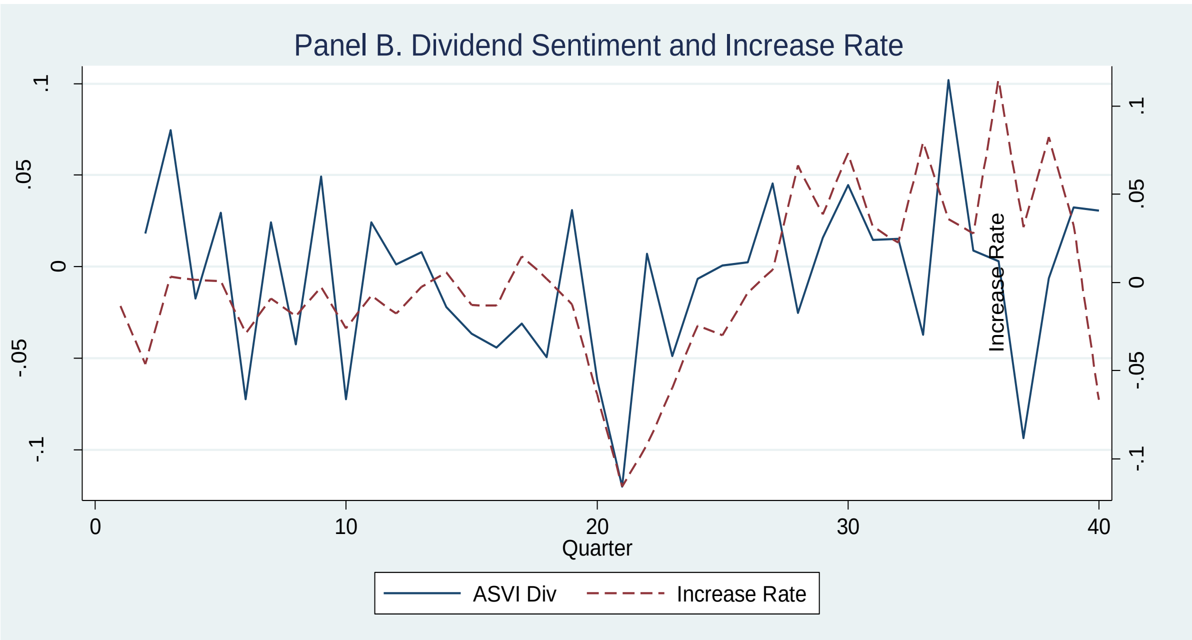
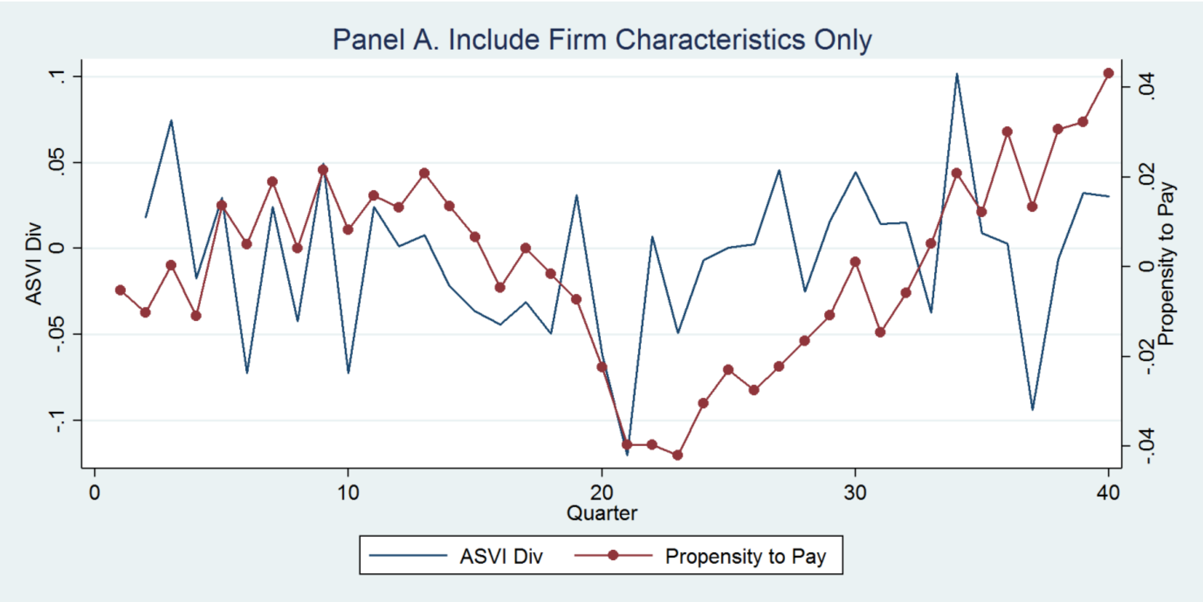
