Another dividend puzzle:
Why do dividend-paying firms pay dividends *quarterly*?

Suk Hi kim
College of Business Administration
University of Detroit Mercy
4001 W. McNichols Road
Detroit, MI 48221
Phone: 313-993-1264
Fax: 313-993-1673
Email: ink@udmercy.edu

Kenneth A. Kim
State University of New York at Buffalo
School of Management

Takeshi Nishikawa
St. Johns University
Tobin College of Business

Another dividend puzzle:
Why do dividend-paying firms pay dividends *quarterly*?

Abstract

In the U.S., dividends are paid quarterly, semiannually, or annually. Why do most dividend-paying firms pay dividends quarterly? We test explanations related to information signaling and agency costs, but neither explanations pan out. We also test whether managers are catering to shareholder demand for frequent dividends, but find no evidence of it. We then conduct an event study to see how the market reacts to dividend frequency-change announcements. When a firm announces an increase in its dividend-payout frequency, we find positive abnormal announcement returns. Further analysis suggests dividend frequency-increasing announcements signal an increase in future dividends, but not future earnings.

Not all dividend-paying firms pay dividends quarterly. Some firms pay dividends only annually or semiannually, e.g., McDonalds, Staples, Disney, and Baxter. This paper tries to identify the determinants of dividend payout frequency. We regress dividend payout frequency on a variety of plausible independent variables. We find that larger firms, firms that pay more annual dividends per share, profitable firms, and firms with low market-to-book ratio of assets, pay dividends more frequently, i.e., on a quarterly basis. What do these findings imply? It appears that firms that *can* pay dividends on a quarterly basis (i.e., large, profitable firms with large dividends) opt to do so, but we do not know why they do so.

Because profitable firms and low market-to-book firms pay dividends on a quarterly basis, the regression results also suggest that (1) profit-signaling and (2) agency costs might play roles in the dividend payout-frequency decision. However, one problem with the profit-signaling explanation is that it has direct implications on dividend *amount*, not on dividend frequency (i.e., the profit-signaling hypothesis is that firms can signal high profitability by committing to a high dividend *amount*). With regard to an agency cost explanation, perhaps having to make frequent dividend payouts effectively restrict managerial discretion. However, if we believe firms with high free cash flow and low market-to-books are indicative of firms with high agency costs, then our regression results are not supportive of this explanation, as we find that firms with *both* high free cash flow and low market-to-books pay dividends *less* frequently. Additional tests of an agency cost explanation, using ownership variables, are also not supportive. Therefore, we are doubtful that profit signaling and agency costs play roles in the dividend payout-frequency decision.

We importantly entertain the possibility that managers pay frequent dividends because this is what shareholders want, i.e., managers are catering to shareholder demand. However,

using catering tests similar to Baker and Wurgler (2004a) and Li and Lie (2006) we cannot find support for this explanation either.

We then conduct an event study to see how the market reacts to dividend frequency-change announcements. We find positive abnormal returns around days when firms announce an increase in dividend-payout frequency, e.g., going from paying dividends annually to quarterly, and some modest evidence of negative abnormal returns when firms announce a decrease in dividend-payout frequency. These event-study findings are odd, as our catering tests show no relation between investor preferences and dividend-payout frequency. So, why would the market react positively to dividend frequency-increasing announcements? We surmise the following. Because quarterly dividend-payers pay larger dividends per year than other dividend-payers, the market anticipates these dividend frequency-increasing firms will eventually increase their dividend amount in the near future. A simple before-and-after analysis corroborates this conjecture -- dividend amount increases immediately after firms start paying dividends more frequently. But this is not the only interesting finding from this before-and-after analysis. Earnings do *not* increase after firms increase their dividend payout frequency. These two findings taken together suggest shareholders desire returns in the form of dividends, consistent with the bird-in-the-hand theory of dividends (Gordon (1962)) and the investor behavioral-preference-for-dividends theory (Shefrin and Statman (1984)).

Overall, our paper raises an interesting question. Why do dividend-paying firms pay dividends quarterly and not less frequently? It is a puzzle because paying dividends less frequently gives firms more flexibility and lowers processing costs (see our Section VI for more discussions on this). We test plausible explanations, but we fail to find a convincing answer to the question. However, we think our paper is still important. Our paper highlights another

dividend puzzle (the original puzzle being why firms pay dividends at all (e.g., see Black (1996)). Our paper also importantly shows that dividend frequency-increasing announcements have information content about future dividends, but not on future earnings.

As far as we know, there is only one other paper that studies dividend-payout frequency. Ferris, Noronha, and Unlu (2006) study dividend-payout frequencies from 32 countries. According to their study, quarterly dividends are common only in Canada and the U.S. (this finding in and of itself underscores the dividend puzzle raised in our paper). Firms in other countries most often pay dividends annually. They suggest the country's legal regime explains dividend payout frequencies. Frequent dividends are valued more in low shareholder-protection countries because frequent payouts limit the ability for controlling shareholders to expropriate wealth from minority shareholders. Because most of those firms pay dividends only annually, it must be the case that those controlling shareholders value the private benefits of control over maximizing share value. This is a plausible explanation for cross-country differences in dividend payout frequencies. Our paper only studies firms from one country, the United States. We focus more on firm-specific factors that drive the dividend payout-frequency decision.

We could provide a lengthy literature review on dividends in general, perhaps with some emphasis on (1) the decision to pay them or not, and (2) how much to pay. However, because these issues would only tangentially relate to our study, we choose instead to get to the point of our study. However, we do provide some detailed discussion of the dividend-payout and dividend-amount decision later when it becomes necessary.

I. Data

All stock price and financial statements data come from CRSP and Compustat. Our initial sample includes all dividend-paying firms listed on NYSE, AMEX, and Nasdaq from

1976 to 2006. The choice of 1976 as the first year of our study is not totally arbitrary. We use quarterly net income data in our study and 1976 is the first year when this data item becomes noticeably less missing. There are some extreme outliers in the quarterly net income variable, so we winsorize the variable at 1 and 99 percent. We use CRSP data item SHRCD to identify ordinary common shares so we can eliminate other share types. We wish to focus on nonregulated industries so we also exclude financial firms and utilities firms from our study. Otherwise, we wish to analyze as much data as possible so we do not require complete data by-firm or by-year, i.e., we only delete missing firm-year observations. We experiment with various filters, such as imposing a minimum firm size requirement, but our results remain very similar regardless of what filters we use, so do not impose them. Our final study sample consists of 31,880 firm-year observations.

A. Summary Statistics

CRSP data item DISTCD indicates firms' dividend-payout frequency. Table I shows the number of firms that pay dividends quarterly, semiannually, and annually, for each year. The percent of firms with a particular dividend payout-frequency, within each year, is in parentheses next to the sample size. From this table, it is clear most dividend-paying firms pay dividends quarterly. While the sample sizes of quarterly payers, semiannual payers, and annual payers varies from year to year, with a notable downward trend in total payers (as highlighted by Fama and French (2001)), note that the percentages of different frequency payers stay stable from year to year. Thus, there appears to be little or no dividend payout-frequency trend in our sample. A question arises: are the semiannual and annual payers essentially the same firms every year? In total, there are 259 unique semiannual payers and 258 unique annual payers for a total of 491 unique firms (26 firms were semiannual and annual payers at one time or another). So the

answer is "yes and no." Note also that 491 unique firms is a nontrivial number of firms, as the average number of dividend-paying firms per year is 1,028.

[Insert Table I Here]

[Insert Table II Here]

Table II contains summary statistics of firm-specific variables used in our study. Summary statistics are reported for the whole sample period, by subperiods, and by whether the firm pays dividends quarterly, semiannual, or annually. What are these firm-specific variables and why do we focus on them? We think these variables might help explain the dividend-payout frequency decision. The table reveals findings, but we wish to summarize those findings from the context of a regression framework, which we discuss next.

II. Regression Tests

A. Identifying Determinants of Dividend-Payout Frequency

To identify the determinants of dividend-payout frequency, we first conduct regression tests where dividend payout frequency is a dependent variable. This leaves us with the challenging task of identifying plausible explanatory variables. How do we identify such variables? We first recognize the two most common explanations for why firms pay dividends are: (1) they are a way for managers to signal their expected profitability to outside shareholders when inside managers know more about the firm than outside shareholders (e.g., Bhattacharya (1979) and Miller and Rock (1985)) and (2) they are a means of limiting the amount of cash that is available at managers discretion when the conflict of interest between managers and shareholders is potentially high (e.g., Rozeff (1982), Easterbrook (1984), and Jensen (1986)). That is, in academic finance parlance, dividends are private information signals in the presence

of information asymmetry and/or moderators of agency costs. For our regression model, we propose the following independent variables.

A.1. Standard Deviation of Quarterly Net Income Divided by Net Income

This variable speaks to a viable information-signaling story. Specifically, firms may pay dividends quarterly to signal their expectation of future profitable earnings for *every quarter* within the year. Such a signal may be valuable and informative if the following two assumptions are correct. First, investors prefer firms with smooth positive earnings (and thus sustainable dividends) from year to year, to firms with volatile earnings (e.g., see Goel and Thakor (2003) and references therein). Second, inside managers have more information about the firm than outside investors (e.g., Myers and Majluf (1984) and Miller and Rock (1985)). If we accept the first assumption, then by extension it would be reasonable to presume investors also prefer smooth earnings from *quarter to quarter*. If we accept both assumptions, then making quarterly payments represents a valuable and informative signal to outsiders. For these reasons, firms that anticipate low standard deviations of positive quarterly net income should opt to pay dividends quarterly. Firms with high standard deviation of quarterly net income (we could call these "seasonal firms") will also want to send this valuable signal, but it is risky (and therefore potentially costly) for them to do so, as they are unable to generate the necessary positive and stable quarterly net income to cover quarterly dividends. That is, there is a separating equilibrium. Therefore, we expect quarterly net income volatility to be negatively correlated with dividend payout frequency.

