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Journal of Financial Economics 60 (2001) 45–72

JOURNAL OF
Financial
ECONOMICS

www.elsevier.com/locate/econbase

Corporate payout policy and managerial stock incentives[☆]

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Received 1 March 1997; received in revised form 1 April 2000; accepted 17 January 2001

Abstract

We examine how corporate payout policy is affected by managerial stock incentives using data on more than 1,100 nonfinancial firms during 1993–97. We find that management stock ownership is associated with higher payouts by firms with potentially the greatest agency problems – those with low management stock ownership and few investment opportunities or high free cash flow. We also find that management stock options are related to the composition of payouts. We find a strong negative relationship between dividends and management stock options, as predicted by Lambert et al (1989), and a positive relationship between repurchases and management stock options. Our results suggest that the growth in stock options may help to explain the rise in repurchases at the expense of dividends. © 2001 Published by Elsevier Science S.A.

JEL classification: G30; G32

Keywords: Dividends; Share repurchases; Executive stock options; Stock incentives

[☆]The views expressed in this paper are those of the authors and not necessarily those of the Federal Reserve Board. We thank Stewart Myers, Manju Puri, Bill Schwert, and especially Jarrad Harford, the referee, for helpful comments, and Kyle Nagel, Mike Pizzi, Melissa Post, and Wendy Huang for outstanding research assistance.

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1. Introduction

Managerial stock incentives have the potential to help align the incentives of managers and shareholders. Hall and Liebman (1997) document that stock-based compensation has grown dramatically since 1980, suggesting that corporations regard stock incentives as being of practical importance. However, only a few studies investigate how managerial stock incentives influence management activities and, in particular, the extent to which they mitigate various agency problems.¹

This paper investigates how corporate payout policy is affected by managerial stock incentives. We focus on payout policy because the free cash flow problem described by Jensen (1986) is one of the most severe agency conflicts between management and shareholders. Managers deploy internally generated cash flow in a way that does not maximize shareholder wealth, such as financing value-destroying investments instead of returning funds to investors through dividends and share repurchases. An important question is whether managerial stock incentives help to mitigate the free cash flow problem.

In principal, managerial stock incentives can influence payout policy in one of two ways. The first potential link is that managerial stock incentives, by better aligning the interests of management and shareholders, could result in a higher level of total payouts. To the extent that greater alignment of management-shareholder interests through the use of stock incentives helps mitigate free cash flow problems, the level of repurchases and dividends may be positively related to management share ownership and stock options. This line of argument is similar to that of Mehran (1992) and, especially, Berger et al. (1997), who hypothesize that incentive compensation and management stock ownership, by mitigating conflicts between managers and shareholders, can lead to an increased and more optimal use of leverage.

The second potential link is through the incentive to alter the composition of corporate payouts. The dramatic growth in recent years of open market share repurchases as a means of distributing cash to shareholders (see, e.g., Jagannathan et al., 2000) suggests a fundamental change in corporate payout decisions that could be related to the growing use of managerial stock incentives. As first suggested by Lambert et al. (1989), executive stock options furnish management with the incentive to reduce dividends given that the value of executive stock options, like all call options, are negatively related to future dividend payments. Consistent with this hypothesis, they document that dividends are reduced relative to expected levels following the adoption of executive

¹ Among these are Berger et al. (1997), which examines how chief executive officer (CEO) stock and stock options influence the choice of leverage; Denis et al. (1997), which examines how insider stock ownership affects corporate diversification; and Mehran et al. (1998), which examines how CEO share ownership and stock options influence voluntary liquidation decisions.

stock option plans. The expected effect of management stock options on total payouts is uncertain; *ceteris paribus*, management will be indifferent to retaining the proceeds from a reduction in dividends or using them to repurchase stock, as the value of their call options will be the same in either case. However, to the extent that management aims to achieve a target payout level, option-induced reductions in dividends may be offset by increases in repurchases so that total payouts are largely unaffected.

To investigate how stock incentives are related to the deployment of cash flow, we examine the relationship between payouts and stock incentives while controlling for measures of free cash flow. Our study uses Standard & Poor's (S&P) *Execucomp* database, which provides information from company proxy statements on the amount of stock and stock options held by senior management for the universe of S&P 1500 firms since 1992. Combining *Execucomp* with *Compustat*, we use data on more than 1,100 nonfinancial firms to examine the determinants of open market share repurchases and dividends during 1993–97. We also examine determinants of total payouts – the sum of repurchases and dividends – and its composition during this period. An important feature of this analysis is the focus on long-term corporate payout policy, in contrast to much of the literature that focuses on factors that determine short-run policy or policy changes, such as the decision to repurchase stock in a given year or to increase dividends. In particular, we examine how firm characteristics influence average dividend and repurchase policy over a three to five year period. The advantage of this approach is that it abstracts from factors that may influence the timing of policy changes that are difficult for researchers to control for; e.g., companies repurchasing stock if they believe prices are too low or increasing dividends to signal higher earnings.

We have several principal findings. First, management stock ownership is associated with higher payouts by firms with potentially the greatest agency problems – those with low management stock ownership and few investment opportunities or high free cash flow. However, we find no relationship between the level of stock ownership and payouts by firms with relatively high management ownership, more numerous investment opportunities, and more limited free cash flow. We conclude that managerial stock incentives might mitigate agency costs at companies with the most serious excess cash flow problems, but that payouts at other firms are at the margin unaffected. We also find strong evidence that repurchases and dividends are strongly related to firm characteristics in a way consistent with the agency cost theoretic explanation of payouts. In particular, we document that repurchases and dividends are positively related to net operating cash flow and size and negatively related to market-to-book and leverage.

Second, controlling for free cash flow, stock option holdings are strongly correlated with the composition of payouts. We find a strong negative relationship between dividends and management stock options, as predicted by

Lambert et al. (1989). Our estimates imply that a one standard deviation change in the management stock option variable reduces dividend yields by an economically significant 38 basis points. We also find a statistically significant positive relationship between repurchases and management stock options, which, together with the dividend results, suggests that stock options could help to explain the rise in repurchases at the expense of dividends. These results are robust to estimation across various subsamples.

Third, other factors, in addition to stock options, influence the choice between dividends and repurchases. Stock options are correlated with a tilt toward repurchases and away from dividends. The need for financial flexibility also appears to affect the composition of payouts. We find that repurchases as a share of total payouts is positively related to the market-to-book ratio and to the volatility of operating income. These results are consistent with the hypothesis that firms with larger numbers of investment opportunities and less predictable cash flow require greater financial flexibility and, hence, rely more on opportunistic share repurchases than on additional obligatory dividends to disgorge cash flow. However, these results also call into question our interpretation of the relationship between payouts and options. Stock options could proxy for investment opportunities, in which case the relationship between payouts and options could arise because of the need for financial flexibility, not because of the incentive effects of options. We address this possibility in Section 3.4. The weight of the evidence supports our interpretation that options have a direct incentive effect on payouts.

Although the literature on corporate payouts – dividends and repurchases – is a large one, few studies have focused on agency cost-based explanations of payout policy. Smith and Watts (1992) document that industries with potentially the greatest agency costs (those with fewer growth opportunities) have higher dividend yields, suggesting that payouts are used as a bonding mechanism to control agency costs. They use data averaged over time (five-year increments) as well as by industry. Gaver and Gaver (1993) find similar results at the firm level using one year of data. With respect to share repurchases and agency costs, Bagwell and Shoven (1988) and Dittmar (1997) have tested for an empirical relationship between annual share repurchases and growth opportunities, proxied by price-to-book, holding constant operating income. Both studies show that repurchases are positively correlated with operating income and negatively related to price-to-book ratios, although Dittmar finds that the coefficient on price-to-book is not consistently negative over all the years in her sample. These papers assume implicitly an alignment of shareholder and management incentives, and they do not test directly what factors motivate firms to disgorge free cash.

