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Effect of institutional ownership on dividends: An agency-theory-based analysis☆

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ABSTRACT

This study examines the effect of institutional ownership on dividend payouts through the lens of agency theory. We hypothesize that only institutions with certain traits are likely to monitor. Monitoring institutions will use dividend payouts as a tool to mitigate firms' agency problems, conditional on those firms' financial performance. We find that (1) there is a positive relation between lagged long-term institutional ownership with a large stake and the dividend payout ratio, (2) the positive relation is more salient in firms with high agency costs, and (3) the positive relation is more salient when external monitoring is weak. These findings support that (1) concentrated and long-term institutional investors play a monitoring role and (2) monitoring institutions use dividend payouts as a monitoring device. Our findings are robust to endogeneity tests, level and change models, alternative income-based dividend payout measures, alternative measures of long-term institutions, and sub-period analyses.

1. Introduction

This paper investigates the influence of monitoring institutional investors on firms' dividend payouts and explores whether this influence is related to agency costs. Whereas both institutional investors and dividends are documented to mitigate agency costs (Chen, Harford, and Li, 2007; John, Knyazeva and Knyazeva, 2011), our study focuses on whether and how institutional investors use dividend payouts as a tool to accomplish the task.

As major shareholders, institutional investors have power over corporate policies, especially when they have concentrated holdings (Hartzell and Starks, 2003) and long-term investment horizons (Gaspar, Massa, and Matos, 2005). Higher dividends can serve as an effective monitoring tool to mitigate the manager-shareholder agency conflict, especially at firms where such agency costs are high (John, Knyazeva, and Knyazeva, 2011). We therefore hypothesize that long-term institutions with large ownership stakes use dividend payouts as a monitoring device, especially at firms with high agency costs.

To test our hypotheses, we use the 10 largest long-term institutional shareholders of a firm (Top10LTOwners) as our proxy for institutions that are likely to monitor (monitoring institutions). The Top10LTOwners are likely to be more influential as they have large stakes (Chen, Harford, and Li, 2007), more sensitive to agency problems as they have concentrated holdings (Hartzell and Starks, 2003), and lower monitoring costs due to their long investment horizons (Harford, Kecskes, and Mansi, 2014). We proxy agency costs with positive free cash flow and low Tobin's Q, as firms with these characteristics are likely to be cash cows with poor investment opportunities (Jurkus, Park, and Woodard, 2011). We also proxy agency costs with high earnings management, as managers can use earnings management to serve their own interests at the expense of shareholders (Chung, Firth, and Kim, 2005). We use two proxies for information-quality-related external monitoring systems: (1) the Herfindahl–Hirschman index (HHI), which is a product market concentration index, and (2) quality of access to public information. Both proxies are related to external information transparency and influence managers' effort levels (Hart, 1983).

Our empirical findings from a large sample of U.S. firms over the 1995–2009 period provide supporting evidence for our hypotheses. A higher proportion of the Top10LTOwners is associated with a higher future dividend payout ratio. This relation is only salient in firms with high agency costs or weak external monitoring mechanisms. Our findings

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support the monitoring role of certain institutional investors and are consistent with an agency-theory-based interpretation: the presence of higher proportion of monitoring institutions leads to higher dividend payouts at firms with high agency costs or weak monitoring mechanisms.

Our study also contributes to the literature on the interaction between dividends and other monitoring mechanisms (Allen, Bernardo, and Welch, 2000; Grinstein and Michaely, 2005; Grullon and Michaely, 2012; Hoberg, Phillips, and Prabhala, 2014; Officer, 2011, and others) by providing further empirical evidence supporting the role of dividends as a tool to mitigate agency costs. We confirm the findings of Grinstein and Michaely (2005) that firms with high institutional holdings generally prefer lower dividend payouts. However, unlike Grinstein and Michaely (2005), we show that the Top10LTOwners are likely to monitor and have a different relation with dividend payouts from general institutional owners. When there are other strong external monitoring mechanisms, including product market competition and quality of access to public information, the Top10LTOwners do not influence dividend payouts. Our results are robust to measures of the proportion of shares owned by the Top10LTOwners, endogeneity tests, level and change models, sub-period analyses, and a number of dividend payout ratios that are calculated based on alternative measures of the firm's income.

We focus on dividend payments when examining the effect of institutional ownership on firms' payout policies in an agency theory framework. Dividends are stickier than repurchases, and dividend payout is a more credible monitoring device (Farre-Mensa, Michaely, and Schmalz, 2014). Managers state that they will pass up positive net present value projects before cutting dividends but do not make the same claim about repurchases (Brav, Graham, Harvey, and Michaely, 2005; John and Knyazeva, 2006). However, our results are robust to the inclusion of repurchases. Our results remain largely the same before and after the dividend tax law change in 2003, and after excluding pension funds from our sample. As pension funds face more favorable tax rates compared to other institutions, they are more likely to be subject to the clientele effect. So our findings suggest that a tax-related explanation is less likely.

2. Development of hypotheses

Agency theory predicts that manager–shareholder conflicts lead to agency costs, which hurt shareholder value (Jensen, 1986). Previous literature has proposed numerous mechanisms, including both dividends and institutional investors that mitigate agency costs. Through cash disbursement that reduces free cash flow at the firm, dividends can be used as a monitoring device that reduces agency costs, including managers' consumption of perks and overinvestment (Easterbrook, 1984; Grossman and Hart, 1980; Jensen, 1986). Through strengthened corporate governance, institutional investors with certain characteristics serve as monitors and mitigate agency costs. Such monitoring have been reflected by monitoring institutions' influences on executive compensation, earnings management, and mergers and acquisitions (Hartzell and Starks, 2003; Khan, Dharwadkar, and Brandes, 2005; Velury and Jenkins, 2006).

