Payout Policy Choices and Shareholder Investment Horizons

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Abstract

This paper examines how shareholder horizons influence payout policy choices. We infer institutional shareholders' investment horizons using the frequency with which they turnover their overall stock portfolios prior to the payout decision. We find that the frequency and amount of repurchases increases with ownership by short-term investors, to the detriment of dividends. We also find that the market reacts less positively to repurchases made by firms held by short-term institutions. These findings are consistent with a model in which undervalued firms signal through repurchases, but firms held by short-term investors make repurchases more often because those investors care mostly about the short-term price reaction. Hence the market rationally discounts the signal provided by such repurchases. Our findings suggest that shorter shareholder horizons might be one contributing factor to the increasing popularity of buybacks.

JEL Classification: G35; G32
Keywords: payout policy; repurchases; institutional investors; investment horizon; shareholder heterogeneity.

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1. Introduction

Over the last three decades, share repurchase activity has experienced extraordinary growth. Repurchases are now an important form of payout of U.S. firms, and the long-term trend in payout choices points toward a lower proportion of firms paying dividends and replacing them with repurchases (Fama and French, 2001; Grullon and Michaely, 2002; Julio and Ikenberry, 2004). These major shifts in payout policy occurred concurrently with the rise of institutional ownership. The percentage of equity ownership held by institutional investors now represents over 70% of firm's total equity, up from 24% in 1980 (Gompers and Metrick, 2001; Gillan and Starks, 2007).

Although their importance in equity markets has increased, institutional investors are far from an homogeneous group (e.g. Hotchkiss and Strickland, 2003). In particular, money managers differ widely in terms of their investment horizon, that is, the length of time an investor is expected to remain a shareholder. Some institutions behave in a short-term way, acting as "speculators", while others are more long-term oriented, behaving as "activists" (Gillan and Starks, 2007). Moreover, the average investment horizon has changed over time. For example, Bogle (2003) reports that mutual fund managers are currently holding the stock in their portfolio for an average holding period of approximately one year, versus six years in the early 1970s.[1]

The objective of this paper is to focus on how the investment horizon of a firm's shareholders affects the choice of payout method. The theoretical framework we make appeal to is based on a signaling model of the payout choice by Lucas and McDonald (1998). Although the evidence on the empirical performance of signaling models is mixed (see Allen and Michaely (2003) for a critical review), the model has the advantage of offering clear-cut predictions of the impact of investor horizons on payout choices. In addition, the adverse selection framework seems like a natural place to start because the presence of heterogeneous shareholders is implicit in many signaling models.[2]

In the Lucas and McDonald (1998) model, managers (whose interests are aligned with shareholders) must decide how to distribute excess cash. Managers have superior information relative to the market, and investors update their beliefs on the (unknown to them) value of assets in place by observing the firms' payout decision. Note that in this world paying cash is always optimal, the only question is how to do so. Building on the intuition of Chowdry and Nanda (1994) that dividends and repurchases are not perfect substitutes in the presence of adverse selection, the authors show that

[1] The short-term nature of institutional investors is also stressed in Stein (1989), Porter (1992), and Froot, Perold and Stein (1992).

[2] The major theoretical papers on payout policy employing signaling (e.g. Bhattacharya, 1979; Miller and Rock, 1985; John and Williams, 1985; Williams, 1988), make the assumption that either some or all shareholders face liquidity needs in the short-run. Managers thus care both about the next period's stock price as well as about "long-term" value for staying shareholders.

managers deciding which payout mechanism to use face two opposite forces. On the one hand, paying cash through a dividend is costly because dividend income tax rates are assumed to be higher than capital gains tax rates. On the other hand, making a repurchase implies that wealth may be transferred between shareholders that stay with the firm after the repurchase and shareholders who sell their shares. If the firm's stock price increases following a repurchase announcement, selling shareholders are happy (they see the value of their holdings go up) but non-selling shareholders face a dilution cost if the repurchase price is too high.[3]

Lucas and McDonald (1998) show that a signaling equilibrium exists in which relatively more undervalued firms signal their value to the market by paying a larger proportion of their cash through repurchases. This equilibrium is supported as follows. In the absence of taxes, an overvalued firm with only long-term shareholders will never repurchase its own shares. The market thus interprets a repurchase as unambiguously good news, bidding the firm's price up. In the presence of taxes, the firms will separate. As the quality of the firm increases (that is, the degree of undervaluation increases), managers choose to pay higher repurchases because the dilution costs are decreasing in the degree of undervaluation. The market reacts accordingly, increasing the firm's valuation in a direct relation with the amount of repurchases. The equilibrium is incentive compatible because a low quality firm that would attempt to disguise itself as a high quality firm by diverting an extra dollar from dividends to repurchases would save on taxes (and make selling shareholders happier) but incur in a relatively higher dilution cost.[4]

The model's main insight of interest to us is that the trade-off each firm faces depends on the investment horizon of its shareholders. Short-term shareholders who sell their shares in a potential repurchase benefit from the (non-negative) price reaction to a repurchase announcement and save on taxes. Hence they will unambiguously prefer that managers make a repurchase.[5] Non-selling shareholders are the ones facing the dilution cost, and face the trade-off described earlier. In other words, a large presence of short-term shareholders effectively lowers the firm-wide dilution cost because it lowers the weight that managers put in the costs borne by non-selling shareholders. Managers will therefore optimally choose to perform a larger amount of repurchases in firms with more short-term investors. Recognizing this, the market attributes a proportionally lower valuation increase (given a similar-sized repurchase) to a repurchasing firm dominated by short-term investors relative to a repurchasing firm dominated by long-term investors.

[3] Ofer and Thakor (1987) propose a similar signaling model of the choice between dividends and repurchases in which the cost of signaling comes from managers' under-diversification. We control for executive compensation characteristics in our analysis below.

[4] Key in this reasoning is the fact that selling shareholders do not care about the firm's fundamental value, but only about the price increase subsequent to the payout policy announcement.

[5] Shareholders who participate pro-rata in the repurchase will also strictly prefer repurchases to dividends because they are indifferent to the repurchase price but prefer to save the dividend taxes. Note that, for the equilibrium to work, the percentage of selling shareholders must be bounded from above (Lucas and McDonald, 1998).

The Lucas and McDonald (1998) model thus offers testable predictions considering the relation between investor horizons and payout choice for firms that distribute cash to shareholders. First, the proportion of cash paid through a repurchase should be associated with a shorter shareholder horizon. Second, the frequency of the use of repurchases should be associated with a shorter shareholder horizon. Finally, the market reaction to a repurchase should be decreasing in the investment horizon of the firm's shareholders. The model also predicts that these effects will be stronger for firms characterized by higher information asymmetries. The reason is that, for these firms, dilution costs are particularly important. Firms that announce a repurchase are interpreted by the market as severely undervalued and the price reaction is correspondingly stronger. Exogenous changes in investor horizon will therefore have a greater impact on observed use of repurchases and repurchase announcement returns. As usual, our underlying null hypothesis is that in perfect capital markets investment horizon should not matter because arbitrage through “home-made dividends” makes payout policy irrelevant (Miller and Modigliani, 1961).

Our working hypothesis is cast in a signaling framework, but other theories can potentially predict an impact of investors' horizon on payout policy. Gaspar, Massa, and Matos (2005), and Chen, Harford, and Li (2007) report evidence that long-term institutional investors seem to possess superior monitoring abilities, in the spirit of Shleifer and Vishny's (1992) large shareholder. If dividends are a more credible and stronger commitment to payout (Lintner, 1956), then the presence of monitoring long-term shareholders could be associated with higher dividends, and the presence of short-term shareholders with higher repurchases. In an important contribution, Allen, Bernardo, and Welch (2000) propose a model of payout policy in which managers interested in keeping institutional investors with monitoring abilities pay dividends. The reason is that the benefits of future monitoring are priced in firm value, therefore counterbalancing the tax cost of dividends.

In spite of its appeal, monitoring theories have some shortcomings when addressing the issue of the choice between repurchases and dividends. First, it is not clear why short-term shareholders would be associated with repurchases if they do not monitor management; the latter might simply choose not to payout any excess cash flow. Second, if long-term shareholders are monitors, they might as well force payouts through repurchases (e.g. Nohel and Tarhan, 1998), because at least that would be cheaper in the case of taxable institutions. Third, is it not clear that payout policy and investor monitoring are substitute or complementary mechanisms in minimizing the distortions emerging from separation of ownership and control. One can imagine a world where paying dividends is unnecessary to improve incentives because shareholder monitoring would do the job instead. Finally, Grinstein and Michaely (2005) show that empirically there seems to be no sign of causality running from payout policy to institutional ownership, leading them to reject the predictions of Allen, Bernardo and Welch (2000).

We sidestep the issues related to the role of investor monitoring by focusing on the set of firms to which the model of Lucas and McDonald (1998) applies, that is, the set of firms with positive payouts in a given year. We believe that cross-sectional differences in shareholder monitoring play less of a role for these firms, since they are already distributing cash to shareholders. We nevertheless offer some results for a larger sample of non-payers in the last section of the paper, and also investigate the direction of causality between payout choices and shareholder horizons. Our empirical analysis uses a broad sample of U.S. non-financial firms for the period 1984 to 2008.

The availability of data on institutional holdings provides a unique opportunity to infer the investment horizon from actual portfolio behavior. We characterize investors in terms of their investment horizon by looking at the average turnover level of their portfolio positions (Gaspar, Massa and Matos, 2005). Short-term investors are defined as those exhibiting a high portfolio turnover (i.e. a high volume of buying and selling of stocks relative to their average portfolio holdings). Our main variable of interest is Investor Turnover, the average portfolio turnover rate across all the institutional investors present in a firm's shareholding structure. We use this measure to study how the average investment horizon of the firm's institutional shareholders affects payout policy choices and the market reaction to repurchase announcements.

Our results show that firms whose ownership structures are characterized by more short-term oriented investors use a higher proportion of repurchases in their payouts. If institutional investors hold on to their investments for 5 months less than the average of 27 months in our sample (i.e. one standard deviation in Investor Turnover), the share of repurchases in total payout increases by 9.5% (a 26% relative increase) and the probability of the firm repurchasing stock instead of increasing a dividend increases by 2.5% (a 5% relative increase). We also find that the market reaction to a stock repurchase announcement decreases with investors' horizon. An increase of Investor Turnover of one standard deviation reduces the cumulative abnormal return around the announcement date by 27 basis points, a 14 percent change relative to the average 2.0% gain in our sample of repurchase announcements. We also document that these effects, although valid for all firms in the sample, are of larger magnitude for firms characterized by stronger information asymmetry (larger analyst forecast errors and larger analyst forecast dispersion). These findings are consistent with our working hypothesis. We also conduct several robustness tests and report similar patterns when looking at the level (rather than the composition) of payout, and when we adjust our estimates for potential self-selection issues. We also find that reverse causality does not seem to be driving our results.

Although our analysis focuses on firms that make distributions, we also perform tests in an extended sample that includes non-paying firms. We find that the presence of short-term investors is associated with making a repurchase, unconditionally in any given year or for the first time in the firm's history. Short-term shareholders also seem to decrease the probability of a dividend payment. In contrast, long-term investors are associated with positive payouts, both in the form of repurchases and

dividends (though more strongly in the case of dividends). This is consistent with the notion that long-term investors have monitoring abilities and lead firms to increase payouts, irrespective of the form that these distributions take.

Our paper contributes to the growing literature on the impact of shareholder horizons on corporate policy and stock prices. Bushee (1998) finds that firms held by "transient" institutional investors (that is, investors with short holding horizons and holding small stakes) tend to reduce R&D expenses when faced with earnings shortfalls. Gaspar, Massa and Matos (2005) report that (arguably monitoring) long-term shareholders are associated with less frequent but higher-quality merger and acquisitions (M&A). Chen, Harford and Li (2007) also examine M&A deals and find that long-term, independent investors seem particularly effective in monitoring. Derrien, Kecskés and Thesmar (2009) argue that the impact of shareholder horizons is induced by market inefficiency and hence particularly relevant in the presence of firm misvaluation. Ownership by short-term oriented institutions has been linked to greater stock liquidity (Bushee, 2001), higher stock price volatility (Bushee and Noe, 2000), lower accruals quality (Liu and Peng, 2006), lower credit ratings and higher credit spreads (Elyasiani, Jia and Mao, 2006), greater sensitivity of CEO compensation to negative performance (Shin, 2008), higher capital expenditures (Cella, 2009), higher momentum returns and subsequent returns reversal (Cremers and Pareek, 2010), and greater amplification of market-wide negative shocks (Cella, Ellul and Giannetti, 2010). Yan and Zhang (2009) report that short-term investors are able to predict short-term information and profit from it through their trades.

Our paper also extends the literature on the relation between institutional ownership and dividend policy (see Allen and Michaely (2003) for a detailed survey). Amihud and Li (2006) show the declining information content of dividend announcements and explain it in terms of higher percentage of institutional holdings in announcing firms. Hotchkiss and Lawrence (2003) provide evidence in favor of dividend clienteles within institutional investors. Our paper shows that different categories of investors have a differential impact on the form-of-payout choice. This might explain why tests involving the level of institutional ownership might not find a significant impact of ownership on payout policy (Grinstein and Michaely, 2005).

Finally, our findings indicate that shorter investor horizons might be one contributing factor to the long-term trend of increasing buybacks as a way for firms to make distributions. In the last three decades, institutional investors' share of the equity market has increased substantially. Simultaneously, there is evidence of a reduction in the average investment horizon of institutions (Bogle, 2003). The evidence presented in this paper is consistent with investment horizon playing a role in the shift from payouts in the form of dividends to payouts in the form of share buybacks (Fama and French, 2001; Grullon and Michaely, 2002).

A related paper that came to our attention is Hovamakian and Li (2010), which concentrate on the sample that includes both paying and non-paying firms. Like us, they report that the presence of long-term investors is unconditionally associated with higher payouts, while for payers there is a strong association between on one hand, short-term investors and repurchases, and, on the other hand, long-term investors and dividends. The authors interpret their findings as consistent with monitoring by long-term investors and with the notion that short-term investors are better informed and thus prefer making repurchases (Brennan and Thakor, 1990).[6] Although our results largely concur, our paper differs from theirs by including the analysis of the market reaction to a repurchase announcement as well as a careful inspection of causality effects. Given our theoretical framework we also interpret the results slightly differently. It is not clear to us why managers would allow short-term shareholders to profit from their information by making a repurchase, especially if their interests diverge due to an agency conflict.[7] It is also unclear how to reconcile the supposedly superior information of short-term shareholders with the monitoring role of long-term shareholders, since effective monitoring relies on information.[8]

Our paper takes the variation in shareholders' horizons as exogenous. For the purposes of this paper, we are agnostic concerning the reasons why investors have heterogeneous holding horizons. Possible reasons include differences in the demographics and liquidity needs of the final owners of the institutional portfolios (Edelen, 1999), the distorted incentives induced by delegated asset management (Scharfstein and Stein, 1990; Allen and Gorton, 1993; Dow and Gorton, 1997; Goldman and Slezak, 2003), the inability to continuously gather fresh capital to implement long-term strategies (Shleifer and Vishny, 1997), or variations in risk-aversion of agents trying to trade on long-term information (Holden and Subrahmanyam, 1996).