Few studies examine directly the effect of managerial incentives and payout policy. Contrary to our results, Rozeff (1982) finds that dividend payouts are negatively related to insider stock holdings. He argues that insider stock

ownership provides direct incentive alignment between managers and shareholders, while dividends serve as a bonding mechanism to reduce management's scope for making unprofitable investment out of internal funds. Thus, insider stock ownership and dividend policy are viewed as substitute means of addressing potential agency problems. This approach assumes that the optimal level of payouts is chosen conditional on stock incentives and begs the question of how the level of payouts is determined.

White (1996) examines the use of explicit mechanisms to encourage dividend payments; i.e., provisions of executive compensation contracts that link executive bonuses to dividend payments. She finds that such provisions are more common where management stock ownership is lower and that such provisions result in higher dividend payments. Her findings implicitly suggest that management stock ownership encourages dividend payments, because the use of alternative mechanisms to encourage dividends is greater when management stock ownership is lower. But she neither investigates the relationship between dividends and stock ownership outside the context of the compensation provision nor examines the role of stock options.

Jolls (1998), Bartov et al. (1998), and Weisbenner (1998) use a discrete-choice framework to investigate the effect of employee or management stock options on a firm's choice between increasing dividends and repurchasing stock. Consistent with our results, each finds that the probability of repurchasing stock is positively related to stock options. Because none of these studies exploits data on quantities, they do not address the effect of stock incentives on total payouts, and only Jolls (1998) considers the role of stock ownership – and only restricted stock grants.²

Numerous studies focus on self-tender offers instead of open market repurchases. These studies suggest that self-tender offers are undertaken to explicitly signal management's belief that its firm's stock is undervalued (see, e.g., Dann, 1981; Vermaelen, 1984) or to serve as a means of countering a takeover threat (Bagwell, 1991).³ Because self-tender offers are undertaken for reasons other than to distribute cash, and because they now account for less than 10% of total repurchases, we exclude them from our analysis.

The remainder of our paper is organized as follows. In Section 2 we describe our sample and data. In Section 3 we present our main findings, describe the results of alternative specifications, discuss why stock options are not

² Jolls's hypothesis regarding the link between repurchases and options is identical to ours, but her empirical approach is different. She uses one year of data (1993) for a sample of dividend-paying firms to estimate a multinomial logit model of a firm's decision to repurchase stock, increase dividends, repurchase stock and increase dividends, or do neither.

³ See also Ofer and Thakor (1987), Brennan and Thakor (1990), Hausch and Seward (1993), and Persons (1994) for theoretical models of self-tenders, and Asquith and Mullins (1986) and Comment and Jarrell (1991) for empirical analyses.

dividend-protected, and address alternative interpretations of our option results and the possible endogeneity of management stock incentives. Section 4 concludes.

2. Sample and data description

To investigate the relationship between corporate payout policy and managerial stock incentives, we use data from Standard & Poor's *Compustat* and *Execucomp* databases. *Compustat* is our source for dividends, repurchases, and firm characteristics, while *Execucomp* is our source for managerial stock incentives. Because the *Execucomp* database begins with year-end 1992, the date at which new disclosure requirements for executive compensation became effective, our sample period covers dividends and repurchases made during 1993–97.

2.1. Sample selection

To construct our sample we begin by merging *Compustat* with *Execucomp*, which includes executive compensation data for firms in the S&P 500, S&P Midcap 400, and S&P Smallcap 600 indices. We then eliminate annual observations that contain missing values for any of our variables as well as financial firms, utilities, and regulated telephone companies (standard industrial classification code 4813).⁴ This procedure yields 4,987 annual observations with between one and five observations per firm. Next, because we want to focus our analysis on average payout policy over a horizon longer than one or two years, we eliminate all observations for firms which have only one or two annual observations in the merged data. We are left with a sample of 4,663 observations for 1,108 firms: 161 firms with three observations, 555 firms with four observations, and 392 firms with five observations. Because our unit of observation is firm-level averages (or standard deviation in the case of the volatility of operating income), our regression sample has 1,108 observations.

2.2. Payout variables

Our measure of dividend payout is regular cash dividends on common stock divided by the market value of common stock. To measure regular cash dividends we start with *Compustat* data item A21 (cash dividends-common). We

⁴ Financial firms are omitted for a variety of reasons, the most important of which is that *Compustat* does not report their stock repurchases. Heavily regulated firms (utilities and phone companies) are omitted because their payout policies may be significantly affected by their regulated status (Smith and Watts, 1992).

then use *Bloomberg* to investigate all annual dividend payments that exceed 5% of the market value of stock and delete observations that involve special dividend payments. The small number of special dividends that we find (four of the 4,663 annual observations) is consistent with DeAngelo et al. (2000), who find that special dividends have been used infrequently in recent years.

For repurchase payout we use open market repurchases of common stock divided by the market value of common stock. To measure open market repurchases, we start with *Compustat* data item A115 (purchase of common and preferred stock). This item overstates open market repurchases of common stock for a number of reasons (Stephens and Weisbach, 1998; Jagannathan et al., 2000). First, it includes all other forms of common stock repurchases such as self-tender offers and privately negotiated third-party transactions. Second, it includes repurchases of preferred stock. Third, it includes a variety of other transactions such as the conversion of other classes of stock into common stock.

As with dividends, we hand-check repurchases that exceed 5% of the market value of a firm's stock. In this case we use *Dow Jones Interactive* (all news sources) to determine whether a self-tender offer, privately negotiated transaction, or purchase or redemption of preferred stock has occurred. We believe that using a 5% cutoff allows us to identify most instances where overcounting would result from using *Compustat* data item A115. Using this procedure, we delete repurchase data for 65 of our 4,663 annual observations.⁵

Table 1 reports descriptive statistics for payouts in our sample. Total payouts average 2.5% of the market value of common stock. Jagannathan et al. (2000) report that the aggregate payout ratio for *Compustat* firms is approximately 3% during our sample period. We would expect their aggregate payout ratio, which is equivalent to a value-weighted average to exceed the unweighted average reported in Table 1 because payout ratios are positively correlated with firm size. In addition, our sample excludes utilities which pay high dividends. Payouts in our sample are almost evenly divided between regular cash dividends (1.3%) and open market repurchases (1.2%). Repurchases as a share of payouts average 47.8%.

Dividends and repurchases are positively correlated, but not highly so (Table 2). Accordingly, the distribution of total payouts appears less positively skewed than the distribution of either dividends or repurchases (Fig. 1).

⁵ We find that observations with the highest repurchase payouts typically involve transactions other than open market repurchases; conversely, we find that observations with payouts close to the bottom of the range that we investigate (5%) usually do not involve such transactions. We delete the four dividend and 65 repurchase observations when forming firm-average payout variables. Another approach is to delete those firms from our sample, which reduces the sample size from 1,108 to 1,043 firms. The two approaches yield similar empirical results. In some cases data item A115 corresponds to repurchases net of equity issuance, which *Compustat* indicates with a combined figure code. We treat such observations as missing values.

