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The Shareholder Base and Payout Policy*

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Abstract

We examine the relation between the shareholder base and payout policy. Consistent with the idea that the shareholder base is related to the cost of external financing we find that firms with small shareholder bases have lower payout levels and maintain higher cash holdings. We show that undertaking an open market repurchase results in a significant reduction in the size of the shareholder base. Consequently, we find that firms with small shareholder bases are less likely to undertake a repurchase (reduce the shareholder base even further) and are more likely to pay special dividends.

JEL CLASSIFICATION: G35, G14, G15.

KEYWORDS: Payout Policy, Investor Recognition, Cost of Capital, Special Dividends, Repurchases, Asymmetric Information.

I Introduction

Finance practitioners acknowledge that having a broad shareholder base is an important factor for many corporate decisions. For example, in a recent study of firm payout policy, Brav, Graham, Harvey and Michaely ((2005), p. 523) survey financial executives and conclude that "With respect to payout policy, the rules of the game include ... [to] have a broad and diverse investor base ..." In practice, the acquisition and management of the shareholder base

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is the task of the investor relations department or an investor relations firm.[1] Wolfe Axelrod Weinberger Associates LLC, an investor relations firm, state in their company profile "Our efforts culminate in a broader shareholder base, increased liquidity, a lower future cost of capital, and a better valuation relative to the client's peer group."[2]

Despite the apparent importance of the shareholder base there is little academic evidence documenting the impact of the shareholder base on corporate decisions. In this paper we investigate the effect of the shareholder base on the level and method of payout. There are several arguments that imply that external financing is costly for firms with small shareholder bases, either due to asymmetric information or lack of visibility. Firstly, the investor base may proxy for the amount of external financing that is available. Merton (1987) argues that the shareholder base measures the recognition of the firm. He develops an incomplete risk sharing model where the size of the firm's investor base is negatively related to the required return on the firm and hence its cost of capital.[3] In this setting, a small shareholder base implies that a limited fraction of the market is informed about the stock and hence the firm has a limited number of investors to raise capital from. Merton argues that the shareholder base can be expanded (allowing more funds to be raised), but at an increasing cost.[4]

[1] Brennan and Tamarowski (2000) and Bushee and Miller (2008) discuss the role of the investor relations department.

[2] http://www.wolfeaxelrod.com/profile.htm

[3] There is a growing literature that documents a relationship between investor recognition and the value of the firm. Kadlec and McConnell (1994), Foerster and Karolyi (1999) and King and Segal (2009) consider the effect of listing decsions on the shareholder base and its implications for firm valuation. Additionally, Lehavy and Sloan (2008), Bodnaruk and Östberg (2009), and Fang and Peress (2008) document that there is a cross-sectional relationship between investor recognition and returns and therefore the cost of capital.

[4] Grullon, Kanatas and Weston (2004) finds that firms that have higher advertising expenditure also have

Secondly, having a large number of shareholders may reduce asymmetric information between insiders and outsiders through more information production. The intuition behind this argument is captured in the model of Holmström and Tirole (1993). In their model, an increase in liquidity trading (the investor base) leads to an increase in stock price informativeness through more information acquisition by speculators. Additionally, empirically it has been documented that analysts tend to follow firms that have more investors.[5,6] So a large investor base leads to greater analyst coverage and overall more information production which ultimately implies less asymmetric information about the firm.

Both of the above arguments imply that external financing is costly for firms with small shareholder bases. Effectively, for firms with limited shareholder bases there is a wedge between the internal and external cost of funds.[7]

We develop and test three hypotheses concerning the relation between the shareholder base and payout policy using a sample of firms on NYSE, NASDAQ and AMEX between 1984 and 2004. First, a negative relation between the cost of external financing and the shareholder base implies that we expect firms with small shareholder bases to maintain higher cash reserves and pay out less to their shareholders. We find that small shareholder base firms have lower payout levels and have larger cash reserves. Firms at the 25^{th} percentile of the shareholder base hold between 4.75% and 6.38% more in cash reserves and pay out

a larger number of shareholders, implying that the shareholder base can be expanded at a cost.

[5] See Bhushan and O'Brien (1990).

[6] Additionally, Bjerring, Lakonishok, Vermaelen (1993), Dimson and Marsh (1984) and Womack (1996) document that analyst forecasts are informative.

[7] Kaplan and Zingales (1997) define a financial constraint as a wedge between the internal and external cost of capital.

between 12.32% and 23.37% less of their total assets (all relative to the unconditional mean) than firms at the 75^{th} percentile. We corroborate the above results on payout and cash holdings in an experimental setting by considering the introduction of decimal quotes on the NYSE, NASDAQ and AMEX in 2001. Decimalization significantly lowered trading costs and thereby raised the demand for shares by retail investors and resulted in larger shareholder bases. This increase in the shareholder base is associated with increased payout and decreased cash holdings.

Second, given that there is a relation between the shareholder base and the cost of external financing this has a potential implication for the method of payout. A firm considering making a special distribution can do it either in the form of a share repurchase or through a special dividend. However, an open market repurchase program may result in a smaller shareholder base if some shareholders tender all of their shares. We verify this conjecture by demonstrating that a share repurchase program reduces the shareholder base of the firm by at least 3.70% over the year of repurchase and the subsequent year. In contrast, non-repurchasing firms experience, on average, a 3.69% increase in the shareholder base over a two year period. Additionally, we find that special dividends either have a neutral or even positive effect on the shareholder base. Hence, we argue that while repurchases are more tax efficient they come at a cost of reduction in the shareholder base and therefore higher costs of external financing.

Third, given that a repurchase reduces the size of the shareholder base, we examine whether firms with already limited shareholder bases are less likely to use a repurchase as a payout method and thereby reduce the size of the shareholder base even further. We find that the shareholder base significantly affects the decision to undertake one-time distribu-

tions to shareholders and the method of distribution (special dividend or share repurchase). Small shareholder base companies are more likely to pay special dividends. Conditional on undertaking a special distribution, companies with small shareholder bases choose to use a special dividend (rather than repurchase stock) in 9.05% of cases while 6.49% of special distributions of large shareholder base firms are special dividends.

This paper is most closely related to the literature on investor recognition and investor relations. This literature (see footnote 3) documents the effect of the shareholder base on firm value and returns. The finding that the size of the shareholder base is negatively related to returns implies that small shareholder base firms have high costs of financing. We contribute to this literature by showing that the shareholder base is also related to payout policy.

There are a number of papers that considers the effect of investor composition on payout policy. For example, Grinstein and Michaely (2005) examine the relation between institutional holdings and payout policy. Among other things, they find that institutions prefer dividend-paying to non-dividend paying firms and firms that repurchase shares. Instead of considering the composition of the firm's investor base we examine the size of the shareholder base. In fact, our measure of the shareholder base is weakly negatively related to the degree of institutional holdings (the correlation is -8.8%), which makes intuitive sense if institutional investors hold larger positions. Nonetheless, we control for institutional holdings in our estimations and this does not affect our results qualitatively. Additionally, in a robustness section, we demonstrate that our results are independent of investor composition. In essence, the clientele literature considers stock demand by certain investor groups and relates that to payout policy whereas we consider the relation between total investor demand and payout policy.

Our paper is related to the extensive literature on the level and method of payout. One of the central and most cited determinants of the level of payout is agency costs (Easterbrook (1984), and Jensen (1986)). Early work by Rozeff (1982) uses the shareholder base as a proxy for the degree to which the firm is exposed to agency costs. In Rozeff's setting a firm that has a large shareholder base is also more exposed to agency problems and therefore pays out more as dividends. Rozeff documents a positive correlation between the shareholder base and dividend payout, which is what we find (except that we consider *Total Payout*). Although the size of the shareholder base may be related to the agency costs of the firm, studies that examine the effect of exogenous increases in the shareholder base (Amihud, Mendelson and Uno (1999), see section IV.C below) document that increases in the shareholder base are also associated with price increases.[8] If the shareholder base only is a proxy for agency costs, then we would expect a price decrease following an exogenous increase in the shareholder base as the agency problem has been aggravated. In our regressions we include a host of control variables that capture agency costs.

Another strand of literature relates financial constraints to the level of payout (e.g., Kaplan and Zingales (1997), Cleary (1999), and Whited and Wu (2006)). This literature uses a set of variables (including whether a firm has a positive dividend payout) to construct measures of the cost of external financing. In contrast, this paper provides evidence that the shareholder base influences the cost of external financing and therefore is related to payout and cash holdings of firms.

Finally, this paper is related to the literature that examines the determinants of the

[8] See footnote 3.

method of payout.[9] To our knowledge we are the first to demonstrate that a repurchase adversely affects the shareholder base and that this adverse impact is a possible explanation for why firms pay dividends even though repurchases are more tax efficient. Other potential reasons for undertaking a repurchase rather than a dividend include trading gains by insiders (Barclay and Smith (1988)), improved stock liquidity (Barclay and Smith (1988)), flexibility (Stephens and Weisbach (1998)) and maintaining the Earnings-Per-Share (EPS) in the presence of stock option exercise (Kahle (2002)).[10]

The remainder of this paper is organized as follows. In Section II, we present testable hypotheses, and we describe our data in Section III. In Section IV, we present empirical findings. We consider the robustness of our results in Section V, and in Section VI we conclude.

II Testable Hypotheses

Our testable hypotheses come from the tenet that there is a negative relation between the size of the shareholder base and the cost of external financing. For example, the model of Holmström and Tirole (1993) can be used to justify why price informativeness is related to

[9] Black (1976) coined the term "dividend puzzle" which refers to the fact that dividends represent a substantial proportion of total payout even though repurchases are more tax efficient. To explain this puzzle there has to be some drawback to using a repurchase as a payout method instead of dividends. As we have shown, one difference between repurchases and dividends is that a repurchase reduces the shareholder base while a dividend does not. Therefore a possible explanation to the dividend puzzle is that firms are reluctant to reduce their shareholder base.

[10] It is noteworthy that the improved liquidity, flexibility and EPS motives for undertaking a repurchse cannot explain the extensive use of dividends since they all present advantages of repurchases over dividends.

the size of the shareholder base.[11] If a larger shareholder base implies more liquidity traders, then this creates incentives for speculators to acquire more information. This in turn leads to lower asymmetric information and therefore to a lower cost of external financing. Since the shareholder base is related to price informativeness the wedge between the cost of internal and external funds is decreasing in the size of the shareholder base.

Merton (1987) argues that a good measure of the recognition of a firm is the size of its shareholder base. Likewise, the recognition of a firm is related to the availability of external financing. So a firm with a large shareholder base is widely recognized and therefore has a large pool of investors to raise financing from. Merton argues that increasing the shareholder base may be possible, but at a cost that is increasing. Therefore, it is costly for a firm with a limited shareholder base to raise external financing since this requires a costly increase in the shareholder base (the firm requires more recognition).

The above arguments imply that the wedge between the cost of internal and external financing is negatively related to the size of the shareholder base. Therefore we expect firms with small shareholder bases to rely more on internal financing. As a result these firms are expected to pay out less to their shareholders and maintain higher cash reserves. Stated formally,

H1: Firms with small shareholder bases pay out less and hold larger cash reserves.