Institutional investors are only likely to monitor in a cost-efficient setting (Chen, Harford, and Li, 2007). A long investment horizon reduces institutional investors' monitoring costs, making them more likely to monitor (Harford, Kecskes, and Mansi, 2014). As long-term institutional investors are highly desirable to the firm, managers take them seriously (Beyer, Larcker, and Tayan, 2014; Gaspar, Massa, and Matos, 2005). Managers could please their shareholders by pre-committing to dividends. For example, John, Knyazeva, and Knyazeva (2011) show that rural firms have weaker governance mechanisms and pre-commit to higher dividend payouts to mitigate agency conflicts.

At the same time, a large stake increases the probability and effectiveness of monitoring, as institutions can gain access to the board through large holdings (Carleton, Nelson, and Weisbach, 1998). Concentrated long-term institutional investors can therefore vote on dividend policy to address their concerns on manager–shareholder conflicts.

Based on the above arguments, we believe that monitoring institutional investors are likely to be concentrated and long-term and propose the following joint hypothesis:

Hypothesis 1. *Top10LTOwners are likely to monitor and a higher proportion of Top10LTOwners is associated with greater future dividend payouts.*

Our Hypothesis 1 is closely related to the findings in Crane, Michenaud, and Weston (2014) with an important distinction. Whereas Crane, Michenaud, and Weston (2014) suggest that higher overall institutional ownership causes firms to pay more dividends and repurchase more shares, we argue that only concentrated long-term institutional ownership is positively associated with dividend payouts.

Following an agency-theory-based interpretation of dividends, *ceteris paribus*, monitoring institutions are more likely to intervene in firms with high agency costs as their benefits from doing so will be higher. Agency costs are likely to be high in firms with both free cash flow and poor investment opportunities, as the managers are more likely to have negative net present value projects at these firms (Chung, Firth, and Kim, 2005). As earnings management can also reflect agency costs, the extent of earnings management can serve as a proxy for the presence of an agency cost (Cornett, Marcus, and Tehranian, 2008). If the Top10LTOwners use dividend payouts as a monitoring device, we expect the disciplinary effect to be more salient in firms with high agency costs. We therefore propose the following hypotheses:

Hypothesis 2a. *The proportion of Top10LTOwners is positively associated with dividend payouts in firms with both positive free cash flow and poor investment opportunities.*

Hypothesis 2b. *The proportion of Top10LTOwners is positively associated with dividend payouts in firms with higher earnings management.*

Product market competition improves the quality of the information about managerial performance that shareholders can obtain and drives prices toward minimum average costs. Product market competition, therefore, monitors managers to increase firm efficiency (Giroud and Mueller, 2010; Hart, 1983; Holmstrom, 1982; Nalebuff and Stiglitz, 1983). Similar to product market competition, investors' access to public information is another important external monitoring mechanism as managers will be less inclined to discriminate their effort in a more transparent environment. We therefore propose the following hypotheses:

Hypothesis 3a. *Product market competition influences the relationship between the proportion of Top10LTOwners and dividend payouts.*

Hypothesis 3b. *The quality of investors' access to public information influences the relation between the proportion of Top10LTOwners and dividend payouts.*

3. Data and main results

3.1. Data

We use Thomson Reuters' 13F quarterly institutional common stock holdings data for the institutional ownership variables and the Compustat and Center for Research in Security Prices (CRSP) databases for the financial data. The 13F mandatory institutional reports are filed with the Securities and Exchange Commission (SEC) on a calendar quarter basis and are compiled by Thomson Reuters (formerly known as the 13F CDS/Spectrum database). The SEC's Form 13F requires all institutions with more than $100 million under management at the end of the year to report their long positions of equity. The reported positions are those in which the institution owns more than 10,000 shares or shares

of over $200,000 in market value. Our sample includes all publicly traded U.S. firms in the CRSP and Compustat databases between 1995 and 2009 that have CRSP share codes of 10 or 11. We exclude firms that are financials or utilities and firms with zero institutional ownership. For each firm that has non-missing and non-zero institutional ownership, we calculate the ratio of shares owned by the 10 largest shareholders to the total shares outstanding as our measure of ownership concentration (*Top10own*), similar to Burns, Kedia, and Lipson (2010). We differentiate institutional investors as long term or short term based on Bushee's categorization that is available at Professor Bushee's personal site: http://acct3.wharton.upenn.edu/faculty/bushee/. According to Bushee (1998), dedicated institutional investors are characterized by large average investments in portfolio firms with extremely low turnover ratios, quasi-indexers are characterized by low turnover and diversified holdings, and transient investors have high portfolio turnover ratios and highly diversified portfolio holdings. We categorize both dedicated and quasi-index institutional ownership as long-term and transient ownership as short-term. We calculate the ratio of shares owned by institutions that are the10 largest shareholders (*Top10Own*). Out of *Top10Own*, we define the ratio of shares owned by these top10 owners with a long-term investment horizon as *Top10LTIO* and that by top10 owners with a short-term investment horizon as *Top10STIO*, respectively.

We define the dividend payout ratio as cash dividends normalized by net income. Institutional investors may condition their use of dividend payouts as a monitoring device on the economic condition of the firm. A firm can have a negative net income for various reasons, such as poor performance, major investments, and a large one-time write off. We suggest that the Top10LTOwners are more likely to use dividend payouts as a monitoring device when the firm has a positive net income. To investigate how monitoring institutional ownership influences dividend payouts to alleviate agency costs, we limit our sample to firms with positive earnings in the previous year. After imposing the above restrictions, our sample contains 31,140 firm-year observations from 5977 unique firms over 1995–2009.