Table 1
Sample distribution of payouts, managerial stock incentives, and firm characteristics

The sample has 1,108 firms in the S & P 1500 Composite index during 1993–97 for which three or more years of data are available. Financial firms, utilities, and regulated phone companies (standard industrial classification code 4813) are excluded. Dividends are regular cash dividends (*Compustat* item A21, corrected for special dividends using *Bloomberg*). Repurchases are open market repurchases of common stock (*Compustat* item A115, corrected for self-tenders, privately negotiated transactions, and purchase or redemption of preferred stock using *Dow Jones Interactive*). Market value is the market value of common stock. Management shares are shares held by executive officers as reported in company proxy statements. Management options are shares underlying options held by executive officers as reported in company proxy statements. Shares outstanding are shares of common stock. Net operating cash flow is operating income before depreciation (*Compustat* item A13) minus capital expenditures (*Compustat* item A128). Market-to-book assets is the market value of assets divided by the book value of assets, where the market value of assets is the book value of assets plus the market value of equity minus the book value of equity. Data are firm-level averages of annual observations except the volatility of operating income, which is the firm-level standard deviation of annual observations.

Variable	Mean	Standard deviation	Percentile				
			Minimum	25th	50th	75th	Maximum
<i>a. Payouts</i>							
Dividends/market value	0.013	0.014	0.000	0.000	0.009	0.023	0.064
Repurchases/market value	0.012	0.016	0.000	0.000	0.004	0.019	0.130
Total payout/market value	0.025	0.023	0.000	0.003	0.021	0.041	0.146
Repurchases/total payout ^a	0.478	0.378	0.000	0.088	0.441	0.881	1.000
<i>b. Management stock incentives</i>							
Management shares/shares outstanding	0.059	0.098	0.000	0.004	0.016	0.065	0.805
Management options/shares outstanding	0.023	0.024	0.000	0.007	0.016	0.031	0.222
<i>c. Other explanatory variables</i>							
Net operating cash flow/assets	0.074	0.109	−0.752	0.037	0.080	0.127	0.830
Market-to-book assets	1.748	1.196	0.162	0.997	1.384	2.078	10.969
Log of assets	6.621	1.509	2.730	5.546	6.456	7.592	12.327
Debt/assets	0.215	0.164	0.000	0.089	0.201	0.314	1.625
Volatility of operating income/assets	0.037	0.040	0.001	0.015	0.025	0.043	0.575

^a Excludes 186 firms with total payout equal to zero

Table 2

Correlation of payout and managerial stock incentive variables

The full sample has 1,108 firms in the S&P 1500 Composite index during 1993–97 for which three or more years of data are available. Financial firms, utilities, and regulated phone companies (standard industrial classification code 4813) are excluded. Dividends are regular cash dividends (*Compustat* item A21, corrected for special dividends using *Bloomberg*). Repurchases are open market repurchases of common stock (*Compustat* item A115, corrected for self-tenders, privately negotiated transactions, and purchase or redemption of preferred stock using *Dow Jones Interactive*). Market value is the market value of common stock. Management shares are shares held by executive officers as reported in company proxy statements. Management options are shares underlying options held by executive officers as reported in company proxy statements. Shares outstanding are shares of common stock. Data are firm-level averages of annual observations. *P*-values are in parentheses.

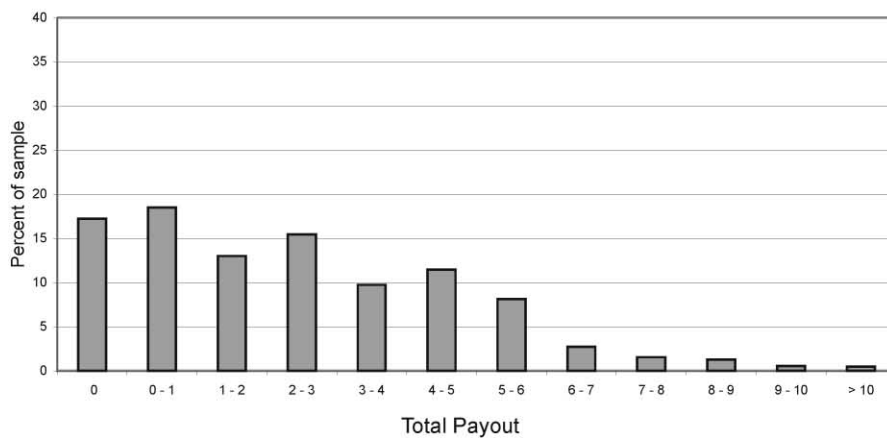
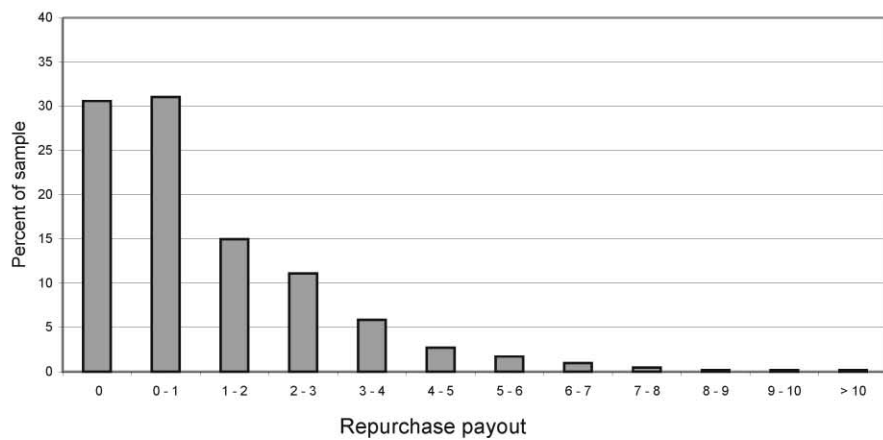
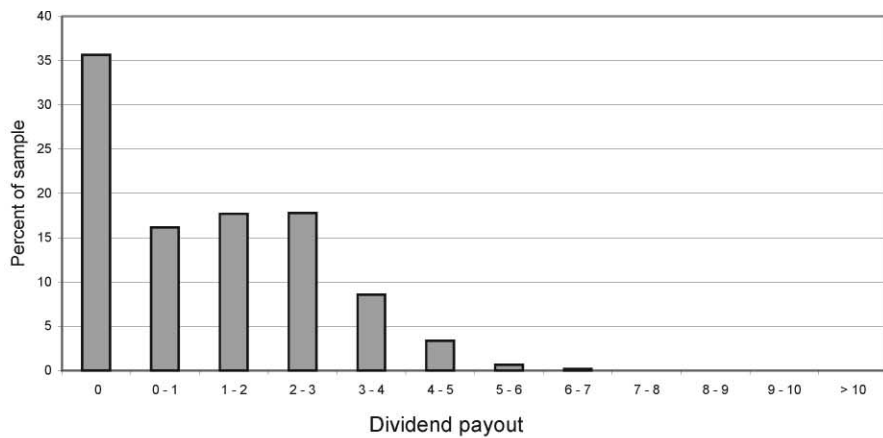
Variable	Dividends	Repurchases	Management shares	Management options
<i>a. Full sample (n = 1108)</i>				
Dividends/market value	—			
Repurchases/market value	0.16** (0.000)	—		
Management shares/shares outstanding	– 0.12** (0.000)	– 0.07* (0.014)	—	
Management options/shares outstanding	– 0.35** (0.000)	– 0.05 (0.079)	0.03 (0.285)	—
<i>b. Subsample with management shares ≤ 5% (n = 780)</i>				
Dividends/market value	—			
Repurchases/market value	0.14** (0.000)	—		
Management shares/shares outstanding	– 0.25** (0.000)	– 0.11** (0.003)	—	
Management options/shares outstanding	– 0.40** (0.000)	– 0.07 (0.053)	0.34** (0.000)	—

**Statistically significant at 1% level.

*Statistically significant at 5% level.