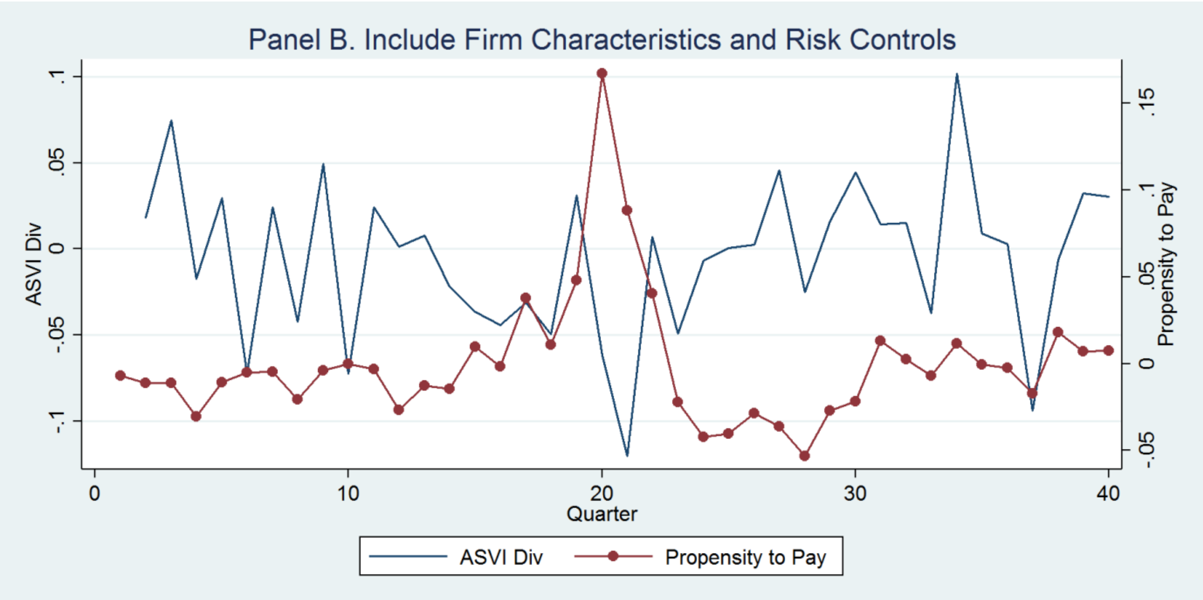