For each year, our specific measure of quarterly net income volatility is the standard deviation of that year's quarterly net income divided by that year's annual net income (so this is a coefficient of variation of four numbers). We focus on net income simply because dividends

come directly from net income. However, we recognize that net income is a "smoothed" accounting earnings variable. Therefore, we also use the standard deviation of quarterly cash flows from operations (i.e., EBITDA) as an alternative profitability variable.

A.2. Firm Size, Firm Maturity, and Fixed Assets Ratio

Each of these three variables is a common proxy for information asymmetry (e.g., see Lewellen (2006)). We use three proxy measures of information asymmetry simply because each variable could proxy for something else and also because there is little consensus as to which variable best captures the firm's degree of information asymmetry. We propose, as have others (e.g., Lewellen (2006)), that larger firms, mature firms, and firms with more tangible assets have *less* information asymmetry. These variables are important if we assume the degree of information asymmetry varies across firms and that this variation plays a role in the dividend payout-frequency decision. Earlier, we suggested that if managers know more about the firm than outsiders, then paying dividends on a quarterly basis could represent a valuable signal to outsiders. *However,* here we are proposing that if firms have low information asymmetry, then they may not have to use frequent dividend payouts as a signal. Therefore, we expect each of these independent variables to be negatively correlated to dividend payout frequency.

In regression tests, firm size is the log of total assets, firm maturity is a sales-to-total assets ratio, and the third information asymmetry proxy is simply a fixed assets-to-total assets ratio. Here, total assets refer to book assets. A comment on our firm maturity measure is in order. A firm with a high sales-to-total assets ratio is considered a mature firm, and thus one with less information asymmetry (Lewellen (2006)). An obvious alternative way to measure firm maturity is firm age. Unfortunately, the initial public offering date is frequently missing in Compustat. As an alternative way of measuring firm age, we use the first year the firm appears

in CRSP to proxy for the firm's founding year. In regression analyses, we find that neither our firm age variable nor the sales ratio is robustly correlated (at least not in the hypothesized direction) with dividend-payout frequency. So, it does not matter which firm maturity measure we use. Because firm age is censored at a minimum of 0 years and a maximum of 81 years, we choose to report results using the sales ratio.

A.3. Annual Dividend Amount per Share

This is the only independent variable we consider that does *not* relate directly to (1) information-signally under information asymmetry or (2) agency costs. Why should dividend amount per share matter? Maybe managers do not want to divvy up their small annual dividend into quarters. That is, managers believe there is a lower bound on an "optimal" dividend amount. It appears that managers believe there are optimal *stock price* ranges (for recent papers on this topic, see Benartzi, Michaely, Thaler, and Weld (2007) and Baker, Greenwood, and Wurgler (2008)). If managers believe there are optimal stock price ranges, then it is conceivable that managers also believe there are optimal dividend amount per share ranges. This is a behavioral explanation. One potential problem with this explanation is that firms could do reverse splits to increase the size of their dividends per share. However, because reverse splits are negative signals (e.g., see Lamoureux and Poon (1987)), we think this behavioral explanation is worth testing. The explanation predicts a positive relation between total annual dividend amount and dividend payout frequency.

In regression tests, we use the total annual dividend amount per share as an independent variable (so, for example, for quarterly payers this is the sum of four dividends per share).

A.4. Net Income per Share

This variable, and the justification for using this variable, is directly borrowed from the literature on the dividend-paying and dividend-amount decision. One of the most common explanations for why firms pay dividends (and why firms increase dividends), is to signal their future positive and sustainable profitability (e.g., Bhattacharya (1979) and Miller and Rock (1985)). Such firms are the only ones that can send this signal in a separating equilibrium. Therefore, there is a posited positive relation between dividends and profitability -- dividends signal profitability, and large dividends signal large profitability. However, note that this specific signaling explanation is not *directly* relevant to our study. All of our firms are dividend-payers, and we are not regressing dividend *amount* on profitability. But, if dividends are profitability signals, then perhaps managers believe paying dividends four time times per year is a more effective profit-signal than paying dividends once per year. So, we test to see if profitability is positively related to dividend-payout frequency.

In regression tests, we use net income per share as our profitability measure simply because dividends per share come directly from net income per share. We realize net income is a smoothed accounting returns variable. So, we also experiment with other measures of profitability such as operating returns (i.e., EBITDA).

A.5. Free Cash Flow, Market-to-Book, and their Interaction Term

These variables, and the justification for using these variables, are also directly borrowed from the literature on the dividend-paying and dividend-amount decision. Besides the profit-signaling explanation, the other most common explanation for why firms pay dividends and why they sometimes pay large dividends is to moderate the agency cost of free cash flows (e.g., Jensen and Meckling (1976), Rozeff (1982), Easterbrook (1984), and Jensen (1986)). Dividend payouts, especially large ones, restrict managerial discretion. However, note that this agency

explanation is not *directly* relevant to our study. All of our firms are dividend-payers, and we are not regressing dividend *amount* on agency cost proxies. But, if dividends moderate agency costs, then perhaps firms believe paying dividends four times per year is more effective at restricting managerial discretion than paying dividends once per year. So, we test to see if agency cost is positively related to dividend payout frequency.

We need a variable that identifies firms with high agency cost. Specifically, we need a variable that captures firms with high free cash flow *but also* with low growth prospects. Therefore, we create an interaction term between two firm-specific variables. The first variable is net income plus depreciation to identify firms with high free cash flow (e.g., see Lehn and Poulsen (1989) and Lang, Stulz, and Walkling (1991)). We do not subtract dividends from our free cash flow measure as we specifically wish to see how much free cash there is before dividends are paid out. We experiment with different measures of free cash flow (e.g., our measure net of dividends, and also operating returns), but these results are the same as reported results. Because dividends are paid on a per share basis, our free cash flow measure is also on a per share basis.

The second variable is a dummy variable equal to one if the firm has a below median market-to-book ratio of assets for that year, otherwise this dummy is equal to zero. Our market-to-book ratio is simply book assets minus book equity plus market equity all divided by book assets, as in Fama and French (2001) and Baker and Wurgler (2004a).[1] A low market-to-book ratio is the best indicator of a firm with low investment opportunities (e.g., see Adam and Goyal (2006); they use a real options approach to conduct a horse race among different proxies of investment opportunities)). The interaction term between our free cash flow variable and the low market-to-book dummy represents our agency cost measure. Using this interaction term to

identify firms with high agency costs is not our innovation. A similar interaction is used in Opler and Titman (1993) and Lang, et al. (1991) to identify firms with high agency costs. The agency cost explanation predicts a positive relation between our interaction term and dividend payout frequency.

A few readers of an earlier version of our paper felt the agency cost explanation was quite viable, and that we did not do enough to test it. Therefore, in response to this constructive criticism, we obtain ownership structure data to bolster our agency costs tests. We discuss that ownership data, those tests, and those results, when we discuss our findings on the interaction term.

B. Regression Results

Our regression model is as follows. Dividend payout frequency is the dependent variable. It takes the value of 0, 1, or 2, depending on whether the firm pays dividends annually, semiannually, or quarterly, respectively. Because the dependent variable is discrete, we use an ordered logit model. We have already introduced our independent variables. In our regression models, the dependent variable and all independent variables are contemporaneous by-year. We could have lagged independent variables by one year, but those results are the same as what is presented, which is not surprising as our variables are positively serially correlated from year to year. This brings up the next point. Because we are using panel data, we follow the advice of Petersen (2007) and include year dummies in the regression model and we cluster the standard errors by firm. These procedures best ensure unbiased standard errors and correctly sized confidence intervals.

Table III shows regression results. We report results for the entire study period, 1976-2006, and also for subperiods. Note that our set of independent variables include three different

measures of what are essentially accounting returns: annual dividends per share, free cash flow per share, and net income per share. A correlation analysis (not reported) confirms that these three measures are positively highly correlated ($\rho>0.40$ for all three pairwise correlations). Therefore, we are unable to combine these three independent variables in the same regression model. A correlation analysis of our other independent variables and a variance inflation factor test suggest no other potential multicollinearity problems.

[Insert Table III Here]

From Table III, we see that standard deviation of quarterly net income is not related to dividend-payout frequency. We expected a negative relation. We recognize that reported net income is a smoothed accounting returns variable, so we make a substitution and use the standard deviation of quarterly cash flows from operations (i.e., stdev of quarterly EBITDA/EBITDA) as a quarterly earnings volatility measure. However, the results stay the same -- there is no statistically significant relation between quarterly earnings volatility and dividend payout frequency. That is, seasonal firms are not paying dividends less frequently per year. Because quarterly cash flows from operations data are missing for 23 percent of our firm-year sample, we choose to report results using quarterly net income volatility.

We see that larger firms and firms that pay larger annual dividends per share pay dividends more frequently per year. Therefore, it appears that small firms with small dividends do not wish to process four tiny payouts per year. Results from subperiod samples suggest that until recently, mature firms (those with higher sales to total assets) pay dividends more frequently per year. The statistically significant positive signs on firm size and the sales ratio, and the statistically insignificant sign on the fixed assets ratio, are unexpected. We thought firms

with low information asymmetry (i.e., big, mature firms with tangible assets) would pay dividends *less* frequently.

Until recently, firms with high net income per share also pay dividends more frequently per year. Net income is a smoothed accounting return measure, so we also test operating returns (i.e., EBITDA) instead of net income, but the results are nearly identical -- profitability is positively related to dividend payout-frequency. Do firms pay dividends on a quarterly basis to signal their high profitability? The profitability results are consistent with this interpretation, but at this point we realize it would be premature to make that conclusion. The overall results so far merely seem to suggest that those firms that *can* pay dividends frequently (i.e., large, profitable firms with large dividends per share) opt to do so.

Firms with high free cash flows and firms with low market-to-books pay dividends more frequently per year. These results suggest that firms with high agency costs pay dividends more frequently. However, the interaction term between free cash flow and the low market-to-book dummy has a negative sign. That is, firms with *both* high free cash flows and low market-to-books pay dividends less frequently per year. Therefore, the evidence that frequent dividends are moderators of agency costs is weak.