2.3. Management stock and stock option variables

Our primary measures of managerial stock incentives are stock and stock options held by executive officers as a percentage of total shares outstanding. These data are reported in company proxy statements and are available through *Execucomp*. Other studies measure managerial stock incentives using equity ownership data for only the chief executive officer (CEO) (e.g., Berger et al., 1997; Mehran et al., 1998) or equity ownership data for all corporate insiders including outside board members (e.g., Denis et al., 1997). Our choice of data is dependent upon their availability in *Execucomp*; however, we believe it is



reasonable to assume that corporate financial policy reflects the interests of all executive officers and not just those of the CEO.

Executive officers, on average, directly own 5.9% of the shares in their firms (Table 1, panel b). The shares underlying their options average 2.3% of company shares. While the average number of directly held shares is almost two-and-a-half times the average number of shares underlying stock options, the median number of shares held directly and underlying options are virtually identical at 1.6%. Berger et al. (1997) report that the average CEO stock holdings for *Forbes* 500 firms during 1984–91 (2.7%) is more than 15 times the average number of shares underlying CEO stock options (0.17%). The difference between the relative magnitude of stock and stock options in their sample and ours owes partly to the fact that their data include only exercisable stock options while our data include both exercisable and unexercisable options. However, the difference likely also reflects the rapid increase in stock option awards in the last decade (Hall and Liebman, 1997).⁶

The distribution of directly held shares is highly skewed (Fig. 2). Although the median management ownership is 1.6%, 30% of the sample has management ownership greater than 5% and nearly 10% of the sample has management ownership greater than 20%. Morck et al. (1988) observe that at sufficiently high levels of stock ownership managerial entrenchment may dominate the positive incentive effects of more direct alignment. We are careful to check the sensitivity of our empirical results to the inclusion and exclusion of firms with high management ownership.

Table 2 reports the sample correlations between payouts and managerial stock incentives for the full sample and a subsample of firms for which management ownership is less than 5%. In both the full sample and the subsample, the correlation between payouts and stock incentives is negative, most significantly in the case of dividends and stock options, consistent with the negative correlation between dividends and the use of incentive compensation plans reported by Smith and Watts (1992). The correlations involving management stock

⁶ Jolls (1998) reports that the average number of options per executive officer in her sample (which covers fiscal year 1992) is 0.4% of shares outstanding. Her data, like ours, include exercisable and unexercisable options. Assuming that the average number of executive officers covered in her proxy statements is between four and five, her data imply an average holding by all officers of between 1.6 and 2% of shares outstanding, close to our sample average.

Fig. 1. Distribution of dividend, repurchase, and total payout. The sample has 1,108 firms in the S&P 1500 Composite index during 1993–97 for which three or more years of data are available. Data are firm-level averages of annual observations. Dividend payouts are regular common stock dividends divided by the market value of common stock. Repurchase payouts are open market repurchases of common stock divided by the market value of common stock. Total payout is the sum of dividend and repurchase payouts

ownership appear sensitive to the inclusion of high ownership firms as they are somewhat stronger in the subsample than in the full sample.⁷

2.4. *Other firm characteristics*

Agency cost-based explanations of corporate payout policy imply that firms with high levels of free cash flow and low marginal financing costs will have larger payouts. Firms with high levels of free cash flow are at greater risk of overinvesting and, hence, derive greater benefits from distributing cash to shareholders. Firms with relatively low marginal financing costs can distribute more cash to shareholders knowing that if they must raise external funds in the future – because cash flow is lower than expected or profitable investment opportunities are greater than expected – the funds will be relatively inexpensive.

Conceptually, free cash flow is cash flow in excess of that required to fund all projects that have positive net present values (Jensen, 1986). Our proxies for free cash flow include earnings before interest, taxes and depreciation (EBITDA) less capital expenditures, or net operating cash flow, scaled by assets. Other studies use operating income, or EBITDA, scaled by assets as a proxy for free cash flow. Its shortcoming is that it does not reflect the outlays necessary to undertake positive net present value investments. However, net operating cash flow may also misstate free cash flow if companies invest in negative net present value projects. As a practical matter, we obtain similar results using either measure though specifications that include net operating cash flow consistently outperform those that include EBITDA. A third possibility is to use net operating cash flow less interest expense. This variable performs very similarly to net operating cash flow.

Our proxies for free cash flow also include a measure of investment opportunities. The most widely used measure of investment opportunities is the market-to-book asset ratio (see, e.g., Smith and Watts, 1992; Opler and Titman, 1993). Agency cost theories of corporate payouts predict a negative relationship between payouts and the market-to-book ratio.

Our proxy for external financing costs is firm size, measured as the log of assets. Larger firms are generally regarded as having more stable cash flows and

⁷ The correlation between direct stock ownership and stock options also appears sensitive to the inclusion of high-ownership firms. It is close to zero in the full sample ($\rho = 0.03$) but is significantly positive in the lower-ownership subsample ($\rho = 0.34$). The explanation for this result may be that both stock grants and stock options are awarded as part of incentive compensation programs; thus, among firms where incentive compensation accounts for the majority of management ownership, ownership and options are positively correlated. However, among high-ownership firms, ownership levels may reflect financing and ownership history more than the effects of stock incentive programs (i.e., a company could have been significantly financed or founded by the current management). For these firms, ownership and options will be less strongly correlated.