We control for differences between firms using the logarithm of the firm's market capitalization (to control for the size effect), firm age (to control for the lifecycle effect documented by DeAngelo, DeAngelo, and Stulz, 2006), past volatility of the firm's stock, leverage, cash ratio, return on assets, sales growth (a proxy for investment opportunities), and proportion of fixed assets. Past volatility is calculated based on monthly stock returns over the past 2 years and controls for firm risk. We winsorize all of the ownership and control variables at the 1% and 99% levels to alleviate the effect of outliers.

3.2. Summary statistics

Table 1 presents the summary statistics for all of the variables. Our main dependent variable, the dividend payout ratio, is the cash dividend divided by the net income during the previous year. The mean dividend payout ratio is 21.1%, with a median of 0 and a standard deviation of 47.0%. The 75% percentile is 25.4%. We also calculate the average dividend payout ratio for the firms without a restriction on positive net income and find that the mean, median, and standard deviation of the dividend payout ratio are 12.6%, 0, and 42.6%, respectively. The other dividend payout measures—cash dividends normalized by income before extraordinary items (*IB*), earnings before interest and taxes (*EBIT*), contemporaneous net income (*NI*), market value, and total payouts normalized by net income—are also higher for our sample of firms. Our sample also has higher profitability (mean ROA at 1.9% vs −4.5%) and a lower cash holding ratio and sales growth rate than the firms without a positive net income restriction.

3.3. Institutional ownership and dividend payouts

We first examine how institutional ownership in the previous year influences the firm's propensity to pay dividends. The results are reported in columns 1–3 in Table 2. The dependent variable is a dividend dummy that equals 1 if the firm pays dividends and 0 otherwise. The results from the logit models show that the total ownership by institutions (*Total IOR*), ownership by institutions with largest stakes in the firm (*Top10own*), and ownership by these institutions that have both large stakes and short-term investment horizons (*Top10STIO*) are all negatively associated with future propensity to pay dividends. There is also no significant relation between *Top10LTIO* and the dividend-paying propensity. The propensity to pay dividends increases with an increase in firm size, fixed assets ratio, firm age, or profitability, and decreases with an increase in leverage, cash ratio, sales growth, or firm risk.

When analyzing the effect of institutional ownership on dividend payouts, omitted unobservable firm characteristics may lead to spurious results due to endogeneity concerns. For example, some firms may have founding CEOs who are reluctant to pay dividends and this attitude may then become a part of the corporate culture. We can address the concern that omitted time-invariant firm characteristics drive our results by controlling for firm-fixed effects in the regression models. The chi-square statistic from the Hausman test is highly significant, suggesting a panel firm fixed effect model is preferred to a panel random effects model.

We then use firm-fixed effects models to investigate how different types of institutional ownership in the previous year influence the dividend payout ratio. The dividend payout ratio increases with an increase in firm size or cash ratio, and decreases with an increase in leverage, firm risk, or profitability. This suggests that different firm characteristics influence both the propensity to pay dividends and the dividend payout ratio. The results reported in columns 4–6 of Table 2 show that greater *Total IOR* is not significantly associated with the dividend payout ratio. *Top10own* and *Top10LTIO* are both positively associated with the dividend payout ratio, supporting Hypothesis 1. *Top10STIO* is not associated with the dividend payout ratio. Our findings show that different types of institutional ownership have different effects on the propensity to pay and the magnitude of the payout ratio. This suggests that ownership types affect how institutional investors use dividends as a channel for monitoring.

As *Top10LTIO* and *Top10STIO* add up to *Top10IO*, a regression including *Top10IO* with *Top10LTIO* and *Top10LSTO* is subject to problems

Table 1
Descriptive statistics
Table 1 reports the descriptive statistics for main variables used in our study over the period of 1995–2009.

Variable	N	Mean	Median	P25	P75	SD
Div_t/NI_{t-1}	31,140	0.211	0.000	0.000	0.254	0.470
$Div\ Dum_t$	31,043	0.411	0.000	0.000	1.000	0.492
Div_t/IB_{t-1}	31,140	0.210	0.000	0.000	0.254	0.485
$Div_t/EBIT_{t-1}$	31,131	0.110	0.000	0.000	0.145	0.236
Div_t/NI_t	31,139	0.161	0.000	0.000	0.203	0.483
$Div\ Yield_t$	31,039	0.009	0.000	0.000	0.014	0.017
$Div_t/Mktcap_{t-1}$	30,977	0.010	0.000	0.000	0.015	0.018
Dvc_t/NI_t	31,043	0.150	0.000	0.000	0.195	0.384
$Totpay_t/NI_t$	29,185	0.453	0.134	0.000	0.631	1.126
Log(MV)	31,081	6.160	6.144	4.652	7.541	2.106
Leverage	31,031	0.205	0.179	0.021	0.326	0.189
Cash/TA	31,135	0.156	0.081	0.024	0.228	0.181
ROA	31,140	0.046	0.054	0.020	0.092	0.110
Sale's Growth	31,081	0.141	0.092	−0.003	0.221	0.319
Tobin's Q	29,643	1.930	1.482	1.101	2.192	1.469
Net FA/TA	31,082	0.288	0.221	0.106	0.416	0.231
Log(Firm age)	31,128	2.516	2.546	1.873	3.219	0.869
Past volatility	26,628	0.136	0.121	0.088	0.167	0.070
FCF/TA	27,250	0.099	0.099	0.062	0.142	0.089
Total IOR	31,140	0.521	0.550	0.267	0.771	0.297
Top10own	31,140	0.342	0.346	0.214	0.458	0.185
Top10LTIO	31,140	0.253	0.239	0.126	0.359	0.165
Top10STIO	31,140	0.075	0.048	0.010	0.111	0.083
ZIP2 Top10LTIO	31,104	0.540	0.533	0.467	0.605	0.134
FF48 Top10LTIO	31,139	0.543	0.542	0.482	0.602	0.087
HHI	31,139	0.080	0.056	0.032	0.091	0.086

Table 2
Propensity to pay and dividend payout regressions.
Table 2 reports the relation between lagged institutional ownership of various types and dividend payout. Columns 1–3 report results from logit regressions with the dependent variable being *Div Dum*. Columns 4–7 report results from panel firm fixed effects regressions with the dependent variable being Div_t/NI_{t-1}. All model standard errors are robust standard errors clustered at the firm level.