A few readers of an earlier version of our paper felt the agency cost explanation was quite viable, and that we did not enough to test it. Therefore, in response to this constructive criticism, we obtain inside ownership data from Institutional Shareholders Services (ISS). Firms with low inside ownership are posited to have high agency costs, as the interests of managers and shareholders are not aligned (Jensen and Meckling (1976)). However, at certain high levels of inside ownership, inside-owners become entrenched and are free from outside-shareholer discipline (Morck, Shleifler, and Vishy (1988) and McConnel and Servaes (1990)). Therefore,

ISS codes their inside-ownership variable with the following indicator variables: an indicator if the aggregate ownership of officers and directors is below 1% or greater than 30% (these are firms posited to have high agency costs), an indicator if the aggregate inside ownership is between 1% and 5%, and an indicator if inside ownership is between 5% and 30% (these are firms posited to have low agency costs). The ISS ownership data are available beginning with 2001.

We create two ownership dummy variables. The first dummy equals 1 if inside-ownership is less than 1% or greater than 30%, and zero otherwise. The second dummy equals 1 if inside-ownership is less than 5% and greater than 30%, and zero otherwise. The dummy variables are indicative of firms with high agency costs. These dummies are alternatively included in Table III's regression models. Because the ownership data begin at 2001, there are only 4,025 firm-year observations in these regression tests. An agency cost explanation predicts a positive relation between the ownership dummy variables and dividend payout frequency. Overall, from these regression results, we find that both dummies are *negatively* related to payout frequency (the relation is only statistically significant for the first dummy). Again, firms with high agency costs are not the ones paying dividends on a quarterly basis. Because these ownership results merely confirm the findings of our agency cost test using the interaction term, we do not tabulate these results separately, but they are available from us upon request.

We conduct yet another agency cost test. We include the log of the firms' total number of shareholders as an independent variable in Table III's regression models. Firms with more shareholders are posited to have greater ownership dispersion, and thus greater agency costs (Rozeff (1982)). An agency cost explanation predicts a positive relation between this shareholder variable and dividend payout frequency. However, the actual sign on the

shareholder variable is negative, and statistically significant in most models.[2] Therefore, we feel confident concluding that agency costs do not explain the dividend payout-frequency decision. Again, we choose not to report these additional results as they generally repeat the insights of our agency cost test using the interaction term, but these results are available from us upon request.

Overall, the regression results in Table III raise as many questions as it answers. The results seem to suggest that firms that *can* pay dividends frequently (large, profitable firms with large dividends) choose to do so. However, we do not know why managers think making frequent payouts is beneficial. The positive relation between dividend-payout frequency and net income is consistent with the explanation that frequent dividend-payouts are signals of high profitability. However, two problems with this interpretation are: (1) profit-signaling has direct implications on dividend *amount*, not on dividend frequency, and, (2) how are so many firms able to send this supposed profit-signal? Given that most dividend-payers pay dividends on a quarterly basis, maybe managers believe this is what shareholders want. We test this next.

III. Catering Tests

It is possible firms are catering to their shareholders' desire for frequent dividend payments. Why would shareholders want dividends to be paid quarterly instead of annually? We do not attempt to offer an explanation. But it appears that managers often rationally cater to what shareholders want in an effort to maximize share price. For example, Baker and Wurgler (2004a,b) argue and show that firms will initiate dividend payouts when the market puts a valuation premium on dividend-payout firms. Li and Lie (2006) extend the argument and show that firms will increase their dividend amounts under those same market preferences. Because firms appear to adopt dividend policies that cater to shareholder desires, we also consider catering to be a viable explanation for why firms pay dividends quarterly and not less frequently.

To test the catering hypothesis, we use approaches very similar to Baker and Wurgler (2004a) and Li and Lie (2006). They focus on dividend-payers versus nonpayers, and also on dividend amounts. Our focus is on quarterly payers versus nonquarterly payers. Therefore, for our sample, for each year, dividend-paying firms are categorized into quarterly dividend-payers or nonquarterly dividend-payers. For each category of firms, by year, we calculate its mean equally-weighted market-to-book ratio and its mean value-weighted market-to-book ratio. Then, for each year, we calculate the mean valuation premium for being a quarterly dividend-payer as opposed to being a nonquarterly dividend-payer by taking the log of the ratio of their respective mean market-to-books. When quarterly payers have larger market-to-books than nonquarterly payers, we assume the market values quarterly payers more than nonquarterly payers. Table IV reports these results.

[Insert Table IV Here]

From Table IV, we see that the valuation premium (i.e., *Quarterly Premium*) for being a quarterly dividend-payer is sometimes positive and sometimes negative throughout our sample period. During almost all of the 1980s, quarterly payers trade a discount. However, from 1989 to 1998, we see positive equally-weighted *Quarterly Premium* values and negative value-weighted *Quarterly Premium* values, which suggest that quarterly-paying *large* firms are trading at a discount while other quarterly-payers are trading at a premium. In recent years, quarterly payers in general appear to be trading at a discount. We recognize one potential problem with the quarterly premium variable is that it may also reflect the relative investment opportunities of quarterly payers and nonquarterly payers. Baker and Wurgler (2004a) importantly recognize this issue as well when they compare the market-to-books of dividend payers and nonpayers.

However, they convincingly show that time-varying relative investment opportunities do not affect their catering test, a test that is very similar to ours.

A catering hypothesis suggests that when *Quarterly Premium* is positive, or more positive than in other years, firms will increase their dividend-payout frequency to cater to shareholder preferences for frequent dividends. To capture the extent to which firms increase their payout frequency, we create a variable called *Frequency-Increasers*, which is the total number of dividend-payers that increase their dividend frequency in year *t*, divided by the total number of nonquarterly dividend payers in year *t-1* (alternatively, we could also create a variable called *Quarterly-Initiators* that represents firms that go from being nonquarterly dividend-payers to quarterly dividend-payers, but those results are virtually the same as what is reported for *Frequency-Increasers* (the correlation coefficient between *Frequency-Increasers* and *Quarterly-Initiators* is 0.99)). We also create another by-year variable called *AvgCAR* which is the average CAR(-1,1) of firms that announce an *increase* in dividend-payout frequency during a particular year. If there are no such firms in a given year, then *AvgCAR* is set to zero (this only occurs two times). What is CAR(-1,1)? It is the cumulative three-day abnormal return surrounding dividend frequency-change announcements, where day -1 and day 1 are the days before and after the announcement day 0, respectively (we discuss the estimation of our CAR(-1,1) measure in more detail in section II.C). We run the following regression model:

$$Frequency\text{-}Increasers_t = a + b_1(Quarterly\ Premium_{t-1}) + b_2(AvgCAR_{t-1}) + e_t, \quad (1)$$

where all variables are previously defined, b_1 and b_2 are parameter coefficients on the independent variables, a is the intercept, and e is the error term.

A catering hypothesis predicts positive b_1 and b_2 coefficients. That is, if nonquarterly-paying managers recognize that investors value quarterly dividend-paying firms relatively more

than nonquarterly dividend-paying firms, then these managers will increase their payout frequency to cater to investor preferences, i.e., b_1 should be positive. If nonquarterly-paying managers see that other firms that increased their dividend frequency enjoy relatively high valuation increases upon the frequency-change announcement, then these managers will also increase their payout frequency to also enhance their own shareholders' wealth, i.e., b_2 should be positive.

Table V, Panel A, reports regression tests of the catering hypothesis. Statistical significance is based on heteroscedastic-consistent standard errors. From models (1) – (4) of this table, we see no evidence that firms change from paying dividends less frequently to more frequently because shareholders prefer it (i.e., none of the parameter coefficients are statistically significant). The dependent variable is essentially an equally-weighted measure, and so one may focus on the equally-weighted *Quarterly Premium* independent variable, but as pointed out by Baker and Wurgler (2004a), a value-weighted premium emphasizes larger firms and is thus likely to be more "visible" to potential manager-caterers. However, from the results we see that it does not matter which premium independent variable we focus on, as both are statistically insignificant. That is, firms do not appear to be catering to time-varying shareholder demand for frequent dividends. Note also that the adjusted R-squares are negative for these models.

[Insert Table V Here]

We recognize that there may be a direct relation between a firm's market-to-book and its dividend policy. Baker and Wurgler (2004a) recognize this issue as well. For our catering test, this concern appears especially valid based on findings in Table III, where we find low market-to-book firms pay dividends quarterly. Controlling for this relation is straightforward. We include the lagged average market-to-books of nonquarterly payers (these are the firms in

question) in regression models. These results are reported in models (5) and (6) of Table V. From these regression results, we see a somewhat unexpected finding in model (5): the mean value-weighted *Quarterly Premium* variable is negatively related to the *Frequency-Increasers* dependent variable. A catering explanation, however, predicts a positive relation between these two variables. Model (6) shows no significant relation between *Quarterly Premium* and *Frequency-Increasers*, consistent with models (1) – (4). These latter results mean that, after controlling for a potential relation between market-to-book and dividend payout-frequency, whatever residual propensity there is to *increase* payout-frequency is still *not* captured by shareholder preferences for frequent dividends.

We try one more test of a catering explanation. We follow Li and Lie (2006) and test to see if $AvgCAR_t$ is correlated to *Quarterly* $Premium_t$. Here, the two variables are contemporaneous at year *t*. Following the logic of Li and Lie (2006), if a catering hypothesis is correct, then during years when *Quarterly Premium* is relatively high, firms that announce an increase in dividend payout-frequency should experience higher abnormal announcement returns than in other years, i.e., there should be a positive correlation between $AvgCAR_t$ and *Quarterly* $Premium_t$. These correlations are reported in Panel B of Table V. From this panel, we again see no evidence consistent with catering. In fact, we even see a statistically significant negative correlation.

A. Brief Discussion of Catering Results

Readers may doubt that managers would *ever* respond and react so quickly to time-varying shareholder demand for frequent dividend-payouts. However, Baker and Wurgler (2004a) show that managers will actually *initiate* dividend payouts when the market *recently* puts a high valuation premium on dividend-paying firms. In fact, in their paper, the relation

between annual dividend initiation rates and annual shareholder valuation premiums for dividend-payers is not only strongly positive, their simple regression model yields adjusted R-square values of around 60 percent.