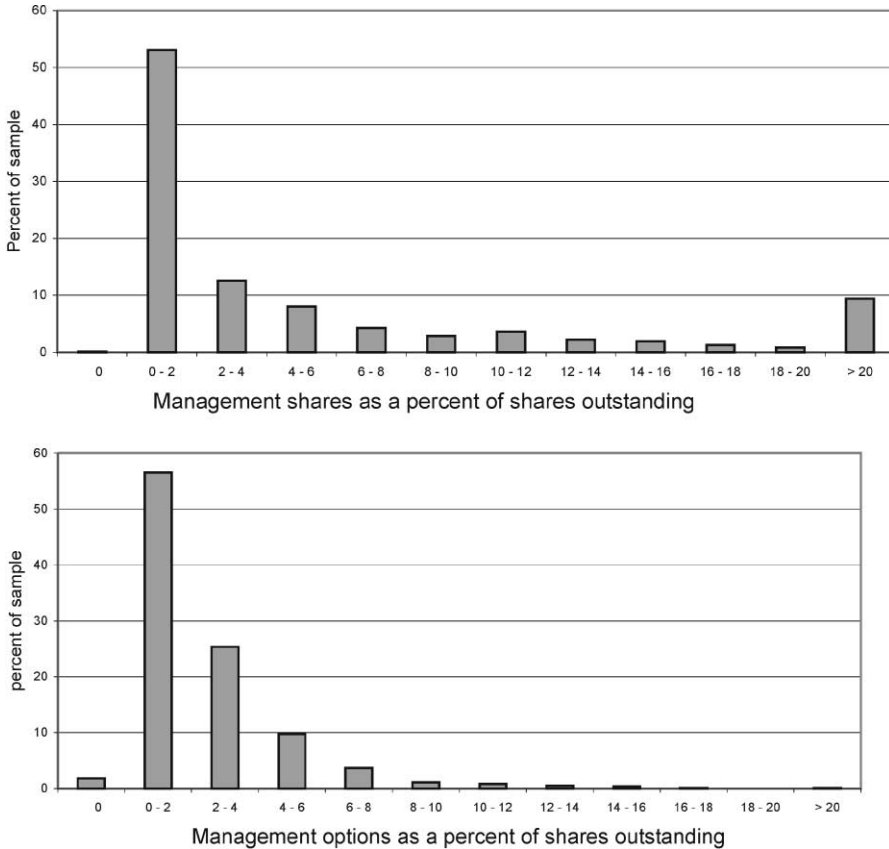


Fig. 2. Distribution of management shares and options. The sample has 1,108 firms in the S&P 1500 Composite index during 1993–97 for which three or more years of data are available. Data are firm-level averages of annual observations. Management shares are shares held by executive officers as reported in company proxy statements. Management options are shares underlying options held by executive officers as reported in company proxy statements.

posing less information asymmetries resulting in lower financing costs (Smith and Watts, 1992; Opler and Titman, 1993). We also control for leverage, although it is not exogenous. As leverage increases, the probability of financial distress, and, hence, external financing costs, increases. Debt is also an alternative method of disgoring free cash flow (Jensen, 1986; Berger et al., 1997). Thus, we expect that firms that rely more on debt to disgorge free cash will rely less on dividends and share repurchases.

Finally, we control for the volatility of operating income, measured as the standard deviation of EBITDA scaled by assets. Greater uncertainty about

future levels of internally generated cash could increase the demand for precautionary holdings of cash and reduce the level of payouts (Jagannathan et al., 2000). Jagannathan et al. suggest that uncertainty affects the composition of payouts, with firms with more uncertain cash flows favoring repurchases over dividends owing to their greater flexibility.

The distribution of these explanatory variables is summarized in Table 1 (panel c). None of the variables appears to have significant outliers, and no observations were truncated or excluded from the analysis.

3. Empirical results

Our primary empirical results are reported in Table 3. We estimate four separate tobit regression models: one-sided tobit models for dividends, repurchases, and total payouts, which are censored at zero, and a two-sided tobit model for repurchases as a share of payouts, which is censored at zero and one. We report both marginal effects, evaluated at the mean of the explanatory variables, and marginal effects multiplied by a one standard deviation change in the explanatory variables. We multiply all quantities by 100 so that they correspond to percentage point changes in the dependent variable.

Turning first to the role of stock incentives, the relationship between management stock and stock options and payouts appears to differ dramatically. As shown in row 1 of Table 3, no apparent link exists between share ownership and payouts. The estimated marginal effects of share ownership are almost identically zero in all four payout equations with *p*-values close to 1. Thus, little evidence appears to support the hypothesis that stock incentives in the form of management stock encourage larger payouts in the full sample.

Conversely, management stock options appear to have very pronounced effects on payouts. As shown in row 2, a one standard deviation increase in stock options is associated with a reduction in dividend payouts of 38 basis points (-0.38) and an increase in repurchases of 13 basis points (0.13). These effects are consistent with the hypothesis that options alter the composition of corporate payouts by discouraging dividend payments. These estimates suggest that roughly one-third of the option-induced reduction in dividends is channeled toward repurchases with two-thirds (25 basis points) retained by the firm. However, the relationship between total payouts and stock options suggests that total payouts decline only 13 basis points in response to a one standard deviation increase in stock options. Thus, our estimates suggest that between one-third and two-thirds of option-induced reductions in dividends are redirected toward repurchases with the remainder retained by the firm. There is no evidence that stock options encourage larger total payouts.

The coefficients on the remaining explanatory variables in the payout regressions provide strong support for agency-based theories of payouts. In each of the

Table 3

Tobit estimates of the determinants of corporate payouts

The sample has 1,108 firms in the S&P 1500 Composite index during 1993–97 for which three or more years of data are available. Data are firm-level averages of annual observations except the volatility of operating income, which is the firm-level standard deviation of annual observations. One-sided tobits are used for the dividend, repurchase, and total payout regressions; a two-sided tobit is used for the repurchase share regression. All regressions are estimated with industry dummies. The first entry in the table is the marginal effect times 10^2 . The second entry is the marginal effect times 10^2 times the standard deviation of the explanatory variable. The third entry (in parentheses) is the p -value of the marginal effect.

Independent variables	Dividend payout	Repurchase payout	Total payout	Repurchase share
<i>Managerial stock incentives</i>				
1. Management shares/shares outstanding	0.01 0.00 (0.96)	0.11 0.01 (0.79)	– 0.09 – 0.01 (0.89)	1.28 0.12 (0.94)
2. Management options/shares outstanding	– 15.87** – 0.38 (0.00)	5.44** 0.13 (0.00)	– 5.65* – 0.13 (0.04)	761.69** 18.03 (0.00)
<i>Other explanatory variables</i>				
3. Net operating cash flow/assets	4.54** 0.50 (0.00)	5.03** 0.55 (0.00)	8.63** 0.94 (0.00)	– 2.79 – 0.30 (0.90)
4. Market-to-book assets	– 0.39** – 0.47 (0.00)	– 0.29** – 0.35 (0.00)	– 0.60** – 0.72 (0.00)	4.51** 5.40 (0.00)
5. Log of assets	0.20** 0.30 (0.00)	0.26** 0.39 (0.00)	0.48** 0.72 (0.00)	1.73 2.61 (0.19)
6. Debt/assets	– 0.74** – 0.12 (0.00)	– 1.60** – 0.26 (0.00)	– 2.33** – 0.38 (0.00)	– 13.73 – 2.26 (0.23)
7. Volatility of operating income/assets	– 4.26** – 0.18 (0.00)	2.08 0.08 (0.12)	– 0.18 – 0.00 (0.92)	159.24** 6.44 (0.01)
Number of observations	1,108	1,108	1,108	922
Mean of dependent variable times 10^2	1.28	1.18	2.45	47.80
Log likelihood	1,722.9	1,697.9	2,063.6	– 777.3

**Statistically significant at 1% level.

*Statistically significant at 5% level.

three payout level regressions (dividends, repurchases, and total payouts), the coefficients on the four primary agency costs variables have the predicted signs and are statistically and economically significant. For example, a one standard deviation increase in net operating cash flow is associated with an estimated 50 and 55 basis point increase in dividends and repurchases, respectively, and a 94 basis point increase in total payouts; a one standard deviation decrease in market-to-book increases dividends and repurchases by an estimated 47 and 35 basis points, respectively, and total payouts by an estimated 72 basis points. These estimated effects equal 30 to 40% of the sample mean payout levels. The impact of agency factors generally agrees with other studies, although the statistical significance of some of our estimates are higher than in other studies, suggesting that the role of agency factors could emerge more clearly using longer-term payout data. Market-to-book, for example, is not significant in Jolls (1998) or Weisbenner (1998), and only in some regressions in Dittmar (1997); they each use annual data.