Since the shareholder base and the cost of external financing are negatively related, a

[11] Harris ((2003), p. 238) writes that "Informed trading is most profitable in markets with many uninformed traders. In such markets, many informed traders compete to acquire information and act on it. These markets therefore have very informative prices."

reduction in the shareholder base will make external financing even more expensive which leads to a lower firm value. Indeed, Brav et al. ((2005), p. 515) report that "Many firms feel that their stock price would fall if they had a less diverse investor base."

The method of payout may have implications for the size of the shareholder base. For example, when a firm undertakes a repurchase there are two countervailing effects on the size of the shareholder base. On the one hand, the firm generates attention by announcing a repurchase, but on the other hand, if a substantial proportion of shareholders tender their entire stake then the shareholder base will fall as a result of a repurchase. We anticipate the second effect to dominate. Hence our second hypothesis:

H2: Share repurchases reduce the size of the shareholder base.

If a repurchase results in a smaller shareholder base, we expect that firms will try to avoid undertaking a repurchase if the shareholder base is already limited (and external financing is expensive). In contrast, a special dividend has no adverse impact on the shareholder base. This leads to the following testable hypothesis:

H3: Firms with small shareholder bases are more likely to pay a special dividend and less likely to undertake a repurchase.

III Sample and Variable Construction

A Data

Our sample includes firms listed on NYSE, AMEX and Nasdaq. Data on returns, prices, repurchases and shares outstanding of stocks are obtained from the CRSP-Compustat Merged Industrial Database (CCM). We only consider firms with CRSP share codes 10 or 11. Therefore, we exclude ADRs, closed-end funds, REITs, and shares of firms incorporated outside the United States. Our main variable of interest is the number of common shareholders of record (*Shareholder Base*, CCM data 100), hence we exclude firms for which this variable is missing.

We consider the period from 1984 to 2004. The choice of this period is motivated by the introduction of SEC Rule 10b-18 in 1982, which provides a legal safe harbor for companies repurchasing their shares, which greatly reduced the ambiguity associated with this activity. Furthermore, since 1984, firms have been required to report the value of their repurchases in their cash flow statements and this item can be found in the CRSP-Compustat Merged database as data item 115.

Our dependent variables are measures of firm cash holdings and payout. We follow Opler, Pinkowitz, Stulz and Williamson (1999) and define *Cash* as the ratio of cash to total assets net of cash. *Total Payout* is defined as the sum of total dividends and repurchases over total assets. We construct our measure of repurchases using the CCM data item Purchase of Common and Preferred Stock (item 115), which reports the amount of money a company

spends on repurchasing its own securities.[12,13] To construct our variable *Fraction Repurchased* we divide the dollar value of shares repurchased by market capitalization. We further screen stock repurchases by setting repurchases equal to zero for any firm that does not repurchase at least 1% of its market value of equity (as in Dittmar (2000)).

We draw from DeAngelo, DeAngelo, and Skinner (2000) in identifying special dividends. We classify a cash distribution as a special dividend if it carries distribution code of 1262 or 1272. These codes are used by CRSP if dividends are labeled year-end, final, extra, or special. We do not include "interim" dividends (code 1282) since they are relatively uncommon in our sample period. We also exclude dividends with distribution code 1292 which are defined as "non-recurring, or proceeds from sale of rights" because they are generally not pure cash payouts to stockholders. We set a special dividend dummy (*Special Dividend*) to 1 if a company has paid a special dividend in a particular year and 0 otherwise.

In selecting our sample we omit firms with missing or negative values of *Market Capitalization* and *Book-to-Market*. We winsorize all of our variables at the 1^{st} and 99^{th} percentiles. We also remove companies with values of *Cash* above 0.8. This leaves us with $52,679$ firm year observations which is the basis for our analysis.[14]

Table 1 presents descriptive statistics of our data. In our sample, firm cash holdings (*Cash*) are on average 14.62% of total assets. This is in line with Opler et al. (1999). The

[12] As a robustness test we have removed repurchases of preferred stock from our measure of repurchases (like in Dittmar (2000) and Weisbenner (2004)). The results are not affected.

[13] Banyi, Dyl and Kahle (2008) compare the accuracy of different sources of repurchase data and conclude that Compustat purchases of common stock is the most accurate.

[14] As a robustness test, we removed all financial and regulated firms from our sample without affecting our results qualitatively.

average total payout (*Total Payout)* in our sample is 2.40% of total assets. The average firm in our sample has 17,150 shareholders of record (*Shareholder Base*). However, the median firm only has 1,830 shareholders. To correct for skewness we use the logarithm of the *Shareholder Base.* Additionally, a repurchase is undertaken in 22.66% of all firm years. A special dividend is undertaken in 1.71% of all firm years. In unreported analysis we document a declining trend in the frequency of special dividends. DeAngelo et al. (2000) conclude that this is due to firms that undertake special dividends frequently relabel these as regular dividends. However, like DeAngelo et al. (2000) we also find that the frequency of "large" specials does not decrease over our sample period.

There are a number of alternative stories that we need to control for. First, Grinstein and Michaely (2005) document that institutions avoid firms that do not pay dividends. However, among dividend payers they prefer firms that pay lower dividends. Institutions also prefer repurchasers and those firms that repurchase regularly. To that end, we include among our control variables the fraction of outstanding equity held by institutions (*Institutional Ownership*) which we calculate from 13f-filings that are included in the CDA / Spectrum database.

Second, several papers document that undervaluation is an important motive for undertaking a repurchase (e.g., Ikenberry, Lakonishok and Vermaelen (1995), Ikenberry, Lakonishok and Vermaelen (2000)). It could well be that firms with large shareholder bases are undervalued and therefore repurchase more often. We control for the undervaluation motive by including the book-to-market ratio, the stock performance during the previous year and the Rhodes-Kropf, Robinson and Viswanathan (2007) measure of misvaluation in our estimations.

Third, since we argue that a small shareholder base creates a wedge between the cost of internal and external funds our paper is related to the literature on financial constraints. To control for traditional measures of financial constraints we include the Whited and Wu (2006) index (*Whited-Wu*) in our regressions.[15]

Fourth, Barclay and Smith (1988) argue that one reason to avoid undertaking a repurchase is that this may harm stock liquidity. They find that the bid-ask spread widens around repurchase announcements.[16] Using detailed buyback data from Hong Kong, Brockman and Chung (2001) find that the bid-ask spread widens and the depth narrows during repurchase periods. However, they also find that the spread and the depth returns to benchmark levels once managers disclose that they are the source of the trading.[17,18] Nevertheless, we control for liquidity by considering the volume of shares traded over the past year divided by the number of shares outstanding (*Stock Liquidity*).

Fifth, a large shareholder base may indicate that ownership is dispersed and therefore firms with large shareholder bases might be more exposed to agency problems. If large shareholder base firms are more exposed to agency problems we would expect them to pay out less to investors. To control for differences in agency costs across firms we consider

[15] In unreported results, we have also included the Kaplan and Zingales (1997) index in our estimations without affecting our results qualitatively.

[16] Miller and McConnell (1995) find no evidence of a widening in bid-ask spread when considering a different sample and methodology.

[17] Grullon and Ikenberry (2000) find that firms that are actively repurchasing are less sensitive to market movements in a bearish market.

[18] In a study of U.S. repurchases, Cook, Krigman and Leach (2004) find that liquidity increases after a repurchase and they attribute this result to the difference in the disclosure environment between Hong Kong and the U.S..

the fraction of shares owned by the top five company executives (*Managerial Ownership*). Additionally, we control for differences in incentives provided to executives by including the proportion of total compensation to the management of the firm paid in the form of stock options (*Option Based Compensation*). Including this variable in our analysis also ensures that our results are not driven by repurchases that are undertaken to offset stock grants and option exercises by firm managers. These measures are calculated from the Thompson / Reuters Insider Database. A number of studies examine the relation between firm governance and cash holdings (e.g., Dittmar and Mahrt-Smith (2007) and Harford, Mansi and Maxwell (2008)). We therefore include the Gompers, Ishii and Metrick (2003) governance index (G) as a control variable. We also include *Board Size* and *Board Independence* as controls. The board controls as well as the Gompers et al. index are obtained from the Investor Responsibility Research Center (IRRC).

Last, Hovakimian, Opler and Titman (2001) document that one motive for undertaking a repurchase is to alter the firm's capital structure. To that end, we include the debt-to-equity ratio (*Debt-to-Equity*) when determining the factors that influence the decision of undertaking a repurchase or paying a special dividend.

We provide a detailed description of the variables in the Appendix.

B Excess Shareholder Base

Grullon, Kanatas and Weston (2004) note that there is a strong relation between the *Number of Common Shareholders* and variables such as *Market Capitalization* and *Age*. In order to ensure that our results are not driven by other firm characteristics which are not directly

related to the recognition of the firm, we remove the effect of a number of variables on the *Number of Common Shareholders*. In all subsequent analysis we use the residuals from this regression, which we call *Excess Shareholder Base*, as our measure of the shareholder base.[19] In a different context, Hong, Kubik and Stein (2009) estimate a similar regression and use the residuals as a measure of firm visibility.

Table 2 presents our regression results. For each of the 22 years in our sample we estimate a cross-sectional regression where the dependent variable is the logarithm of the *Number of Common Shareholders* and then we report the average of all the estimates. We follow Grullon et al. and include *Age, Return on Equity, Market Capitalization, 1/Share Price, Stock Liquidity, Past Year Return* and *Volatility* as explanatory variables. It is important to account for size since even though larger firms have more press coverage and larger analyst following, which is associated with larger recognition they also have more shares available to buy. Illiquid stocks might have fewer shareholders due to the large transaction costs associated with trading them and not due to recognition. Therefore to control for transaction costs we include both *1/Share Price* and the volume based liquidity measure *Stock Liquidity*. Both *Age* and *Volatility* control for total risk of the firm. Firms that have performed well recently might have a lot of investors, but this does not necessarily represent a permanent firm characteristic. To that end, we include *Return on Equity* and *Past Year Return* to control for the effect of recent performance on the shareholder base.[20] Certain investors

[19] Bodnaruk and Östberg (2009) document that the residual shareholder base is negatively related to returns.

[20] Unlike Grullon et al. we do not include advertising expenditure in our regressions. Firstly, it is likely to be highly related to the recognition that the firms has by individual investors. Secondly, including a measure of advertising expenditure would result in a tenfold decrease in sample size.

might only invest in "value" or "glamour" stocks and therefore we include *Book-to-Market* into our specifications as a control for firm type.

The regression results are qualitatively similar to what Grullon et al. (2004) find. Large, value and older firms have more shareholders. Additionally, firms that are cheap to trade (that have a high *1/Share Price*) also have more shareholders. Firms with good recent performance (both in terms of *Return on Equity* and *Past Year Return*) have fewer shareholders. Grullon et al. (2004) point out that this finding is consistent with the "disposition effect" whereby investors hold on to past losers and sell winners.

We define *Excess Shareholder Base (ExShBase)* as the residual from this regression and employ it as our measure of recognition throughout the rest of our study. A firm who has a positive *Excess Shareholder Base* (residual) has a larger shareholder base than expected according to its fundamentals. Using the *Excess Shareholder Base* instead of the *Number of Common Shareholders* does not alter the direction of the effects that we measure, but in general reduces the economic magnitude of the effects measured.

For the shareholder base to be related to the cost of external financing it is important that having a small shareholder base is a persistent characteristic. If this is not the case then a firm with a small shareholder base can just wait until its shareholder base returns to normal levels.