The remainder of the paper is organized as follows. Section 2 describes the data and the variables we use. Section 3 analyzes the impact of investor horizon on the choice of payout policy and the market reaction to repurchase announcements. Section 4 presents several robustness checks. Section 5 investigates the impact of investor horizons in the sample that includes non-paying firms. A brief conclusion follows.

[6] The argument that short-term investors are better informed is supported by evidence that short-term institutions seem to predict future short-term stock returns (Yan and Zhang, 2009).

[7] Brennan and Thakor (1990) "deliberately ignore the role of management as an informed party" in their paper (p. 995).

[8] Yan and Zhang (2009) do not find evidence that long-term shareholders predict long-term stock returns.

2. Data And Empirical Testing Issues

2.1. Sample Construction

Our main source is the CRSP-COMPUSTAT Merged database containing firm-level annual data on dollar payouts for US listed firms during the period 1984-2008. We exclude regulated utilities, financial firms, and securities other than common stock. Following Ikenberry, Lakonishok and Vermaelen (1995) and Grullon and Michaely (2002), we exclude the year 1987 for firm year observations, because of the exceptional nature of repurchases made after the October 87 crash. We require that firms report a positive payout, that is, a dividend, a repurchase, or both.

The annual data is complemented by two databases containing information on changes in payout policy. The first is the Securities Data Corporation (SDC) database, from which we extract announcement dates for open market repurchase program announcements. We follow Jagannathan et al. (2000) and use this information to adjust the COMPUSTAT dollar amount of repurchases by keeping repurchase values only for those years in which there is an announcement in SDC in that year or in one of the previous two years (we also exclude announcements made in the last quarter of 1987). The second database is the CRSP Monthly Stocks event file of dividend announcements. We keep all events with CRSP declaration codes equal to 1232 (ordinary quarterly dividends) with non-missing declaration dates. Following Amihud and Li (2006) we take only those firms with dividend increases where the change in the dividend per share amount is at least 0.5%. Moreover, we require that, for each firm-year, we have data on all our main explanatory variables.

2.2. Measuring Shareholders' Horizons

Information on portfolio holdings of institutional investors is available from the ThomsonReuters Spectrum 13F database, which consists of quarterly holdings filings of qualified money managers to the Securities and Exchange Commission. The dataset contains the positions of more than 10,000 shares or US$200,000 in value of all institutions with more than US$100 million dollars under discretionary management. Gompers and Metrick (2001) provide an early detailed analysis of this dataset.

Our main variable of interest is Investor Turnover, a measure of the investment horizon of institutions holding stock in the firm prior to a distribution announcement (Gaspar, Massa and Matos, 2005). The rationale behind this measure is that an investor can be considered short-term if it churns its overall portfolio frequently. Inversely, an investor can be considered long-term if it holds its stock positions unchanged for a considerable length of time. Having characterized each investor with

positive holdings within a firm's shareholding structure, we can then characterize firms based on their average shareholder profile in terms of investor horizon prior to the payout.

To calculate Investor Turnover we therefore follow a two-step procedure. First, we calculate each institutional investor's turnover rate as a measure of how frequently that investor rotates his positions on all stocks of his portfolio for any given quarter. Denote by Q_t the set of companies held by investor i at time t. Define the turnover rate of investor i at time t as

$$TR_{i,t} = \frac{\sum_{k=1}^{Q_t} \left| N_{k,i,t} P_{k,t} - N_{k,i,t-1} P_{k,t-1} - N_{k,i,t-1} \Delta P_{k,t} \right|}{\sum_{k=1}^{Q_t} \frac{N_{k,i,t} P_{k,t} + N_{k,i,t-1} P_{k,t-1}}{2}} \quad (1)$$

where $P_{k,t}$ and $N_{k,i,t}$ represent the price and the number of shares, respectively, of company k held by institutional investor i at quarter t. This definition follows the ones commonly used to assess overall portfolio rotation of mutual funds, as in Carhart (1997).[9]

The quarter turnover rates are then averaged over the previous 4 quarters to provide us with a more stable and precise identification of which investors persistently turn over their portfolios. We finally we calculate Investor Turnover for company k as the weighted average of the (time-averaged) turnover rates of all its institutional investors:

$$\text{Investor Turnover}_{k,t} = \sum_{i \in S_{k,t}} w_{k,i,t} \left(\frac{1}{4} \sum_{r=1}^{4} TR_{i,t-r-1} \right) \quad (2)$$

where $S_{k,t}$ is the set of shareholders in company k at time t, and $w_{k,i,t}$ as the weight of investor i in the total percentage held by institutional investors at quarter t in company k. It is important to note that Investor Turnover is based on the overall portfolio behavior of investors in firm k, and not on turnover at the level of the stock of the company involved in a distribution event. This makes it less likely to be contaminated by information-based trading due to an approaching distribution announcement. Furthermore, in our tests Investor Turnover (as well as all other independent variables) are lagged one period, further ensuring that Investor Turnover is predetermined with respect to the event.[10]

To supplement our tests, we also compute the fraction of a firm's shares held by High (Mid/Low) Turnover investors as the sum of holdings held by investors in the top (middle/bottom) 33rd percentile of the time averaged turnover rates (the expression inside the parentheses in equation 2) in every year.

[9] Note that, by construction, the range of the Investor Turnover variable is the interval [0,2]. When performing this calculation, we exclude throughout the sample investors who enter the 13F universe for the first time in the quarter (for they would automatically have a maximum 'turnover rate' of 2). We also exclude from the procedure any stock of a company that has just entered the sample (for exactly the same reason).

[10] We also check whether firms exhibit time-series changes in Investor Turnover in the quarters surrounding changes in payout policy announcements and find no evidence of investor 'pre-positioning' prior to an announcement.

2.3. Control variables

In addition to repurchases and dividend information, we obtain data on accounting variables from COMPUSTAT (please refer to the Appendix for precise definitions and details on variable construction). The methodology and set of control variables that we use follows closely the one employed by Jagannathan et al. (2000). We use the log of firm assets, the Market-to-Book ratio, and the Debt-to-Equity ratio to control for firm size, value, and leverage. We include operating income, non-operating income, and the standard deviation of operating income to control for the impact of the 'permanence' of cash-flows on the form-of-payout decision (Guay and Harford, 2000; Jagannathan et al., 2000). We use the Prior Payout ratio (ratio of dividends to net income) to control for the fact that dividends are 'sticky'. We measure the liquidity of the firms' assets as the difference between current assets and current liabilities normalized by total assets. To reduce noise, our accounting variables are equal-weighted moving averages constructed from the values of the variables in the past three years.[11]

We gather data on stock market-related variables from CRSP. We compute the last 12 months' stock return to control for the impact of recent run-ups in the decision to payout. We use two measures to control for individual stock liquidity, because the latter has been found to influence the decision to repurchase (e.g. Brockman, Howe, and Mortal, 2008) and one possible criticism of the Investor Turnover measure is that it might be correlated with liquidity.[12] The first measure is the share turnover of the past year, defined as yearly trading volume divided by the number of shares outstanding. The second measure is Amihud's (2002) Illiquidity ratio, the yearly average of the daily ratio between a stock's absolute return and its dollar volume. Finally, we use as proxy for information asymmetry the number of analysts from I/B/E/S.

We extend this basic set of control variables by adding other important controls in some of our regression specifications. The tax disadvantage of dividends is calculated as using the difference between dividend tax rates and capital gain tax rates in the NBER TAXSIM Model (Feenberg and Coutts, 1993). We compute from ExecuComp the average level of managerial ownership and the average percentage of executive compensation paid in the form of options, to control for the influence of compensation in payout choices (e.g. Dittmar, 2000; Fenn and Liang, 2001; Kahle, 2002). Finally, we include the GIM Governance Index of Gompers, Ishii and Metrick (2003) to control for the influence of governance in the payout decision.

[11] The standard deviation of operating income is calculated using the previous 5 years of data.

[12] Note that this concern is minimized by the fact that the definition of Investor Turnover for firm *k* is calculated using the turnover rate on all stock holdings of each investor, not the turnover of their holdings in firm *k*.

2.4. Summary Statistics

Panel A of Table 1 presents the main characteristics of our firm-level panel. Our sample contains 25,182 firm-year observations. The average firm pays out 96 million dollars (M USD) in either dividends or repurchases, but the distribution of payout is substantially skewed (DeAngelo, DeAngelo and Skinner, 2004). The median firm pays 5M USD in dividends per year and there is no repurchase activity reported in slightly less than half of firm-years. The average share of repurchases in total payout is 35% and slightly higher for firms increasing their payout (48%).

All remaining variables are lagged one period with respect to the payout measures. Concerning institutional ownership, Table 1 shows that the average Investor Turnover is 0.22 in our sample and that institutions hold on average 51% of the firm's shares. This figure means that around 0.22/2=11% of the portfolio is turned over in a quarter, or around 44% of the position is turned over in a given year.[13] One equivalent way to put it is that the institutional investors are holding an average stock in their portfolio for a period of around 12/0.44=27 months. Short-term investors (that is, investors in the top third in terms of turnover rates in a given year) hold about 9% of the firm, while long-term investors hold about 23% of the firm on average. The statistics for our accounting variables are comparable with the summary statistics reported in Jagannathan et al. (2000). The average (log) firm size is 6.2, corresponding to about 495 million dollars in assets. The median firm has operating margins of 15% of assets and a Market-to-Book ratio multiple of 2.2. Managers of firms in our sample own 4% of the firm and the average firm has a score of 9 in the GIM index of governance. Note that the number of observations available for variables entering our extended specification is lower because executive compensation data is only available after 1992 and the governance index is only available for a limited number of firms.

Panel B of Table 1 presents summary statistics at the event level for firms with repurchase announcements on SDC (open market repurchases) and CRSP Monthly Stocks (dividend increase announcements). In addition to the variables described earlier, we calculate the Cumulative Abnormal Return (CAR) for the daily window (-1, +1) around each event date and a proxy for the size of a repurchase based on the number of shares sought in the transaction.[14] Panel B of Table 1 reports that the average CAR for repurchasing firms is 2%, and that firms intend to acquire 6.8% of their shares on average.

To better understand the differences between firms doing share repurchases and firms announcing an increase in dividend, Panel B of Table 1 shows means and medians of all the variables separately for the two sets of firms, as well as "significance stars" for the t-test (rank sum test) of

[13] Recall that Investor Turnover takes values in the interval [0,2]. Given that CDA/Spectrum has quarterly frequency, the estimates of turnover are naturally lower than those that would have been obtained if we had had data at a higher frequency.

[14] When SDC does not contain data on the number of shares sought in the repurchase, we estimate it using the actual repurchase amount reported in CRSP in a year and the average share price during the year.

equality of means (medians). All the control variables are lagged one year with respect to the payout announcement date. The results show that, relative to firms announcing an increase in dividend, repurchasing firms have higher Investor Turnover but also smaller size, higher Market-to-Book ratios, lower operating margins, higher operating income volatility, and lower recent stock market performance. Repurchasing firms also have higher share turnover but also higher average illiquidity. This evidence is consistent with the findings of previous literature and indicates the importance of controlling for all these characteristics in the regression analysis.

3. Shareholder Horizons and Payout Policy

3.1. Investor Turnover and the Share of Repurchases in Payout

We start by looking at the relation between shareholder investment horizons and the use of repurchases as a fraction of total payout by firms. Our dependent variable is effectively left- and right-censored at 0 and 1, respectively. For that reason we estimate a Tobit model (dropping firm subscripts for clarity)

$$y^*_{1,t} = \alpha_1 + \beta_1 \times \text{Investor Turnover}_{t\text{-}1} + \gamma_1 \mathbf{X}_{t\text{-}1} + \varepsilon_t \tag{3}$$

$$y_{1,t} = \begin{cases} 0 & \text{if } y^*_{1,t} \le 0 \\ y^*_{1,t} & \text{if } 0 > y^*_{1,t} > 1 \\ 1 & \text{if } y^*_{1,t} \ge 1 \end{cases}$$

where y_1, the dependent variable, is the observed share of repurchases in payout and **X** is a matrix containing the control variables described in section 3.3.

Table 2 presents the estimation results. In Panel A, the dependent variable is the Share of Repurchases in Total Payout across all paying firms. In Panel B, the dependent variable is the ratio of Repurchase in Payout-Increasing Firms, in which, as the name indicates, we restrict ourselves to firms that perform either a repurchase or a dividend increase in a given year, in the spirit of Guay and Harford (2000). Results are very similar in the two cases, so we comment mostly using the results of Panel A.

The results of our basic specification in column 1 of Table 2 show that Investor Turnover affects positively the share of repurchases (coefficient t-statistic 6.21), providing evidence that a higher proportion of short-term investors is associated with a higher use of buybacks. Results for other variables are in line with previous literature. The use of a higher fraction of repurchases is associated with smaller firms (coefficient of Size is negative with t-statistic -8.44), firms with lower Operating Income (t-stat. -5.22) and more volatile cash flow (coefficient of Standard Deviation of Operating

Income is positive with t-stat. 3.69), and with worse previous stock performance (coefficient of Last 12 Month Return is negative with t-stat. -5.92). The coefficient of Institutional Holdings is not statistically significant (and in general does not have a consistent sign across specifications). Finally, repurchasing firms exhibit higher trading volume (t-stat. 4.17) but Illiquidity does not seem to affect the proportion of how much to payout in repurchases.

Column 2 presents estimation results of the Tobit model with the expanded set of control variables. Firms with higher Managerial Holdings repurchase relatively less (t-stat. -8.61), and firms in which executives receive more of their compensation in options repurchase relatively more (t-stat. 17.22). The latter result is consistent with findings of Fenn and Liang (2001) and Kahle (2000). Better governance also seems to be associated with more repurchases (t-stat. -21.09). This result differs from that of John and Knyazeva (2006) that report an insignificant coefficient in a similar type regression. Note also that, because of data availability for these corporate governance variables, the number of observations in this specification drops substantially relative to our basic specification.

To gauge the economic significance of our results, we first note that an increase in one standard deviation of Investor Turnover (equal to 0.076 from Panel 1 of Table A) corresponds to an decrease in investment horizon of 7 months relative to the sample average of 27 months.[15] Multiplying the marginal effect of 1.253 (from column 1 of Panel A) by 0.076, we get an increase in the share of repurchases in total payout of about 9.5%. This would represents an 26.1 percent increase in the payout share of the average repurchase, from 35.6% to 45.1%.