As pointed out by Baker and Wurgler (2004a), other papers that similarly show that managers rationally respond to mispricing include Baker and Wurgler (2000) and Baker, Greenwood, and Wurgler (2003) for security issuance, Baker and Wurgler (2002) for capital structure, Shleifer and Vishny (2003) for mergers, and Morck, Shleifer, and Vishny (1990), Stein (1996), Baker, Stein, and Wurgler (2003), and Polk and Sapienza (2008) for corporate investment. Graham and Harvey (2001) and Jenter (2005) also show that managers, in general, react to mispricing.

If arbitrage cannot eliminate these kinds of (possibly irrational or uniformed) mispricing, or valuation differences between sets of firms, and if managers are so rational as to react quickly to aggregate market demand (and in such dramatic fashion as to go from being a nondividend-paying firm to becoming a dividend-paying firm), then we could certainly expect rational managers to increase their dividend payout-frequency if there is a recent and significant shareholder preference for frequent dividends. At the least, if rational managers have been thinking (either passively or actively) about increasing payout-frequency, it is reasonable to assume that they would wait until market consensus is favorable towards frequent payouts. However, we do not find this to be the case. That is, it does not appear that managers pay dividends on a quarterly basis because they are catering to shareholders.

IV. Event Study Tests

Because our empirical analyses thus far have uncovered little about the determinants of the dividend payout-frequency, we conduct an event study to see how the market reacts to

dividend frequency-change announcements. Specifically, we attempt to identify any abnormal returns surrounding dividend frequency-change announcements.

We search Factiva, Lexis/Nexus, and Proquest databases for announcement dates and we are able to find 169 dividend frequency-change announcements. There are 135 occurrences where firms announce an increase in their dividend-payout frequency (alternatively, we could also identify firms that specifically announce becoming *quarterly* dividend payers (there are 118 such firms), but results for those specific announcements are the same as what we report for dividend frequency-increase announcements). There are only 34 occurrences where firms announce a decrease in their dividend-payout frequency. For each announcement, we calculate daily abnormal returns (ARs) using a standard event-study methodology. We obtain market model estimates by using 250 trading days of returns data, beginning 271 days before and ending 21 days before the announcement. Our benchmark market return is the CRSP equally-weighted market return (using CRSP value-weighted market returns yield similar results). The ARs for days -1, 0, and 1 (where day 0 is the announcement day) are accumulated to obtain a cumulative three-day abnormal return (i.e., CAR(-1,1)) surrounding the announcement date. Of course, we could also report returns using longer event windows surrounding the announcement day, but those results are similar to what is presented here, so we do not tabulate them. Table VI, Panel A, shows our initial CAR(-1,1) results.

[Insert Table VI Here]

From Table VI, Panel A, we see that the mean abnormal return surrounding dividend frequency-increase announcement days is a statistically significant and positive 2.18 percent. The median abnormal return is also significantly positive. It appears the market likes frequent dividend payouts. However, the abnormal return surrounding dividend frequency-decrease

announcement days is not statistically significant. We do not dwell on this latter finding, as the sample size is small.

Among the 135 dividend frequency-increase announcements, there are 86 times when the firm also simultaneously announces a dividend *amount* increase. So, we do not know if the positive abnormal announcement return is due to the dividend payout-frequency increase or due to the dividend amount increase.[3] Therefore, we separate our sample into (1) firms that simultaneously announce a dividend amount increase, (2) firms that make no simultaneous announcement about a dividend amount change, and (3) firms that simultaneously announce a dividend amount decrease. Panel B of Table VI reports CAR(-1,1)s for these subsamples. From this panel, we see that firms that announce a dividend-frequency increase and do *not* simultaneously announce a change in their dividend amounts still experience a statistically significant positive 2.52 percent abnormal return. So, for these firms at least, it is clear that the market reacts positively to dividend frequency-increase announcements. Note also that for firms that announce a dividend-frequency *decrease* and do *not* announce any change in their dividend amounts experience a statistically significant *negative* 1.23 percent abnormal return. This latter finding again suggests that the market likes frequent dividend payouts per year. But due to the small sample size, we do not focus on this latter finding too much.

It is well known that many firms increase dividends at a fairly constant rate (e.g., this stylized fact goes back to at least Gordon (1959)). Therefore, some dividend amount-increase announcements may not be a surprise to the market. It is difficult to identify the portion of the announced dividend amount that is unexpected. Over the long run, dividends might grow at a constant rate, but over the short run they more often grow by a constant *amount*, i.e., dividend

growth is rather sticky. Therefore, we calculate expected annual dividend, $E[dividend_t]$, for year *t* simply as follows:

$$E[dividend_t] = dividend_{t-1} + (dividend_{t-1} - dividend_{t-2}), \quad (2)$$

where $dividend_{t-n}$ is the annual dividend from *n*-year before the year of the announcement day. So, if the annual dividend at year *t-1* is 30 cents and the annual dividend at year *t-2* is 27 cents, then the expected dividend for year *t* is 33 cents (=0.30+(0.30-0.27)). For some firms, the dividend at *t-2* is zero. Applying equation (2) to these firms assumes dividends are expected to double from year *t-1* to *t*, therefore, for those firms we impute an expected dividend by looking at those firms' subsequent dividends to determine what the expected dividend for time *t* may have been at time *t-1*. A distinct steady trend always emerges, but we admit this is subjective. Using these $E[dividend_t]$ numbers, we identify the unexpected dividend change (*UDC*), in percent, to be as follows:

$$UDC = (announced\ dividend\ amount - E[dividend_t])/\ E[dividend_t]. \quad (3)$$

So, if our hypothetical firm announces a 35 cent dividend, then its unexpected dividend change in percent is 6.06% (=(0.35-0.33)/0.33).

Panel C of Table VI shows CAR(-1,1)s for categories based on whether any announced dividend amount is larger or smaller than expected (i.e., when $UDC \neq 0$). Overall, these findings corroborate findings in Panel B. We experiment with other ways of identifying unexpected dividend changes (e.g., see Firth (1996) for different ways of doing it), but the results always turn out similar to what is reported in Panels B and C.

However, our discussion so far only focuses on the sample of "clean" dividend frequency-increase announcements. We have not said anything about the 86 announcements where dividend-frequency and dividend-amount increases are simultaneously announced. For

this particular sample, the question is "which announcement is primarily responsible for the positive announcement returns?" Are those positive returns entirely due to the announcement of a dividend *amount* increase? The answer is "probably not," given that firms that *only* announce a dividend *frequency*-increase experience such economically large announcement returns. Perhaps the best way to ensure that dividend *amount*-increase announcements are not entirely responsible for the positive announcement returns is to run a regression on these 86 announcements using CAR(-1,1) as a dependent variable and *UDC* as an independent variable. If the market is primarily reacting to the dividend amount announcement, then the parameter coefficient on *UDC* should be significantly positive. We run the regression and we get the following results:

$$\text{CAR}(-1,1) = 0.024^{***} - 0.001\ (UDC).$$

The intercept is positive and statistically significant, while the parameter coefficient on *UDC* is not positive and not statistically significant. The market's reaction does not appear to be correlated to the announced dividend amount. Therefore, the positive announcement returns for these 86 announcements must be due to the dividend *frequency*-increase announcement.

A. Regressing CARs on Firm-Specific Variables

We conduct additional regression tests on CARs to see if firm-specific factors are related to abnormal announcement returns. Some might view these tests to be more reliable and more revealing than our earlier ordered logit regression tests. For the sample of firms that announce increases in dividend payout-frequency, we regress their CAR(-1,1)s on the same firm-specific variables as in our logit model. The firm-specific variables are lagged by one year. Results are reported in Table VII.

[Insert Table VII Here]

From Table VII, we see that only one independent variable, the low market-to-book dummy, is related to abnormal announcement returns. However, when we investigate the robustness of this finding, we find that a continuous market-to-book ratio is not related to announcement returns. Because our firm-specific variables (whose initial considerations were based on hypotheses related to information signaling and agency costs) do not seem related to announcement returns, it again suggests that information-signaling and agency costs do not play significant roles in the dividend frequency-payout decision. These regression results stay intact even when we include a dummy variable indicating when firms simultaneously announce a dividend amount increase (not reported).

B. So What Do the Abnormal Announcement Returns Reveal?

Positive abnormal announcement returns surrounding dividend frequency-increase announcements suggest the market likes frequent dividend payouts. *However*, our earlier catering tests do *not* reveal a positive relation between dividend payout frequency and shareholder preferences for frequent dividends. So, the positive abnormal returns that we document here cannot be because the market likes frequent dividends, in and of itself. However, the positive announcements returns do suggest that dividend frequency-increase announcements convey some sort of good news to the markets. Given our earlier regression findings that firms that pay *large* annual dividend amounts per share pay dividends on a quarterly basis, we conjecture the following: for these dividend frequency-increasing firms, perhaps the market anticipates an abnormal increase in their annual dividends in the near future. We test this conjecture. We conduct a simple before-and-after test to see if dividends do abnormally increase after firms announce an increase in dividend-payout frequency.

V. Before-and-After Analysis

For each of our independent variables, we compare year -1 to year 0, year 0 to year +1, and year +1 to year +2, where year 0 is the year the firm announces a change in dividend-payout frequency. We focus on *changes* from year to year rather than on levels for each year, as test statistics based on changes are more powerful than those based on levels (see Barber and Lyons (1996)). We show both unadjusted changes in firm-specific variables and adjusted changes in firm-specific variables. Adjusted changes are based on a matching procedure. Following Lie (2001) and Grullon and Michaely (2004), we match each of our sample firms to a matching firm from the same industry, then for each of our sample firm's independent variables we identify a firm with a similar level of that firm-specific variable in year -1, a similar change in that firm-specific variable from year -1 to year 0, and a similar market-to-book ratio in year -1. Adjusted change for each sample firm is the sample firm's change net of the matching firm's change. Lie (2001) shows that these benchmark adjustments yield more powerful test statistics than do other benchmark adjustments. We show results for dividend payers that increase their dividend payout-frequency (again, alternatively, we could show results for firms that become *quarterly* dividend payers, but those results are the same as what is reported here). Results are presented in Table VIII.