To examine whether the shareholder base is persistent, we split firms into quartiles on the basis of *ExShBase*. Firms in quartile 4 have the largest shareholder bases adjusting for their fundamentals. We identify when a firm enters the largest quartile for the first time and we record which quartile these firms belong to over the subsequent 5 year period.[21] The results

[21] We restrict our analysis to firms with at least 5 years of uninterrupted values of *Excess Shareholder Base*

are provided in Table 3. After 5 years, 56.5% of firms originally falling into the quartile with the largest shareholder bases still belong to this quartile. Another 31.1% have migrated to quartile 3, which implies that 87.6% of firms originally in quartile 4 still have a shareholder base that is larger than what is expected according to their fundamentals. The results are similar for firms that have the smallest shareholder bases (quartile 1). After 5 years, 51.9% of quartile 1 firms still belong to quartile 1. In total, 82.8% of quartile 1 firms still belong to quartile 1 or 2 after 5 years. Thus, having a small or large shareholder base seems to be a persistent firm characteristic.

IV Results

A The Shareholder Base and Payout

Firms with negative values of *ExShBase* have smaller shareholder bases than implied by their fundamental characteristics. Following Hypothesis 1, we expect these firms to have high costs of external financing and therefore pay out less. In Panel *A* of Table 4 we provide univariate evidence on the relation between *ExShBase* and *Total Payout.* Companies with negative values of *ExShBase* pay out on average 2.21% while firms with positive values pay out on average 2.59% (or 17.19% more) of their total assets. Additionally, when we only consider firms with positive values of *Total Payout*, small shareholder base firms pay out on average 3.50% and large shareholder base firms pay out 3.89% (or 11.14% more) of their

following entering the highest (lowest) quartile of *ExShBase*. This restriction does not affect our results in any significant way.

total assets. These differences are statistically significant at the 1% level.

In Panel B of Table 4 we restrict the *Total Payout* to be between 0% to 100% of net income. This selection reduces the average payout significantly. Firms with positive values of *ExShBase* pay out 1.55% of total assets whereas firms with negative values pay out 1.41% (positive *ExShBase* firms payout 9.93% more). The difference is statistically significant.

Panel C of Table 4 reports the results from our multivariate analysis with *Total Payout* as the dependent variable. Specifications (1) and (2) are Fama-MacBeth regressions with industry fixed effects. For each year we estimate a Tobit regression with *Total Payout* as a dependent variable. We report average regression coefficients. The reported p-values are based on Newey-West (2 lags) corrected standard errors of the estimated average regressions coefficients.

The rest of the specifications are pooled panel Tobit regressions with time and industry fixed effects with standard errors that are clustered at industry (SIC2) level. Neyman and Scott (1948) document that maximum likelihood estimation with fixed effects results in an "incidental parameter problem." In a recent contribution Greene (2004a) documents that in Tobit regressions the incidental parameter problem is small when T is 5. Given that in our case T is equal to 21, and that univariate and Fama-MacBeth results corroborate our Tobit results, we are comfortable that our results are not driven by econometric errors.[22]

Specification (3) includes $ExShBase^2$ in order to capture non-linearities in the relation

[22] Greene (2004b) documents that the incidental parameter problem is larger for Probit regressions (which we use in Section IV.E). However, he benchmarks the fixed effect, pooled and random effect estimators in a Probit setting and concludes (p. 111) "It seems likely based on this and all the preceding results that for T larger than 8, the results will probably favour the fixed-effects estimator."

between the shareholder base and payout. In all of our specifications *ExShBase* is significantly positively related to *Total Payout*.

In terms of relative economic impact, considering specification (3) the impact of *ExShBase* is roughly 53% the impact of *Market Capitalization* and 82% the impact of *Book-to-Market*. Specification (6) illustrates that the impact of the shareholder base on payout is greater than that of governance variables like *Board Size*, *Board Independence* and *G-index*.

In specification (4), going from the 25^{th} to the 50^{th} percentile of *ExShBase* increases *Total Payout* by 0.39%. However, going from the 50^{th} to the 75^{th} percentile of *ExShBase* only increases *Total Payout* by 0.24%. This indicates that the relation between the shareholder base and payout is stronger the smaller the shareholder base is and is consistent with the hypothesis that financial constraints are more binding for firms with smaller shareholder bases.

Arguably, the relation between the shareholder base and payout should be attenuated for firms that have a need for external financing. Fazzari, Hubbard, and Petersen (1988) demonstrate that firms in need of external financing will not pay out any dividend regardless of their degree of financial constraints. Intuitively, a firm that has a need for financing will invest its earnings rather than retain the earnings or distribute them to shareholders irrespective of the size of the shareholder base.

To test this we estimate the need for external financing as done by Demirgüç-Kunt and Maksimovic (1998) and Durnev and Kim (2005). We define the external financing need as the difference between the firm's actual growth rate and the sustainable growth rate. We estimate the actual growth rate as the prior 2-year geometric average of annual growth rate in total assets. We estimate the sustainable growth rate as the 2-year average of $ROE_t/(1 - ROE_t)$,

where ROE_t is the firm return on equity in year t.

We define a dummy variable, *Need External Financing* that takes the value of 1 if the growth of total assets is greater than the sustainable growth rate ($ROE_t/(1-ROE_t)$) and 0 otherwise.[23] In our sample 32.67% of firms are in need of external financing. Specification (2) and (5) interacts our variable *ExShBase* with the dummy variable *Need External Financing* and its complement. In both specifications we find that the effect of the shareholder base is significantly larger for firms that do not need external financing.

Turning to the control variables, as expected, variables that capture the amount of funds available to the firm, such as *Cash* and *Operating Income* are positively related to the payout level. Additionally, variables that capture outflows from the firm, such as the *Debt-to-Equity* ratio and *Capex* are negatively related to payout, illustrating that there is a trade-off in the use of funds. Companies with higher return volatility and overvalued companies seem to have lower payout levels. Additionally, firms that are more financially constrained according to the *Whited-Wu* index pay out less. The inclusion of the *Whited-Wu* index, *Institutional Ownership* and *Industry Concentration* does not affect our results in any significant way. Also the inclusion of corporate governance variables *G*-index, *Board Size* and *Board Independence* does not affect our conclusion that the shareholder base is positively related to *Total Payout*. Overall, these results support the hypothesis that the shareholder base is positively and

[23] We choose $ROE_t/(1-ROE_t)$ rather than $ROLTC_t/(1-ROLTC_t)$ (where $ROLTC$ is the return on long term capital) or $(ROA_t \times b_t)/(1-ROA_t \times b_t)$ (where ROA is the return on assets and b is the fraction of earnings retained for investment) since we are interested in the relation between the need for financing and payout to equity holders. See Demirgüc-Kunt and Maksimovic (1998) for a lengthier description of the alternative measures of the need for financing.

statistically significantly related to payout.

B The Shareholder Base and Cash Holdings

Panel *A* of Table 5 presents univariate results of the relation between *Excess Shareholder Base* and *Cash*. Companies with small shareholder bases (negative *ExShBase*) on average have a ratio of cash to total assets of 16.48% while firms with large shareholder bases (positive *ExShBase*) maintain on average cash holdings of 12.76% of total assets (or 29.95% less). The difference is statistically significant at the 1% level. The effect is similar in economic magnitude and statistically significant when we consider median cash holdings.

Panel *B* of Table 5 displays our regression analysis. Specifications (1) and (2) are cross-sectional Fama-MacBeth regression while the other specifications are pooled panel regressions. The coefficient of *ExShBase* is negative and statistically significant in all specifications, indicating that the shareholder base is negatively related to cash holdings. Inspecting specification (4) that includes a squared term, $ExShBase^2$, we see that going from the 25^{th} to the 75^{th} percentile in terms of *ExShBase* decreases *Cash* by 0.75% which represents 5.26% of the unconditional mean. However, going from the 25^{th} to the 50^{th} percentile of *ExShBase* decreases *Cash* by 0.45% and going from the 50^{th} to the 75^{th} percentile of *ExShBase* only decreases *Cash* by 0.30%. Therefore, just as with *Total Payout,* the relation between the *Excess Shareholder Base* and Cash is non-linear. The relation is stronger for firms with small shareholder bases. The economic magnitude of the shareholder base is similar across all of our specifications.

The relative impact of the shareholder base on *Cash* is economically significant. Con-

sidering specification (3) the impact of *ExShBase* is roughly 35% the impact of *Market Capitalization* and 19% the impact of *Book-to-Market*. Specification (6) illustrates that the impact of the shareholder base on *Cash* is 84% of *G-index*, but 2.7 times larger than the impact of *Board Size*.

Like in the payout case, we investigate whether the need for external financing attenuates the impact of the shareholder base. Specifications (2) and (5) document that the slope coefficient is significantly lower for those firms that have a need for external financing, indicating that for firms that have no surplus earnings to retain the effect of shareholder base on cash is weakened.

Concerning the control variables, we find that larger firms have lower *Cash* ratios. Since large firms consist of more projects that have less than perfectly correlated cash needs, it makes sense that larger firms maintain smaller cash to asset levels. Likewise, value firms (high *Book-to-Market* ratio) have lower cash holdings. The lower cash holdings of large firms and firms with high *Book-to-Market* ratios has also been documented by Opler et al. (1999) and Dittmar, Mahrt-Smith and Servaes (2003). Additionally, firms with high levels of *Capex* have lower *Cash* ratios. Variables that are related to the amount of cash that is disgorged to investors, such as *Institutional Ownership* and the *Debt-to-Equity* level are also associated with lower cash holdings. Finally, firms that are more financially constrained according to the *Whited-Wu* index have larger cash holdings.

C Decimalization, the Shareholder Base and Payout

So far we have documented that there is a relation between the shareholder base and payout and cash. However, this does not establish that having a large shareholder base leads to higher payout levels and lower cash retention. It could equally well be that the firm's payout and cash policies attract a larger shareholder base.

To establish a causal link we need an exogenous shock that affects the shareholder base, but does not alter the firm's operations and thereby has no direct effect on payout policy or cash holdings. The introduction of decimal quotes on the NYSE, NASDAQ and AMEX in the mid of 2000 to the end of April 2001 significantly lowered the transaction costs associated with trading stocks and thereby increased investor demand and therefore also the size of the shareholder base.[24] This effectively alters the demand for the firm's stock without directly affecting the firm's investment opportunity set. Despite the market collapsing in early to mid 2001 the average firm's shareholder base increased by 2.56% between the end of 1999 and the end of 2001. Fang, Noe and Tice (2009) use decimalization to establish a causal link between liquidity and firm performance.[25] In an earlier contribution Amihud, Mendelson and Uno (1999) consider a very similar experiment. They examine the effect of a reduction in the minimum trading lot in Japan and find that this institutional change is associated with an increase in the shareholder base, liquidity and stock price.

[24] On the 29^{th} January 2001 the NYSE and AMEX switched to decimal quotes while NASDAQ switched on the 9^{th} of April.

[25] Both Bessembinder (2003) and Furfine (2003) have documented that decimilization had a significant impact on transaction costs. They also find that the gain is restricted to those stocks that are actively traded.