	1	2	3	4	5	6	7
VARIABLES	*Div Dum*	*Div Dum*	*Div Dum*	Div_t/NI_{t-1}	Div_t/NI_{t-1}	Div_t/NI_{t-1}	Div_t/NI_{t-1}
$Log(MV)_{t-1}$	0.397***	0.323***	0.320***	0.012*	0.009	0.011*	0.020***
	(12.646)	(12.595)	(12.364)	(1.894)	(1.588)	(1.831)	(2.946)
$Leverage_{t-1}$	−0.904***	−0.921***	−0.919***	−0.117***	−0.117***	−0.117***	−0.115***
	(−3.841)	(−3.894)	(−3.899)	(−3.397)	(−3.409)	(−3.394)	(−3.336)
$Cash/TA_{t-1}$	−1.085***	−1.066***	−1.040***	0.151***	0.146***	0.151***	0.156***
	(−3.624)	(−3.576)	(−3.479)	(4.227)	(4.106)	(4.220)	(4.390)
ROA_{t-1}	3.151***	3.214***	3.341***	−1.685***	−1.667***	−1.662***	−1.663***
	(4.803)	(4.855)	(5.047)	(−14.895)	(−14.787)	(−14.757)	(−14.758)
$Sale's\ Growth_{t-1}$	−1.097***	−1.110***	−1.046***	−0.005	−0.004	−0.002	−0.002
	(−9.984)	(−9.910)	(−9.491)	(−0.544)	(−0.484)	(−0.221)	(−0.183)
$Net\ FA/TA_{t-1}$	0.619***	0.672***	0.648***	0.077	0.076	0.072	0.071
	(2.726)	(2.954)	(2.846)	(1.197)	(1.179)	(1.129)	(1.110)
Log(Firm age)	1.075***	1.083***	1.066***	0.023	0.017	0.013	0.024
	(17.007)	(16.998)	(16.708)	(1.047)	(0.790)	(0.609)	(1.124)
Past volatility	−12.853***	−12.823***	−12.446***	−0.151**	−0.139**	−0.132**	−0.144**
	(−15.074)	(−14.961)	(−14.662)	(−2.305)	(−2.126)	(−2.012)	(−2.197)
$Total\ IOR_{t-1}$	−1.041***			−0.019			−0.138***
	(−5.315)			(−0.650)			(−3.220)
$Top10own_{t-1}$		−0.851***			0.088**		
		(−3.168)			(2.513)		
$Top10LTIO_{t-1}$			−0.384			0.116***	0.240***
			(−1.381)			(3.094)	(4.850)
$Top10STIO_{t-1}$			−2.702***			−0.051	0.091
			(−5.948)			(−0.982)	(1.343)
Year fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed	Yes	Yes	Yes	No	No	No	No
Firm fixed	No	No	No	Yes	Yes	Yes	Yes
Industry-Year fixed	No	No	No	No	No	No	No
Constant	−3.305***	−3.237***	−3.346***	0.175***	0.172***	0.172***	0.117*
	(−9.971)	(−9.421)	(−9.864)	(2.763)	(2.804)	(2.801)	(1.827)
Partial *F*-test of ($Total\ IOR_{t-1} + Top10LTIO_{t-1} = 0$)							7.14*** ($p = 0.008$)
Observations	22,526	22,526	22,526	22,414	22,414	22,414	22,414
R-squared (Pseudo R^2)	0.338	0.335	0.337	0.042	0.042	0.043	0.044

Robust *z* and *t*-statistics in parentheses.
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

caused by severe multicolinearity. We therefore focus on results from regressions using the following three ownership variables: *Total IOR*, *Top10LTIO*, and *Top10STIO* and report results in column 7 of Table 2. Whereas *Total IOR* describes the effect of overall institutional ownership, *Top10LTIO* and *Top10STIO* capture the incremental effect of ownership concentration and investment horizons. The effect of the Top10LTOwners on dividend payouts is therefore calculated as the sum of effects from *Total IOR* and *Top10LTIO* (0.240–0.138 = 0.102 in column 7). To test the null joint hypothesis that there is no effect of the Top10LTOwners on dividend payout, we conduct a partial *F*-test on the parameters of *Total IOR* and *Top10LTIO* (Kennedy, 1996, p.89). The partial *F*-statistic is 7.14 and significant at the 1% level. Even though not tabulated, when we add control of industry-year fixed effects, our results continue to hold.

3.4. Endogeneity and causality

The endogenous nature of ownership makes it difficult to produce conclusive evidence on the effect of monitoring institutions on dividends (Demsetz and Lehn, 1985). We address this concern by estimating a change model similar to Moser and Puckett (2009) and an instrumental variable (IV) regression.