In columns 3 and 4 of Table 2, we use as main dependent variable the fraction of the firm's shares held by different types of investors classified according to their investment horizon. Recall that a High (Mid/Low) Turnover Investor is an institution on the top (mid/bottom) third in terms of overall portfolio turnover rate in a given year. The results show that the holdings of High Turnover Investors are strongly positively associated with the weight of repurchases in total payouts by firms (coefficient t-stat. 4.34 in column 3 of Panel A), while the holdings of Low Turnover Investors are negatively associated with repurchases (t-stat. -2.13). These results are robust across specifications in both Panel A and B. To gauge the significance of these effects, an increase of one standard deviation in IO of High Turnover Investors (0.074 from Table 1) would lead to an increase in the use of repurchases of $1.07 \times 0.072 = 7.9\%$. Simultaneously, a decrease in IO of Low Turnover Investors of one standard deviation (0.15 from Table 1) would lead to an increase in the use of repurchases of $-0.367 \times 0.15 = -5.5\%$.

[15] Adding 0.076 to the sample average of Investor Turnover of Panel A of Table 1 (0.221) gives a turnover of 0.296/2 = 14.8% per quarter, or 59.2% per year. This leads to an investment horizon of 12/0.59 = 20 months.

3.2. An Additional Test Based on Information Asymmetry

The Lucas and McDonald (1998) model predicts that the impact of a repurchase will be stronger in situations in which the asymmetry of information between the firm and the market is high. We test this prediction by computing for firms in the sample two proxies commonly employed to capture information asymmetry. The first is the firm-level Analyst Forecast Errors (AFE), the yearly average of the monthly forecast error in end-of-fiscal-year earnings per share (EPS). For every month we calculate the ratio (actual EPS – average forecast EPS) / average forecast EPS and average it over the year. The second is Dispersion of Opinion (DOP), the ratio between the standard deviation of analysts' EPS forecasts and the absolute value of the average EPS forecast. Based on these variables, we create two dummy variables that take the value of 1 if a firm is above the sample median in terms of AFE or DOP in a given year, and 0 otherwise. We call these High AFE and High DOP firms, respectively. We then interact these two dummy variables with Investor Turnover and insert them in our regression specification. The coefficient of these interactions allow us to understand if there is a differential impact of Investor Turnover in firms for which asymmetric information is highest. We also introduce in the specification the level of AFE and DOP to control for the level of asymmetric information surrounding the firm.

The results in columns 5 and 6 in Panel A of Table 2 indicate that the predictions of the model seem correct. Not only Investor Turnover is still positive and significant controlling for information asymmetry, but the interaction terms Investor Turnover × High AFE and Investor Turnover × High DOP are positive and statistically significant (t-stat 1.77 and 2.02, respectively). The results are stronger in Panel B, for the set of payout-increasing firms, with larger coefficients and stronger t-statistics (t-stat 3.52 and 2.76, respectively for Investor Turnover × AFE and Investor Turnover × DOP). Of the two proxies for asymmetric information, only DOP is positive and significant at the 10% level. We conclude that the evidence is in favor of our working hypothesis.

3.3. Investor Turnover and the Repurchase vs. Dividend Decision

This section focuses on the relation between investor horizon and the decision by firms of making a repurchase or increasing their dividend payout. We estimate a Probit regression

$$y^*_{2,t} = \alpha_2 + \beta_2 \times \text{Investor Turnover}_{t-1} + \gamma_2 \mathbf{X}_{t-1} + \varepsilon_t \qquad (4)$$

$$y_{2,t} = \begin{cases} 0 \text{ if } y^*_{2,t} \le 0 \\ 1 \text{ if } y^*_{2,t} > 0 \end{cases}$$

where y_2, the dependent variable, is an indicator variable that takes the value 1 if a firm makes an open market repurchase announcement and 0 if the firm announces an increase in dividends. **X** is again the matrix of control variables described in section 3.3.

Column 1 of Table 3 presents the results of estimating the Probit model under our basic specification. The coefficient of Investor Turnover is positive and highly significant (t-statistic 5.38). This suggests that firms held by short-term investors, when deciding whether to distribute cash through a repurchase or a dividend increase, do so proportionally more via a repurchase. The marginal effect of Investor Turnover (not shown in the table) is 0.342, implying that increase of one standard deviation in Investor Turnover represents an increase in the probability of a repurchase of around $0.342 \times 0.074 = 2.5\%$.[16] This is a 5.5 percent increase relative to the unconditional mean of likelihood of a repurchase (equal to 8,102/17,599 = 46% from Table 1). The estimates in column 2 that controls for executive compensation characteristics and firm governance yield similar results.

Columns 3 and 4 of Table 3 show that IO of High Investor Turnover has a positive and significant loading (t-stat. 5.53), and IO of Low Investor Turnover has a negative and significant loading (t-stat. 2.53). In terms of marginal effects (not shown in the table), the two variables mentioned have derivatives of 0.34 and -0.12 respectively. This implies that an increase of one standard deviation in IO of High Turnover Investors leads to an increase in the probability of repurchases by $0.34 \times 0.072 = 2.8\%$. Simultaneously, a decrease in IO of Low Turnover Investors of one standard deviation (0.15 from Table 1) would lead to an increase in the use of repurchases by $-0.12 \times 0.15 = 1.8\%$.

The coefficients of the other explanatory variables are in line with previous literature. The probability of a repurchase is negatively associated with firm size, albeit not in every specification. Variables reporting consistently significant results across all specifications are Operating Income (negative correlation with choosing a repurchase), Standard Deviation of Operating Income (positive correlation with choosing a repurchase), Last 12 Month Return (negative correlation), and Last 12 Month Share Turnover (positive correlation).

Finally, columns 5 and 6 repeat the test suggested in section 4.2 by including interaction terms between Investor Turnover and proxies that capture high information asymmetry. We find that these interactions are positive and statistically significant (t-statistic 3.19 in the case of Investor Turnover × High AFE and t-statistic 3.90 in the case of Investor Turnover × High DOP). Hence the impact of Investor Turnover on the payout decision is stronger for firms characterized by stronger information asymmetries. The evidence is once again consistent with our hypothesis.

[16] All marginal effects in this paper are evaluated using the sample average of the individual marginal effects.

3.4. Shareholder Investment Horizons and the Market Reaction to Repurchase Announcements

The final prediction of our hypothesis concerns the relation between Investor Turnover and the market's abnormal returns around repurchase program announcements. We adopt a cross-sectional event-study framework and run the following regression model

$$\text{CAR}_t = \alpha_3 + \beta_3 \times \text{Investor Turnover}_{t\text{-}1} + \gamma_3 \mathbf{X}_{t-1} + \varepsilon_t \quad (5)$$

where the dependent variable is the cumulative abnormal return over the daily window (-1, +1) around the announcement of an open market repurchase. **X**, the matrix of control variables, is similar to the one employed in previous specifications but now also includes the size of the repurchase as an additional control.

The results are reported in Table 4. Column 1 shows that the coefficient of Investor Turnover is negative and statistically significant (coefficient -0.037, t-statistic -2.29). In terms of economic significance, an increase of investor turnover of one standard deviation reduces the abnormal return by -0.037 × 0.074 = -0.27%, a decrease of 14 percent relative to the sample average of 2.0% cumulative abnormal return. This result is robust across the different specifications reported in the table. Columns 3 and 4 show that the effect of Investor Turnover seems mostly coming from the set of investors with particularly High Turnover. The coefficient of IO of High Turnover Investors is negative and strongly significant (coefficient -0.073, t-statistic -6.49). The impact of a one standard deviation increase of ownership by these investors would reduce the abnormal return by -0.073 × 0.072 = -0.52%, or 26 percent relative to the sample average CAR.

Regarding the other variables of interest, Size of Repurchase is strongly positive and statistically significant across all specifications. It is worth noting that the coefficient on the Institutional Ownership is negative and statistically significant in all but one model. This result confirms the evidence of Amihud and Li (2006) who find that higher institutional ownership seems to be associated with lower signaling power of payout policy announcements. Other variables that have significant results in most specifications include Size (negative correlation with abnormal announcement returns), prior stock returns (negative correlation) and Illiquidity (positive correlation).

Finally, columns 5 and 6 present results conditioning on the level of information asymmetry. The coefficient estimates of the interaction terms Investor Turnover × High AFE and Investor Turnover × High DOP are positive and statistically significant. Taking the first of the interactions as an example, the results in column 5 show that the effect of Investor Turnover is dampened by about 40% relative to the point estimate of Investor Turnover alone (0.021/0.053). If there is a lot of uncertainty surrounding the firm, the market will adjust its valuation by relatively more conditional on the horizon of the firm's investors. This is what Lucas and McDonald would predict. Surprisingly the results show that the level of asymmetric information (that is, the level of AFE and the level of DOP) does not seem

to matter. However the strong statistical significance of Illiquidity might mean that this variable is picking up the level of adverse selection implicit in stock prices.

4. Robustness Checks

4.1. Investment Horizons and the Absolute Level of Payout

Our first robustness check addresses the issue of whether our findings hold for the level (and not only the proportion) of repurchases. For this purpose we estimate an OLS regression of the level of both repurchases and dividends on Investor Turnover and our set **X** of control variables:

$$y_{4,t} = \alpha_4 + \beta_4 \times \text{Inv.Turnover}_{t-1} + \gamma_4 \mathbf{X}_{t-1} + \varepsilon_t \quad (6)$$

In our implementation of y_4 we take logarithms of the levels of payout to accommodate the skewness exhibited by these variables and discussed in section 3.4.

Table 5 presents the results. In columns 1 to 3, the dependent variable is the log of (1 + Repurchases Amount). The results show that Investor Turnover is positive and statistically significant (coefficient 0.312, t-stat. 2.19). The estimate in the extended specification is larger, but of similar statistical significance (coefficient 1.068, t-stat. 2.03). Finally, the impact of the fraction of shares held by High Turnover Investors is positive and significant at the 10% level (coefficient 0.689, t-stat. 1.66).

These results are in marked contrast with those of columns 4 to 6, in which the dependent variable is the log of (1 + Dividend Amount). The coefficients of Investor Turnover are negative and strongly significant (coefficient -0.888, t-stat. -7.84 in the basic specification). Column 6 shows that the presence of High Turnover and Mid Turnover investors is negatively associated with dividend payouts but the presence of Low Turnover investors is associated with larger dividend payouts (coefficient 0.504, t-stat. 2.20). We conclude that the investment horizon of shareholders affects payouts in the direction predicted by our hypotheses.

4.2. Causality Analysis

The results in section 4 establish a link between investor horizon and repurchase policy. One potential objection to our interpretation of these findings is that the causality might run from payout policy to the investment horizons of shareholders. The model of Allen, Bernardo, and Welch (2000) predicts that firms will choose their payout policy to attract certain types of shareholders, namely those that can provide monitoring benefits. Gaspar, Massa, and Matos (2005) and Chen, Harford and Li (2007) provide evidence in the context of M&A deals consistent with the monitoring abilities of long-term

shareholders. Hence one possibility is that dividend-paying institutions attract long-term investors while firms that distribute cash via a repurchase attract short-term shareholders.

To address this issue, we run a test of causality between the choice of payout policy (Share of Repurchase to Total Payout) and Investor Turnover. We estimate

$$\text{Share of Repurchases}_{t} = \alpha_5 + \beta_5 \times \text{Inv.Turnover}_{t-1} + \phi_5 \text{Share of Repurchases}_{t-1} + \gamma_5 \mathbf{X}_{t-1} + \varepsilon_t \quad (7)$$

$$\text{Inv.Turnover}_{t} = \alpha_6 + \beta_6 \times \text{Inv.Turnover}_{t-1} + \phi_6 \text{Share of Repurchases}_{t-1} + \gamma_6 \mathbf{X}_{t-1} + \varepsilon_t \quad (8)$$

which is essentially a panel vector-autoregressive (VAR) regression (e.g. Holtz-Eakin, Newey, and Rosen, 1988). We use the generalized-method-of-moments dynamic panel data estimator of Blundell and Bond (1998) to accommodate endogeneity of the lagged endogenous variables inherent in our specification.[17] Equations (7) and (8) are estimated in differences, using as instruments the levels and differences of the endogenous variables (lags 2 to 4) and the differences of all other control variables in the **X** matrix. The Sargan test of over-identifying restrictions is reported along with our results to ensure that the instruments are appropriately chosen.

To save space, Table 6 presents our results focusing only on the parameter estimates of the endogenous variables. In Panel A the endogenous variable related to repurchases is the Share of Repurchases in Total Payout, while in Panel B it is the Share of Repurchases in Payout-Increasing Firms. In both panels the estimates in columns 1 and 2 employ our basic specification, while estimates in columns 3 and 4 employ our extended specification.

Results indicate that the causality runs from investor characteristics to payout policy rather than the other way around. Focusing on columns 1 and 2 of Panel A, the lagged Share of Repurchases variable is strongly statistically significant in the Share of Repurchases equation (coefficient 0.403, t-stat. 16.77), but Investor Turnover is also positive and statistically significant (coefficient 0.511, t-stat. 2.08). In contrast, in the Investor Turnover equation the lagged value of Investor Turnover is significant (coefficient 0.143, t-stat. 2.14) but not the lagged value of the payout policy variable. Panel B reports similar estimates in the set of payout-increasing firms. These results support the interpretation that it is investor horizons that affects the relative use of buybacks or dividends and not the opposite.[18]

Our findings stand somewhat in contrast with Grinstein and Michaely (2005), who find that repurchases attract total institutional ownership (even though dividends do not) and that institutions do not cause changes in payout. Besides methodological and sample differences, our results make the

[17] Another advantage of this estimator is that it accommodates high persistence in the dependent variable, which is a pronounced feature of payout variables.

[18] Similar results are found if we use the fraction of the shares held by each type on investor (that is, High, Mid or Low Turnover) instead of Investor Turnover.

point that institutions are not homogeneous and that investment horizon differences seem to play a role in payout in ways consistent with theory. Both our papers, however, share the conclusion that the evidence seems inconsistent with the predictions of the Allen, Bernardo and Welch (2000) model (in that causality seems to run from ownership to payout policy and not the other way around). This conclusion is of course predicated on the belief that the impact of payout policy on ownership should be observed within a period of one year.[19]

4.3. Sample Selection Issues

Our main hypotheses derived from the Lucas and McDonald (1998) model are applicable to positive payout firms, for which the main decision is how to distribute cash to shareholders. However our focus on a sample of firms with positive payouts begs the question of whether we might face a sample selection problem. If Investor Turnover affects the likelihood of a payout being observed in the first place, the estimates presented so far might suffer from sample selection bias. In this subsection we replicate our results using a two-stage Heckman methodology to correct for sample selection. We present the results of the second stage estimation only. Section 5 discusses the characteristics and estimation results of the first-stage selection equation across all firms (those with positive payout and those with zero payouts).