The sign and magnitude of the regression coefficients in the dividend and repurchase regressions are similar, which suggests that dividends and repurchases serve a similar function and that in many respects they are regarded as close substitutes. The repurchase share regression (Table 3; fourth column) provides some further insight into the issue of substitutability. The mix of repurchases and dividends appears not to vary in any systematic way with net operating cash flow, size, or leverage. However, the payout mix does vary systematically with growth options, as proxied by market-to-book. This result is sensible to the extent that high market-to-book firms face not only more profitable investment opportunities, but also greater uncertainty about the level of profitable investment opportunities. With greater uncertainty, firms could require a more flexible payout policy and, hence, rely more heavily on repurchases than dividends.

The results for the volatility of operating income provide further evidence of the importance of flexibility. Increases in the volatility of operating income reduce dividends, in line with the flexibility hypothesis of Jagannathan et al. (2000), and significantly increase the share of payouts made through repurchases.

3.1. Alternative specifications

We consider a number of alternative specifications to the basic model. We estimate specifications that include an interaction term between net operating cash flow and market-to-book to more accurately identify firms with high levels of free cash flow. As in Opler and Titman (1993), we construct a high free cash flow dummy variable that indicates whether a firm simultaneously has both below-median market-to-book and above-median net operating cash flow; similarly, we construct a low free cash flow dummy variable that indicates

whether a firm simultaneously has above-median market-to-book and below-median net operating cash flow. Using these definitions, there are 185 high free cash flow firms and 186 low free cash flow firms in the full sample. (As these figures imply, the sample correlations between net operating cash flow and market-to-book are positive; thus, less than a quarter of the sample falls into either of these two groups.) When we add these dummy variables to the basic specification, their coefficients are generally of the predicted sign, though they are not large and only marginally significant. The marginal effect of the high free cash flow dummy variable is 0.20 in the repurchase regression and 0.25 in the total payout regression with p -values of 0.07 and 0.12, respectively. The net operating cash flow and market-to-book variables remain highly significant with only slightly reduced marginal effects. Thus, we conclude that the variables in the basic specification adequately capture free cash flow.⁸

Because leverage is endogenous, leverage may be correlated with our regressions' error terms. For this reason, we reestimate our primary regressions without leverage. The results from these regressions are not significantly different from those shown in Table 3.

The relationship between leverage and marginal financing costs also could be u-shaped. Firms with little or no debt are that way because they are very risky and face high external financing costs. Conversely, firms with high leverage are near their debt capacity and face high external financing costs at the margin. Under these circumstances, the relationship between payouts and leverage may not be monotonic either; it could be positive at low levels of leverage, and negative elsewhere.⁹ To investigate this possibility we include a dummy variable that takes a value of one for firms in the lowest leverage quartile (debt/assets < 0.089). The u-shaped hypothesis predicts a negative coefficient for this variable. Consistent with this hypothesis, the marginal effect of the low-leverage dummy variable is -0.25 and statistically significant in the repurchase regression (p -value = 0.03). This estimate implies that the repurchase payout of firms in the lowest debt quartile is 25 basis points less than otherwise. However, this variable enters insignificantly into the dividend and total payout regressions. We conclude that mis-specification of our primary equations with respect to leverage likely is not a problem.

Finally, we split the sample into below-median- and above-median-size firms. As Graham and Harvey (2000) note, differences in the corporate finance practices of small and large firms are pervasive. Although we control for size in our regressions, splitting the sample permits us to capture nonlinear size effects.

⁸ If we omit net operating cash flow and market to book, the high- and low-free cash flow dummies have the predicted signs and are highly significant.

⁹ We thank the referee for suggesting this possibility.

The results for the two size groups are qualitatively similar to the results for the full sample. Within both size subsamples, stock options are negatively and highly significantly related to dividend payouts and positively related to repurchases. Likewise, within both subsamples, the relationship between payouts and stock ownership is insignificant in all three payout regressions. The relationship between payouts and firm characteristics is consistent with the predictions of agency theory for both size groups. Using a log likelihood ratio test, we reject the hypothesis that the payout regressions are the same for the two size groups (at the 1% level in the case of dividends and the 5% level in the case of total payouts). However, the differences in the regression results for the two groups appear to relate mainly to the magnitude of the regression coefficients, not their sign or statistical significance.¹⁰

3.2. *The effects of management share ownership*

We find no relationship between payouts and management ownership for the full sample. This result is at variance with the positive relationship between firm value and ownership documented in Morck et al. (1988) and McConnell and Servaes (1995), and the relationships between corporate financial policy and ownership documented in Berger et al. (1997), Denis et al. (1997) and Mehran et al. (1998). We consider two ways in which mis-specification of our regressions could obscure the existence of positive incentive effects.

First, the relationship between payouts and the determinants of payout policy could be nonlinear. Morck et al. (1988) emphasize the nonlinear relationship between firm value and ownership. They suggest that, above some critical level, increases in ownership are no longer beneficial because management becomes entrenched. Even without entrenchment, at some critical ownership level, management could have sufficient incentives to make the value-maximizing payout, in which case further increases in ownership would have no effect. Either way, the positive relationship between management ownership and payouts will be most evident when management ownership is low. Likewise, management stock incentives could be most important, and therefore most evident, in situations where the agency costs of free cash flow are potentially most severe.

To investigate whether stock incentive effects are present at firms with low levels of management ownership and potentially high agency costs, we estimate our payout regressions for low-ownership, high-agency cost subsamples.

¹⁰ The difference in the regression coefficients appears to be largely the result of differences in the dispersion of the regression variables within the two subsamples. While the coefficients and marginal effects generally are larger for the larger firms, the dispersion of the regression variables is uniformly smaller. Consequently, little difference exists in the marginal effects multiplied by the standard deviation of the explanatory variables for the two subsamples.

Table 4

Tobit estimates for management ownership variable in low-ownership, high-agency cost subsamples

In panel a, the tobit specifications used are the same ones used in Table 3. In panel b, the tobit specifications used are the same ones used in Table 3 except that log (dollar value of management shares) replaces management ownership share. High free cash flow firms are firms with below-median market-to-book ratios and above-median net operating cash flow as in Opler and Titman (1993). The first entry in the table is the marginal effect times 10^2 . The second entry is the marginal effect times 10^2 times the standard deviation of the management ownership variable within the subsample. The third entry (in parentheses) is the p -value of the marginal effect.

Subsample	Dividend payout	Repurchase payout	Total payout
<i>a. Management ownership variable: management shares/shares outstanding</i>			
Management shares < 5%	– 2.49	4.07	– 5.41
Market-to-book < 1	– 0.03	0.05	– 0.06
($n = 224$)	(0.81)	(0.67)	(0.70)
Management shares < 5%	– 3.39	12.93	10.94
High free cash flow	– 0.04	0.16	0.13
($n = 139$)	(0.71)	(0.30)	(0.49)
<i>b. Management ownership variable: log (dollar-value management shares)</i>			
Dollar-value management shares < median	0.01	0.22**	0.22
Market-to-book < 1	0.01	0.29	0.29
($n = 187$)	(0.92)	(0.00)	(0.08)
Dollar-value management shares < median	– 0.05	0.37**	0.35
High free cash flow	– 0.06	0.41	0.38
($n = 99$)	(0.70)	(0.02)	(0.09)
Dollar-value management shares < median	0.04	0.22**	0.26*
Market-to-book < 1 or high free cash flow	0.05	0.28	0.32
($n = 247$)	(0.58)	(0.00)	(0.02)

**Statistically significant at 1% level.

*Statistically significant at 5% level.