The change model includes the same variables as the level model in column (7) of Table 2, but includes changes to examine how change in institutional ownership is related to future dividend payouts. We report the results in columns 1–2 in Table 3. In column 1, we regress the change in dividend payout ratio that is calculated based on net income between year t and $t + 1$ on change in *Top10LTIO* between year $t - 1$ and t and the changes in other explanatory variables between year $t - 1$ and t. In column 2, we regress the change in dividend payout that is calculated based on net income before extraordinary items between year t and $t + 1$ on change in *Top10LTIO* between year $t - 1$ and t and the changes in other explanatory variables between year $t - 1$ and t. The results show that an increase in lagged *Top10LTIO* is associated with an increase in dividend payouts when we control for year and industry fixed effects, supporting Hypothesis 1.

The *R*-squared from change models on the relation between institutional ownership and dividends is usually low, ranging from less than 1% in Grinstein and Michaely (2005) to 3% in Hartzell and Starks (2003). Moser and Puckett (2009) include additional control variables like changes in Beta, changes in market to book ratio, etc. and their *R*-squared is close to 5% as well. Even though the *R*-squared from our change models is less than 5%, it is in line with the previous studies.

Next, we introduce two instruments similar to Jiraporn, Jiraporn, Boeprasert, and Chang (2014). These instruments are both related to

Table 3
Future dividend payout change regression.
Table 3 reports the relation between change in future dividend payout and various types of institutional ownership change. The sample is restricted to firm-years with NI_t and $NI_{t-1} > 0$. All model standard errors are robust standard errors clustered at the firm level.

	1	2
VARIABLES	$\Delta(Div_{t+1}/NI_t)$	$\Delta(Div_{t+1}/IB_t)$
$\Delta\ Log(MV)_t$	0.021**	0.015
	(2.342)	(1.562)
$\Delta\ Leverage_t$	−0.174***	−0.217***
	(−3.452)	(−3.954)
$\Delta\ Cash/TA_t$	0.123**	0.155***
	(2.480)	(2.582)
$\Delta\ ROA_t$	−1.987***	−1.949***
	(−13.504)	(−12.325)
Δ Sale's $Growth_t$	−0.009	0.006
	(−0.579)	(0.364)
Δ Net FA/TA_t	0.047	0.057
	(0.413)	(0.480)
$Log(Firm\ age)_t$	0.003	0.001
	(1.073)	(0.191)
Δ Past $volatility_t$	−0.123	−0.139
	(−1.430)	(−1.532)
Δ Total IOR_t	−0.035	−0.001
	(−0.692)	(−0.013)
$\Delta\ Top10LTIO_t$	0.155**	0.117*
	(2.403)	(1.722)
$\Delta\ Top10STIO_t$	0.019	−0.019
	(0.241)	(−0.239)
Year fixed	Yes	Yes
Industry fixed	Yes	Yes
Partial *F*-test of	5.29**	9.65***
(Δ Total $IOR_t + \Delta\ Top10LTIO_t = 0$)	($p = 0.022$)	($p = 0.002$)
Overall *F*-statistic	19.73***	21.61***
Observations	16,455	16,455
R-squared	0.040	0.031

Robust *t*-statistics in parentheses.
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Top10LTIO and are not driven by firm-specific characteristics: annual mean *Top10LTIO* of all other firms in the same two-digit zip area (*Zip2Top10LTIO*) and mean *Top10LTIO* of all other firms that are in the same industry (*FF48 Top10LTIO*) of the 48 industries defined by Fama and French (1997).

A valid IV must meet two criteria. It must affect the value of *Top10LTIO* and it must not affect firm performance through channels other than its direct effect on *Top10LTIO*. Due to certain shared-location-related influence, the *Zip2Top10LTIO* of all other firms in the same two-digit zip area should be positively correlated with that of a specific firm. For example, an industry cluster (a group of firms in the same industry that cluster geographically, Krugman, 1991), may attract long-term institutional investors that have favorable opinions about the long-term prospects of that industry. In the local bias literature, Hochberg and Rauh (2013) show that state politicians' influence on public pension funds leads to the overweighting of private equity investments in the home state.

If the Top10LTOwners own a large stake in a firm for industry-related reasons, *FF48top10LTIO* should be positively correlated with *Top10LTIO*. The first stage IV regression shows that our two instruments are not weak as they have an *F*-statistic of 19.44 (p-value = 0.000) (Stock and Yogo, 2005). An endogeneity test suggests that *Top10LTIO* is endogenous (p-value = 0.003). Hansen's *J*-test shows that at least one of the instruments in the IV regression is valid (p-value = 0.668). The estimated coefficient of *Top10LTIO* is positive and significant, suggesting a 1.21% rise in dividend payouts for a 1% increase in the predicted *Top10LTIO*. The results from the two stages of the IV regression are reported in Table 4. The results in the second stage confirm the positive relation between *Top10LTIO* and the dividend payout ratio, which is both statistically and economically significant.

Table 4
Instrumental variable regression.
IV regression is estimated using a two-stage least squares regression and the dependent variable in the first stage is *Top10LTIO*. There are two instruments: the first instrument is *Zip2 Top10LTIO*, based on geographical location (with same two-digit zip codes) and the second instrument is *FF48Top10LTIO*, based on industry (within the same industry of the 48 as defined in Fama and French, 1997). The dependent variable in the second stage is Div_t/NI_{t-1}. Both stages control for year and industry fixed effects and all model standard errors are robust standard errors clustered at the firm level.