We estimate several models of the type

$$z_t^* = \alpha_7 + \beta_7 \times \text{Investor Turnover}_{t\text{-}1} + \gamma_7 \mathbf{X}_{t-1} + \delta_7 \mathbf{W}_{t-1} + \eta_t \tag{9}$$

$$y_{8,t} = \alpha_8 + \beta_8 \times \text{Investor Turnover}_{t\text{-}1} + \gamma_8 \mathbf{X}_{t-1} + \sigma_8 \lambda + \varepsilon_t \tag{10}$$

$$y_{8,t} = \begin{cases} \text{unobserved} & \text{if } z_t^* \le 0 \\ y_{8,t} & \text{if } z_t^* > 0 \end{cases}$$

where the dependent variable y_8 refers to the different left-hand side variables of interest analyzed in section 3. The latent variable z^* in the selection equation (5) determines whether y_8 is observed. The parameter λ in the outcome equation (6) refers to Heckman's (1979) "Lambda" that corrects for sample selection, and the standard errors of the second stage must be corrected accordingly to account for the fact that λ is a generated regressor. To help towards model identification, we supplement the matrix of control variables **X** with another set of variables **W** that we postulate to be correlated with selection but not with observed outcomes. We use two variables: Sales Growth, the average of the past three years' percentage change in sales; and Log of Firm Age, the (lagged) natural logarithm of the time in years since the firm first enters the COMPUSTAT database. Our rationale is that both of these

[19] Grinstein and Michaely (2005) test explicitly for periods longer than one year by choosing the right lag *m* in their dynamic regressions. They report that a lag *m* = 1 seems to better fit the data.

variables reflect the degree of maturity of the firm, which is an important determinant of whether the firm will initiate payouts (e.g. Grullon, Michaely and Swaminathan, 2002).

Table 7 presents the results of the second stage (that is, outcome equation), for our three main results. Columns 1 and 2 of Table 7 replicate columns 1 and 2 of Panel A of Table 2; columns 3 and 4 replicate columns 1 and 2 of Table 3; and columns 5 and 6 replicate columns 1 and 2 of Table 4.[20]

The results of column 1 and 2 show that the coefficient of Investor Turnover is positive and significant in both specifications, although the magnitude of the coefficients is lower relative to Table 2 (for example, the sample-selection adjusted estimate in the basic specification is 0.71 in column 1 of Table 7 versus 1.25 in Table 2). We think at least part of this decrease in magnitude is explained by the fact that we run the outcome equation as an OLS (albeit with corrected standard errors), not taking into account the censoring of the Share of Repurchases variable (an inspection of all other variables' coefficients indicates that the point estimates are uniformly lower in absolute value). Concerning other variables, Standard Deviation of Operating Income and Last 12 Month Share Turnover are strongly positively correlated with the proportional use of repurchases. Interestingly the Size variable changes sign and the sample-selection adjusted estimate is strongly positive.

Columns 3 and 4 also support our previous findings. The coefficient of Investor Turnover is positive and strongly statistically significant in both specifications, with somewhat larger point estimates than those of Table 3. Results for other variables are similar, apart from Last 12 Month Return which changes sign.

Finally, columns 5 and 6 also show a negative and statistically significant impact of Investor Turnover on the market's reaction to the repurchase announcement. The point estimates are again slightly larger; as an example, the coefficient of Investor Turnover in column 5 (-0.055, t-stat. -3.85) implies a reduction of the abnormal return by $-0.055 \times 0.074 = -0.4\%$, a decrease of 20 percent relative to the sample average of 2.0% cumulative abnormal return. The results for the remaining variables are similar, with the Size of Repurchase having a strongly positive influence on the market's reaction. Overall, we conclude that our results are not driven, and are robust to, sample-selection issues.

5. Evidence including Non-Paying Firms

5.1. Likelihood of Payout

Our working hypotheses focused so far exclusively within the set of 'payers', or firms that report positive payouts. However, there might be reasons why investor horizon might affect the decision of 'non-regular payers' to pay in a given year, or for 'non-payers' to initiate cash distributions if they have

[20] The first-stage results can be found in column 5 of Panel A of Table 8.

not done so in the past. Focusing on these firms sets us outside the Lucas and McDonald model, however, because now the firm's decision of how to distribute is mingled with the decision whether to distribute. In particular, agency problems probably play a much bigger role in this sample.

We estimate a Probit specification in the set of firm-year observations that have non-missing values for all the control variables in our basic specification. As explained in section 5.3, we add two further variables that influence the decision to initiate regular payouts: Sales Growth, the average of the past three years' percentage change in sales; and Log of Firm Age, the (lagged) natural logarithm of the time in years since the firm first enters the COMPUSTAT database. Our rationale is that both of these variables reflect the degree of maturity of the firm (e.g. Grullon, Michaely and Swaminathan, 2002).

Panel A of Table 8 present the results of the Probit estimation. The dependent variable in column 1 and 2 is a dummy variable that takes the value of 1 if a firm performs a share repurchase in a given year, and 0 otherwise. In columns 3 and 4 the dependent variable is a dummy variable that takes the value of 1 if a firm pays a dividend, and 0 otherwise. Finally, in columns 5 and 6 the dependent variable is a dummy variable that takes the value of 1 if a firm has a positive payout, and 0 otherwise. The specification in column 5 is essentially the first stage of the Heckman model presented in section 5.3.

Column 1 indicates that Investor Turnover is positively associated with repurchase activity (coefficient 0.431, t-stat. 3.05). The comparative statics reveals however that the effect is small: the marginal effect (not reported) is 0.067, implying that a one standard deviation increase in Investor Turnover increases the likelihood of a repurchase in the sample by 0.5% (compared to an unconditional repurchase frequency of 26%).[21] The results for the different subsets of investors explain why this is the case. The coefficient of IO of High Turnover Investors is positive and significant, but the IO of Low Turnover Investors is also positive and significant. Hence both short-term and long-term investors are associated with repurchases in this sample, in contrast with our findings in Table 3.

One explanation for these results is that agency considerations play a greater role in non-paying firms than in the set of firms with positive payouts. Hence long-term investors with monitoring abilities will push for cash distributions independently of whether they are repurchases or dividends.

The results in the remaining columns seem to confirm this conjecture. Column 4 shows that the impact of the holdings of Low Turnover Investors on dividend payout is strongly positive and significant (coefficient 0.82, t-stat. 5.61). Column 6 indicates that the impact of the holdings of Low Turnover Investors on choosing a positive payout is also strongly positive and significant (coefficient 0.783, t-stat. 7.32). In both cases the impact of short-term investors is negative and significant.

[21] The standard deviation of Investor Turnover in this larger sample is 0.094.

In summary, in the larger sample Investor Turnover is still positively associated with repurchases and negatively associated with dividends. However long-term investors seem to be associated with higher frequency of distributions, independently of the way they are made. This is consistent with the possible monitoring role of long-term oriented shareholders.

5.2. Payout initiation

Panel B of Table 8 repeats the same exercise but now we focus on the firm's decision whether to initiate a distribution. Columns 1 and 2 present estimation results in which the dependent variable is a dummy variable equal to 1 in the first year that a firm announces a repurchase, and 0 otherwise. In columns 3 and 4 the dependent variable is a dummy variable that takes the value of 1 in the first year that a firm announces a dividend, and 0 otherwise.[22]

The results show that Investor Turnover is positively associated with the likelihood that the firm makes a repurchase for the first time (coefficient 0.431, t-statistic 3.05). This result is due to the positive impact of the holdings of short-term (that is, High Turnover) investors. In contrast, columns 3 and 4 indicate that the decision to initiate a dividend seems unrelated to investor horizon. Neither Investor Turnover nor the holdings of the different investor groups are statistically significant.

Taken together, the results from this section indicate that the presence of short-term oriented investors induces firms to initiate or make repurchases. At the same time, short-term investors are associated with lower use of dividends both for regular and non-regular payers. Long-term shareholders seem to play a role in guaranteeing that firms continue to distribute cash once they start doing so, and their presence seems to be associated with payouts independently of the way non-regular payers choose to make their distributions.

6. Conclusion

We test the hypothesis that short-term oriented investors have a preference for payout in the form of repurchases when a firm is deciding how to distribute cash to their shareholders.

Using institutional ownership data we construct proxies for shareholders' investment horizons based on the frequency with which investors rotate their overall stock portfolios. We then relate these proxies of investors' horizons to payout policy choices and the market reaction to repurchase announcements. Our results show that firms whose ownership structures are characterized by more short-term oriented investors use a higher proportion of repurchases in their payouts. They also choose

[22] To estimate the repurchase or dividend initiation, we ignore the first year in which the firm enters the sample. This makes the number of observations drop slightly relative to Panel A.

to perform repurchases more often (rather than increasing their dividend payouts). When such firms announce a repurchase, the market attributes lower positive signaling value to a repurchase by a firm mostly held by short-term institutions.

All these findings are consistent with a signaling model in which undervalued firms signal their worth to the market by making a repurchase. Potentially overvalued firms pay dividends more often because it is never in their shareholders' interest to repurchase overvalued shares. However short-term shareholders only care about the short-term price reaction, because they will be selling their shares. They therefore put pressure on managers to make a repurchase. The market recognizes this and attributes a lower valuation change to repurchasing firms held by short-term investors (Lucas and McDonald, 1998). The effect is stronger for firms characterized by stronger information asymmetries.

We present conduct several robustness tests. We find similar patterns when looking at the level (rather than the composition) of payout, and when we adjust our estimates for potential self-selection. We also find that reverse causality does not seem to be driving our results.

Although our analysis focuses on regular payers (the natural setting to test Lucas and McDonald, 1998), we also perform tests in an extended sample that includes non-regular and non-paying firms. We find that short-term investors are associated with initiating or making a repurchase, while long-term investors are associated with positive payouts independently of their form. This is consistent with the notion that long-term investors have monitoring abilities (Gaspar, Massa, and Matos, 2005; Chen, Harford and Li, 2007).

Our paper contributes to the growing literature on the impact of shareholder horizons on an array of corporate policies. We also qualify and extend the literature on the relation between institutional ownership and dividend policy. We show that different categories of investors have a differential impact of the form-of-payout choice. This might explain why prior tests involving the level of institutional ownership might not find a significant impact of ownership on payout policy (Grinstein and Michaely, 2005).

Our findings imply that shorter horizons might be one contributing factor to the increased popularity of buybacks as a way for firms to make distributions. In the last three decades, institutional investors' share of the equity market has increased substantially. Simultaneously, there is evidence of a reduction in the average investment horizon of institutions (Bogle, 2003). The evidence presented in this paper is consistent with investment horizon playing a role in the shift from payouts in the form of dividends to payouts in the form of share buybacks (Fama and French, 2001; Grullon and Michaely, 2002). This is an exciting avenue for future research.

Appendix

This appendix describes in detail the construction of the variables used in our study.

Repurchases Amount is the annual dollar value of repurchases from COMPUSTAT (data item PRSTKC). We retain only values for firm-years in which there is an announcement of an open market repurchase in the SDC database in the current or any of the previous two years (Jagannathan et al., 2000). We exclude the year 1987 (e.g. Ikenberry, Lakonishok and Vermaelen, 1995; Grullon and Michaely, 2002). The SDC data contains the necessary announcement dates for the announcement return regressions (we exclude the last quarter of 1987 for announcement data). Dividends Amount is the dollar amount of dividends from Compustat (item DVC). To gather data on announcement dates corresponding to changes in dividend policy, we use the CRSP monthly files and keep all events with CRSP declaration codes equal to 1232 (ordinary quarterly dividends) with non-missing declaration dates. Following Amihud and Li (2006) we take only those dividend increases where the change in the dividend per share amount is at least 0.5%. Total Payout is the sum of the dollar amounts of dividends and repurchases (PRSTKC+DVC). Share of Repurchases in Total Payout is the dollar amount of repurchases divided by Total Payout. Dividend Increase is the positive change in Dividend Amount per share times the number of shares outstanding (item CSHO). Share of Repurchases in Payout Increasing Firms is the ratio between Repurchases Amount and the sum (Repurchases Amount + Dividend Increase).

We use the ThomsonReuters Spectrum 13F database to calculate variables related to institutional owners. Investor Turnover in company *k* is calculated in two steps. Denoting by *Q* the set of companies held by investor *i*, the turnover rate *TR* of investor *i* at quarter *t* as

$$TR_{i,t} = \frac{\sum_{k=1}^{Q} \left| N_{k,i,t} P_{k,t} - N_{k,i,t-1} P_{k,t-1} - N_{k,i,t-1} \Delta P_{k,t-1} \right|}{\sum_{k=1}^{Q} \frac{N_{k,i,t} P_{k,t} + N_{k,i,t-1} P_{k,t-1}}{2}}$$

where $P_{k,t}$ and $N_{k,i,t}$ represent the price and the number of shares, respectively, of company *k* held by institutional investor *i* at quarter *t*. Investor Turnover for company *k* is the weighted average of the average turnover rates over the previous 4 quarters of all its institutional investors:

$$\text{Investor Turnover} = \sum_{i \in K} w_{k,i,t} \left(\frac{1}{4} \sum_{r=1}^{4} TR_{i,t-r-1} \right)$$

where *K* is the set of shareholders in company *k*, and $w_{k,i,t}$ is the weight of investor *i* in the total percentage held by institutional investors at quarter *t* in company *k*. Institutional Ownership (IO) is the ratio of a firm's shares held by institutional investors relative to total shares outstanding. IO of High

(Mid/Low) Turnover Investors is the fraction of a firm's shares held by investors in the top (middle/bottom) 33rd percentile of the investor's turnover rates over the previous 4 quarters.

Unless otherwise stated, all other accounting variables are equal-weighted moving averages constructed from the values of the variables in the past three years. Size is measured by the log of total assets (item AT). Market-to-Book Ratio is the ratio of the market value of equity at the end of the fiscal year (the product of items PRCC_F × CSHO) to book value of equity (item CEQ). Debt-to-Equity Ratio is the ratio of long term debt (item DLTT) to the book value of equity (item CEQ). Operating Income is the ratio of operating income (item OIBDP) to total assets (item AT) and Non-Operating Income is the ratio of non-operating income (item NOPI) to total assets. Standard Deviation of Operating Income is the standard deviation of the ratio of operating income to the total assets measured over the past five years. Prior Payout Ratio is the ratio of total dividends (item DVC) to net income available to common shareholders (item IBCOM). Liquid assets are measured as current assets (item ACT) minus current liabilities (item LCT) divided by total assets (item AT).