Figure 3: Dividend sentiment and the propensity to pay dividends

This figure shows the time series relation between dividend sentiment and the propensity to pay dividends from 2004 to 2013. *ASVI_Div* is the abnormal search volume index where the search term includes *"dividend"* or *"dividends"* or *"payout"* or *"dividend stocks"* or *"dividend yield"* or *"dividend payout"*. The propensity to pay is the difference between the actual fraction of firms paying dividends in a given quarter minus the expected fraction of firms paying dividends. In Panel A, the expected value is the average predicted value from the Fama-MacBeth logit regression that includes four firm characteristics suggested in Fama and French (2001): asset growth, firm's size percentile relative to NYSE firms, M/B, and earnings divided by book assets. In Panel B, we include two additional risk controls suggested in Hoberg and Prabhala (2009): systematic risk and idiosyncratic risk. To eliminate seasonality from the propensity to pay dividends (*ASVI_Div*), we regress the ratio on quarter (month) dummies and obtain the residual.





Appendix A.1 Variable definitions

Panel A. Firm characteristics	
NYP	The NYSE market capitalization percentile, i.e., the percentage of NYSE firms having equal or smaller capitalization than firm *i* in quarter *t*. *Source: Compustat*
M/B	Book assets (item 44) minus book value of equity (item 60+item 52) plus market value of equity (item 12*item 61), all divided by book assets (item 44) *Source: Compustat*
dA/A	The difference between book assets (item 44) and lagged book assets, all divided by lagged book assets *Source: Compustat*
E/A	Earnings before extraordinary items (item 8) plus interest expense (item 22) plus income statement deferred tax (item 35), all divided by book assets (item 44) *Source: Compustat*
Panel B. Risk	
Systematic_risk	The standard deviation of the predicted value from a regression of a firm's daily excess stock returns (raw returns less the riskless rate) on the market factor (i.e., the value-weighted market return less the riskless rate). One firm-quarter observation of systematic risk is calculated using firm-specific daily stock returns within one quarter. *Source: Center for Research in Securities Prices (CRSP)*
Idiosyncratic_risk	The standard deviation of residuals from the above regression used to define systematic risk. *Source: Center for Research in Securities Prices (CRSP)*
Panel C. Fund Characteristics	
Fund Flow	Computed as $(TNA_{i,t}-TNA_{i,t-1})/TNA_{i,t-1}-r_{i,t}$ where $TNA_{i,t}$ denotes fund *i*'s total net assets in quarter *t* and $r_{i,t}$ denotes fund *i*'s return in quarter *t* as reported in CRSP, winsorized at the top 99% and bottom 1%. *Source: CRSP, Estimated*
Abnormal Fund Flow	The average fund flow of high dividend funds minus that of all other conventional funds. We define a mutual fund as a high dividend fund if the fund name contains "*high dividend*" or "*super dividend*" or "*ultra dividend*". *Source: CRSP, Estimated*
Fund Size	The lagged natural logarithm of a fund's total net assets.

	Source: CRSP
Fund Age	The natural logarithm of a fund's age computed from the date the fund was first offered ((*first_offer_dt* in CRSP) *Source: CRSP, Estimated*
Fund Risk	The standard deviation of the fund return using the past three monthly return observations *Source: CRSP, Estimated*
Past Fund Return	The average fund return in the past three months *Source: CRSP*
Expense Ratio	The ratio of total investment that shareholders pay for the fund's operating expenses, which include 12b-1 fees *Source: CRSP*
Turnover Ratio	The fund turnover ratio *Source: CRSP*
Fund Family Size	The natural logarithm of the assets of the entire fund family at the start of the quarter *Source: CRSP*
Family Flow	The growth rate of fund *i*'s fund family due to flows in quarter *t*, excluding flows in fund *i*. It is computed as $(TNA_{f,t}-TNA_{f,t-1})/TNA_{f,t-1}-r_{f,t}$ where $TNA_{f,t}$ denotes fund company *f*'s total net assets less fund *i* in quarter *t* and $r_{f,t}$ denotes fund company *f*'s equal weighted return in quarter *t*. *Source: CRSP, Estimated*
Segment Flow	The growth rate of fund *i*'s market segment (i.e., all other funds with the same CRSP investment objective code) due to flows in quarter *t*, excluding flows in fund *i*. It is computed as $(TNA_{j,t}-TNA_{j,t-1})/TNA_{j,t-1}-r_{j,t}$ where $TNA_{j,t}$ denotes segment *j*'s total net assets less fund *i* in quarter *t* and $r_{j,t}$ denotes segment *j*'s equal weighted return in quarter *t*. *Source: CRSP, Estimated*