	1	2
	First stage	Second stage
VARIABLES	*Top10LTIO*	Div_t/NI_{t-1}
Top10LTIO		1.209**
		(2.491)
$Log(MV)_t$	0.025***	−0.020
	(24.03)	(−1.633)
$Leverage_t$	0.015	−0.015
	(1.54)	(−0.490)
$Cash/TA_t$	−0.018*	0.090***
	(−1.74)	(2.853)
ROA_t	−0.064***	0.013
	(−6.15)	(0.306)
Sale's $Growth_t$	−0.039***	0.036
	(−12.99)	(1.597)
Net FA/TA_t	−0.020**	0.130***
	(−2.18)	(4.387)
$Log(Firm\ age)$	−0.011***	0.094***
	(−5.32)	(11.363)
Past volatility	−0.313***	−0.177
	(−13.50)	(−1.052)
Instruments:		
Zip2 Top10LTIO	0.049***	
	(5.22)	
FF48 Top10LTIO	0.068***	
	(2.91)	
Constant	0.068***	−0.029
	(2.91)	(−0.277)
F-tests of excluded instruments	19.44***	
	($p = 0.000$)	
Endogenous chi-square test	8.761	
	($p = 0.003$)	
Hansen's *J*-test	0.184	
	($p = 0.668$)	
Observations	26,401	26,401
R^2	0.308	0.057

Robust *t* (the first equation) and *z*-statistics (the second equation) in parentheses.
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

4. Effect of the Top10LTOwners on dividend payouts and agency costs

4.1. Firm-level agency costs, the Top10LTOwners, and dividend payouts

To test Hypothesis 2a, we proxy agency costs with (1) positive free cash flow with poor investment opportunities and (2) the magnitude of earnings management. The measure of free cash flow is adapted from Lang, Stulz, and Walkling (1991). It is calculated as operating income before depreciation minus income taxes, increases in deferred tax, and investment tax credit and interest expenses. We do not subtract dividends to calculate free cash flow as this paper investigates the effect of institutional monitoring on dividends. However, our results remain qualitatively the same if the free cash flow measure excludes cash flow for dividends. We use Tobin's Q as a proxy for investment opportunities and define poor investment opportunities as Q less than 1, following Lang, Stulz, and Walkling (1991).

Similar to Chung, Firth, and Kim (2002), our measure of earnings management follows the modified Jones model (1991). Previous studies claim that this model is the most powerful in detecting earnings management between competing models (Dechow, Sloan, and Sweeney, 1995) and is both effective (Davidson, Jiraporn, Kim, and Nemec, 2004) and reliable (Guay, Kothari, and Watts, 1996). We calculate the difference between reported earnings and operating cash flows as our measure of accruals. We also estimate the expected accruals by regressing total accruals of all firms in an industry with the same 2-digit SIC code on firm characteristics that may influence accruals: total assets; revenue; property, plant, and equipment; and accounts receivable.

We report the results for two subsamples, firms with positive free cash flow and Tobin's Q less than 1, and firms with positive free cash flow and Tobin's Q greater than or equal to 1, in columns 1 and 2 of panel A in Table 5. The positively significant partial *F*-statistic in column 1 tells us that the Top10LTOwners are positively associated with higher dividend payouts only in firms with both positive free cash flow and low Q. We also report the results on the relation between the Top10LTOwners and firms with above- and below-median earnings management, in columns 3 and 4, respectively. As expected and shown by the highly significant partial *F*-statistic in column 3, the positive relation between the Top10LTOwners and dividend payouts only exists in firms with higher absolute magnitudes of earnings management. Higher proportion of the Top10 short-term owners does not lead to dividend payout increases, as suggested by the either insignificant or negative joint effect of *Total IOR* and *Top10STIO*. Our findings provide support for Hypotheses 2a and 2b, suggesting that concentrated long-term institutional ownership leads to higher dividend payouts only at firms with high agency costs.

4.2. Top10LTOwners, external monitoring mechanisms, and dividend payouts

We use product market competition and the quality of access to public information in the state where the firm's headquarters are located as proxies for external monitoring mechanisms. Similar to Jurkus, Park, and Woodard (2011), we construct the Herfindahl concentration

Table 5
Institutional ownership and dividend payout: severity of agency problems.

Panel A. Free cash flow and earnings management as a proxy for severity of agency problems.
Firms in columns 1 and 3 are likely to have more severe agency problems while firms columns 2 and 4 are not.

VARIABLES	1	2	3	4
	Div_t/NI_{t-1}	Div_t/NI_{t-1}	Div_t/NI_{t-1}	Div_t/NI_{t-1}
	Positive Free Cash Flow Low Tobin's Q	Positive Free Cash Flow High Tobin's Q	High Earnings Management	Low Earnings Management
$Total\ IOR_{t-1}$	−0.141	−0.158***	−0.103*	−0.200***
	(−0.908)	(−2.960)	(−1.930)	(−2.837)
$Top10LTIO_{t-1}$	0.404**	0.174***	0.234***	0.237***
	(2.026)	(2.858)	(3.436)	(3.103)
$Top10STIO_{t-1}$	−0.080	0.116	0.042	0.054
	(−0.338)	(1.374)	(0.445)	(0.497)
Financial variables Controlled	Yes	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes	Yes
Firm fixed	Yes	Yes	Yes	Yes
Partial *F*-test of	$F = 4.85$**	$F = 0.11$	$F = 5.94$**	$F = 0.37$
$(Total\ IOR_{t-1} + Top10LTIO_{t-1} = 0)$	$(p = 0.028)$	$(p = 0.738)$	$(p = 0.015)$	$(p = 0.546)$
Overall *F*-statistic	$F = 2.94$***	$F = 11.09$***	$F = 5.99$***	$F = 9.57$***
Observations	3071	15,163	10,458	11,956
R-squared	0.081	0.049	0.033	0.063

Panel B. Other monitoring mechanisms that influence the severity of agency problems
Firms in columns 2 and 3 have stronger external monitoring systems while firms in columns 1 and 4 do not.