We use CRSP to calculate variables related to stock market performance. Last 12 Month Stock Return is the compounded monthly return for the previous year. Last 12 Month Share Turnover is the sum of the trading volume over the previous year divided by the number of shares outstanding. Illiquidity is the yearly average of the daily ratio between a stock's absolute return and its dollar volume, averaged over all days in the month with non-zero volume:

$$ILLIQ_{k,s} = \frac{1}{Days_{k,s}} \sum_{d=1}^{Days_{k,s}} \frac{\left|R_{k,s,d}\right|}{DVol_{k,s,d}}$$

where $Days_{k,s}$ is the number of valid observation days in year s, and $R_{k,s,d}$ and $DVol_{k,s,d}$ are, respectively, the daily return and dollar volume of stock k on day d of year s. The ratio is rescaled by a factor of 10^6. We use the I/B/E/S Summary Files to calculate variables related to analyst coverage. Number of Analysts is the average number of analysts covering a stock during a year. In what follows we use forecasts for the end-of-fiscal-year earnings per share (EPS). Analyst Forecast Error (AFE) is the yearly average of the monthly calculation (actual EPS – average forecast EPS) / average forecast EPS. Dispersion of Opinion (DOP) is the ratio between the standard deviation of analysts' EPS forecasts and the absolute value of the average EPS forecast. We define indicator variables called High AFE (High DOP) that take the value of 1 if the firm's AFE (DOP) is above the sample median in a given year, and 0 otherwise.

NBER Tax Disadvantage of Dividends is calculated as the difference between the average marginal dividend income tax rate and the long-term capital gain tax rate in the NBER TAXSIM Model. We use COMPUSTAT's ExecuComp Database to obtain data on executive remuneration. Managerial Holdings is the sum of the shares owned excluding options (item SHROWN_EXCL_OPTS) by the top five executives of each company divided by the number of

shares outstanding (item CSHO from COMPUSTAT). Manager Stock Options is the ratio of the value of option compensation (OPTION_AWARDS_BLK_VALUE) to total compensation (item TDC1) for the top five executives of each company. GIM Governance Index is the Gompers, Ishii and Metrick (2003) index of shareholder rights based on 24 governance factors provided by the Investor Responsibility Research Center. A higher score of the GIM index denotes lower quality of governance.

In the announcement returns analysis, the Cumulative Abnormal Return (CAR) for the daily window (-1, +1) is obtained from Eventus using the CRSP Value-Weighted Index excluding dividends. The parameter estimation window ranges from -110 to -11 days with a minimum of 50 days of trading required. Repurchase Size is equal to SDC's percentage of firm's shares sought in the transaction (item PSOUGHT) if that item is not missing. Otherwise it is estimated as the ratio between the dollar repurchases (item PRSTKC) and the average stock price (item PRCC_F) over the firm's current and previous fiscal years, itself divided by the previous year's shares outstanding (item CSHO).

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Table 1
Summary Statistics

This table presents summary statistics for the sample used in this study. Our main source is the CRSP-COMPUSTAT Merged database, that contains firm-level annual data on dollar payouts for US listed firms during the period 1984-2008. We exclude regulated utilities, financial firms, and firms which have a share code in CRSP different from 10 or 11. This data is complemented by two datasets of announcements of changes in payout policy. The first is the Securities Data Corporation (SDC) database of open market repurchase program announcements. We take all open market repurchase announcements from the SDC database and collect the dollar value of repurchases from COMPUSTAT for only those years in which there was an announcement in SDC in that year or in one of the previous two years (Jagannathan et al., 2000). We exclude the year 1987 for firm year observations and the last quarter of 1987 for announcement data (e.g. Ikenberry, Lakonishok and Vermaelen, 1995; Grullon and Michaely, 2002). The second is the CRSP Monthly Stocks event file of dividend announcements. We keep all events with CRSP declaration codes equal to 1232 (ordinary quarterly dividends) with non-missing declaration dates. Following Amihud and Li (2006) we take only those dividend increases where the change in the dividend per share amount is at least 0.5%.

Panel A presents the summary statistics data for our firm-level panel (please refer to the Appendix for full details on variable construction). Our sample is composed of firms reporting positive payouts. Repurchases (Dividends) Amount is the annual dollar value of repurchases (dividends) in millions of USD. Total Payout is the sum of dividends plus repurchases. Share of Repurchases in Total Payout is the ratio of Repurchases Amount to Total Payout. Dividend Increase is the dollar positive change in Dividend Amount. Share of Repurchases in Payout Increasing Firms is the ratio between Repurchases Amount and the sum (Repurchases Amount + Dividend Increase). Investor Turnover is the lagged weighted average of the portfolio turnover of the firm's institutional investors over the four quarters of a year, calculated following Gaspar, Massa, and Matos (2005). Institutional Ownership (IO) is the lagged fraction of the firm's shares held by institutional investors. IO of High (Mid/Low) Turnover Investors is the lagged fraction of a firm's shares held by investors in the top (middle/bottom) 33rd percentile of institutional investor's turnover rates. Unless otherwise noted, all accounting variables are equal-weighted moving averages constructed from the values of the variables in the past three years. Size is the log of total assets. Market-to-Book Ratio is the ratio of market value of equity to book value of equity. Debt-to-Equity Ratio is the ratio of long term debt to book equity. (Non-)Operating Income is the ratio of (non-)operating income to total assets. Standard Deviation of Operating Income is the standard deviation of the ratio of operating income to total assets measured over the past five years. Prior Payout Ratio is the ratio of total dividends to net income. Liquid assets are current assets minus current liabilities divided by total assets. Last 12 Month Stock Return is the compounded stock return for the previous year. Last 12 Month Share Turnover is the sum of the trading volume over the previous year divided by the number of shares outstanding. Illiquidity is the lagged yearly average of the daily ratio between a stock's absolute return and its dollar volume (Amihud 2002). Number of Analysts is the lagged average number of analysts covering a stock during a year. NBER Tax Disadvantage of Dividends is the difference between the average marginal dividend income tax rate and the long-term capital gain tax rate in the NBER TAXSIM Model. Managerial Holdings is the fraction of shares owned (excluding options) by the top five company executives. Manager Stock Options is the ratio of the value of option compensation to total compensation for the top five company executives. GIM Governance Index is the Gompers, Ishii and Metrick (2003) index of shareholder rights.

Panel B shows the summary statistics around announcements of payout changes (repurchases and dividend incrreases). The Cumulative Abnormal Return (CAR) for the daily window (-1, +1) is measured against the CRSP value-weighted index. Repurchase Size is equal to SDC's percentage of firm's shares sought in the transaction if that item is not missing. Otherwise it is estimated as the ratio between the dollar repurchases and the average stock price over the current and past year, divided by the previous year's shares outstanding. All other variables are defined as before. The symbols ***,**,* denote significance levels of 1%, 5% and 10%, respectively, for the t-test (rank sum test) that the means (medians) are equal across the two sub-samples.

Table 1 (cont.)
Summary Statistics

Panel A: Summary statistics, firm-year observations

Variable	N	Mean	Std. Dev.	Q1	Median	Q3
Repurchases Amount	25,182	54.544	259.700	0	0.023	9.803
Dividend Amount	25,182	41.639	145.245	0.350	5.151	25.271
Total Payout	25,182	96.184	332.307	3.033	11.852	52.938
Dividend Increase	25,182	5.987	56.518	0	0.100	1.605
Share of Repurchases in Total Payout	25,182	0.356	0.437	0	0	0.906
Share of Rep. in Payout Increasing Firms	22,482	0.483	0.483	0	0.386	1.000
Investor Turnover	25,182	0.221	0.076	0.168	0.208	0.257
Institutional Ownership (I.O.)	25,182	0.514	0.236	0.335	0.522	0.690
I.O. of High Turnover Investors	25,182	0.093	0.074	0.041	0.076	0.126
I.O. of Medium Turnover Investors	25,182	0.161	0.103	0.083	0.149	0.224
I.O. of Low Turnover Investors	25,182	0.230	0.150	0.111	0.209	0.329
Size	25,182	6.206	1.641	4.989	6.129	7.384
Market-to-Book Ratio	25,182	3.023	3.982	1.477	2.156	3.286
Debt-to-Equity Ratio	25,182	0.602	1.851	0.068	0.318	0.678
Operating Income	25,182	0.161	0.091	0.114	0.156	0.204
Non-Operating Income	25,182	0.010	0.014	0.002	0.007	0.016
Std. Dev. Of Operating Income	25,182	0.040	0.042	0.017	0.029	0.049
Liquid Assets	25,182	0.266	0.197	0.114	0.249	0.396
Prior Payout Ratio	25,182	0.549	27.009	0	0.172	0.372
Last 12 Months' Return	25,182	0.168	0.533	-0.118	0.098	0.352
Last 12 Months' Share Turnover	25,182	1.262	1.403	0.474	0.828	1.534
Illiquidity	25,182	0.287	1.216	0.002	0.016	0.118
Number of Analysts	25,182	8.614	7.576	3.000	6.000	12.000
NBER Tax Disadvantage of Dividends (%)	25,182	-5.223	5.228	-9.695	-1.799	-1.185
Managerial Holdings	11,594	0.042	0.091	0.002	0.008	0.032
Managerial Stock Options	10,005	0.280	0.214	0.111	0.253	0.420
GIM Governance Index	12,916	9.404	2.755	7.000	9.000	11.000

Table 1 (cont.)
Summary Statistics

Panel B: Summary statistics for firms announcing payout changes

Variable	All event firms						Repurchasing firms			Dividend-increasing firms				
	N	Mean	Std. Dev.	Q1	Median	Q3	N	Mean	Median	N	Mean		Median	
Investor Turnover	17,599	0.216	0.071	0.167	0.205	0.250	8,102	0.262	0.246	9,497	0.244	***	0.228	***
Institutional Ownership (I.O.)	17,599	0.544	0.224	0.384	0.554	0.706	8,102	0.573	0.590	9,497	0.519	***	0.529	***
I.O. of High Turnover Investors	17,599	0.094	0.072	0.044	0.078	0.126	8,102	0.224	0.211	9,497	0.208	***	0.200	***
I.O. of Medium Turnover Investors	17,599	0.166	0.097	0.096	0.155	0.224	8,102	0.105	0.088	9,497	0.085	***	0.071	***
I.O. of Low Turnover Investors	17,599	0.252	0.150	0.137	0.236	0.352	8,102	0.175	0.166	9,497	0.158	***	0.148	***
Size	17,599	6.451	1.643	5.249	6.415	7.662	8,102	6.242	6.156	9,497	6.629	***	6.580	***
Market-to-Book Ratio	17,599	3.245	3.643	1.686	2.421	3.614	8,102	3.558	2.532	9,497	2.978	***	2.337	***
Debt-to-Equity Ratio	17,599	0.521	1.777	0.060	0.282	0.589	8,102	0.564	0.227	9,497	0.485	***	0.316	***
Operating Income	17,599	0.175	0.090	0.128	0.170	0.217	8,102	0.160	0.158	9,497	0.187	***	0.178	***
Non-Operating Income	17,599	0.010	0.013	0.002	0.007	0.015	8,102	0.010	0.007	9,497	0.010		0.007	
Std. Dev. Of Operating Income	17,599	0.036	0.039	0.015	0.026	0.044	8,102	0.044	0.031	9,497	0.030	***	0.023	***
Liquid Assets	17,599	0.264	0.194	0.117	0.247	0.389	8,102	0.288	0.267	9,497	0.244	***	0.232	***
Prior Payout Ratio	17,599	0.512	31.436	0	0.203	0.360	8,102	0.144	0	9,497	0.826		0.277	***
Last 12 Months' Return	17,599	0.230	0.522	-0.046	0.155	0.401	8,102	0.213	0.120	9,497	0.243	***	0.179	***
Last 12 Months' Share Turnover	17,599	1.290	1.353	0.489	0.849	1.579	8,102	1.725	1.198	9,497	0.918	***	0.664	***
Illiquidity	17,599	0.163	0.780	0.001	0.008	0.058	8,102	0.204	0.007	9,497	0.128	***	0.009	***
Number of Analysts	17,599	9.958	8.113	4.000	8.000	14.000	8,102	9.155	7.000	9,497	10.643	***	9.000	***
NBER Tax Disadvantage of Dividends	17,599	-4.738	4.942	-9.396	-1.744	-1.185	8,102	-4.531	-1.744	9,497	-4.914	**	-1.799	*
Managerial Holdings	8,859	0.039	0.086	0.002	0.007	0.029	4,317	0.009	0.002	4,001	0.010	*	0.002	
Managerial Stock Options	7,492	0.282	0.213	0.118	0.254	0.420	3,788	0.313	0.288	3,704	0.251	***	0.227	***
GIM Governance Index	9,736	9.481	2.758	8.000	10.000	12.000	4,662	9.142	9.000	5,074	9.793	***	10.000	***
Cumulative Abnormal Return (-1,+1)	17,599	0.011	0.064	-0.015	0.007	0.034	8,102	0.020	0.015	9,497	0.003	***	0.002	***
Size of Repurchase	8,073	0.068	0.080	0.026	0.050	0.089	8,073	0.068	0.050					

Table 2. Shareholder Investment Horizons and the Share of Repurchases in Payout

This table presents regression results of the relation between the share of payout in the form of repurchases and investor turnover. Our sample is composed of firms reporting positive payouts. We use Tobit regressions because our dependent variables are left- and right-censored in the interval [0,1]. In Panel A the dependent variable is the Share of Repurchases to Total Payout, the ratio of dollar repurchases to Total Payout (dividends plus repurchases). In Panel B the dependent variable is the Share of Repurchase in Payout-Increasing Firms, the ratio between Repurchases Amount and the sum (Repurchases Amount + Dividend Increase). Dividend Increase is the dollar positive change in dollar dividends. Our main independent variable of interest is Investor Turnover, the lagged weighted average of the portfolio turnover of the firm's institutional investors over the four quarters of a year, calculated following Gaspar, Massa, and Matos (2005). Please refer to the caption of Table 1 and the Appendix for definitions and details on the construction of all variables. Column 1 presents our basic specification and column 2 shows our extended specification. The latter has a much lower number of observations due to the fact that executive compensation data is only available after 1992 and the governance index is only available for a limited number of firms. Columns 3 and 4 repeat the analysis using as main independent variable the lagged fraction of a firm's shares held by investors in the top (middle/bottom) 33rd percentile of institutional investor's turnover rates. Columns 5 and 6 present results of interacting Investor Turnover with firms with High Analysts' Forecast Errors and High Dispersion of Opinion, respectively. Analyst Forecast Error (AFE) is the yearly average of the monthly (actual EPS – average forecast EPS) / average forecast EPS. Dispersion of Opinion (DOP) is the ratio between the standard deviation of analysts' EPS forecasts and the absolute value of the average EPS forecast. We define indicator variables called High AFE (High DOP) that take the value of 1 if the firm's AFE (DOP) is above the sample median in a given year, and 0 otherwise. Regressions include industry dummies and yearly dummies. Industries are defined using the Fama and French (1992) classification. We use standard errors clustered by firm to accommodate heteroscekedasticity and within-firm autocorrelation. T-statistics are reported in parentheses and the symbols ***, **, * denote significance at 1%, 5% and 10%.