Like Fang et al. we consider the change in our dependent variables (*Total Payout* and *Cash*) one year prior the event to one year after the event. We choose this event window since each market shifted some stocks to decimal trading at earlier dates.[26] Our main independent variable is the change in the shareholder base. As a control variable we include Δ*Effective Relative Spread* to capture the impact of changes in liquidity on payout and cash holdings.[27] Additionally, in case decimalization affected the relative incentives of retail investors and institutional investors to hold shares we have included the change in *Institutional Ownership* (measured as the change fraction of outstanding equity held by institutional investors) as a control variable. The correlations between $\Delta \log \#Shareholders$, Δ*Institutional Ownership* and Δ*Effective Relative Spread* are all below 10% in absolute terms.

Panel *A* of Table 6 presents our results when we consider the change in *Total Payout* as the dependent variable. The main independent variable in specification (1), the change in the log of the number of shareholders, is positively and statistically significantly (at the 1% level) related to the Δ*Total Payout*. In terms of economic significance, a one standard deviation larger change in the log of number of shareholders leads to a 0.25% larger increase

[26] Bessembinder (2003) notes that roughly 150 stocks on the NYSE were introduced at various dates to decimal trading prior to the 29^{th} January 2001. Likewise roughly 200 stocks on the NASDAQ were shifted to decimal trading prior on two dates prior to the 9^{th} of April.

[27] We use the *Effective Relative Spread* as opposed to *Stock Liquidity* that we use in the rest of the paper for two reasons. First, to make sure that our results are comparable to those of Fang et al. (2009). Second, *Stock Liquidity* requires the data from the previous year which would mean having data for the numerator from after the event and data for the denominator from before the event. Nonetheless, our results are not qualitatively altered depending on our choice of liquidity definition.We are grateful to Shane Corwin for sharing with us data on *Relative Spreads* estimated from TAQ.

in Δ*Total Payout*. This should be compared to mean change in *Total Payout* of -0.89% over our observation period. Specification (3) is identical to specification (1) except that we consider the Δ*ExShBase* as the main independent variable. A one standard deviation increase in Δ*ExShBase* leads to an increase in Δ*Total Payout* of 0.40% and the effect is statistically significant at the 1% level.

We consider the same control variables as Fang et al. (2009) with the exception of the S&P 500 dummy that is insignificant in all of their specifications. Interestingly, the change in institutional ownership is never statistically significantly related to the change in *Total Payout* and the sign of the coefficient changes depending on whether we consider only firms with positive payout.

An equal fall in transaction costs across stocks implies a larger relative impact on stocks with low prices. Therefore it is likely that decimalization was a larger event for low price stocks. To investigate this conjecture we introduce two dummy variables; *Low Price* (*High Price*) which takes the value 1 if the price is between five and ten dollars (above ten dollars) and 0 otherwise. In our sample, 36.72% of stocks were in the \$5 to \$10 price range at the end of 1999. In specifications (2) and (4) we interact our measure of the shareholder base with dummy variables for the stock price level to examine whether the strength of the relation differs across stock price levels. As expected, in both specifications the economic effect is substantially larger for low price stocks.

To make sure that our results are not in some way influenced by non-paying firms we consider only firms that have positive payout levels in the beginning of 1999 in specifications (5) to (8). Specifications (5) and (6) has as main independent variable the change in the log of the number of shareholders while specifications (7) and (8) considers Δ*ExShBase*. The

significance levels and economic impact are very similar to specifications (1) to (4).

In Panel B of Table 6 we consider $\Delta Cash$ as dependent variable. Like in Panel A we consider the change in in the log of the number of shareholders in specifications (1) and (2) while specifications (3) and (4) uses $\Delta ExShBase$ as the main independent variable. In both specifications our proxy for the change in the shareholder base is negatively related to the change in cash holdings ($\Delta Cash$) and the relation is statistically significant at the 1% level. In specification (1), a one standard deviation increase in the change in the number of shareholders results in a reduction of cash holdings of 1.61%. The corresponding impact in specification (3) of $\Delta ExShBase$ on the change in cash holdings is a reduction of 3.26%. These numbers should be compared to the unconditional mean change in cash holdings of -2.25%. Specifications (2) and (4) interact our dummy variables *Low Price* and *High Price* with our measures of the shareholder base. Similarly to when we considered payout, the relation between changes in the shareholder base and $\Delta Cash$ is significantly stronger for low price stocks for which decimalization was a larger event. Additionally, we find that firms that experience positive changes in *Institutional Ownership*, *Total Assets* and *Past Year Return* also have positive changes in cash levels. In both panels of Table 6 we include industry fixed effects and cluster standard errors on the industry level.

The results of these panels indicate that when there is an exogenous drop in the transaction costs associated with trading in stocks, firms experience an increase in the shareholder base. This relation has been documented by Amihud et al. (1999) who find that reducing trading costs results in an increase in the shareholder base, liquidity and a stock price increase. We build on this by showing that there is a relation between the increase in the shareholder base and how payout and cash holdings change. A larger change in the

shareholder base results in a larger positive change in payout and a smaller change in cash holdings. Both of these results are indicative of the cost of external financing being related to the size of the shareholder base.

Although no event is a perfect natural experiment, we believe that decimalization has a number of advantages over other events such as the Jobs and Growth Tax Relief Reconciliation act of 2003 and state level tax changes. By altering the relative tax treatment of repurchases and dividend the Jobs and Growth Tax Relief Reconciliation act of 2003 altered the incentives for the two payout methods. Therefore this event has implications for clientele effects. State level tax changes are often endogenous to the performance of firms within the state. So, an increase in state level taxes might be motivated by low tax revenues from state firms which then coincides with low firm payouts. In this setting, it would be hard to argue that the lower payout is driven by a reduction in the shareholder base due to an increase in taxes rather than poor firm performance. The advantage with decimalization as an event is that it is most likely unrelated to firm performance.

D Repurchases and the Shareholder Base

In this section we investigate Hypothesis 2; whether a repurchase reduces the size of the shareholder base. To argue that maintaining the size of the shareholder base is an important consideration when choosing the method of payout we need to verify that undertaking a share repurchase and paying special dividends affects the shareholder base differently. In particular, for special dividends to have an advantage over repurchases we should observe that the latter reduces the shareholder base (and thus increases the cost of external financing) while the

former does not. Therefore, we examine the effect of repurchases and special dividends on the size of shareholder base.

Table 7 presents the results from pooled panel regressions. Our dependent variable is the change in the logarithm of the number of common shareholders ($\Delta ShBase$) in year t (and $t+1$), where t is the year when the special distribution is made. We present results in terms of changes in the number of common shareholders to facilitate interpretation, but the results in terms of changes in *Excess Shareholder Base* are qualitatively equivalent.[28] Our main variables of interest are *Share Repurchase* and *Special Dividend*. *Share Repurchase* is a dummy variable that takes the value of 1 if the firm has repurchased at least 1% of its outstanding stock in year t. *Special Dividend* is a dummy variable that takes the value of 1 if the firm undertakes a special dividend in year t. We find that undertaking a repurchase leads to a fall in the shareholder base over years t and year $t+1$. Undertaking a repurchase in year t leads to a reduction in the shareholder base in year t of between 1.26% and 2.41%. This reduction continues in year $t+1$, so over two years (t and $t+1$) the shareholder base is reduced by between between 3.70% and 4.91%.[29] At the same time, paying a special dividend leads to an increase in the shareholder base. This increase in the shareholder base could be due to the attention that is associated with a special dividend. These results demonstrate that repurchases and special dividends have a substantial and asymmetric effects on the shareholder base. If the shareholder base is valuable then there is a clear disadvantage to using a repurchase as the distribution method.

[28] The correlation between $\Delta ExShBase$ and changes in log number of shareholders is 86.9%.

[29] In unreported results, we find that there is no relation between special distributions and the change in the shareholder base in year $t+2$.

One potential concern is that firms may issue equity in the future to counter the negative impact of the repurchase on the shareholder base. In unreported results we find that repurchasing firms are less likely to undertake a Seasoned Equity Offering at any point over the next three years. Therefore if anything the difference in shareholder base between repurchasing and non-repurchasing firms is widened over the following three years.

Open market repurchase programs often continue for several years, so a firm that repurchases in year t is likely to have repurchased in year $t-1$. To control for this we include the change in the shareholder base over the previous year ($\Delta sh.\ base_{t-1}$) and the year before that ($\Delta sh.\ base_{t-2}$) in our specifications. It turns out that there is a negative and significant relation between current changes and previous changes, implying that there is a certain amount of mean reversion in the shareholder base. However, the amount of mean reversion present is limited since Table 3 illustrates that having a small or large shareholder base is a fairly persistent characteristic.

E The Shareholder Base and the Choice of Payout Method

In this section we investigate Hypothesis 3; whether the size of the shareholder base matters for the choice of payout method. If maintaining a broad shareholder base is valuable to the firm then the choice of distribution method is important. A repurchase reduces the size of the shareholder base and is therefore costly. As a result, firms with particularly small shareholder bases should be more reluctant to reduce the size of the shareholder base through a repurchase. On the other hand, a special dividend does not reduce the size of the shareholder base. Therefore, we expect that firms that have particularly small shareholder

bases should be more likely to undertake special dividends while firms with large shareholder bases should favor repurchases that are more tax efficient.

In Table 8, Panel *A* we examine the univariate relation between the shareholder base and the decision to undertake a repurchase and pay special dividends. We split firms into two groups depending on whether they have an *Excess Shareholder Base* that is below or above zero.[30]

We find that firms with large shareholder bases are 7.5% more likely to undertake a repurchase than small shareholder base firms. The difference is significant at the 1% level. Additionally, large shareholder base firms repurchase 20.5% more than small shareholder base firms.

The probability that a firm with a large (small) *Excess Shareholder Base* undertakes a special dividend is 1.40% (2.02%). The 0.62% difference between firms with positive and negative *Excess Shareholder Base* is statistically significant. So, firms with large shareholder bases are more likely to undertake a repurchase and less likely to undertake a special dividend than firms with small shareholder bases.

The decision to undertake a repurchase or a special dividend can be seen as two sequential decisions. First, the firm decides whether to make a special distribution to shareholders. Second, the firm chooses the method of distribution. Hypothesis 3 suggests that given a special distribution, firms with a small shareholder base should be more likely to undertake a special dividend. In Panel *B* and *C* of Table 8 we relate the shareholder base to the method of payout while conditioning on the decision to make a special distribution to shareholders.

[30] These results are qualitatively unaltered if we use the median level of the *Excess Shareholder Base* as breakpoint.

To do this, we employ a two stage probit procedure, where the dependent variable in the first stage is a dummy variable that takes the value of 1 if the firm undertakes a special distribution (repurchase or special dividend) and 0 otherwise. In the second stage the dependent variable is a dummy variable that takes the value of 1 if the firm undertakes a repurchase and 0 if the firm undertakes a special dividend.

Examining the first stage regressions in Panel B of Table 8, we find firms with larger shareholder bases are more likely to make special distributions, which is consistent with our earlier findings for total payout. In particular, going from 25^{th} to 75^{th} percentile of *Excess Shareholder Base* increases the likelihood of a special distribution by 1.32% or 6.09% relative to the unconditional mean. Additionally, we find that larger firms, value firms, firms with greater operating income and firms with larger amounts of payout in the previous period are more likely to undertake a special distribution. Firms with larger institutional ownership and low dividend payout are also more likely to undertake a one time distribution.