Following Morck et al. (1988), we define low ownership as ownership less than 5%. We define high agency costs in two ways. We use the conventional cutoff of a market-to-book ratio less than 1. However, firms with low market-to-book ratios are not necessarily those with the most severe free cash flow problems, as they include firms with poor earnings histories that have few growth opportunities and little free cash. Thus, we also create a subsample using the Opler and Titman (1993) definition of high free cash flow firms (firms with a market-to-book ratio less than the sample median and net operating cash flow greater than the sample median).

Table 4, panel a, reports tobit estimates for management stock within these subsamples. The results are similar to those in Table 3. In particular, the coefficients on management ownership are close to zero and statistically insignificant in all regressions. Thus, nonlinearities alone do not explain the absence of a positive relationship between payouts and ownership in our regressions.

Second, the measure of management stock ownership that we use could be a source of misspecification. The agency literature cited above generally uses percentage equity ownership to measure management incentives, as we do. However, Baker and Hall (1998) argue that, for many incentive problems, the dollar value of management ownership is a more accurate measure of management incentives. In particular, for activities whose percentage impact on firm value is similar across firms of different sizes, the dollar value of management ownership is the better measure.¹¹ Hoarding free cash, which we focus on, arguably is an example of an agency problem that imposes costs that are proportionate to firm size.

To investigate whether using a dollar-based measure of management stock incentives alters our findings, we replace management percentage stock ownership with the log of the dollar value of management stock in our regressions. We do so first for the entire sample; we find no statistically significant relationship between payouts and ownership. We then use the log of the dollar value of management stock in subsample regressions, using the median of the dollar-value management ownership variable to define the subsample. The results from these regressions suggest that management stock holdings increase total payouts through increases in repurchases (Table 4, panel b). For firms with a below-median dollar value of management ownership and a market-to-book ratio less than 1, a one standard deviation increase in management ownership (standard deviation over the subsample) increases repurchases by an estimated 29 basis points (p -value = 0.00); for firms with below-median management ownership and high free cash flow, as defined in Opler and Titman (1993), a one standard deviation increase in management stock increases repurchases by an estimated 41 basis points (p -value = 0.02). These estimated effects are on the order of 20% of the mean repurchase levels for these subsamples. The relationship between total payouts and management ownership is positive and of a similar magnitude, though significant only at the 10% level.

¹¹ The intuition is as follows: Let c be the percentage loss in firm value that results from a particular activity. The wealth loss to management will be c times the *value* of its equity stake. Conversely, the types of activities for which management ownership share is the better measure of incentives are those whose *dollar impact* is the same across firms (as might be the case for the purchase of a corporate jet). In that case, the wealth loss to management is the fixed dollar cost times management's ownership share.

Little overlap exists between the subsamples used in the first two rows of panel b: 80% of the firms with a market-to-book ratio less than 1 are not high free cash flow firms (148 out of 187 firms), and 60% of the high free cash flow firms do not have a market-to-book ratio less than 1 (60 out of 99 firms). Thus, the two sets of regression results are largely independent. In the third row of panel b, we report regression results for firms with a below-median dollar value of management ownership and high potential agency costs as defined by either criterion. The magnitude of the relationship between payouts and ownership is similar to that in the first two regressions but now the results for both repurchases and total payouts are statistically significant.

Finally, we use the dollar value of management ownership to estimate payout regressions for firms with above-median values of management ownership or firms that do not have high potential agency costs (results not reported). The relationship between payouts and ownership within these subsamples is again zero. Our results are consistent with the joint hypothesis that the dollar value of management ownership is the appropriate measure of management incentives for payout decisions and that such incentives are important at the margin in cases where management ownership is low and potential agency costs are most severe.¹²

3.3. *Stock options and the incentive to substitute repurchases for dividends*

The results in Table 3 strongly suggest that stock options affect the composition of payout policy, inducing a substitution away from dividends to share repurchases. To illustrate the incentive to reduce dividends that managers face, consider how the value of management stock options are affected by a decision to permanently lower a stock's dividend yield from 2.5% to 2%. (This action could be undertaken without cutting the dividend. Instead, the firm could simply not increase the dividend as much as it otherwise would have.) Over the life of a ten-year option, such a decision results in lower dividends equal to 5% of the value of the firm (ten years times 0.5% per year). Assuming that the average delta or price sensitivity of an option to the underlying share price is 50%, the decision to permanently reduce the dividend yield by 0.5% will result

¹² We also split the sample of low market-to-book and high free cash flow firms at the median ownership share (1.6%) instead of at the 5% cutoff suggested by Morck et al. (1988). Using this breakpoint, we find that ownership is significant for the low-ownership share firms, as for the low-dollar holdings firms. (The low ownership share and low dollar holding samples overlap, but not entirely. Among low market-to-book firms, for example, 144 firms are in both the low ownership share group of 180 firms and the low dollar holdings group of 187 firms.) However, we also find a positive relationship for high ownership share firms. These results are in contrast to our findings of no relationship for either below or above 5% ownership share firms and suggest that the relationship between ownership *share* and payouts is not robust.

in an increase in option value equal to 2.5% of the share price.¹³ Thus, the management wealth effect that results from this relatively modest alteration in dividend policy equals or exceeds the average shareholder wealth effects that result from major dividend and open market repurchase announcements.¹⁴

The negative relationship between option values and dividend payments – and, hence, management's incentive to reduce dividends – obtains only if options are not dividend-protected. However, the absence of dividend protection appears to be the norm. Murphy (1998) reports that among 618 large companies that granted options to their CEOs in 1992, only seven had plans that included dividend protection. Weisbenner (1998) documents that in his sample of 799 companies that granted stock options in 1994, only two offered dividend protection.

The most compelling explanation for not dividend-protecting options is related to their accounting treatment. Operationally, dividend protection is accomplished through adjustments to an option's exercise price. Under current accounting standards, such options are considered variable-plan options because the strike price is contingent upon future events and, therefore, the cost of these options must be recognized on the income statement as compensation expense.¹⁵ In contrast, fixed-plan options, options for which the exercise price is known at the time of grant, never result in a compensation expense as long as the option is granted with an exercise price greater than or equal to the current

¹³ This discussion relies on the approximation that the value of a call on a dividend-paying stock is equal to the value of a call on a nondividend-paying stock with a stock price equal to the current stock price minus the present value of expected dividends over the life of the option (see Hull, 1989). We further assume that the expected rate of increase in the stock price (and, hence, the dollar value of dividend payments) is equal to the rate used to discount future dividend payments. Management stock options typically are issued at-the-money; the delta of an at-the-money call is approximately 50%.

¹⁴ For dividend increases, see, e.g., Asquith and Mullins (1986) and Laux et al. (1998); for open market repurchases, see, e.g., Comment and Jarrell (1991), Ikenberry et al. (1995) and Stephens and Weisbach (1998).

¹⁵ Current accounting standards are set out in the Statement of Financial Accounting Standards No. 123, *Accounting for Stock Based Compensation* (FAS 123), which was issued in October 1995 after years of intense debate. The main point of contention was whether compensation costs should be recorded for fixed-plan options granted at-the-money. The Financial Accounting Standards Board (FASB) yielded to pressures not to require that expenses be recorded, citing that the issues were so divisive that it threatened the FASB's working relationship with its constituents and the future of setting accounting standards. Thus, FAS 123 encourages but does not require that companies recognize the compensation expense for grants of stock options based on new fair value accounting rules. Companies that choose not to adopt the new rules will continue to apply the existing accounting rules contained in Accounting Principles Board Opinion No. 25, *Accounting for Stock Issued to Employees*. Since FAS 123 was issued, few if any companies have adopted the fair value accounting rules. Instead, most continue to apply APB 25 to retain the favorable accounting treatment for fixed-plan options.

market price. Thus, firms have a strong incentive to avoid variable-plan options in favor of fixed-plan options that do not allow for dividend protection.