VARIABLES	1	2	3	4
	Div_t/NI_{t-1}	Div_t/NI_{t-1}	Div_t/NI_{t-1}	Div_t/NI_{t-1}
	High HHI	Low HHI	Better access to state public info	Worse access to state public info
$Total\ IOR_{t-1}$	−0.123*	−0.112**	−0.232***	−0.062
	(−1.832)	(−2.060)	(−3.172)	(−1.058)
$Top10LTIO_{t-1}$	0.269***	0.150**	0.285***	0.201***
	(3.514)	(2.406)	(4.001)	(2.669)
$Top10STIO_{t-1}$	0.029	0.147*	0.097	0.088
	(0.280)	(1.668)	(0.943)	(0.920)
Financial variables controlled	Yes	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes	Yes
Industry fixed	No	No	No	No
Firm fixed	Yes	Yes	Yes	Yes
Partial *F*-test of	$F = 7.43$***	$F = 0.42$	$F = 0.84$	$F = 6.74$***
$(Total\ IOR_{t-1} + Top10LTIO_{t-1} = 0)$	$(p = 0.007)$	$(p = 0.515)$	$(p = 0.361)$	$(p = 0.010)$
Overall *F*-statistic	$F = 9.01$***	$F = 5.96$***	$F = 7.79$***	$F = 6.08$***
Observations	12,088	10,325	10,512	10,407
R-squared	0.058	0.034	0.045	0.044

Robust *t*-statistics in parentheses.
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

index, which is calculated as the sum of the squared market shares, as the measure of product market competition:

$$HHI_{jt} = \sum_{i=1}^{N_j} S_{ijt}^2, \quad (1)$$

where s_{ijt} is the market share of firm i in industry j in year t and firms with the same three-digit SIC codes are assumed to belong to the same industry. We calculate market shares based on firms' sales using Compustat data and exclude firms for which sales are either missing or negative.

Different states have different regulations and policies on public access to information and therefore present different external governance and informational environments for businesses. The Center for Public Integrity (www.publicintegrity.org) collects data in a number of categories that reflect the quality of corporate governance and transparency, such as access to public information, executive accountability, and legislative accountability, and report scores for each state. The ranks of state-level governance from the scoring system are highly correlated with those reported by Glaeser and Saks (2006) and Hochberg and Rauh (2013). We use this scoring system as our second proxy for the strength of external monitoring.

We estimate the relation between the Top10LTOwners and the dividend payout ratio in two sets of subsamples, firms with above- and below-median HHI values, and firms with above- and below-median ranks of the quality of access to public information in the state where the firm's headquarters are located. We report the results in panel B of Table 5. As suggested by the highly significant partial *F*-statistics in columns 1 and 4, the Top10LTOwners are positively associated with the dividend payout ratio in the subsamples with weaker external monitoring systems, that is, firms in an industry with low competition or firms located in a state with poor access to public information. When strong external monitoring systems are in place, the Top10LTOwners are not associated with the dividend payout ratio. Our findings provide support for Hypotheses 3a and 3b.

5. Robustness

Although our results are consistent with hypotheses based on agency theory, tax and clientele effects have long been thought to influence the relationship between institutional ownership and dividend payouts. An alternative explanation for our results is that the positive relation between Top10LTOwners and dividend payouts is due to the 2003 dividend tax cut, as firms that already pay dividends increased the amount after the tax cut (Chetty and Saez, 2006). We investigate this alternative by dividing our sample into observations from before and after 2003. We re-estimate the relation and report the results in columns 1 and 2 of Table 6. The coefficient estimates for *Top10LTIO* in both before- and after-2003 subsamples are positive and significant, alleviating the concern that our findings are driven by the change in the tax law.

We conduct further robustness checks using alternative measures of the dividend payout ratio. We examine the alternative dividend measures of total payouts, dividends for common/ordinary shares, and cash dividends and report these results in columns 3–8 in Table 6. We normalize the dividend amount by alternative income measures, including *IB*, *EBIT* instead of *NI* and find the relation between *Top10LTIO* and the alternative dividend payout measures to remain positive and significant. We also calculate the dividend yield, which is the dividend per share in year t divided by price per share in year $t-1$ to estimate the relation between *Top10LTIO* and the dividend yield. The relation between the Top10LTOwners and dividend yield remains positive, but insignificant at the conventional level according to the *F*-statistics. The differential relation between the Top10LTOwners on income- and market value-based dividend payout measures suggests that income is an important condition that the Top10LTOwners consider when they use dividend payout as a monitoring tool, consistent with our argument in Section 3.1. Even though they are not tabulated, our results are also robust to normalizing cash dividends or common dividends by contemporaneous net income.

Institutions may have different clientele due to their different tax advantages. For example, despite the institutions' similar investment horizons, the clientele attracted to pension funds is usually different from that to mutual funds. We investigate the clientele effect due to the tax advantages of pension funds by excluding pension funds from the Top10LTOwners. The results still hold, suggesting that our results are not driven by the clientele effect.

We conduct further robustness checks on the effect of Top10LTOwners on dividend payouts. We identify long-term institutional ownership based on the churn rate (turnover ratio) of each institution following Gaspar, Massa, and Matos (2005). We also include another type of majority ownership, block holder ownership, as a

Table 6
Sub-period and robustness tests.
Columns 1–2 present results from pre-2002 and post-2003 sub-periods, respectively. The dependent variables in Columns 3–8 are alternative measures of dividend payout.