In the second stage we consider the method of payout while conditioning on the decision to undertake a special distribution. We find that firms with smaller shareholder bases favor paying special dividends over undertaking repurchases. In particular, a decrease in excess shareholder base from 75^{th} to 25^{th} percentile increases the likelihood that a special distribution is a special dividend by 1.08% (or 13.97% relative to the unconditional mean). The second stage regression also indicates that when controlling for the decision to make a special distribution, firms with high levels of dividend payout, and good past performance are less likely to use a repurchase as a payout method. The results of this section indicate that firms with limited shareholder bases are reluctant to use repurchases as a method of payout.

V Robustness

There is an extensive literature on the relation between the composition of the shareholder base and payout policy. For example, institutions may prefer to hold stocks with a particular payout policy for tax reasons. This would imply causality from the payout policy to the ownership structure. However, the causality could also be the reverse; institutions prefer a particular payout policy and they encourage the firm to follow this policy. Two recent contributions to this literature are Graham and Kumar (2006) and Grinstein and Michaely (2005) that consider clientele effects due to retail investors and institutional ownership respectively. This literature raises two relevant issues for our paper. First, is it possible that serial correlation in payout in conjunction with reverse causality could explain our results? The story would be that payout policy determines the size of the shareholder base and current levels of payout are determined by past levels of payout. To explore this issue in this section we examine the relation between our variables of interest in a series of vector autoregressions. Second, is our variable of interest, *Excess Shareholder Base*, related to the ownership composition of the firm? To address this we conduct multivariate sorts to verify that the relation between *Excess Shareholder Base* and *Total Payout* and *Cash* holds for stocks with different investor composition and other characteristics which different clienteles might show preference over.

To examine whether past levels of payout determine both current levels of payout and the size of the shareholder base we estimate the following set of vector autoregressions (e.g.,

Grinstein and Michaely (2005)):

$$\begin{aligned} Payout_{i,t+1} &= c_0 + c_1 Payout_{i,t} + d_1 ExShBase_{i,t} + \boldsymbol{\phi}\mathbf{W}_t + \varepsilon_{i,t+1} \\ Cash_{i,t+1} &= a_0 + a_1 Cash_{i,t} + b_1 ExShBase_{i,t} + \boldsymbol{\beta}\mathbf{W}_t + \nu_{i,t+1} \\ ExShBase_{i,t+1} &= k_0 + k_1 ExShBase_{i,t} + l_{1,} Cash_{i,t} + z_1 Payout + \boldsymbol{\gamma}\mathbf{W}_t + \eta_{i,t+1} \end{aligned}$$

where *Payout*, *Cash* and *ExShBase* are defined as before and $\mathbf{W}_t$ is a vector of control variables and the corresponding coefficients are given by $\boldsymbol{\phi}$, $\boldsymbol{\beta}$ and $\boldsymbol{\gamma}$ for the respective equation.[31] As always, we include industry and time dummies and cluster standard errors at the industry level.

The estimation results in Table 9 indicate that the *Excess Shareholder Base* Granger causes *Payout* and *Cash*. However, it does not appear as if past levels of *Cash* and *Payout* Granger causes *ExShBase*. These results and the effect of decimalization (see section C of the Results) are supportive of the thesis that the shareholder base affects payout and cash holdings of firms.

To illustrate that the relation between the shareholder base and payout is not driven by investor composition we conduct multivariate sorts in Table 10. In Panel *A* of Table 10 we first sort companies into five size quintiles followed by two groups by either *Institutional Ownership (IO)* or *Book-to-Market* or *Whited-Wu* or *Misvaluation*. Following this, all stocks are split into two groups according to their *Excess Shareholder Base*. This implies that we have 20 groups of stocks ($5 \times 2 \times 2$). We report the difference in *Total Payout* between large shareholder base firms (greater than median *Excess Shareholder Base*) and small shareholder

[31] We use the Akaike Information Criterion to determine the optimal number of lags. We cannot reject the hypothesis that the optimal number of lags is one.

base firms. From *Hypothesis 1* we expect this difference to be positive. Examining the results for the three-way sort on size, *Institutional Ownership and Excess Shareholder Base,* we find that in the majority of cases, large shareholder base firms have larger levels of *Total Payout*. It is comforting to observe that the exceptions to this relation are found among the smallest firms (size quintiles 1 and 2). The three-way sorts on size, *Book-to-Market* and *Excess Shareholder Base* indicate that whether the stock is a value or glamour stock cannot explain the larger payout levels of large shareholder base firms. Similar conclusions can be drawn when examining the sorts on *Whited-Wu* and *Misvaluation.* The results remain economically and statistically significant when considering median payout levels which indicates that outliers are not driving our results.

In Panel *B* of Table 10 we follow the same sorting procedure as in Panel *A*, but consider differences in *Cash* holdings between large and small shareholder base firms. Following *Hypothesis 1* we expect the difference to be negative. Examining the results for *Institutional Ownership*, we find that in the majority of cases large shareholder base firms have lower cash holdings (except for size quintiles 1 and 2 where the difference is not always significant). Overall, when examining the other variables that we sort on, we find strong support for the hypothesis that large shareholder base firms have lower cash holdings.

The evidence presented in Table 10 indicate that the differences in *Total Payout* and *Cash* between large and small shareholder base firms cannot be explained by differences in institutional ownership or other variables that might have clienteles.

VI Conclusion

Survey evidence presented by Brav et. al (2005) and the amount of resources spent by firms on investor relations indicate that the shareholder base is of importance to firms. One reason why a large shareholder base is important is that it reduces the cost of external financing. Firstly, having a large shareholder base may reduce asymmetric information between insiders and outsiders through more information production. Secondly, the shareholder base may be related to the recognition of the firm and hence the availability of external financing. For example, Merton ((1987), p.500) states that "an increase in the relative size of the firm's investor base will reduce the firm's cost of capital and increase the market value of the firm." Common to both the asymmetric information and the recognition story is that the cost of external is negatively related to the size of the shareholder base.

We develop and test three implications of there being a relation between the shareholder base and the cost of external financing. First, we verify that firms with small shareholder bases behave as if they are financially constrained; they payout less and have higher cash reserves. Second, we document that the method of payout affects the size of the shareholder base. Undertaking a repurchase reduces the size of the shareholder base while a special dividend is neutral or even has a slight positive effect. Third, we document that firms that have small shareholder bases are less likely to undertake a repurchase (reduce the shareholder base further), thereby effectively avoiding a smaller shareholder base. However, small shareholder base firms are more likely to use special dividends as a distribution method. Overall, the findings of this paper suggest that the shareholder base not only affects firm valuation, but is also an important consideration for payout policy.

The findings of this paper suggest that further research should examine how recognition interacts with firm decisions. A recent example of this is Lou (2010) who finds that firms increase advertising prior to undertaking seasoned equity offerings. However, additional work is needed to strengthen the link between recognition, returns and corporate policies of firms.

References

Amihud, Y.; H. Mendelson; and J. Uno. "Number of Shareholders and Stock Prices: Evidence from Japan." *Journal of Finance,* 54 (1999), 1169-1184.

Banyi, M.; E. A. Dyl; and K. Kahle. "Errors in Estimating Share Repurchases." *Journal of Corporate Finance*, 14 (2008), 460-474.

Barclay, M. J., and C. W. Smith Jr. "Corporate Payout Policy: Cash Dividends versus Open-Market Repurchases." *Journal of Financial Economics,* 22 (1988), 61-82.

Bessembinder, H. "Trade Execution Costs and Market Quality after Decimalization." *Journal of Financial and Quantitative Analysis,* 38 (2003), 747-777.

Bhushan, R., and P. O'Brien. "Analyst Following and Institutional Ownership." *Journal of Accounting Research,* 28 (1990), 55-76.

Bjerring, J. H.; J. Lakonishok; and T. Vermaelen. "Stock Prices and Financial Analysts' Recommendations." *Journal of Finance* 38, (1983), 187-204.

Black, F. "The Dividend Puzzle." *Journal of Portfolio Management* 2 (1976), 5-8.

Bodnaruk, A., and P. Östberg. "Does Investor Recognition Predict Returns?" *Journal of Financial Economics,* 91 (2009), 208-226.

Brav, A.; J. R. Graham; C. R. Harvey; and R. Michaely. "Payout Policy in the 21st Century." *Journal of Financial Economics,* 77 (2005), 483-527.

Brennan, M. J., and C. Tamarowski. "Investor Relations, Liquidity and Stock Prices." *Journal of Applied Corporate Finance,* 12 (2000), 26-37.

Brockman, P., and D. Y. Chung. "Managerial Timing and Corporate Liquidity: Evidence from Actual Share Repurchases." *Journal of Financial Economics,* 61 (2001), 417-448.

Bushee B. J., and G. S. Miller. "Investor Relations, Firm Visibility and Investor Following." Working Paper, University of Pennsylvania, The Wharton School (2008).

Cleary, S. "The Relationship between Firm Investment and Financial Status." *Journal of Finance,* 54 (1999), 673-692.

Cook, D. O.; L. Krigman; and J. C. Leach. "On the Timing and Execution of Open Market Repurchases." *Review of Financial Studies,* 14 (2004), 463-498.

DeAngelo, H.; L. DeAngelo; and D. J. Skinner. "Special Dividends and the Evolution of Dividend Signaling." *Journal of Financial Economics,* 57 (2000), 309-354.

Demirgüç-Kunt, A., and V. Maksimovic. "Law, Finance, and Growth." *Journal of Finance,* 53 (1998), 2107-2137.

Dimson, E., and P. R. Marsh. "An Analysis of Brokers' and Analysts' Unpublished Forecasts of UK Stock Returns." *Journal of Finance,* 39 (1984), 1257-1292.

Dittmar, A. "Why Do Firms Repurchase Stock?" *Journal of Business,* 73 (2000), 321-357.

Dittmar, A., and J. Mahrt-Smith. "Corporate Governance and the Value of Cash." *Journal of Financial Economics,* 83 (2007), 599-634.

Dittmar, A.; J. Mahrt-Smith; and H. Servaes. "International Corporate Governance and Corporate Cash Holdings." *Journal of Financial and Quantitative Analysis* 38, (2003), 111-134.

Durnev, A., and E. H. Kim, "To Steal or Not to Steal: Firm Attributes, Legal Environment, and Valuation." *Journal of Finance,* 60 (2005), 1461-1493.

Easterbrook, F. H. "Two Agency-Cost Explanations of Dividends." *American Economic Review,* 74 (1984), 650-659.

Fang, L., and J. Peress. "Media Coverage and the Cross-Section of Stock Returns." *Journal of Finance,* 64 (2009), 2023-2052.

Fang, V. W.; T. H. Noe; and S. Tice. "Stock Market Liquidity and Firm Value." *Journal of Financial Economics,* 94 (2009), 150-169.

Fazzari, S. M.; R. G. Hubbard; and B. C. Petersen. "Financing Constraints and Corporate Investment." *Brookings Papers on Economic Activity,* 1 (1988), 141-206.

Foerster, S. R., and G. A. Karolyi. "The Effects of Market Segmentation and Investor Recognition on Asset Prices: Evidence from Foreign Stocks Listing in the United States." *Jornal of Finance,* 54 (1999), 981-1013.

Furfine, C. "Decimalization and Market Liquidity." *Economic Perspectives,* 27 (2003), 2-12.