Panel A: Dependent variable is Share of Repurchases in Total Payout												
	(1)		(2)		(3)		(4)		(5)		(6)	
Investor Turnover	1.253	***	1.182	***					1.399	***	1.517	***
	(6.21)		(14.91)						(6.78)		(6.95)	
IO of High Turnover Investors					1.07	***	0.646	***				
					(4.34)		(5.74)					
IO of Mid Turnover Investors					0.167		0.044					
					(0.91)		(0.61)					
IO of Low Turnover Investors					-0.367	**	-0.288	***				
					(-2.13)		(-5.72)					
Institutional Ownership (IO)	0.189		0.062	**					0.186		0.09	
	(1.37)		(2.29)						(1.34)		(0.78)	
Size	-0.199	***	-0.053	***	-0.186	***	-0.048	***	-0.187	***	-0.164	***
	(-8.44)		(-21.05)		(-7.86)		(-18.78)		(-7.96)		(-7.17)	
Market-to-Book Ratio	0.003		-0.005	**	0.004		-0.005	***	0.002		0.003	
	(0.57)		(-2.86)		(0.77)		(-2.83)		(0.45)		(0.50)	
Debt-to-Equity Ratio	0.012		-0.006	*	0.01		-0.006	*	0.012		0.007	
	(1.12)		(-1.91)		(0.93)		(-1.68)		(1.18)		(0.69)	
Operating Income	-1.478	***	0.327	***	-1.44	***	0.356	***	-1.399	***	-1.267	***
	(-5.22)		(3.80)		(-5.12)		(4.13)		(-4.87)		(-4.67)	
Non-Operating Income	2.202		2.493	***	2.08		2.392	***	1.829		2.031	
	(1.58)		(4.67)		(1.49)		(4.50)		(1.32)		(1.48)	
Std. Dev. Of Op. Income	2.53	***	1.636	***	2.482	***	1.62	***	2.481	***	1.778	***
	(3.69)		(6.15)		(3.64)		(6.07)		(3.58)		(3.12)	
Liquid Assets	0.361	**	0.349	***	0.363	**	0.352	***	0.346	**	0.367	**
	(2.43)		(7.78)		(2.46)		(7.81)		(2.36)		(2.51)	
Prior Payout Ratio	-0.005	**	-0.002	***	-0.005	**	-0.002	***	-0.005	**	-0.005	**
	(-2.22)		(-16.65)		(-2.24)		(-17.62)		(-2.21)		(-2.42)	
Last 12 Mths. Return	-0.131	***	-0.015	*	-0.134	***	-0.017	*	-0.146	***	-0.122	***
	(-5.92)		(-1.67)		(-6.03)		(-1.83)		(-6.64)		(-5.33)	
Last 12 Mths. Share Turnover	0.189	***	0.197	***	0.192	***	0.2	***	0.189	***	0.231	***
	(4.17)		(26.91)		(4.19)		(26.53)		(4.08)		(11.77)	
Illiquidity	0.01		-0.012	*	0.013		-0.018	***	0.013		0.037	
	(0.68)		(-1.90)		(0.86)		(-2.84)		(0.74)		(1.46)	
Number of Analysts	0.03	***	0.012	***	0.03	***	0.012	***	0.029	***	0.025	***
	(7.32)		(11.97)		(7.35)		(12.00)		(7.19)		(6.52)	
NBER Tax Disadv. of Div.			0.00				-0.006	***				
			(0.02)				(-2.96)					
Managerial Holdings			-0.458	***			-0.49	***				
			(-8.61)				(-9.34)					
Managerial Stock Options			0.667	***			0.668	***				
			(17.22)				(17.12)					
GIM Governance Index			-0.037	***			-0.036	***				
			(-21.09)				(-20.75)					
Inv. Turnover x AFE									0.189	*		
									(1.77)			
Analysts' Forecast Errors (AFE)									0.007			
									(1.02)			
Inv. Turnover x DOP											0.224	**
											(2.02)	
Dispersion of Opinion (DOP)											0.023	*
											(1.75)	
Intercept	1.411	***	0.563	***	1.676	***	0.817	***	1.301	***	1.128	***
	(6.24)		(29.38)		(7.47)		(42.36)		(5.81)		(5.03)	
Industry and time dummies	Yes		Yes		Yes		Yes		Yes		Yes	
N	25,182		8,774		25,182		8,774		24,511		21,378	
R-squared	0.18		0.14		0.18		0.14		0.18		0.19	

Panel B: Dependent variable is Share of Repurchases in Payout-Increasing Firms						
	(1)	(2)	(3)	(4)	(5)	(6)
Investor Turnover	1.882 ***	1.764 ***			1.441 ***	1.521 ***
	(6.22)	(15.13)			(4.69)	(4.65)
IO of High Turnover Investors			1.418 ***	0.686 ***		
			(3.99)	(4.17)		
IO of Mid Turnover Investors			0.134	-0.052		
			(0.50)	(-0.51)		
IO of Low Turnover Investors			-0.448 *	-0.685 ***		
			(-1.78)	(-9.46)		
Institutional Ownership (IO)	0.21	-0.127 ***			0.249	0.142
	(1.06)	(-3.22)			(1.25)	(0.83)
Size	-0.17 ***	0.003	-0.157 ***	0.012 ***	-0.162 ***	-0.14 ***
	(-5.15)	(0.75)	(-4.72)	(3.34)	(-4.89)	(-4.30)
Market-to-Book Ratio	0.004	-0.004 *	0.005	-0.004	0.005	0.004
	(0.53)	(-1.69)	(0.68)	(-1.58)	(0.60)	(0.47)
Debt-to-Equity Ratio	0.009	-0.025 ***	0.007	-0.024 ***	0.007	0.005
	(0.61)	(-5.06)	(0.47)	(-4.90)	(0.50)	(0.31)
Operating Income	-2.161 ***	0.503 ***	-2.119 ***	0.551 ***	-1.92 ***	-1.615 ***
	(-5.47)	(4.02)	(-5.38)	(4.39)	(-4.87)	(-3.95)
Non-Operating Income	3.431 *	3.248 ***	3.283 *	3.105 ***	3.43 *	4.352 **
	(1.73)	(4.10)	(1.65)	(3.94)	(1.71)	(2.07)
Std. Dev. Of Op. Income	4.983 ***	4.713 ***	4.921 ***	4.703 ***	4.678 ***	3.58 ***
	(5.04)	(11.22)	(4.98)	(11.16)	(4.81)	(3.83)
Liquid Assets	0.539 **	0.537 ***	0.541 **	0.548 ***	0.555 ***	0.574 ***
	(2.54)	(8.24)	(2.55)	(8.37)	(2.61)	(2.69)
Prior Payout Ratio	-0.001	0.003 ***	-0.001	0.003 ***	-0.001	-0.002
	(-0.33)	(19.35)	(-0.38)	(18.08)	(-0.33)	(-0.66)
Last 12 Mths. Return	-0.395 ***	-0.271 ***	-0.396 ***	-0.273 ***	-0.386 ***	-0.362 ***
	(-10.37)	(-18.48)	(-10.32)	(-18.29)	(-10.21)	(-9.38)
Last 12 Mths. Share Turnover	0.249 ***	0.281 ***	0.253 ***	0.285 ***	0.248 ***	0.303 ***
	(3.86)	(25.80)	(3.89)	(25.47)	(3.83)	(10.56)
Illiquidity	0.034	-0.063 ***	0.038 *	-0.071 ***	0.049 **	0.07 *
	(1.53)	(-6.79)	(1.69)	(-7.47)	(1.98)	(1.86)
Number of Analysts	0.028 ***	0.007 ***	0.028 ***	0.007 ***	0.028 ***	0.024 ***
	(4.83)	(4.80)	(4.85)	(4.83)	(4.89)	(4.42)
NBER Tax Disadv. of Div.		-0.008 **		-0.017 ***		
		(-2.41)		(-5.27)		
Managerial Holdings		-0.88 ***		-0.932 ***		
		(-11.57)		(-12.43)		
Managerial Stock Options		0.756 ***		0.752 ***		
		(13.35)		(13.20)		
GIM Governance Index		-0.043 ***		-0.043 ***		
		(-17.36)		(-17.05)		
Inv. Turnover x AFE					0.57 ***	
					(3.52)	
Analysts' Forecast Errors (AFE)					0.008	
					(0.80)	
Inv. Turnover x DOP						0.472 ***
						(2.76)
Dispersion of Opinion (DOP)						0.063 **
						(2.19)
Intercept	1.828 ***	0.508 ***	2.218 ***	0.868 ***	1.739 ***	1.503 ***
	(5.79)	(18.33)	(7.09)	(31.15)	(5.49)	(4.72)
Industry and time dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	22,482	7,940	22,482	7,940	22,338	19,648
R-squared	0.17	0.12	0.16	0.12	0.16	0.17

Table 3. Shareholder Investment Horizons and the Likelihood of a Repurchase

This table presents Probit regression results of the relation between the likelihood of a repurchase and investor turnover. Our sample is composed of firms reporting positive payouts. The dependent variable takes a value of 1 if a firm makes an open market share repurchase announcement and a value of 0 for a dividend increase announcement. Our main independent variable of interest is Investor Turnover, the lagged weighted average of the portfolio turnover of the firm's institutional investors over the four quarters of a year, calculated following Gaspar, Massa, and Matos (2005). Please refer to the caption of Table 1 and the Appendix for definitions and details on the construction of all variables. Column 1 presents our basic specification and column 2 shows our extended specification. The latter has a much lower number of observations due to the fact that executive compensation data is only available after 1992 and the governance index is only available for a limited number of firms. Columns 3 and 4 repeat the analysis using as main independent variable the lagged fraction of a firm's shares held by investors in the top (middle/bottom) 33rd percentile of institutional investor's turnover rates. Columns 5 and 6 present results of interacting Investor Turnover with firms with High Analysts' Forecast Errors and High Dispersion of Opinion, respectively. Analyst Forecast Error (AFE) is the yearly average of the monthly (actual EPS – average forecast EPS) / average forecast EPS. Dispersion of Opinion (DOP) is the ratio between the standard deviation of analysts' EPS forecasts and the absolute value of the average EPS forecast. We define indicator variables called High AFE (High DOP) that take the value of 1 if the firm's AFE (DOP) is above the sample median in a given year, and 0 otherwise. Regressions include industry dummies and yearly dummies. Industries are defined using the Fama and French (1992) classification. We use standard errors clustered by firm to accommodate heteroscekedasticity and within-firm autocorrelation. T-statistics are reported in parentheses and the symbols ***, **, * denote significance at 1%, 5% and 10%.

Dependent Variable: Dummy equal to 1 for a Repurchase announcement and equal to 0 for a Dividend increase announcement												
	(1)		(2)		(3)		(4)		(5)		(6)	
Investor Turnover	1.13	***	1.192	***					0.87	***	1.102	***
	(5.38)		(2.64)						(3.85)		(4.42)	
IO of High Turnover Investors					1.122	***	1.09	***				
					(5.53)		(3.10)					
IO of Mid Turnover Investors					0.249		0.352					
					(1.52)		(1.43)					
IO of Low Turnover Investors					-0.411	**	-0.243					
					(-2.53)		(-1.05)					
Institutional Ownership (IO)	0.178		0.267						0.212	*	0.244	**
	(1.61)		(1.59)						(1.93)		(2.13)	
Size	-0.166	***	-0.075	*	-0.15	***	-0.062	*	-0.158	***	-0.145	***
	(-7.51)		(-2.08)		(-6.74)		(-1.72)		(-7.14)		(-6.28)	
Market-to-Book Ratio	0.012	*	0.000		0.012	*	0.000		0.012	**	0.011	*
	(1.92)		(0.04)		(1.93)		(0.01)		(1.96)		(1.87)	
Debt-to-Equity Ratio	0.012		0.074	*	0.01		0.072	**	0.011		0.009	
	(1.08)		(1.96)		(0.94)		(1.97)		(1.01)		(0.80)	
Operating Income	-2.874	***	-1.357	***	-2.78	***	-1.273	***	-2.676	***	-2.493	***
	(-11.60)		(-3.14)		(-11.27)		(-2.94)		(-10.70)		(-9.69)	
Non-Operating Income	0.144		3.279		0.104		3.198		0.252		0.897	
	(0.11)		(1.42)		(0.08)		(1.39)		(0.19)		(0.64)	
Std. Dev. Of Op. Income	3.845	***	4.607	***	3.764	***	4.585	***	3.572	***	3.696	***
	(5.30)		(4.47)		(5.15)		(4.45)		(5.03)		(5.87)	
Liquid Assets	-0.012		-0.028		-0.003		-0.014		0.002		0.051	
	(-0.08)		(-0.13)		(-0.02)		(-0.07)		(0.01)		(0.31)	
Prior Payout Ratio	-0.011		-0.003		-0.011		-0.003		-0.011		-0.008	
	(-1.30)		(-0.59)		(-1.34)		(-0.65)		(-1.30)		(-1.20)	
Last 12 Mths. Return	-0.21	***	-0.135	***	-0.217	***	-0.142	***	-0.207	***	-0.194	***
	(-9.29)		(-3.11)		(-9.60)		(-3.27)		(-9.12)		(-7.95)	
Last 12 Mths. Share Turnover	0.216	***	0.222	***	0.215	***	0.22	***	0.217	***	0.203	***
	(9.87)		(7.32)		(9.73)		(7.22)		(9.90)		(9.03)	
Illiquidity	0.04		-0.016		0.045		-0.029		0.077	***	0.100	**
	(1.50)		(-0.04)		(1.57)		(-0.07)		(3.35)		(3.07)	
Number of Analysts	0.015	***	0.005		0.016	***	0.005		0.016	***	0.013	***
	(4.67)		(1.03)		(4.74)		(1.09)		(4.70)		(3.95)	
NBER Tax Disadv. of Div.			22.088	***			23.474	**				
			(3.00)				(3.17)					
Managerial Holdings			-0.344				-0.399					
			(-1.26)				(-1.47)					
Managerial Stock Options			0.473	***			0.465	***				
			(4.26)				(4.17)					
GIM Governance Index			-0.028	***			-0.027	**				
			(-2.94)				(-2.92)					
Inv. Turnover x AFE									0.367	**		
									(3.19)			
Analysts' Forecast Errors (AFE)									0.026			
									(1.28)			
Inv. Turnover x DOP											0.45	***
											(3.90)	
Dispersion of Opinion (DOP)											0.034	
											(1.17)	
Intercept	1.229	***	26.868	**	1.436	***	28.745	**	1.133	***	0.965	***
	(5.92)		(3.05)		(7.10)		(3.24)		(5.45)		(4.38)	
Industry and time dummies	Yes		Yes		Yes		Yes		Yes		Yes	
N	17,599		6,710		17,599		6,710		17,523		15,970	
R-squared	0.23		0.12		0.23		0.12		0.23		0.22	

Table 4. Shareholder Investment Horizons and the Market Reaction to Repurchase Announcements

This table presents regression results of the relation between the stock market's reaction to a repurchase announcement and investor turnover. Our sample is composed of firms reporting positive payouts and announcing a repurchase. The dependent variable is the Cumulative Abnormal Return (CAR) for the daily window (-1, +1) is measured against the CRSP value-weighted index. Our main independent variable of interest is Investor Turnover, the lagged weighted average of the portfolio turnover of the firm's institutional investors over the four quarters of a year, calculated following Gaspar, Massa, and Matos (2005). Please refer to the caption of Table 1 and the Appendix for definitions and details on the construction of all variables. Column 1 presents our basic specification and column 2 shows our extended specification. The latter has a much lower number of observations due to the fact that executive compensation data is only available after 1992 and the governance index is only available for a limited number of firms. Columns 3 and 4 repeat the analysis using as main independent variable the lagged fraction of a firm's shares held by investors in the top (middle/bottom) 33rd percentile of institutional investor's turnover rates. Columns 5 and 6 present results of interacting Investor Turnover with firms with High Analysts' Forecast Errors and High Dispersion of Opinion, respectively. Analyst Forecast Error (AFE) is the yearly average of the monthly (actual EPS – average forecast EPS) / average forecast EPS. Dispersion of Opinion (DOP) is the ratio between the standard deviation of analysts' EPS forecasts and the absolute value of the average EPS forecast. We define indicator variables called High AFE (High DOP) that take the value of 1 if the firm's AFE (DOP) is above the sample median in a given year, and 0 otherwise. Regressions include industry dummies and yearly dummies. Industries are defined using the Fama and French (1992) classification. We use standard errors clustered by firm to accommodate heteroscekedasticity and within-firm autocorrelation. T-statistics are reported in parentheses and the symbols ***, **, * denote significance at 1%, 5% and 10%.