[Insert Table VIII Here]

From Table VIII, we see that the annual dividend amount significantly increases after firms decide to increase their dividend payout frequency. No other variable shows a strong significant change from year 0 to year +1, or from year +1 to year +2. However, the reader may be skeptical of these dividend findings for two reasons. First, it is possible that our matching sample on annual dividends is of poor quality. Our sample firms experience large increases in annual dividends around the event year, even from year -1 to year 0. Therefore, we did find it

difficult to find matching firms that also experience such large increases in annual dividends from year -1 to 0. Therefore, we alternatively estimate expected dividends as we did in our equation (2), using the change in dividends from year -2 to year -1 as a measure of expected dividend change from year -1 to year 0, from year 0 to year 1, and from year 1 to year 2. We wish to see if actual dividend changes exceed expected dividend changes, and overall we again find strong evidence that they do.

A second reason why a reader may be skeptical of our abnormal dividend-increase findings is that many of our sample firms specifically announce an increase in dividends, thus rendering our documented dividend increases as expected and thus trivial. Therefore, we conduct a simple before-and-after analysis on a subsample of firms that announce an increase in dividend payout frequency and with *no* simultaneous announcement of a dividend amount increase. We find that these firms do experience significant dividend increases, even against a set of matching firms. Just as important, for those firms that do announce dividend amount increases, we compare their actual dividend amount increase to their announced dividend amount increase, and we find that the actual dividend increase exceeds the announced increase. For the sake of space, we do not tabulate these additional results in separate tables.

So, what do the findings of abnormal dividend increases in Table VIII suggest? This finding is consistent with our conjecture that the market reacts positively to a dividend frequency-increase announcement not necessarily because it likes frequent dividends, but because it anticipates a subsequent abnormal increase in dividend amount.

One other result from this before-and-after analysis that is also interesting is that net income per share does *not* increase after firms increase their dividend-payout frequency (other measures of accounting returns also show no changes). In fact, there is even a statistically

significant decline in net income from year 0 to year 1. The before-and-after findings on net income, taken together with our before-and-after findings of abnormal dividend increases and our documented positive announcement returns, suggest investors prefer earnings in the form of dividends. We conduct subperiod investigations of our event study tests and our before-and-after analysis, and we find that our reported findings hold for every subperiod.

Four final comments. First, the lack of findings on net income changes after dividend frequency-increase announcements casts further doubt that frequent payouts are profitability signals, which is a possibility that we entertained based on our ordered logit regression tests.

Second, note that free cash flow and market-to-book does not change after dividend frequency-increase announcements, again suggesting that agency costs do not play a role in the dividend payout-frequency decision.

Third, we also conduct a before-and-after analysis on firms that announce dividend frequency-*decreases*. However, there are no statistically significant changes after the year of the dividend frequency-decrease announcement. Due to the lack of statistical findings, and also due to small sample sizes, we do not tabulate these results for the sake of space.

Finally, note that we could look at firm-specific changes from year -1 to year 0 to potentially help us identify the determinants of dividend payout-frequency *changes*. Based on those firm-specific changes, it appears that as firms become more profitable in net income, and as they enjoy higher market-to-books, they subsequently increase their dividend-payout frequency. The net income result is consistent with our earlier finding that profitable firms pay dividends more frequently. The latter finding on market-to-book is a bit of a mystery. It could be that those firms are low market-to-book firms that are able to increase their market values when they increase their dividend payout-frequency.

VI. Why a Puzzle?

The vast majority of dividend-paying firms, from around the world, do *not* pay dividends on a quarterly basis (despite the fact that many of these firms are required to file quarterly financial statements). U.S. dividend-paying firms are not required to pay dividends on a quarterly basis, but yet most of them do. Why do we consider the decision to pay dividends on a quarterly basis a puzzle?

From the investor perspective, investors should be indifferent between a 20 cent annual dividend and a 5 cent quarterly dividend. Reinvesting quarterly dividends to take advantage of compounding is not an issue, as investors could position themselves to receive the 20 cent annual dividend up front. The time intervals between ex dividend dates and dividend payout dates are similar between quarterly payers and nonquarterly payers, which are one to three weeks. If investors have some psychological or uninformed preference for frequent dividends, then they could alternatively invest in nonquarterly-paying firms that pay dividends at different times during the year. Note also that because dividends are fixed income, those investors who invest in dividend-paying firms are likely to be the same investors who invest in bonds. Bonds usually pay coupons only on a semiannual basis. If there is a preference for frequent cash payouts, then why do bond investors tolerate the infrequent seminannual coupon payouts?

From the firm perspective, we would think that firms would prefer committing to infrequent payouts. This way, firms only need to make sure that they accrue and have enough cash to cover only one payout instead of four. This afforded flexibility would be especially valuable for seasonal firms. For firms that do not have the problem of seasonal cash inflows, their having to accumulate cash for one time annual dividend payments should not be an issue, as accrued cash represents valuable financial slack. Also, any costs to holding cash can potentially

be offset by reinvesting it (theoretically at the same rate investors would). And, not having to process four dividend payments per year potentially leads to a significant savings in processing costs. When McDonalds announced they would go from paying dividends quarterly to annually, they specifically cited savings in processing costs.[1] When former Baxter CEO and Chairman, Harry Kraemer, announced that his firm was switching from paying quarterly dividends to making annual payouts, he stated that he would be "very surprised if a majority of companies did not move to an annual dividend within four or five years."[2] His statement was made during the year 2000; his prediction, for whatever reason, has not come to come true.

Our paper tests a variety of plausible explanations, based on information signaling and agency costs, for why firms pay dividends on a quarterly basis. These explanations fail to solve the puzzle, thus the puzzle remains.

VII. Conclusion

Not all dividend-paying firms pay dividends on a quarterly basis. Some firms pay dividends seminannually or annually. In our paper, we try to identify the determinants of dividend-payout frequency. We regress dividend-payout frequency on a variety of plausible independent variables. We find that larger firms, firms that pay more annual dividends per share, profitable firms, and firms with low market-to-books, pay dividends more frequently, i.e., on a quarterly basis. Based on these results, it appears that those firms that *can* pay dividends on a quarterly basis (i.e., large, profitable firms with large dividends) opt to do so, but we do not know why they do so. Explanations related to (1) signaling under information asymmetry or (2) agency costs, do not pan out. The decision to pay dividends on a quarterly basis is a puzzle, as

[1] *New York Times*, Business Section, November 18, 1999.
[2] *BusinessWeek*, June 19, 2000.

paying dividends less frequently (e.g., annually) would increase firms' flexibility and reduce processing costs.

We test whether firms pay dividends quarterly because this is what shareholders want (i.e., managers are catering to their shareholders' desires), but results from these tests do not support this conjecture. We then conduct an event study to see how the market reacts to dividend frequency-change announcements. When a firm announces an increase in its dividend-payout frequency, we find positive abnormal announcement returns. This finding of a positive market response is at odds with our catering tests. Further analysis reveals that dividend frequency-increase announcements are followed by abnormal increases in dividend payout amounts. One other interesting finding: we do *not* find abnormal increases in net income following dividend frequency-increase announcements. These two findings taken together suggest that dividend frequency-increase announcements signal an increase in future dividends, but not an increase in earnings. Therefore, the positive market reaction implies investors prefer earnings in the form of dividends. Our paper highlights another dividend puzzle: why do firms pay dividends on a quarterly basis? Our paper also reveals that dividend frequency-change announcements have information content on future dividends.

References

Adam, Tim, and Vidhan K. Goyal, 2006, The investment opportunity set and its proxy variables: theory and evidence, MIT working paper.

Baker, Malcolm, Robin Greenwood, and Jeffrey Wurgler, 2003, The maturity of debt issues and predictable variation in bond returns, *Journal of Financial Economics* 70, 261-291.

Baker, Malcolm, Robin Greenwood, and Jeffrey Wurgler, 2008, Catering through nominal share price, NBER working paper #13762.

Baker, Malcolm, Jeremy Stein, and Jeffrey Wurgler, 2003, When does the market matter? Stock prices and the investment of equity-dependent firms, *Quarterly Journal of Economics* 118, 969-1006.

Baker, Malcolm, and Jeffrey Wurgler, 2000, The equity share in new issues and aggregate stock returns, *Journal of Finance* 55, 2219-2257.

Baker, Malcolm, and Jeffrey Wurgler, 2002, Market timing and capital structure, *Journal of Finance* 57, 1-32.

Baker, Malcolm, and Jeffrey Wurgler, 2004a, A catering theory of dividends, *Journal of Finance* 59, 1125-1165.

Baker, Malcolm, and Jeffrey Wurgler, 2004b, Appearing and disappearing dividends: the link to catering incentives, *Journal of Financial Economics* 73, 271-288.

Barber, Brad M., and John D. Lyon, 1996, Detecting abnormal operating performance: the empirical power and specification of test statistics, *Journal of Financial Economics* 41, 359-400.

Benartzi, Shlomo, Roni Michaely, Richard H. Thaler, and William C. Weld, 2007, The nominal price puzzle, UCLA working paper.

Bhattacharya, Sudipto, 1979, Imperfect information, dividend policy and the "bird in the hand" fallacy, *Bell Journal of Economics* 10, 259–270.

Black, Fischer, 1996, The dividend puzzle, *Journal of Portfolio Management* 2, 5-8.

Easterbrook, Frank H., 1984, Two agency-cost explanations of dividends, *American Economic Review* 74, 650-659.

Fama, Eugene F., and Kennneth R. French, 2001, Disappearing dividends: changing firm characteristics or lower propensity to pay?, *Journal of Financial Economics* 60, 3–43.

Ferris, Stephen P., Gregory Noronha, and Emre Unlu, 2006, The more, the merrier: an international analysis of the frequency of dividend payment, University of Missouri working paper.