Gompers, P. A.; J. L. Ishii; and A. Metrick. "Corporate Governance and Equity Prices." *Quarterly Journal of Economics,* 118 (2003), 107-155.

Graham, J. R., and A. Kumar. "Do Dividend Clienteles Exist? Evidence on Dividend Preferences of Retail Investors." *Journal of Finance,* 61 (2006), 1305-1336.

Greene, W. "Fixed Effects and Bias due to the Incidental Parameters Problem in the Tobit Model." *Econometric Reviews*, 23 (2004a), 125-147.

Greene, W. "The Behaviour of the Maximum Likelihood Estimator of Limited Dependent Variable Models in the Presence of Fixed Effects." *Econometrics Journal*, 7 (2004b), 98-119.

Grinstein, Y., and R. Michaely. "Institutional Holdings and Payout Policy." *Journal of Finance,* 60 (2005), 1389-1426.

Grullon, G., and D. Ikenberry. "What Do We Know About Stock Repurchases?" *Journal of Applied Corporate Finance,* 13 (2000), 31-51.

Grullon, G.; G. Kanatas; and J. Weston. "Advertising, Breadth of Ownership, and Liquidity." *Review of Financial Studies,* 17 (2004), 439-461.

Harford, J.; S. A. Mansi; and W. F. Maxwell. "Corporate Governance and Firm Cash Holdings in the US." *Journal of Financial Economics,* 87 (2008), 535-555.

Harris, L. "Trading and Exchanges." Oxford University Press (2002).

Holmström, B., and J. Tirole. "Market Liquidity and Performance Monitoring." *Journal of Political Economy,* 101 (1993), 678-709.

Hong, H.; J. D. Kubik; and J. C. Stein. "The Only Game in Town: Stock-Price Consequences of Local Bias." *Journal of Financial Economics,* 90 (2009), 20-37.

Hovakimian, A.; T. Opler; and S. Titman. "The Debt-Equity Choice." *Journal of Financial and Quantitative Analysis,* 36 (2001), 1-24.

Ikenberry, D.; J. Lakonishok; and T. Vermaelen. "Market Underreaction to Open Market Repurchases." *Journal of Financial Economics,* 39 (1995), 181-208.

Ikenberry, D.; J. Lakonishok; and T. Vermaelen. "Stock Repurchases in Canada: Performance and Strategic Trading." *Journal of Finance,* 55 (2000), 2373-2397.

Jagannathan, M.; C. Stephens; and M. Weisbach. "Financial Flexibility and the Choice Between Dividends and Stock Repurchases." *Journal of Financial Economics,* 57 (2000), 355-384.

Jensen, M. "The Agency Costs of Free Cash Flow: Corporate Finance and Takeovers." *American Economic Review,* 76 (1986), 323-329.

Kadlec, G. B., and J. J. McConnell. "The Effect of Market Segmentation and Illiquidity on Asset Prices: Evidence from Exchange Listings." *Journal of Finance,* 49 (1994), 611-636.

Kahle, K. M. "When a Buyback isn't a Buyback: Open-market Repurchases and Employee Options." *Journal of Financial Economics,* 63 (2002), 235-261.

Kaplan, S. N., and L. Zingales. "Do Investment-Cashflow Sensitivities Provide Useful Measures of Financing Constraints?" *Quarterly Journal of Economics,* 112 (1997), 169-215.

King, M. R.,. and D. Segal. "The Long-Term Effects of Cross-Listing, Investor Recognition, and Ownership Structure on Valuation." *Review of Financial Studies,* 22 (2009), 2393-2421.

Lehavy, R., and R. G. Sloan. "Investor Recognition and Stock Returns." *Review of Accounting Studies,* 13 (2008), 327-361.

Lou, D. "Attracting Investor Attention Through Advertising." Working Paper, Yale University, New Haven (2010).

Merton, R. C. "A Simple Model of Capital Market Equilibrium with Incomplete Information." *Journal of Finance,* 42 (1987), 483-510.

Miller, J. M., and J. J. McConnell. "Open-Market Share Repurchase Programs and Bid-Ask Spreads on the NYSE: Implications for Corporate Payout Policy." *Journal of Financial and Quantitative Analysis*, 30 (1995), 365-382.

Neyman, J., and E. L. Scott. "Consistent Estimates Based on Partially Consistent Observations." *Econometrica*, 16 (1948), 1-32.

Opler, T.; L. F. Pinkowitz; R. M. Stulz; and R. Williamson. "The Determinants and Implications of Corporate Cash Holdings." *Journal of Financial Economics,* 51 (1999), 3-46.

Rhodes-Kropf, M.; D. Robinson; and S. Viswanathan. "Valuation Waves and Merger Activity: The Empirical Evidence." *Journal of Financial Economics,* 77 (2007), 561-603.

Rozeff, M. S. "Growth, Beta and Agency Costs as Determinants of Dividend Payout Ratios." *Journal of Financial Research*, 5 (1982), 249-259.

Stephens, C., and M. Weisbach. "Actual Share Reacquisitions in Open-Market Repurchase Programs." *Journal of Finance,* 53 (1998), 313-334.

Weisbenner, S. "Corporate Share Repurchases in the 1990s: What Role Do Stock Options Play?" Working Paper, University of Illinois, Urbana-Champaign (2004).

Whited, T. M., and G. Wu. "Financial Constraints Risk." *Review of Financial Studies,* 19 (2006), 531–559.

Womack, K. "Do Brokerage Analysts' Recommendations Have Investment Value?" *Journal of Finance,* 51 (1996), 137-157.

Appendix: Variable Definitions

Variable	Description of Variable and Source of Data
Shareholder base	number of common shareholders of record (in 000s) CRSP-COMPUSTAT Merged database (CCM) data item # 100.
Market cap	year-end equity market capitalization: (price x shares outstanding), CCM data 24 x data 25.
Book-to-market, B/M	ratio of long-term debt to the total equity of the firm: CCM data 9/ data 60.
Price-to-earnings, P/E	ratio of the year-end stock price to earnings per share for the prior fiscal year: CCM data 24/data 58.
Debt-to-equity, D/E	ratio of long-term debt to the total equity of the firm: CCM data 9/ data 60.
Operating income	ratio of operating income to total assets: CCM data 13/ data 6.
R&D	ratio of R&D to total assets, set zero when missing: CCM data 46 / data 12
Cash	ratio of cash holdings to total assets: CCM data 1/ data 6.
Dividend payout	ratio of dollar amount of dividends to total assets: CCM data 21/ data 6.
Total payout	sum of dollar amount of dividends and dollar volume of repurchases divided by total assets: CCM (data 21 + data 115)/ data 6.
Stock liquidity	sum of the monthly share volume over the previous year divided by the number of shares outstanding at the end of the year: CRSP Monthly Stocks.
Past year return	compounded monthly return for the previous year: CRSP Monthly Stocks.
Volatility	stock return volatility, computed as the standard deviation of daily stock returns for the previous year: CRSP Daily Stocks
Capital expendit, Capex	ratio of capital expenditure to total assets of the firm: CCM data 128/ data 6.
Firm age	number of years the firm existed in CRSP daily stocks database.
Share price	median price of the firm share over the previous one year: CRSP daily stocks.
ROE	ratio of earnings to average equity for the prior fiscal year: CCM data 20/ (data 60 + data 60(t-1))/2).
Institutional ownership	year-end fraction of shares outstanding owned by institutional fund managers: Spectrum 13f.
Industry concentration	sum of the squared market share of each firm in the same industry during a year. Market share is defined as the total sales of the firm in a given year divided by the total sales of the industry in the year. The industry is defined at the three-digit SIC code level, where the SIC codes have been obtained from CRSP Monthly Stocks (SICCD). The sales data comes from CCM: data 12.
Misvaluation (RRV)	sector-adjusted firm-specific valuation errors corresponding to the residuals of Model 3 in Rhodes-Kropf, Robinson and Viswanathan (RRV) (2005) that regresses market value on leverage, book value of assets and net income for twelve Fama-French sectors of the economy. Estimated from CCM.
Whited-Wu index	index of financial constraint of Whited-Wu (2006): WW=-0.091*CF-0.062*DIVPOS+ 0.021*TLTD-

	0.044*LNTA+0.102*ISG-0.035*SG, where CF is a ratio of cash flows to total assets, DIVPOS is an indicator that takes the value of one if the firm pays cash dividends, TLTD is the ratio of the long-term debt to total assets, LNTA is the natural log of total assets, ISG is the firm's three-digit industry sales growth, SG is firm sales growth. Estimated from CCM.
Managerial ownership	fraction of shares outstanding pertaining to the top 5 company executives. Estimated from Thomson Reuters Insider Database.
Option based compensation, OBC	the proportion of total compensation to the management officers of the firm paid in the form of stock options. Estimated from Thomson Reuter Insiders database.
Board independence	ratio of independent directors to total directors. Estimated from IRRC.
Board size	number of directors divided by the logarithm of total assets. Estimated from IRRC.
Corporate governance index, G	measured as in Gompers, Ishii, and Metric (2003): sum of the number of provisions restricting shareholder rights. Data obtained from IRRC.
Special dividend dummy	a dummy variable which takes a value of 1 if a company paid special dividends in a given year, 0 otherwise. A dividend is classified as special if it has a distribution code of 1262 or 172. Estimated from CRSP monthly data.
Need external financing	a dummy variable which a value of 1 if firm's *actual growth* rate exceeds its *sustainable growth* rate. Following Demirguc-Kunt and Maksimovic (1998) and Durnev and Kim (2005) actual growth is measured as 2-year geometric average of annual growth rate in total assets and sustainable growth rate as a 2-year average of ROE/(1 − ROE).
Share repurchase dummy	a dummy variable which takes a value of 1 if a company repurchased shares in a given year, 0 otherwise. A company is defined to have a repurchase if purchase of common and preferred stock less the decrease in par value of preferred stock: (CCM data 115+ data 130) is greater then 1% of total assets.

Table 1: Descriptive Statistics of the Data

We present descriptive statistics on the variables used in our study. All variables are described in Appendix. All variables are winsorized at 1% and 99% of the distribution.

Variable	N	Mean	Median	Std
Shareholder base	52679	17.15	1.83	454.88
Market cap (mln)	52679	1898.18	180.78	10646.16
Book-to-market (B/M)	52679	0.68	0.55	0.58
Price-to-earnings (P/E)	52679	15.88	13.72	43.99
Debt-to-equity (D/E)	52679	0.76	0.34	1.46
Operating income	52679	0.12	0.13	0.14
R&D	52679	0.04	0.00	0.27
Cash	52679	0.14	0.06	0.17
Dividend payout	52679	0.01	0.00	0.02
Total payout	52679	0.02	0.01	0.04
Stock liquidity	52679	1.15	0.74	1.30
Past year return	52679	0.16	0.15	0.53
Volatility (x100)	52679	0.68	0.39	1.15
Capital expenditures (Capex)	52679	0.07	0.05	0.07
Firm age	52679	22.40	18.00	18.03
ROE	52679	0.05	0.11	0.40
Institutional ownership	52679	0.38	0.35	0.25
Industry concentration	52679	0.08	0.05	0.09
Misvaluation (RRV)	38492	-0.04	-0.04	0.37
Whited-Wu index	38492	-0.19	-0.19	0.14
Managerial ownership	5876	0.01	0.00	0.03
Option based compensation, OBC	5876	0.38	0.37	0.25
Board independence	5876	0.63	0.67	0.18
Board size	5876	1.28	1.26	0.30
Corporate governance index	5876	9.28	9.00	2.66
Share repurchase dummy (x100)	52679	22.66	0.00	41.87
Special dividend dummy (x100)	52679	1.71	0.00	12.97

Table 2: Determinants of Shareholder Base

We present the results of a Fama-MacBeth regression relating the shareholder base to its determinants. The dependent variable is the logarithm of common shareholders of record (CCM data 100). All variables are described in Appendix. We include trading exchange and industry (SIC2) fixed effects. Standard errors are clustered by industry (SIC2).