An alternative explanation is that firms do not dividend-protect options to encourage the substitution of repurchases for dividends. This argument assumes that at the margin shareholders have a stronger preference for repurchases vis-à-vis dividends than management. While shareholders might have a preference for repurchases owing to their tax efficiency, it is difficult to think of reasons that management would have a preference for dividends. Conceivably, if managers also hold large amounts of stock, they could have a preference for dividends as a means of cashing out a portion of their investment.

While the option-induced substitution of repurchases for dividends appears to be widespread and can result in substantial ex-post management wealth effects, the impact on shareholders may nonetheless be limited. Management's substitution of repurchases for dividends could adversely affect shareholders in two ways. First, if the substitution resulted in a net reduction in payouts, such actions could increase the agency cost of free cash flow. We conclude that such reductions are small, at most. Second, to the extent that such substitution is not anticipated by shareholders, the reduction in dividends and increase in value of management stock options result in a wealth transfer from shareholders to management. (Conversely, if the shift in payout policy is anticipated, management's overall compensation package can be adjusted ex-ante so that its level of compensation is unaffected.) Offsetting these potential costs is the potential benefit of more tax-efficient distributions even if encouraging tax-efficient distributions is not the motivation for issuing unprotected options.

3.4. Alternative interpretation of stock option results

The relationships we observe among dividends, repurchases, and stock options perhaps are not the result of option-induced substitution, but arise because options are correlated with unobservable characteristics of firms for which lower dividend payments are sensible. For example, as Smith and Watts (1992) argue, firms with many available growth opportunities could rely more heavily on stock options to provide management with the proper incentives when their investment decisions are difficult to monitor. Alternatively, such firms could favor non-cash compensation to conserve cash. Such firms also would be expected to pay lower dividends. Furthermore, if stock options are primarily associated with uncertainty about the timing of investment opportunities, they could predict both lower dividends and higher share repurchases.

While we can never rule out these alternative interpretations, we have controlled for investment opportunities using market-to-book ratios and the estimated coefficients have the expected sign and are highly significant. Market-to-book perhaps is not an adequate control for investment opportunities.

However, in subsample regressions we find that the negative relationship between dividends and stock options exists for firms that arguably have very limited growth opportunities and high free cash flow. For example, we estimate our payout regression for the 185-firm subsample with below-median market-to-book and above-median net operating income. Even for these high free cash flow firms, with total payouts averaging 3.4% of firm value compared with 2.5% for our entire sample, we still observe a very strong negative relationship between dividends and stock options. A one standard deviation increase in stock options results in a 41 basis point decline in dividends (p -value < 0.01), which is about the same as the estimated effect for the full sample. Thus, our results strongly suggest that options are not merely a proxy for growth opportunities.

3.5. *Endogeneity of management stock incentives*

Our analysis assumes that ownership structure is exogenous, whereas it could be determined endogenously, simultaneously with payout policy. Rozeff (1982), for example, argues that payouts and ownership structure are alternative mechanisms to address potential agency problems, and Smith and Watts (1992) argue that both dividend payouts and compensation policy are determined by investment opportunities. More generally, the problem that many variables of interest in corporate finance are endogenous applies to this study. The possibility that management stock incentives are endogenous gives rise to two related concerns. First, single-equation ordinary least squares estimates could be biased. Second, the direction of causality between stock incentives and payouts will be difficult to infer. Cho (1998) highlights these issues in the context of ownership structure, valuation, and investment. He shows, using ordinary least squares regressions, that ownership structure appears to affect corporate value and investment, but that, using a simultaneous equations model, causality runs from investment to firm value to ownership structure.

With respect to our management stock results, the reverse causality story would be that exogenous changes in payouts increase firm value, which in turn increase the dollar value of management ownership. The fact that we find this relationship only for firms with low levels of management ownership and potentially the most severe agency problems does not preclude reverse causality. Though it is plausible that payout would affect ownership through its effect on value at all levels of ownership and free cash flow, it is also plausible that payout decisions sway firm value the most for firms with low ownership and high free cash flow. Lang and Litzenberger (1989) demonstrate that the stock price effects of dividend announcements are stronger for low market-to-book firms.

With respect to our stock options results, reverse causality could explain the negative relationship between dividends and options if higher dividends result in higher stock prices, which in turn causes managers to exercise more options (see, e.g., Huddart and Lang, 1996). This explanation, however, would also predict

a negative relationship between repurchases and options, not the positive relationship that we observe. Thus, our conclusion that the composition of payouts is influenced by management stock options appears more robust with respect to reverse causality.

Instead of estimating a system of simultaneous equations, as in Cho (1998), an alternative approach to dealing with the endogeneity of stock incentives is to identify exogenous changes in stock incentives and to examine the response of payout policy to those changes. Lambert et al. (1989) is an example of this type of analysis. They examine changes in dividends following the initiation of executive stock option plans and find that dividend payouts decline relative to expected levels, consistent with our results. Another, albeit less-related, example is Wallace (1997), who examines changes in payout policy at firms that adopt residual income-based compensation plans. He reports that adopters of such plans on average increase share repurchases by 112%, but there is little change in dividends. This result is also consistent with our finding that management stock incentives increase payouts through repurchases.

4. Conclusion

This paper investigates how corporate payout policy is related to managerial stock incentives. Using data for a sample of more than 1,100 companies, we find evidence suggesting that managerial share ownership furnishes incentives to increase payouts at companies with potentially the most severe agency problems – those with low management stock ownership and few investment opportunities or high free cash flow – while for other firms, management stock ownership has no effect on payouts at the margin. We also find evidence that management stock options induce a substitution away from dividends toward open market repurchases. Over a three- to five-year period, payouts appear to conform to agency-based theories, with the level of both dividends and repurchases increasing with free cash flow and decreasing with external financing costs. The mix of repurchases and dividends is determined in part by the need for flexibility, as suggested by the positive relationships with market-to-book ratios and volatility of income.

Recent studies suggest that firms distribute permanent cash flow shocks as ordinary dividends and temporary cash flow shocks as open market repurchases and that the market interprets payout announcements in a manner consistent with this policy (Jagannathan et al., 2000; Guay and Harford, 2000). Stephens and Weisbach (1998) show that firms favor open market repurchases when shares are undervalued, consistent with the theoretical prediction of Chowdhry and Nanda (1994).

These results, in combination with ours, offer the following picture of corporate payout policy: First, firms distribute free cash through ordinary dividends

and open market repurchases to control the agency costs of free cash flow. Second, the choice of payout method is influenced by firm characteristics, market valuations, the permanence of cash flow shocks, and management incentives. Not all of these factors can explain the surge in repurchases relative to dividends in recent years. The flexibility hypothesis, for example, cannot explain the surge in repurchases unless the need for flexibility has increased, and undervaluation cannot unless firms have become more undervalued, an unlikely scenario given the recent increase in stock prices. By contrast, management stock options, which are used increasingly, could explain the shift in payout mix to repurchases.

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