Firth, Michael, 1996, Dividend changes, abnormal returns, and intra-industry firm valuations, *Journal of Financial and Quantitative Analysis* 31, 189-211

Goel, Anand, and Anjan V. Thakor, 2003, Why do firms smooth earnings?, *Journal of Business* 76, 151-192.

Gordon, Myron J., 1959, Dividends, earnings, and stock prices, *Review of Economics and Statistics* 41, 99-105.

Gordon, Myron J., 1962, The savings, investment and valuation of a corporation, *Review of Economics and Statistics* 44, pp. 37–51.

Graham, John R., and Campbell R. Harvey, 2001, The theory and practice of corporate finance: Evidence from the field, *Journal of Financial Economics* 60, 187-244.

Grullon, Gustavo, and Roni Michaely, 2004, The information content of share repurchase programs, Journal of Finance 59, 651-680.

Jensen, Michael C., 1986, Agency costs of free cash flow, corporate finance, and takeovers, *American Economic Review* 76, 323-329.

Jensen, Michael, C., and William H. Meckling, 1976, Theory of the firm: managerial behavior, agency costs, and ownership structure, *Journal of Financial Economics* 3, 305-360.

Jenter, Dirk, 2005, Market timing and managerial portfolio decisions, *Journal of Finance* 60, 1903-1949.

Lamoureux, Christopher G., and Percy Poon, 1987, The market reaction to stock splits, *Journal of Finance* 42, 1347-1370.

Lang, Larry H.P., René M. Stulz, and Ralph A. Walkling, 1991, A test of the free cash flow hypothesis: the case of bidder returns, *Journal of Financial Economics* 29, 315-335.

Lehn, Kenneth, and Annette Poulsen, 1989, Free cash flow and stockholder gains in going private transactions, *Journal of Finance* 44, 771-787.

Lewellen, Katharina, 2006, Risk, reputation, and IPO price support, *Journal of Finance* 61, 613-653.

Li, Wei, and Erik Lie, 2006, Dividend changes and catering incentives, *Journal of Financial Economics* 80, 293-308.

Lie, Erik, 2001, Detecting abnormal operating returns: revisited, *Financial Management* 30, 77-91.

McConnell, John J., and Henri Servaes, 1990, Additional evidence on equity ownership and corporate value, *Journal of Financial Economics* 27, 595-612.

Miller, Merton H., and Kevin Rock, 1985, Dividend policy under asymmetric information, *Journal of Finance* 40, 1031-1047.

Morck, Randall, Andrei Shleifer, and Robert R. Vishny, 1988, Management ownership and market valuation: An empirical analysis, *Journal of Financial Economics* 20, 293-315.

Morck, Randall, Andrei Shleifer, and Robert Vishny, 1990, The stock market and investment: Is the market a sideshow?, *Brookings Papers on Economic Activity* 2, 157-215.

Myers, Stewart C., Nicholas S. Majluf, 1984, Corporate financing decisions when firms have information that investors do not have, *Journal of Financial Economics* 13, 187-221.

Opler, Tim, and Sheridan Titman, 1993, The determinants of leveraged buyout activity: free cash flow vs. financial distress costs, *Journal of Finance* 48, 1985-1999.

Petersen, Mitchell A., 2007, Estimating standard errors in finance panel data sets: comparing approaches, *Review of Financial Studies*, forthcoming.

Polk, Christopher, and Paola Sapienza, 2008, The stock market and corporate investment: A test of catering theory, *Review of Financial Studies*, forthcoming.

Rozeff, Michael S., 1982, Growth, beta and agency costs as determinants of dividend payout ratios, *Journal of Financial Research* 5, 249-259.

Shefrin, Hersh M., and Meir Statman, 1984, Explaining investors preference for dividends, *Journal of Financial Economics* 13, 253-282.

Shleifer, Andrei, and Robert W. Vishy, 2003, Stock market driven acquisitions, *Journal of Financial Economics* 70, 295-312.

Stein, Jeremy C., 1996, Rational capital budgeting in an irrational world, *Journal of Business* 69, 429-455.

Endnotes

[1] Market equity is end of calendar year stock price times shares outstanding. Book equity is stockholder's equity minus preferred stock liquidating value plus balance sheet deferred taxes and investment tax credit and minus post retirement assets.

[2] One possible interpretation of this negative relation is that firms with more shareholders would bear larger costs to processing so many dividend payments to so many shareholders, and thus pay dividends less frequently.

[3] At this point, a thought will occur to the reader: Does this mean there is a problem with the AvgCAR variable in our earlier catering tests? The answer is "no," and it will soon be revealed why. In addition, we recheck those catering results while eliminating these 86 announcements and the results are the same as what is reported.

[4] For each sample firm, we identify all matching firms with the same 2-digit SIC code, then for each of our sample firm's independent variables, we identify matching firms that come within 20 percent of the independent variable level, within 20 percent of the independent variable's past change, and within 20 percent of the market-to-book ratio. If no firm fits all three criteria, then we use a 1-digit SIC code for matching. If still no firm fits all three criteria we then relax the 20 percent rule as conservatively as possible. We then sum the absolute differences of these three criteria and the matching firm we choose is the one with the minimum summed absolute difference (see Grullon and Michaely (2004, page 661).

Table I
Sample Sizes by Year

This table reports the number of quarterly, semiannual, and annual dividend-paying firms that are listed on the NYSE, AMEX, or Nasdaq, for each year from 1976 to 2006. Percentages represent the percent of those firms for that year.

Year	Quarterly Payers	Semiannual Payers	Annual Payers
1976	881 (93.92%)	38 (4.05%)	19 (2.03%)
1977	1,195 (94.09%)	53 (4.17%)	22 (1.73%)
1978	1,255 (94.57%)	48 (3.62%)	24 (1.81%)
1979	1,239 (94.65%)	46 (3.51%)	24 (1.83%)
1980	1,171 (94.74%)	40 (3.24%)	25 (2.02%)
1981	982 (93.79%)	38 (3.63%)	27 (2.58%)
1982	1,229 (92.34%)	59 (4.43%)	43 (3.23%)
1983	1,262 (91.25%)	64 (4.63%)	57 (4.12%)
1984	1,212 (91.20%)	65 (4.89%)	52 (3.91%)
1985	1,145 (91.45%)	58 (4.63%)	49 (3.91%)
1986	1,026 (90.88%)	58 (5.14%)	45 (3.99%)
1987	951 (91.00%)	55 (5.26%)	39 (3.73%)
1988	936 (91.59%)	45 (4.40%)	41 (4.01%)
1989	938 (91.69%)	44 (4.30%)	41 (4.01%)
1990	926 (91.77%)	40 (3.96%)	43 (4.26%)
1991	910 (91.55%)	40 (4.02%)	44 (4.43%)
1992	921 (92.01%)	35 (3.50%)	45 (4.50%)
1993	944 (92.55%)	34 (3.33%)	42 (4.12%)
1994	968 (92.37%)	38 (3.63%)	42 (4.01%)
1995	946 (92.56%)	34 (3.33%)	42 (4.11%)
1996	955 (92.54%)	32 (3.10%)	45 (4.36%)
1997	928 (91.97%)	38 (3.77%)	43 (4.26%)
1998	887 (92.88%)	34 (3.56%)	34 (3.56%)
1999	794 (92.33%)	31 (3.60%)	35 (4.07%)
2000	728 (91.92%)	26 (3.28%)	38 (4.80%)
2001	652 (92.22%)	23 (3.25%)	32 (4.53%)
2002	630 (91.30%)	22 (3.19%)	38 (5.51%)
2003	637 (91.26%)	25 (3.58%)	36 (5.16%)
2004	725 (91.08%)	28 (3.52%)	43 (5.40%)
2005	764 (91.61%)	27 (3.24%)	43 (5.16%)
2006	715 (92.62%)	23 (2.98%)	34 (4.40%)

Table II
Summary Statistics

This table shows summary statistics of variables used in our study. The sample consists of dividend-paying firms listed on the NYSE, AMEX, or Nasdaq during the period 1976-2006. The firms are categorized by whether they pay dividends quarterly (Q), semiannually (S), or annually (A). (Stdev of quarterly NI)/NI is the standard deviation of year t's quarterly net income divided by year t's annual net income, Total Assets is the book value of total assets in millions, Sales/TA is simply annual sales divided by the book value of total assets, FA/TA is the book value of fixed assets to the book value of total assets, Annual dividend per share is the sum of all dividends paid during the year per share, NI per share is simply annual net income per share, FCF per share is the per share sum of annual net income plus depreciation, and the M-to-B ratio of assets is the ratio of book assets minus book equity plus market equity all divided by book assets. Means and medians for each variable are reported. We also report mean and median differences between quarterly (Q) payers and semiannual (S) payers, between quarterly (Q) payers and annual (A) payers, and between semiannual (S) payers and annual (A) payers. Statistical significance for mean differences are based on a t-statistic and statistical significance for median differences are based on a Wilcoxon z-score. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Full sample (1976-2006) results are presented, as well as subperiod results, 1976-1986, 1987-1996, and 1997-2006.