	Estimate	p-Value
Log (Firm age)	0.40	(0.01)
ROE	-0.17	(0.01)
Log (Market cap)	0.63	(0.01)
Log (B/M)	0.23	(0.01)
1/Share price	1.49	(0.01)
Stock liquidity	0.01	(0.72)
Past year return	-0.07	(0.01)
Volatility	5.01	(0.01)
Exchange dummies	Yes	
Industry dummies	Yes	
Clustering	SIC2	
Adj. R^2	0.431	
N	22	

Table 3: Persistence of Excess Shareholder Base

We report the results on the persistence of excess shareholder base for firms which are selected when they enter the highest (lowest) quartile of excess shareholder base for the first time. Excess shareholder base is the residual of the regression reported in Table 2. Firms are followed for five years to determine the quartile they belong in the subsequent year. Quartile 4 represents the highest excess shareholder base quartile, and Year 0 is the measurement year. Numbers shown are percentages. The number of firms is in brackets. We require companies to have non-missing excess shareholder base for the years -1 to +5 relative to the measurement year.

	Quartile 4	Quartile 3	Quartile 2	Quartile 1
Persistence of Excess Shareholder Base for Firms that are in the Highest Quartile of Excess Shareholder Base in Year 0				
Year 0	1.00 [563]			
Year 1	0.68 [383]	0.29 [162]	0.02 [13]	0.01 [5]
Year 2	0.61 [346]	0.32 [179]	0.05 [27]	0.02 [11]
Year 3	0.57 [322]	0.34 [192]	0.06 [32]	0.03 [17]
Year 4	0.58 [326]	0.32 [179]	0.07 [38]	0.03 [20]
Year 5	0.57 [318]	0.31 [175]	0.08 [45]	0.04 [25]
Persistence of Excess Shareholder Base for Firms that are in the Lowest Quartile of Excess Shareholder Base in Year 0				
Year 0				1.00 [592]
Year 1	0.02 [12]	0.03 [17]	0.30 [179]	0.65 [384]
Year 2	0.04 [24]	0.05 [31]	0.34 [199]	0.57 [338]
Year 3	0.04 [23]	0.07 [43]	0.30 [177]	0.59 [349]
Year 4	0.06 [34]	0.08 [45]	0.31 [186]	0.55 [327]
Year 5	0.06 [37]	0.11 [65]	0.31 [183]	0.52 [307]

Table 4: Shareholder Base and Total Payout

We investigate the relation between the excess shareholder base and total payout. We utilize the residuals from the regression reported in Table 2 as our measure of the shareholder base. The dependent variable is next year total payout, defined as the sum of dividends and repurchases divided by total assets. All variables are described in Appendix. Panel A reports the results of univariate analysis both for the full sample and for the sample of companies with positive total payout. In panel B we report the results of univariate analysis restricting total payout to be within 0% and 100% of net income. Panel C reports result of Tobit regressions. Specifications (1) and (2) are Fama-MacBeth regressions with industry fixed effects. For each year we estimate a Tobit regression with Total Payout as a dependent variable. We report average regression coefficients. The reported p-Values are based on Newey-West (2 lags) corrected standard errors of the estimated average regressions coefficients. Specifications (3)-(7) are panel regressions with industry (SIC2) and time fixed effects with standard errors clustered at industry level. All estimates are multiplied by 100.

Panel A. Univariate Analysis: All Payouts

		Total Payout			Total Payout (>0)	
Excess Shareholder Base	N	Mean	Median	N	Mean	Median
High (Positive)	26506	2.59%	0.91%	17688	3.89%	2.20%
Low (Negative)	26173	2.21%	0.64%	16506	3.50%	1.91%
		t-Stat/p-Value	Wilcoxon/p-Value		t-Stat/p-Value	Wilcoxon/p-Value
		10.16	12.09		7.23	8.69
		0.01	0.01		0.01	0.01

Panel B. Univariate Analysis: Payout Between 0% and 100% of Net Income

		Total Payout			Total Payout (>0)	
Excess Shareholder Base	N	Mean	Median	N	Mean	Median
High (Positive)	20580	1.55%	0.38%	11763	2.70%	1.86%
Low (Negative)	21578	1.41%	0.25%	11914	2.56%	1.69%
		t-Stat/p-Value	Wilcoxon/p-Value		t-Stat/p-Value	Wilcoxon/p-Value
		5.27	5.97		3.75	5.35
		0.01	0.01		0.01	0.01

Panel C. Multivariate Regressions

	Fama-MacBeth						Pooled Panel							
	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value
Excess shareholder base	0.29	(0.01)			0.43	(0.01)	0.43	(0.01)			0.31	(0.01)	0.20	(0.05)
*-- ^2							-0.13	(0.01)						
× Need external financing			0.18	(0.01)					0.28	(0.01)				
× No need external financing			0.34	(0.01)					0.50	(0.01)				
Log (Market cap)	0.15	(0.01)	0.14	(0.01)	0.49	(0.01)	0.50	(0.01)	0.49	(0.01)	0.04	(0.70)	0.42	(0.01)
Log (B/M)	-1.14	(0.01)	-1.14	(0.01)	-0.75	(0.01)	-0.75	(0.01)	-0.75	(0.01)	-1.47	(0.01)	-2.24	(0.01)
D/E	-0.32	(0.01)	-0.32	(0.01)	-0.36	(0.01)	-0.36	(0.01)	-0.36	(0.01)	-0.28	(0.01)	-0.42	(0.01)
P/E	-0.00	(0.01)	-0.00	(0.01)	-0.00	(0.01)	-0.00	(0.01)	-0.00	(0.01)	-0.00	(0.01)	-0.00	(0.01)
Operating income	7.75	(0.01)	7.76	(0.01)	13.73	(0.01)	13.71	(0.01)	13.82	(0.01)	11.36	(0.01)	24.33	(0.01)
R&D	0.89	(0.01)	0.89	(0.01)	0.92	(0.01)	0.92	(0.01)	0.92	(0.01)	0.85	(0.01)	4.86	(0.01)
Cash	1.38	(0.01)	1.37	(0.01)	2.11	(0.01)	2.13	(0.01)	2.11	(0.01)	2.43	(0.01)	4.03	(0.01)
Past year return	-0.95	(0.01)	-0.95	(0.01)	-1.28	(0.01)	-1.29	(0.01)	-1.28	(0.01)	-1.36	(0.01)	-1.91	(0.01)
Volatility	-16.73	(0.01)	16.80	(0.01)	-57.09	(0.01)	-56.32	(0.01)	-57.16	(0.01)	-45.21	(0.01)	-94.36	(0.01)
Capex	-4.76	(0.01)	-4.76	(0.01)	-8.38	(0.01)	-8.43	(0.01)	-8.37	(0.01)	-10.05	(0.01)	-19.03	(0.01)
Institutional ownership	0.20	(0.41)	0.19	(0.44)	0.37	(0.37)	0.28	(0.62)	0.36	(0.38)	0.63	(0.08)	-1.32	(0.01)
Industry concentration	-1.94	(0.31)	-1.52	(0.42)	-0.08	(0.95)	-0.02	(0.99)	-0.01	(0.94)	-0.10	(0.50)	-0.98	(0.68)
Stock liquidity	-0.40	(0.01)	-0.40	(0.01)	-0.64	(0.01)	-0.62	(0.01)	-0.64	(0.01)	-0.55	(0.01)	-0.41	(0.01)
Misvaluation (RRV)											-1.28	(0.01)	-0.35	(0.30)
Whited-Wu index											-12.53	(0.01)	-11.36	(0.01)
Managerial ownership													-8.39	(0.01)
OBC													0.37	(0.47)
Board independence													0.37	(0.46)
Board size													0.77	(0.06)
G-index													0.00	(0.99)
Industry dummies	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Time dummies					Yes		Yes		Yes		Yes		Yes	
Clustering					SIC2		SIC2		SIC2		SIC2		SIC2	
Adj R^2					0.189		0.191		0.189		0.238		0.229	
N	21		21		52679		52679		52679		38492		5876	

Table 5: Shareholder Base and Cash Holdings

We investigate the relation between the excess shareholder base and cash holdings. We utilize the residuals from the regression reported in Table 2 as our measure of the shareholder base. The dependent variable is cash holdings at the end of the next fiscal year divided by total assets net of cash. All variables are described in Appendix. In panel A we report the results of univariate analysis. Panel B reports multivariate regression results. Specifications (1) and (2) are Fama-MacBeth regressions with industry fixed effects. For each year we estimate an OLS regression with Cash as a dependent variable. We report average regression coefficients. The reported p-Values are based on Newey-West (2 lags) corrected standard errors of the estimated average regressions coefficients. Specifications (3)-(7) are panel regressions with industry (SIC2) and time fixed effects with standard errors clustered at industry level. All estimates are multiplied by 100.

Panel A. Univariate Analysis

		Cash Holdings	
Excess Shareholder Base	N	Mean	Median
High (Positive)	28058	12.76%	5.39%
Low (Negative)	27891	16.48%	7.02%
		t-Stat/p-Value	Wilcoxon/p-Value
		14.04	13.92
		0.01	0.01