Dependent Variable: Cumulative Abnormal Return with window (-1,+1) around Repurchase announcements						
	(1)	(2)	(3)	(4)	(5)	(6)
Investor Turnover	-0.037 **	-0.082 ***			-0.053 ***	-0.017 *
	(-2.29)	(-2.80)			(-3.20)	(-1.87)
IO of High Turnover Investors			-0.073 ***	-0.042 **		
			(-6.49)	(-2.39)		
IO of Mid Turnover Investors			-0.014	-0.006		
			(-1.48)	(-0.49)		
IO of Low Turnover Investors			0.006	0.007		
			(0.80)	(0.72)		
Size of Repurchase	0.038 ***	0.045 ***	0.035 ***	0.046 **	0.037 ***	0.031 ***
	(3.37)	(2.95)	(3.77)	(3.10)	(3.30)	(2.69)
Institutional Ownership (IO)	-0.02 ***	-0.004			-0.019 ***	-0.017 ***
	(-3.35)	(-0.52)			(-3.14)	(-2.69)
Size	-0.003 ***	-0.001	-0.004 ***	-0.001	-0.003 ***	-0.003 **
	(-2.98)	(-0.81)	(-3.62)	(-0.85)	(-2.92)	(-2.16)
Market-to-Book Ratio	0.000	-0.001	0.000	-0.001	0.000	0.000
	(1.17)	(-1.06)	(1.36)	(-0.98)	(1.16)	(0.31)
Debt-to-Equity Ratio	-0.001	0.001 **	0.00	0.001 *	-0.001	-0.001 *
	(-1.32)	(2.17)	(0.71)	(1.90)	(-1.39)	(-1.95)
Operating Income	-0.023 *	0.002	-0.013	0.001	-0.019	-0.018
	(-1.67)	(0.09)	(-0.99)	(0.05)	(-1.28)	(-1.19)
Non-Operating Income	-0.061	-0.103	-0.114 *	-0.11	-0.051	0.006
	(-0.84)	(-1.02)	(-1.90)	(-1.11)	(-0.70)	(0.08)
Std. Dev. Of Op. Income	0.044	0.056	0.064 **	0.052	0.041	0.05 *
	(1.56)	(1.30)	(2.50)	(1.20)	(1.41)	(1.64)
Liquid Assets	-0.016 **	-0.015	-0.017 ***	-0.015	-0.017 **	-0.014 *
	(-2.20)	(-1.58)	(-2.69)	(-1.57)	(-2.27)	(-1.76)
Prior Payout Ratio	0.00	0.00	0.00	0.00	0.00	0.00
	(1.28)	(0.99)	(0.92)	(0.81)	(1.29)	(1.27)
Last 12 Mths. Return	-0.009 ***	-0.004	-0.008 ***	-0.004	-0.009 ***	-0.009 ***
	(-4.46)	(-1.19)	(-4.49)	(-1.15)	(-4.43)	(-3.53)
Last 12 Mths. Share Turnover	0.002 **	0.001	0.001	0.001	0.002 **	0.002 **
	(2.41)	(1.45)	(1.38)	(1.43)	(2.34)	(2.08)
Illiquidity	0.003 **	0.104 ***	0.003 **	0.108 ***	0.002 **	0.005 *
	(2.23)	(3.07)	(2.06)	(3.18)	(2.10)	(1.67)
Number of Analysts	0.00	0.00	0.00	0.00	0.00	0.00
	(0.31)	(0.74)	(0.92)	(0.77)	(0.03)	(0.29)
NBER Tax Disadv. of Div.		0.002 **		0.003 ***		
		(1.99)		(3.47)		
Managerial Holdings		0.006		0.006		
		(0.46)		(0.45)		
Managerial Stock Options		-0.003		-0.002		
		(-0.52)		(-0.40)		
GIM Governance Index		0.00		0.00		
		(0.64)		(0.65)		
Inv. Turnover x AFE					0.021 *	
					(2.42)	
Analysts' Forecast Errors (AFE)					0.001	
					(0.48)	
Inv. Turnover x DOP						0.013 *
						(1.73)
Dispersion of Opinion (DOP)						0.001
						(0.91)
Intercept	0.056 ***	0.053 **	0.053 ***	0.04 **	0.055 ***	0.061 **
	(4.53)	(2.57)	(5.30)	(2.02)	(4.70)	(3.25)
Industry and time dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	8,039	3,119	7,524	3,119	8,003	7,218
R-squared	0.03	0.03	0.05	0.02	0.03	0.02

Table 5. Shareholder Investment Horizons and the Level of Payout

This table presents regression results of the relation between the amount of both repurchases and dividends, and investor turnover. Our sample is composed of firms reporting positive payouts. In Column 1 through 3 the dependent variable is the Log of (1+Repurchases Amount). Column 1 (2) uses Investor Turnover as the main independent variable and our basic (extended) regression specification. Column 3 uses our extended specification and IO of High, Mid, and Low Investor Turnover as the main independent variables. This pattern is similar for columns 4 through 6, but using as dependent variable the logarithm of 1 + the annual dollar value of dividends. Please refer to the caption of Table 1 and the Appendix for definitions and details on the construction of all variables. Regressions include industry dummies and yearly dummies. Industries are defined using the Fama and French (1992) classification. We use standard errors clustered by firm to accommodate heteroscekedasticity and within-firm autocorrelation. T-statistics are reported in parentheses and the symbols ***, **, * denote significance at 1%, 5% and 10%.

Investor Turnover and the Level of Payout												
Dependent Variable:	Log of (1+Repurchases Amount)						Log of (1+Dividend Amount)					
	(1)		(2)		(3)		(4)		(5)		(6)	
Investor Turnover	0.312	**	1.068	**			-0.888	***	-1.911	***		
	(2.19)		(2.03)				(-7.84)		(-5.75)			
IO of High Turnover Investors					0.689	*					-1.775	***
					(1.66)						(-6.41)	
IO of Mid Turnover Investors					-0.499						-1.123	***
					(-1.53)						(-5.10)	
IO of Low Turnover Investors					0.035						0.504	**
					(0.10)						(2.20)	
Institutional Ownership (IO)	0.258	**	0.022				-0.709	***	-0.553	***		
	(2.29)		(0.08)				(-6.70)		(-3.17)			
Size	0.352	***	0.488	***	0.485	***	0.808	***	0.953	***	0.931	***
	(14.51)		(9.37)		(9.28)		(40.78)		(27.08)		(26.53)	
Market-to-Book Ratio	0.027	***	0.005		0.004		0.035	***	0.035	***	0.034	***
	(3.51)		(0.40)		(0.34)		(6.41)		(4.77)		(4.57)	
Debt-to-Equity Ratio	-0.042	***	-0.07		-0.068	*	-0.077	***	-0.108	***	-0.105	***
	(-2.61)		(-1.83)		(-1.76)		(-5.20)		(-3.90)		(-3.89)	
Operating Income	1.847	***	4.449	***	4.451	***	2.512	***	4.371	***	4.257	***
	(9.46)		(7.88)		(7.89)		(13.02)		(10.61)		(10.39)	
Non-Operating Income	3.989	***	9.101	**	8.98	***	5.648	***	6.637	***	6.694	***
	(3.54)		(3.27)		(3.22)		(6.06)		(3.65)		(3.70)	
Std. Dev. Of Op. Income	1.358	***	1.856	*	1.857	*	0.625	*	-1.557	**	-1.473	*
	(4.00)		(1.85)		(1.85)		(1.77)		(-1.99)		(-1.90)	
Liquid Assets	0.568	***	0.837	***	0.836	***	0.274	**	0.428	**	0.412	**
	(4.42)		(2.94)		(2.93)		(2.43)		(2.02)		(1.97)	
Prior Payout Ratio	-0.001	***	-0.001	***	-0.001	***	0.000	*	0.000	*	0.000	**
	(-4.08)		(-6.81)		(-6.65)		(1.86)		(1.93)		(2.47)	
Last 12 Mths. Return	0.108	***	0.222	***	0.22	***	0.115	***	0.045		0.055	*
	(5.26)		(4.31)		(4.27)		(7.83)		(1.52)		(1.89)	
Last 12 Mths. Share Turnover	0.105	***	0.115	***	0.119	***	-0.195	***	-0.245	***	-0.24	***
	(4.84)		(3.43)		(3.55)		(-6.54)		(-9.69)		(-9.56)	
Illiquidity	0.048	***	0.123	**	0.118	*	0.037	***	0.061	**	0.066	***
	(6.34)		(1.98)		(1.94)		(6.12)		(2.32)		(2.69)	
Number of Analysts	0.03	***	0.028	***	0.028	**	0.015	***	-0.005		-0.006	
	(6.28)		(3.29)		(3.26)		(3.94)		(-0.88)		(-1.05)	
NBER Tax Disadv. of Div.			-0.023	**	-0.032	***			0.026	***	0.028	***
			(-2.09)		(-2.94)				(4.33)		(4.76)	
Managerial Holdings			-1.091	***	-1.115	***			-0.5		-0.443	
			(-2.77)		(-2.83)				(-1.50)		(-1.35)	
Managerial Stock Options			0.952	***	0.968	***			-0.841	***	-0.824	***
			(5.64)		(5.75)				(-7.41)		(-7.34)	
GIM Governance Index			-0.041	***	-0.041	***			0.059	***	0.058	***
			(-2.75)		(-2.75)				(5.67)		(5.64)	
Intercept	-1.058	***	-4.987	***	-4.697	***	-1.962	***	-3.635	***	-4.104	***
	(-2.90)		(-9.62)		(-9.34)		(-6.97)		(-10.70)		(-12.73)	
Industry and time dummies	Yes		Yes		Yes		Yes		Yes		Yes	
N	25,182		8,774		8,774		25,182		8,774		8,774	
R-squared	0.29		0.24		0.24		0.66		0.63		0.63	

Table 6. Causality Analysis

This table presents dynamic panel estimates of the causal relation between the share of payout in the form of repurchases and investor turnover. Our sample is composed of firms reporting positive payouts. We use the generalized-method-of-moments dynamic panel data estimator of Blundell and Bond (1998) to accommodate endogeneity of the lagged dependent variable and high persistence in the dependent variable. Each equation is estimated in differences. We use as instruments the levels and differences of the endogenous variables (lags 2 to 4) and the differences of all other control variables. In Panel A, column 1, the dependent variable, Share of Repurchases to Total Payout, is regressed on its lag and on lagged Investor Turnover. In Panel A, column 2, the dependent variable is Investor Turnover which is regressed on its lag and on lagged Share of Repurchases to Total Payout. All control variables of our basic specification (cf. Table 2) are used (parameter estimates not shown). Columns 3 and 4 are similar except that they use our extended specification. In Panel B Share of Repurchases in Payout-Increasing Firms is used as endogenous variable along with Investor Turnover. Please refer to the caption of Table 1 and the Appendix for definitions and details on the construction of all variables. Regressions include industry dummies. Industries are defined using the Fama and French (1992) classification. We use standard errors to accommodate heteroscekedasticity. The table shows the p-value of the Sargan test of the null hypothesis of validity of the over-identifying moment conditions. T-statistics are reported in parentheses and the symbols ***, **, * denote significance at 1%, 5% and 10%.

Panel A: Causality Analysis of Share of Repurchases in Total Payout and Investor Turnover

Specification:	Basic Set of Controls		Extended Set of Controls	
Dependent Variable:	Share of Repurchases in Total Payout	Investor Turnover	Share of Repurchases in Total Payout	Investor Turnover
	(1)	(2)	(3)	(4)
Lag Share of Repurchases in Total Payout	0.403***	0.021	0.529***	0.046
	(16.77)	(0.96)	(11.84)	(0.99)
Lag Investor Turnover	0.511**	0.143***	0.529**	0.002
	(2.08)	(2.14)	(2.03)	(0.01)
Industry Dummies	Yes	Yes	Yes	Yes
N	18,593	18,593	7,838	7,838
P-value of Sargan test	0.81	0.61	0.32	0.24

Panel B: Causality Analysis of Share of Repurchases in Payout Increasing Firms and Investor Turnover

Specification:	Basic Set of Controls		Extended Set of Controls	
Dependent Variable:	Share of Repurchases in Payout Increasing Firms	Investor Turnover	Share of Repurchases in Payout Increasing Firms	Investor Turnover
	(1)	(2)	(3)	(4)
Lag Share of Repurchases in Payout-Increasing Firms	0.434***	0.011	0.413**	0.022
	(16.73)	(0.54)	(2.02)	(0.40)
Lag Investor Turnover	0.821**	0.097*	5.24*	-0.057
	(2.37)	(1.80)	(1.83)	(-1.40)
Industry Dummies	Yes	Yes	Yes	Yes
N	15,367	15,367	6,611	6,611
P-value of Sargan test	0.78	0.66	0.30	0.25

Table 7. Estimates adjusting for Sample Selection

This table presents results of replicating the main results adjusting for sample selection. All specifications presented are the second stage of a two-stage Heckman (1979) sample-selection model with appropriately corrected standard errors. The first stage of the selection model is estimated in the universe of CRSP-COMPUSTAT firms for which data on our variables exists (the first stage estimation results are presented in Table 8). Columns 1 and 2 replicates the column 1 and 2 of Table 2. Columns 3 and 4 replicates the column 1 and 2 of Table 3. Columns 5 and 6 replicates the column 1 and 2 of Table 4. Please refer to the caption of Table 1 and the Appendix for definitions and details on the construction of all variables. Regressions include industry dummies and yearly dummies. Industries are defined using the Fama and French (1992) classification. We use standard errors clustered by firm to accommodate heteroscekedasticity and within-firm autocorrelation. T-statistics are reported in parentheses and the symbols ***, **, * denote significance at 1%, 5% and 10%.