[Results are reported on the subsequent page]

Table 2, continued

Whole period	Quarterly (Q) Payers		Semiannual (S) Payers		Annual (A) Payers		Difference of Means Tests			Difference of Medians Tests		
	Mean	Median	Mean	Median	Mean	Median	Q - S	Q - A	S - A	Q - S	Q - A	S - A
(Stdev of quarterly NI)/NI	0.414	0.097	0.640	0.112	0.466	0.131	-0.226*	-0.052	0.174	-0.015***	-0.034***	-0.019***
Total assets	3269.61	433.12	498.56	75.52	1063.96	61.59	2771.05***	2205.65***	-565.40***	357.6***	371.53***	13.93***
Sales/TA	1.470	1.315	1.433	1.315	1.435	1.239	0.037	0.035	-0.020	0.000	0.075***	0.076***
FA/TA	0.355	0.317	0.316	0.251	0.324	0.258	0.039***	0.031***	-0.008	0.066***	0.059***	-0.007
Annual dividend per share	0.750	0.560	0.209	0.150	0.205	0.110	0.541***	0.545***	0.004	0.410***	0.450***	0.040***
NI per share	2.065	1.714	1.086	0.916	1.011	0.814	0.978***	1.054***	0.076	0.798	0.900***	0.102***
FCF per share	3.895	2.988	1.991	1.531	1.732	1.305	1.904***	2.163***	0.259***	1.457***	1.683***	0.226***
M-to-B ratio of assets	1.490	1.226	1.469	1.225	1.755	1.301	0.021	-0.265***	-0.286***	0.001	-0.075***	-0.076***
1976-1986	Quarterly (Q) Payers		Semiannual (S) Payers		Annual (A) Payers		Difference of Means Tests			Difference of Medians Tests		
	Mean	Median	Mean	Median	Mean	Median	Q - S	Q - A	S - A	Q - S	Q - A	S - A
(Stdev of quarterly NI)/NI	0.271	0.089	0.512	0.113	0.333	0.108	-0.241***	-0.062	0.179	-0.024***	-0.019***	0.005
Total assets	1213.82	226.33	118.53	44.78	66.89	31.06	1095.29***	1146.93***	51.64***	181.55***	195.27***	13.72***
Sales/TA	1.625	1.450	1.501	1.356	1.479	1.331	0.124***	0.146**	0.022	0.094***	0.119***	0.025
FA/TA	0.368	0.333	0.319	0.255	0.305	0.247	0.049***	0.063***	0.014	0.078***	0.086***	0.008
Annual dividend per share	0.904	0.720	0.241	0.170	0.176	0.120	0.663***	0.728***	0.066***	0.550***	0.600***	0.050***
NI per share	2.538	2.223	1.329	1.032	1.148	0.842	1.210***	1.391***	0.181	1.190***	1.381***	0.191***
FCF per share	4.499	3.620	2.251	1.693	1.868	1.251	2.248***	2.631***	0.383***	1.927***	2.369***	0.442***
M-to-B ratio of assets	1.222	1.053	1.313	1.119	1.537	1.164	-0.091***	-0.315***	-0.224***	-0.066***	-0.111***	-0.045**
1987-1996	Quarterly (Q) Payers		Semiannual (S) Payers		Annual (A) Payers		Difference of Means Tests			Difference of Medians Tests		
	Mean	Median	Mean	Median	Mean	Median	Q - S	Q - A	S - A	Q - S	Q - A	S - A
(Stdev of quarterly NI)/NI	0.518	0.102	0.423	0.108	0.741	0.155	0.095	-0.222	-0.318	-0.006**	-0.053***	-0.048**
Total assets	3100.05	499.15	460.01	75.34	233.39	66.43	2640.04***	2866.66***	226.62**	423.81***	432.72***	8.91
Sales/TA	1.424	1.281	1.369	1.267	1.313	1.193	0.055	0.112***	0.057	0.014	0.088***	0.074*
FA/TA	0.363	0.326	0.321	0.263	0.347	0.276	0.042***	0.016	-0.026	0.063***	0.05***	-0.013
Annual dividend per share	0.700	0.500	0.178	0.125	0.194	0.100	0.522***	0.505***	-0.016	0.375***	0.400***	0.025***
NI per share	1.683	1.420	0.804	0.749	0.736	0.677	0.880***	0.947***	0.067	0.672***	0.743***	0.072
FCF per share	3.493	2.640	1.656	1.285	1.416	1.211	1.837***	2.077***	0.240**	1.355***	1.429***	0.074**
M-to-B ratio of assets	1.586	1.327	1.438	1.221	1.780	1.255	0.148***	-0.194***	-0.342***	0.106***	0.072**	-0.034
1997-2006	Quarterly (Q) Payers		Semiannual (S) Payers		Annual (A) Payers		Difference of Means Tests			Difference of Medians Tests		
	Mean	Median	Mean	Median	Mean	Median	Q - S	Q - A	S - A	Q - S	Q - A	S - A
(Stdev of quarterly NI)/NI	0.524	0.108	1.212	0.113	0.292	0.133	-0.688***	0.232	0.920*	-0.005	-0.025**	-0.020
Total assets	6954.58	1124.71	1331.72	270.65	3026.79	201.22	5622.86***	3927.79***	-1695.07**	854.06***	923.49***	69.43
Sales/TA	1.267	1.109	1.385	1.325	1.528	1.176	-0.119**	-0.261***	-0.143	-0.216***	-0.067	0.149**
FA/TA	0.322	0.277	0.303	0.219	0.319	0.259	0.019	0.003	-0.040	0.058***	0.018	-0.040
Annual dividend per share	0.552	0.400	0.186	0.140	0.247	0.140	0.366***	0.305***	-0.061***	0.260***	0.260***	0.000
NI per share	1.745	1.426	0.995	0.971	1.179	1.020	0.745***	0.566**	-0.184	0.455***	0.407***	-0.049
FCF per share	3.381	2.533	1.936	1.609	1.948	1.614	1.445***	1.434***	-0.012	0.924***	0.920***	-0.004
M-to-B ratio of assets	1.821	1.471	1.833	1.540	1.952	1.539	-0.012	-0.131**	-0.119	-0.069	-0.068**	0.001

Table III
Regression Results on Dividend Payout-Frequency

This table presents parameter coefficients of our ordered-logit regression models. The sample consists of dividend-paying firms listed on the NYSE, AMEX, or Nasdaq during the period 1976-2006. Dividend payout-frequency is the dependent variable where it takes the value of 0, 1, or 2, depending on whether the firm pays dividends annually, semiannually, or quarterly, respectively. The explanatory variables include the standard deviation of the year's quarterly net income divided by annual net income (Stdev of quarterly NI/NI), the log of the book value of total assets (LogTA), annual sales divided by the book value of total assets (Sales/TA), the book value of fixed assets to the book value of total assets (FA/TA), the sum of all dividends paid during the year per share (Annual dividends per share), annual net income per share (NI per share), the per share sum of net income plus depreciation (FCF per share), a dummy variable equal to one if the firm has a below median market-to-book ratio of assets for that year (Low MB dummy), otherwise this dummy is equal to zero (and the market-to-book ratio is book assets minus book equity plus market equity all divided by book assets), an interaction term between the Low MB dummy variable and the FCF per share variable, and also year dummies. Statistical significance are based on clustered standard errors by firm (see Petersen (2007)). Regression results are run on the whole period, 1976-2006, and also on subperiods, 1976-1986, 1987-1996, and 1997-2006. For each model, we also report a Pseudo R-square and a Wald chi-square statistic.

Independent variables	Whole period			1976-1986			1987-1996			1997-2006		
(Stdev of quarterly NI)/NI	-0.004	-0.004	-0.004	0.004	-0.013	-0.017	-0.004	-0.004	-0.003	-0.006	-0.005	-0.004
Log(TA)	0.507***	0.735***	0.682***	0.579***	0.962***	0.914***	0.619***	0.827***	0.765***	0.370***	0.476***	0.444***
Sales/TA	0.240	0.271	0.253	0.381**	0.485***	0.457**	0.520***	0.509***	0.499***	-0.078	-0.109	-0.126
FA/TA	-0.079	-0.295	-0.544	0.354	-0.036	-0.215	-0.070	-0.517	-0.705	-0.493	-0.491	-0.831
Annual dividend per share	4.903***			5.668***			5.090***			3.556***		
NI per share		0.081***			0.091**			0.090***			0.039	
FCF per share			0.219***			0.193***			0.267***			0.187***
Low M/B dummy			0.358***			0.415**			0.159			0.562***
Low M/B dummy * FCF per share			-0.130***			-0.140**			-0.160**			-0.118*
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	31,880	31,880	31,874	13,551	13,551	13,546	10,216	10,216	10,215	8,113	8,113	8,113
Pseudo R-square	0.232	0.143	0.148	0.299	0.188	0.191	0.253	0.174	0.180	0.139	0.083	0.090
Wald chi-square	215.0	345.7	356.9	115.8	277.8	235.1	126.1	179.8	186.8	70.7	91.5	107.2

Table IV
Quarterly Dividend Payout Premium

This table shows the valuation premium for being a quarterly dividend payer as opposed to being a nonquartelry dividend payer. The sample consists of dividend-paying firms listed on the NYSE, AMEX, or Nasdaq during the period 1976-2006. Each year, dividend-paying firms are categorized into quarterly dividend-payers or nonquarterly dividend-payers. For each category, we calculate its mean equally-weighted (EW) market-to-book ratio of assets (M/B) and its mean value-weighted (VW) market-to-book ratio of assets. Then, we calculate the valuation premium for being a quarterly dividend-payer as opposed to being a nonquarterly dividend-payer (Quarterly Premium) by taking the log of the ratio of their average market-to-books.