VARIABLES	1 Div_t/NI_{t-1} <=2002	2 Div_t/NI_{t-1} >=2003	3 Div_t/IB_{t-1}	4 $Div_t/EBIT_{t-1}$	5 Dvc_t/NI_t	6 $Div_t/Mktcap_{t-1}$	7 *Div Yield*$_t$	8 $Totpay_t/NI_{t-1}$
Total IOR$_{t-1}$	−0.040	−0.106	−0.145***	−0.064***	−0.139***	−0.004***	−0.003***	−0.135
	(−0.705)	(−1.598)	(−3.323)	(−3.173)	(−3.927)	(−2.783)	(−2.696)	(−0.968)
Top10LTIO$_{t-1}$	0.195***	0.242***	0.234***	0.102***	0.213***	0.005***	0.004***	0.501***
	(2.610)	(3.336)	(4.510)	(4.161)	(4.782)	(3.420)	(3.093)	(2.970)
Top10STIO$_{t-1}$	0.042	0.087	0.078	0.059*	0.133**	0.004**	0.003*	−0.421**
	(0.417)	(0.860)	(1.154)	(1.880)	(2.438)	(2.147)	(1.850)	(−2.028)
Financial variables Controlled	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed	No	No	No	No	No	No	No	No
Firm fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Partial *F*-test of	10.52***	4.15**	5.06**	4.16**	4.75**	1.43	0.94	8.42***
(*Total IOR*$_{t-1}$ + *Top10LTIO*$_{t-1}$ = 0)	(p = 0.001)	(p = 0.042)	(p = 0.025)	(p = 0.042)	(p = 0.029)	(p = 0.233)	(p = 0.332)	(p = 0.004)
Observations	10,791	11,623	22,414	22,414	21,871	22,414	22,575	20,378
R-squared	0.059	0.036	0.039	0.027	0.018	0.043	0.049	0.044

Robust *t*-statistics in parentheses.
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

control as these owners have been shown to play a role in agency costs (Ang, Cole, and Lin, 2000). The positive relation between the Top10LTOwners and dividend payouts from these additional checks remains unchanged.

6. Discussion and conclusion

Although agency theory predicts that monitoring institutional owners will push for higher dividend payouts as these payouts are an effective, credible monitoring device, empirical evidence for this prediction has been mixed. Heterogeneity in institutional ownership may have driven this mixed evidence, as different institutions have different incentives and vary in their choices between trading and monitoring. Alternatively, monitoring institutional investors may condition their use of dividend payouts to mitigate agency problems on firms' financial performance and we show that the firms' income is an important conditioning variable. We test the joint hypothesis that concentrated institutional investors with both large stakes and long investment horizons monitor, and that they monitor through the dividend payout channel. We find supporting evidence that is consistent with this hypothesis. We show that the positive relationship is only salient for firms with high agency costs and weak external monitoring systems, suggesting that institutions will only monitor when they foresee improved benefits from doing so.

Future research could explore other characteristics of institutional ownership that monitors, the conditions that influence institutional investors' choice of monitoring tools, and how different types of institutional ownership, such as mutual funds or pension funds, influence dividend payouts. This work could also be extended by investigating how other monitoring mechanisms that are already in place affect institutional investors' monitoring incentives.

Appendix A. Variable definitions and data sources.

Variable name	Definition	Source
Financial variables		
Div_t/NI_{t-1}	*DIV* is total amount of cash dividends paid for common and preferred stocks. NI is net income.	Compustat
Div Dum	Dividend dummy variable. Equals one if firms pay cash dividends, else 0.	Compustat
Div_t/IB_{t-1}	*IB* is net income before extraordinary items.	Compustat
$Div_t/EBIT_{t-1}$	*EBIT* is earnings before interests and taxes.	Compustat
$Div_t/Mktcap_{t-1}$	*Mktcap* is market value of common stock.	Compustat
$Div\ Yield_t$	Dividend per share (t) divided by price per share(t-1)	Compustat
Dvc_t/NI_{t-1}	*DVC* is common dividends declared.	Compustat
Totpay/NI	*TOTPAY* is total cash dividend plus purchases of common and preferred stocks.	Compustat
Log(MV)	Log (market value)	Compustat
Leverage	Debt ratio	Compustat
Cash/TA	Cash dividend divided by total assets	
ROA	Return on assets	Compustat
Sale's Growth	1 year sale's growth rate	Compustat
Tobin's Q	Market value of total assets divided by book value of total assets	Compustat
Low Tobin's Q	Takes 1 if Tobin's Q is less than 1, else 0	Calculated using Compustat
Net FA/TA	Net plant and equipment/total assets	Compustat
Log(Firm age)	Log(firm age + 1)	CRSP
Past volatility	Past 24 month stock return volatility	CRSP
FCF/TA	Free cash flows/total assets	Compustat
Positive FCF	Takes 1 if FCF/TA is positive, else 0.	Calculated using Compustat
HHI	Herfindahl–Hirschman index	Compustat
High HHI	Takes 1 if HHI is greater than median, else 0.	Calculated using Compustat
EM	Absolute magnitude of earnings management	Compustat
High EM	Takes 1 if EM is higher than median, else 0.	
Better state info	Takes 1 if state public information score is higher than median state number, else 0.	Center for Public Integrity (www.publicintegrity.org)
Institutional ownership variables		
Total IOR	Total institutional ownership ratio	13F
Top10own	Top10 institutional ownership ratio	13F
Top10LTIO	Top 10 long-term institutional ownership ratio	13F
Top10STIO	Top 10 short-term institutional ownership ratio	13F
Zip2 Top10LTIO	Annual average Top10 long-term institutional ownership within the same two digit ZIP code area	Calculated using 13F and Compustat
FF48 Top10LTIO	Average Top10 long-term institutional ownership within the same Fama & French 48 industry	Calculated using 13F and Compustat

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