Estimation adjusting for Sample Selection

Dependent Variable:	Share of Repurchases in Total Payout		Dummy equal to 1 for a Repurchase announcement		CAR with window (-1,+1) around Repurchase announcements	
	(1)	(2)	(3)	(4)	(5)	(6)
Investor Turnover	0.708 **	0.149 *	1.710 ***	1.333 ***	-0.055 ***	-0.107 ***
	(2.63)	(1.88)	(3.69)	(3.63)	(-3.85)	(-4.62)
Size of Repurchase					0.039 ***	0.046 ***
					(3.45)	(3.60)
Institutional Ownership (IO)	0.113 ***	0.047	0.231 ***	0.968 *	-0.021 ***	-0.001
	(5.86)	(1.47)	(3.27)	(1.81)	(-4.00)	(-0.19)
Size	0.026 ***	0.068 ***	0.183 ***	-0.018	-0.001	0.000
	(5.27)	(8.34)	(5.63)	(0.92)	(-1.02)	(-0.28)
Market-to-Book Ratio	0.000	0.000	0.221	0.169	0.000	0.000
	(-0.22)	(-0.28)	(0.26)	(1.22)	(0.84)	(0.70)
Debt-to-Equity Ratio	-0.013 ***	-0.016 ***	0.495 *	0.136 ***	-0.002 ***	0.000
	(-2.73)	(-2.83)	(1.73)	(3.44)	(-3.19)	(0.13)
Operating Income	0.555 ***	1.000 ***	-2.615 ***	1.334	-0.021	0.003
	(9.44)	(10.52)	(-8.18)	(1.03)	(-1.40)	(0.16)
Non-Operating Income	1.889 ***	2.748 ***	0.256	3.706	0.011	-0.078
	(8.05)	(6.58)	(0.16)	(1.29)	(0.15)	(-0.90)
Std. Dev. Of Op. Income	0.085	0.128	3.982 ***	4.908 ***	0.031	0.063 *
	(0.85)	(0.87)	(5.03)	(4.00)	(1.47)	(1.82)
Liquid Assets	0.073 ***	0.144 ***	0.134	0.298	-0.013 **	-0.011
	(4.48)	(4.55)	(0.85)	(0.60)	(-2.09)	(-1.43)
Prior Payout Ratio	0.000 *	0.000	0.317	0.576	0.000	0.000
	(1.68)	(1.08)	(0.34)	(1.05)	(0.97)	(0.17)
Last 12 Mths. Return	-0.022 ***	0.006	0.198 ***	0.164 ***	-0.009 ***	-0.003
	(-5.55)	(0.75)	(10.07)	(3.54)	(-6.26)	(-1.59)
Last 12 Mths. Share Turnover	0.042 ***	0.047 ***	0.537 ***	0.414 ***	0.002 ***	0.001 *
	(22.70)	(14.92)	(8.44)	(7.22)	(2.97)	(1.82)
Illiquidity	0.001	-0.018 ***	0.586	0.055	0.003 ***	0.135 ***
	(0.77)	(-5.90)	(0.60)	(0.67)	(3.57)	(6.37)
Number of Analysts	0.004 ***	0.002 *	0.331 ***	0.079	0.000	0.000
	(7.72)	(1.94)	(4.87)	(1.40)	(0.36)	(0.90)
NBER Tax Disadv. of Div.		-0.013		22.308 **		0.002
		(-0.82)		(2.34)		(0.36)
Managerial Holdings		-0.161 ***		0.074 *		0.013
		(-3.47)		(1.66)		(1.03)
Managerial Stock Options		0.197 ***		0.544		-0.001
		(9.38)		(1.05)		(-0.19)
GIM Governance Index		-0.006 ***		0.247 ***		0.000
		(-3.61)		(3.11)		(0.29)
Heckman's Lambda	0.410 ***	0.573 ***	0.080 ***	0.156 *	0.011 **	0.008
	(3.90)	(2.78)	(3.06)	(1.95)	(2.25)	(1.10)
Intercept	-0.213 **	-1.146 ***	1.292 ***	27.204 ***	0.106 ***	0.019
	(-2.57)	(-3.82)	(4.93)	(3.47)	(3.59)	(1.40)
Industry and time dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	25,164	8,774	17,578	6,699	9,269	3,420
R-squared	0.33	0.27	0.23	0.12	0.03	0.04

Table 8. Shareholder Investment Horizons and Likelihood of Payout among Non-Paying Firms

This table presents Probit regression results of the relation between the likelihood of a payout among non-paying firms and investor turnover. The relation is estimated in the universe of CRSP-COMPUSTAT firms for which data on our variables exists (and not only in the sample of firms reporting positive payouts as it is the case in the previous tables). To help identify the equations (necessary to estimate the second-stage regressions shown in Table 7), we add two variables to our basic specification. Sales Growth is the average of the past three years' percentage change in sales (COMPUSTAT item SALE). Log of Firm Age is the lagged natural logarithm of the time in years since the firm first enters the COMPUSTAT database. All other right-hand side variables are defined as in previous tables. Please refer to the caption of Table 1 and the Appendix for definitions and details on the construction of all variables. In Panel A, columns 1 and 2, the dependent variable takes a value of 1 if a firm makes an open market share repurchase announcement in a given year and 0 otherwise. In Panel A, columns 3 and 4, the dependent variable takes a value of 1 if a firm pays a dividend in a given year and 0 otherwise. In Panel A, columns 5 and 6, the dependent variable takes a value of 1 if a firm has a positive payout (that is, makes an open market share repurchase announcement or pays a dividend) in a given year and 0 otherwise. Panel B looks at payout initiation behavior. In columns 1 and 2, the dependent variable takes a value of 1 if a firm makes an open market share repurchase announcement for the first time during the sample period and 0 otherwise. In columns 3 and 4, the dependent variable takes a value of 1 if a firm pays a dividend for the first time during the sample period and 0 otherwise. To construct these initiation indicators we exclude the first year in which a firm first appears in the sample. Regressions include industry dummies and yearly dummies. Industries are defined using the Fama and French (1992) classification. We use standard errors clustered by firm to accommodate heteroscekedasticity and within-firm autocorrelation. T-statistics are reported in parentheses and the symbols ***, **, * denote significance at 1%, 5% and 10%.

Panel A: Investor Turnover and Likelihood of Payout

Dependent Variable:	Dummy equal to 1 if Firm Repurchases, 0 otherwise		Dummy equal to 1 if Firm pays Dividends, 0 otherwise		Dummy equal to 1 if a Firm has positive Payout, 0 otherwise	
	(1)	(2)	(3)	(4)	(5)	(6)
Investor Turnover	0.241 **		-0.984 ***		-0.382 ***	
	(2.02)		(-6.84)		(-3.22)	
IO of High Turnover Investors		0.147 *		-0.634 ***		-0.43 ***
		(1.84)		(-3.90)		(-3.60)
IO of Mid Turnover Investors		-0.029		-0.192		-0.196 *
		(-0.32)		(-1.40)		(-1.94)
IO of Low Turnover Investors		0.500 ***		0.82 ***		0.783 ***
		(5.62)		(5.61)		(7.32)
Institutional Ownership (IO)	0.25 ***		0.117		0.155 **	
	(4.46)		(1.16)		(2.26)	
Size	0.128 ***	0.123 ***	0.341 ***	0.326 ***	0.276 ***	0.264 ***
	(10.45)	(9.90)	(16.22)	(15.38)	(17.89)	(16.97)
Market-to-Book Ratio	0.001	0.000	0.011 *	0.01	0.015 ***	0.014 ***
	(0.30)	(0.09)	(1.65)	(1.52)	(3.73)	(3.47)
Debt-to-Equity Ratio	-0.024 **	-0.022 **	-0.102 ***	-0.1 ***	-0.062 ***	-0.06 ***
	(-2.48)	(-2.44)	(-4.96)	(-4.85)	(-4.57)	(-4.55)
Operating Income	2.18 ***	2.159 ***	4.798 ***	4.744 ***	3.242 ***	3.203 ***
	(20.21)	(20.08)	(17.48)	(17.29)	(21.48)	(21.29)
Non-Operating Income	5.303 ***	5.25 ***	3.898 ***	3.898 ***	5.471 ***	5.406 ***
	(8.66)	(8.58)	(3.90)	(3.90)	(8.00)	(7.94)
Std. Dev. Of Op. Income	-0.021	-0.019	-2.945 ***	-2.957 ***	-0.59 **	-0.585 **
	(-0.87)	(-0.79)	(-5.12)	(-5.11)	(-2.29)	(-2.30)
Liquid Assets	0.469 ***	0.467 ***	0.355 ***	0.355 ***	0.667 ***	0.662 ***
	(6.82)	(6.79)	(2.86)	(2.86)	(8.03)	(7.99)
Prior Payout Ratio	-0.001	-0.001	0.012 **	0.012 **	0.011 **	0.011 **
	(-0.72)	(-0.66)	(2.32)	(2.36)	(2.35)	(2.39)
Last 12 Mths. Return	-0.058 ***	-0.053 ***	0.089 ***	0.092 ***	0.003	0.009
	(-5.00)	(-4.60)	(7.34)	(7.60)	(0.30)	(0.86)
Last 12 Mths. Share Turnover	-0.031 ***	-0.029 ***	-0.251 ***	-0.252 ***	-0.118 ***	-0.117 ***
	(-4.67)	(-4.38)	(-9.74)	(-9.71)	(-9.31)	(-9.19)
Illiquidity	-0.013 ***	-0.015 ***	-0.024 ***	-0.027 ***	-0.027 ***	-0.03 ***
	(-2.92)	(-3.22)	(-2.73)	(-2.94)	(-5.06)	(-5.38)
Number of Analysts	0.006 ***	0.006 **	-0.01 **	-0.01 **	-0.001	-0.002
	(2.73)	(2.62)	(-2.42)	(-2.41)	(-0.38)	(-0.52)
Sales growth	0.001 ***	0.001 ***	0.002 ***	0.002 ***	0.002 **	0.002 **
	(6.16)	(6.05)	(7.99)	(8.28)	(2.07)	(2.37)
Log of Firm Age	0.092 ***	0.087 ***	0.493 ***	0.488 ***	0.366 ***	0.36 ***
	(6.56)	(6.20)	(20.97)	(20.69)	(21.45)	(21.11)
Intercept	-1.689 ***	-1.613 ***	-3.886 ***	-4.081 ***	-2.66 ***	-2.723 ***
	(-16.68)	(-16.71)	(-19.54)	(-20.69)	(-20.74)	(-21.75)
Industry and time dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	52,645	52,645	52,645	52,645	52,645	52,645
R-squared	0.13	0.13	0.45	0.45	0.31	0.31

Panel B: Investor Turnover and Likelihood of Payout Initiation

Dependent Variable:	Dummy equal to 1 if Firm makes a Repurchase for the first time, 0 otherwise		Dummy equal to 1 if Firm pays a Dividend for the first time, 0 otherwise	
	(1)	(2)	(3)	(4)
Investor Turnover	0.431 ***		-0.042	
	(3.05)		(-0.18)	
IO of High Turnover Investors		0.575 ***		0.346
		(4.91)		(1.56)
IO of Mid Turnover Investors		0.334 ***		0.178
		(3.35)		(1.02)
IO of Low Turnover Investors		0.036		-0.158
		(0.38)		(-0.91)
Institutional Ownership (IO)	0.299 ***		0.103	
	(6.31)		(1.16)	
Size	-0.011	-0.005	0.028	0.034 *
	(-1.05)	(-0.46)	(1.44)	(1.72)
Market-to-Book Ratio	0.001	0.002	-0.002	-0.001
	(0.45)	(0.57)	(-0.40)	(-0.30)
Debt-to-Equity Ratio	-0.007	-0.007	-0.002	-0.003
	(-1.29)	(-1.41)	(-0.32)	(-0.40)
Operating Income	0.794 ***	0.803 ***	1.134 ***	1.157 ***
	(10.32)	(10.39)	(4.86)	(4.88)
Non-Operating Income	1.474 **	1.458 **	1.867 *	1.848 *
	(2.59)	(2.57)	(1.71)	(1.74)
Std. Dev. Of Op. Income	-0.062	-0.064	0.012	0.009
	(-0.49)	(-0.50)	(0.53)	(0.39)
Liquid Assets	0.324 ***	0.329 ***	0.186 *	0.191 *
	(5.88)	(5.98)	(1.82)	(1.87)
Prior Payout Ratio	-0.002	-0.002	-0.005 **	-0.005 ***
	(-1.29)	(-1.30)	(-3.27)	(-3.36)
Last 12 Mths. Return	-0.014	-0.013	0.057 ***	0.055 ***
	(-0.96)	(-0.91)	(4.36)	(4.21)
Last 12 Mths. Share Turnover	0.009 *	0.01	-0.005	-0.006
	(1.79)	(1.88)	(-0.43)	(-0.53)
Illiquidity	-0.022 ***	-0.022 **	0.001	0.001
	(-2.84)	(-2.85)	(0.13)	(0.26)
Number of Analysts	0.011 ***	0.011 ***	-0.008 **	-0.008 *
	(5.59)	(5.74)	(-2.01)	(-1.87)
Sales growth	0.001 ***	0.001 ***	0.001 ***	0.001 ***
	(10.32)	(10.33)	(12.72)	(12.73)
Log of Firm age	-0.174 ***	-0.172 ***	-0.169 ***	-0.164 ***
	(-14.95)	(-14.69)	(-7.61)	(-7.43)
Intercept	-1.475 ***	-1.381 ***	-2.507 ***	-2.525 ***
	(-15.74)	(-15.81)	(-13.71)	(-14.50)
Industry and time dummies	Yes	Yes	Yes	Yes
N	50,821	50,821	50,452	50,452
R-squared	0.06	0.06	0.05	0.06