	Quarterly Payers		Nonquarterly Payers		Quarterly Premium	
	EW	VW	EW	VW	EW	VW
Year	M/B	M/B	M/B	M/B	M/B	M/B
1976	1.10	1.50	1.11	1.85	0.0%	-21.0%
1977	1.06	1.31	0.97	1.39	7.9%	-6.9%
1978	1.05	1.29	1.10	1.18	0.7%	13.9%
1979	1.10	1.23	1.15	1.26	-3.4%	0.3%
1980	1.19	1.39	1.44	2.01	-12.8%	-25.4%
1981	1.12	1.20	1.16	1.23	-3.1%	-1.7%
1982	1.24	1.35	1.40	2.09	-6.8%	-30.6%
1983	1.38	1.44	1.77	2.08	-18.3%	-32.1%
1984	1.29	1.36	1.41	1.64	-6.1%	-12.0%
1985	1.41	1.51	1.63	2.42	-9.0%	-28.1%
1986	1.51	1.65	1.72	2.28	-10.2%	-19.8%
1987	1.45	1.64	1.71	6.07	-5.4%	-89.3%
1988	1.47	1.58	1.59	3.58	-2.2%	-65.6%
1989	1.53	1.79	1.59	3.84	2.9%	-51.2%
1990	1.41	1.82	1.34	2.82	7.6%	-27.6%
1991	1.61	2.38	1.58	2.56	5.3%	-7.5%
1992	1.65	2.13	1.58	2.35	9.1%	-12.4%
1993	1.69	1.95	1.75	2.55	4.1%	-25.4%
1994	1.58	1.88	1.55	2.04	5.8%	-2.8%
1995	1.71	2.22	1.76	2.97	5.3%	-21.0%
1996	1.76	2.46	1.71	2.31	7.5%	11.1%
1997	1.95	3.02	1.94	3.29	2.8%	-11.8%
1998	1.86	3.74	1.77	3.16	2.4%	6.6%
1999	1.75	3.53	1.73	3.00	-0.3%	8.9%
2000	1.73	3.65	1.75	2.75	-3.4%	14.5%
2001	1.74	3.02	1.85	2.43	-5.9%	23.3%
2002	1.57	2.39	1.69	2.15	-7.0%	13.1%
2003	1.75	2.41	1.90	3.06	-7.7%	-27.6%
2004	1.87	2.27	2.04	2.96	-9.6%	-30.8%
2005	1.93	2.25	2.24	2.30	-12.5%	-2.8%
2006	1.97	2.18	2.06	2.22	-5.0%	-2.5%

Table V
Tests of Catering

The sample consists of dividend-paying firms listed on the NYSE, AMEX, or Nasdaq during the period 1976-2006. Panel A presents parameter coefficients from an OLS regression model. The dependent variable is the total number of nonquarterly dividend-payers that increase their dividend frequency during year t, divided by the total number of nonquarterly dividend payers during year t-1. Independent variables include *Quarterly Premium*, which is the market valuation premium (on average, for each year) of being a quarterly dividend payer as opposed to being a nonquarterly dividend payer. Annual averages are based on either a value-weighting (*VW*) or an equal-weighting (*EW*). Another independent variable is *AvgCAR* which is the average CAR(-1,1) of firms that announce an increase in dividend frequency that year. CAR(-1,1) is the cumulative three-day abnormal return surrounding dividend frequency-change announcements, where day -1 and day 1 are the day before and after the announcement day 0, respectively. A final set of independent variables are annual average market-to-book ratio of assets of nonquarterly dividnd payers. These annual averages are also based on either a value-weighting (*VW*) or an equal-weighting (*EW*). Panel B presents correlation coefficients between *Quarterly Premium* and *AvgCAR*. There are 30 year-observations in Panel A and 31 year-observations in Panel B. ** and * denote statistical significance at the 5 and 10 percent levels, respectively. In Panel A, statistical significance is based on heteroskedastic-consistent standard errors.

Panel A: Regression results	(1)	(2)	(3)	(4)	(5)	(6)
VW Quarterly Premium$_{t-1}$	-0.034	-0.032			-0.099**	
EW Quarterly Premium$_{t-1}$			0.079	0.134		0.136
AvgCAR(-1,1)$_{t-1}$		0.280		0.416	0.229	0.440
VW Nonquarterly M/B$_{t-1}$					-0.026	
EW Nonquarterly M/B$_{t-1}$						-0.088*
# of year-observations	30	30	30	30	30	30
Adjusted R-square	-0.013	-0.030	-0.026	-0.023	0.054	0.177

Panel B: Correlation results		
	VW Quarterly Premium$_t$	*EW Quarterly Premium*$_t$
AvgCAR$_t$	-0.070	-0.340*

Table VI
Abnormal Returns Surrounding Dividend Frequency-Change Announcements

This table reports cumulative abnormal returns (CAR(-1,1)) for the three-day period (days -1, 0, 1) surrounding dividend frequency-change announcements (on day 0) made by dividend-paying firms listed on the NYSE, AMEX, or Nasdaq during the period 1976-2006. We compute abnormal daily returns using the market model. We estimate the market model by using 200 trading days of return data ending 21 days before the dividend frequency-change announcement. We use CRSP equally-weighted market returns as the benchmark. We use a *t*-test and a Wilcoxon *Z*-test to test whether the mean and median CAR(-1,1) is significantly different from zero. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. We differentiate announcements based on whether firms increase or decrease their dividend payout frequency. Panel A is for the full sample of announcements. Panel B further differentiates firms based on simultaneous announcements (if any) of dividend *amount* changes. Panel C differentiates firms based on simultaneous announcements (if any) of unexpected dividend amount changes.

	Dividend *frequency* *increase* announcement			Dividend *frequency* *decrease* announcement		
	Mean	Median	(#obs)	Mean	Median	(#obs)
Panel A: Full sample	0.0218***	0.0099***	(135)	-0.0054	-0.0042	(34)
Panel B: Samples based on dividend amount announcements (if any)						
When firms also announce an *increase* in dividend *amount*	0.0199***	0.0066***	(86)	0.0161	0.0035	(4)
When there is *no* announcement of a dividend *amount* change	0.0252***	0.0133***	(49)	-0.0123*	-0.0041	(21)
When firms also announce a *decrease* in dividend *amount*	0.0057	0.0030	(3)	0.0013	-0.0043	(9)
Panel C: Samples based on *unexpected* dividend amount announcements (if any)						
When firms also announce an *increase* in dividend *amount* and the announced dividend amount is larger than expected	0.0210***	0.0062***	(71)	-0.0132	-0.0132	(2)
When there is *no* announcement of a dividend *amount* change or when an announced dividend amount change is expected	0.0255***	0.0150***	(55)	-0.0017	-0.0041	(23)
When firms also announce a *decrease* in dividend *amount* and/or any announced dividend amount is smaller than expected	0.0004	0.0036	(9)	-0.0130	-0.0043	(9)

Table VII
Regression on Dividend Frequency-Increasing Announcement Returns: Differentiating on Firm-Specific Variables

This table presents parameter coefficients from an OLS regression model. CAR(-1,1) is the dependent variable, where CAR(-1,1) is the abnormal return surrounding announcements of dividend payout frequency-increases. The explanatory variables include the standard deviation of the year's quarterly net income divided by annual net income (Stdev of quarterly NI/NI), the log of the book value of total assets (LogTA), annual sales divided by the book value of total assets (Sales/TA), the book value of fixed assets to the book value of total assets (FA/TA), the sum of all dividends paid during the year per share (Annual dividends per share), annual net income per share (NI per share), the per share sum of net income plus depreciation (FCF per share), a dummy variable equal to one if the firm has a below median market-to-book ratio of assets for that year (Low MB dummy), otherwise this dummy is equal to zero (and the market-to-book ratio is book assets minus book equity plus market equity all divided by book assets), and an interaction term between the Low MB dummy variable and the FCF per share variable. All explanatory variables are lagged one year prior to the year of the announcement. Heteroscedastic-consistent standard errors are used to assess statistical significance. ** and * indicate statistical significance at the 5 and 10 percent levels, respectively. An adjusted R-square for each model is also reported

Independent variables	(1)	(2)	(3)
(Stdev of quarterly NI)/NI	0.001	0.0004	0.0002
Log(TA)	-0.007	-0.006	-0.006
Sales/TA	-0.014*	-0.014	-0.015
FA/TA	-0.027	-0.022	-0.036
Annual dividend per share	0.042		
NI per share		0.001	
FCF per share			0.006
Low M/B Dummy			0.038**
Low M/B Dummy * FCF per share			-0.008
# of observations	119	119	119
Adjusted R-square	0.025	0.003	0.036

Table VIII
Year-to-Year Changes in Firm Characteristics

This table shows unadjusted changes and adjusted changes in firm characteristics around the year that nonquarterly dividend-paying firms listed on the NYSE, AMEX, or Nasdaq during 1976-2006 announce an increase in their dividend payout frequency. For each firm characteristic, we calculate changes from year -1 to year 0, from year 0 to year +1, and from year +1 to year +2, where year 0 is the year the firm announces an increase in their dividend payout frequency. Adjusted changes are based on a matching procedure. We match each of our sample firms to a matching firm from the same industry, and then for each of our sample firm's independent variables we identify firms with a similar level of the independent variable in year -1, a similar change in the independent variable from year -1 to year 0, and a similar market-to-book ratio in year -1. Each sample firm's adjusted change is the sample firm's change net of the matching firm's change. We use a *t*-test and a Wilcoxon *Z*-test to test whether the mean and median change is significantly different from zero. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

	Unadjusted changes			Adjusted changes		
	-1 to 0	0 to 1	1 to 2	-1 to 0	0 to 1	1 to 2
(Stdev of quarterly NI)/NI						
Mean	-0.285	0.065	0.065	-0.010	-0.300	0.466
Median	-0.017*	0.001	0.011	-0.002	0.000	0.014
N	117	106	93	117	94	76
Total assets						
Mean	-128.132	34.702**	44.246***	-149.588	-10.840	-1.460
Median	8.259***	8.792***	8.165***	0.322	-0.972	-0.136
N	132	121	106	131	117	99
Sales/TA						
Mean	-0.003	-0.022	-0.040	-0.014	-0.008	-0.038
Median	0.011	-0.002	0.010	-0.002	-0.015	-0.029
N	132	121	106	131	117	100
FA/TA						
Mean	0.002	0.005	-0.003	0.001	0.005	0.000
Median	0.001	0.003	0.002	0.000	0.005	0.005
N	132	121	106	130	120	102
Annual dividend per share						
Mean	0.086***	0.034***	0.056***	0.079***	0.034**	0.067***
Median	0.050***	0.017***	0.015***	0.045***	0.013***	0.019***
N	135	121	111	135	121	111
NI per share						
Mean	0.153	-0.297*	0.150	0.124*	-0.391*	0.444
Median	0.175***	-0.008	-0.097	0.005	-0.021	-0.059
N	132	121	106	131	114	89
FCF per share						
Mean	0.173	-0.238	0.164	0.027	-0.013	-0.132
Median	0.216***	-0.006	-0.035	-0.001	-0.045	-0.240
N	132	121	106	131	114	94
M-to-B ratio of assets						
Mean	0.065**	0.004	-0.070	0.122**	-0.032	-0.084
Median	0.058***	-0.008	-0.016	0.110***	-0.056	-0.024
N	131	121	106	130	120	101