Panel B. Multivariate Regressions

	Fama-MacBeth				Pooled Panel									
	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value
Excess shareholder base	-0.65	(0.01)			-0.54	(0.01)	-0.53	(-4.39)			-0.47	(0.01)	-0.63	(0.01)
*-- ^2							0.11	(1.79)						
× Need external financing			-0.35	(0.01)					-0.39	(0.01)				
× No need external financing			-0.76	(0.01)					-0.61	(0.01)				
Log (Market cap)	-1.01	(0.01)	-1.01	(0.01)	-0.94	(0.01)	-0.95	(0.01)	-0.94	(0.01)	-0.56	(0.01)	-0.73	(0.09)
Log (B/M)	-3.99	(0.01)	-4.00	(0.01)	-4.00	(0.01)	-4.00	(0.01)	-4.01	(0.01)	-5.66	(0.01)	-2.88	(0.01)
D/E	-2.13	(0.01)	-2.12	(0.01)	-2.11	(0.01)	-2.12	(0.01)	-2.11	(0.01)	-2.38	(0.01)	-1.92	(0.01)
P/E	0.00	(0.41)	0.00	(0.45)	-0.00	(0.40)	-0.00	(0.42)	-0.00	(0.4)	-0.00	(0.45)	-0.00	(0.39)
Operating income	1.00	(0.73)	0.96	(0.75)	-2.17	(0.08)	-2.14	(0.08)	-2.19	(0.08)	-3.01	(0.10)	10.24	(0.15)
R&D	14.81	(0.01)	14.82	(0.01)	6.97	(0.01)	6.97	(0.01)	6.96	(0.01)	8.73	(0.01)	25.83	(0.02)
Total payout	21.99	(0.01)	21.95	(0.01)	21.51	(0.01)	21.65	(0.01)	21.57	(0.01)	25.06	(0.01)	30.78	(0.01)
Past year return	-0.03	(-0.08)	-0.03	(-0.08)	-0.18	(0.30)	-0.17	(0.34)	-0.18	(0.30)	-0.23	(0.35)	0.80	(0.33)
Volatility	-43.41	(0.01)	-44.18	(0.01)	-14.20	(0.21)	-14.59	(0.22)	-14.04	(0.21)	-10.96	(0.45)	39.25	(0.62)
Capex	-22.04	(0.01)	-22.04	(0.01)	-20.13	(0.01)	-20.12	(0.01)	-20.12	(0.01)	-20.30	(0.01)	-28.17	(0.01)
Institutional ownership	-2.36	(0.01)	-2.32	(0.01)	-2.58	(0.01)	-2.51	(0.01)	-2.58	(0.01)	-3.12	(0.01)	-7.39	(-0.01)
Industry concentration	29.23	(0.18)	44.86	(0.11)	3.18	(0.36)	3.27	(0.31)	3.49	(0.36)	4.59	(0.09)	11.23	(0.34)
Stock liquidity	2.71	(0.01)	2.72	(0.01)	2.49	(0.01)	2.47	(0.01)	2.48	(0.01)	2.52	(0.01)	2.92	(0.01)
Misvaluation (RRV)											-6.36	(0.01)	-2.69	(0.09)
Whited-Wu index											7.68	(0.07)	11.18	(0.08)
Managerial ownership													12.34	(0.31)
OBC													1.45	(1.30)
Board independence													-0.75	(0.43)
Board size													-2.98	(-0.03)
G-index													-0.44	(0.01)
Industry dummies	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Time dummies					Yes		Yes		Yes		Yes		Yes	
Clustering					SIC2		SIC2		SIC2		SIC2		SIC2	
Adj R^2					0.208		0.208		0.208		0.230		0.372	
N	21		21		52679		52679		52679		38492		5876	

Table 6: Decimalization, Shareholder base, and Payout

We relate changes in the shareholder base to changes in total payout and cash holdings around the introduction of decimal trading quotes on NYSE, AMEX, and NASDAQ in 2000/2001 (decimalization). Following Fang et al. (2009) changes in all variables are calculated as the difference between the value of the variable at the end of 2001 and at the end of 1999. Panel A reports the effect of changes in the shareholder base on changes in total payout. We consider both the full sample of companies as well as only the companies which had a positive total payout in 1999. Panel B investigates the impact of changes in the shareholder base around decimalization on changes in cash holdings. Relative effective spread is trade-weighted average of bid ask-spread adjusted by the midpoint of bid-ask range. Total assets is the book value of company total assets (Compustat item #6). Residual volatility is four factor adjusted volatility of company stock returns estimated over 1 year window from daily data and expressed in yearly terms. All other variables are described in Appendix. We utilize industry fixed effects. Standard errors are clustered at industry level. All estimates are multiplied by 100.

Panel A. Change in Shareholder Base and Change in Total Payout

	full sample								if positive payout in 1999							
	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value
ΔLog(#Shareholders)	0.26	(0.00)							0.37	(0.00)						
× Price 5-10$			0.38	(0.00)							0.60	(0.06)				
× Price >10$			0.21	(0.00)							0.36	(0.02)				
ΔExcess shareholder base					0.54	(0.00)							0.66	(0.01)		
× Price 5-10$							0.73	(0.00)							0.82	(0.01)
× Price >10$							0.48	(0.00)							0.62	(0.03)
ΔInstitut. ownership	0.15	(0.90)	0.13	(0.91)	0.72	(0.64)	0.69	(0.66)	-1.18	(0.50)	-1.18	(0.50)	-1.13	(0.53)	-1.13	(0.52)
ΔRelative eff. spread	-5.60	(0.29)	-4.46	(0.29)	-5.28	(0.58)	-5.34	(0.58)	-13.74	(0.17)	-14.01	(0.16)	-10.43	(0.26)	-10.48	(0.25)
ΔLog(Total assets)	-0.75	(0.01)	-0.74	(0.01)	-1.20	(0.00)	-1.19	(0.00)	-1.68	(0.00)	-1.68	(0.00)	-2.91	(0.00)	-2.92	(0.00)
ΔResidual volatility	-7.95	(0.10)	-3.63	(0.11)	-17.02	(0.38)	-17.56	(0.38)	-31.37	(0.00)	-30.35	(0.00)	-24.67	(0.32)	-24.77	(0.31)
ΔPast year return	-0.52	(0.00)	-0.59	(0.00)	-0.67	(0.00)	-0.68	(0.00)	-0.58	(0.01)	-0.57	(0.01)	-0.75	(0.00)	-0.76	(0.00)
Industry FE		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes
Clustering		SIC2		SIC2		SIC2		SIC2		SIC2		SIC2		SIC2		SIC2
N		2724		2724		1913		1913		1726		1726		1779		1396
Adj R^2		0.023		0.024		0.030		0.030		0.036		0.037		0.055		0.055

Panel B. Change in Shareholder Base and Change in Cash Holdings

	(1)		(2)		(3)		(4)	
	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value
ΔLog(#Shareholders)	-0.89	(0.06)						
× Price 5-10$			-1.11	(0.04)				
× Price >10$			-0.54	(0.29)				
ΔExcess shareholder base					-1.05	(0.03)		
× Price 5-10$							-1.60	(0.05)
× Price >10$							-0.85	(0.04)
ΔInstitut. ownership	10.98	(0.00)	10.88	(0.00)	13.08	(0.01)	13.18	(0.01)
ΔRelative eff. spread	22.00	(0.06)	22.49	(0.06)	27.47	(0.34)	27.48	(0.34)
ΔLog(Total assets)	10.77	(0.00)	10.80	(0.00)	11.12	(0.00)	11.10	(0.00)
ΔResidual volatility	-49.06	(0.06)	-49.63	(0.06)	-74.45	(0.37)	-72.88	(0.38)
ΔPast year return	1.64	(0.07)	1.64	(0.05)	1.00	(0.29)	1.01	(0.29)
Industry FE		Yes		Yes		Yes		Yes
Clustering		SIC2		SIC2		SIC2		SIC2
N		2724		2724		1913		1913
Adj R^2		0.1284		0.1281		0.1197		0.1194

Table 7: The Effect of Share Repurchases and Special Dividends on Shareholder Base

We present the results of the effect of share repurchases and special dividends on the shareholder base in the year when the special distribution is undertaken and in the subsequent year. The change in shareholder base in year t is calculated as the difference in the logarithm of the number of common shareholders of record at the end of year t and year t-1. The dependent variable is the change in shareholder base at year t (t+1), where year t is a year when a special distribution is made. All variables are described in Appendix. All estimates are multiplied by 100.

	ΔShareholder Base$_t$		ΔShareholder Base$_t$		ΔShareholder Base$_{t+1}$		ΔShareholder Base$_{t+1}$	
	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value
Share repurchase$_t$	-1.26	(0.03)	-2.40	(0.02)	-2.44	(0.01)	-2.51	(0.01)
Special dividend$_t$	4.45	(0.02)	14.01	(0.02)	-0.19	(0.64)	2.62	(0.01)
ΔShareholder base$_t$					-7.74	(0.01)	-3.97	(0.01)
ΔShareholder base$_{t-1}$	-14.52	(0.01)	-11.27	(0.01)	-3.25	(0.01)	-5.07	(0.01)
ΔShareholder base$_{t-2}$	-4.27	(0.01)	-5.41	(0.01)				
Log (Market cap)	0.17	(0.53)	1.20	(0.15)	-0.83	(0.88)	1.15	(0.53)
Log (B/M)	-4.90	(0.01)	-5.80	(0.01)	-5.37	(0.01)	-1.84	(0.01)
D/E	-0.89	(0.01)	-1.29	(0.03)	-2.36	(0.42)	-1.36	(0.51)
P/E	0.01	(0.08)	0.02	(0.19)	-2.69	(0.99)	1.11	(0.99)
Operating income	3.07	(0.24)	15.07	(0.16)	1.18	(0.01)	1.35	(0.01)
R&D	3.64	(0.09)	8.50	(0.01)	1.52	(0.01)	2.04	(0.02)
Total payout	-33.57	(0.01)	-52.95	(0.01)	-1.37	(0.01)	-1.15	(0.01)
Past year return	1.76	(0.02)	1.60	(0.17)	7.87	(0.01)	3.82	(0.01)
Volatility	44.54	(0.17)	446.65	(0.05)	-0.95	(0.01)	0.25	(0.01)
Capex	22.63	(0.02)	38.38	(0.03)	0.74	(0.01)	0.95	(0.01)
Cash	2.95	(0.02)	-2.05	(0.52)	1.10	(0.02)	-0.30	(0.08)
Institutional ownership	-0.57	(0.61)	4.78	(0.61)	1.00	(0.09)	0.87	(0.01)
Industry concentration	15.90	(0.03)	18.17	(0.02)	2.40	(0.09)	-0.25	(0.03)
Stock liquidity	1.63	(0.01)	0.75	(0.34)	3.31	(0.61)	0.41	(0.79)
Misvaluation (RRV)			1.56	(0.48)			0.04	(0.88)
Whited-Wu index			4.56	(0.67)			1.38	(0.01)
Managerial ownership			0.88	(0.96)			0.67	(0.01)
OBC			1.04	(0.52)			0.43	(0.22)
Industry dummies		Yes		Yes		Yes		Yes
Time dummies		Yes		Yes		Yes		Yes
Clustering		SIC2		SIC2		SIC2		SIC2
Adj. R^2		0.029		0.037		0.026		0.024
Nobs		34345		9077		33465		8100

Table 8: Shareholder Base and the Choice of Payout Method

We relate the excess shareholder base to the likelihood of paying a special dividend and undertaking a repurchase. Panel A presents univariate results on the relation between the excess shareholder base and the decision to pay special dividend and repurchase stock (likelihood and size) in the subsequent year. Panel B presents results of a probit analysis of the relation between the excess shareholder base and the likelihood of undertaking a special distribution (share repurchase or special dividend). The dependent variable is a dummy variable which takes the value of 1 if the company makes a special distribution (special dividend or repurchase) in the following year, 0 otherwise. Panel C presents the results of a probit analysis relating the excess shareholder base to the method of a special distribution. The dependent variable is a dummy variable that takes the value of 1 if the special distribution is a repurchase, 0 if it is a special dividend. We control for selectivity utilizing Heckman's lambda from the selection regression reported in Panel B. All regressions control for time and industry fixed effects with standard errors clustered at industry level. Residuals from the regression reported in Table 2 are used as our measure of the shareholder base. All variables are described in Appendix. Marginal effects for all variables are multiplied by 100.

Panel A. Univariate Analysis

		Likelihood of Special Dividend			Likelihood of Repurchase			Size of Repurchase		
Excess Shareholder Base	N	Mean	t-Stat	Prob	Mean	t-Stat	Prob	Mean	t-Stat	Prob
High (Positive)	28065	1.40%	5.61	0.01	23.48%	4.63	0.01	1.41%	6.75	0.01
Low (Negative)	27939	2.02%			21.84%			1.17%		

Panel B. Shareholder Base and the Decision to Undertake a Special Distribution

	Estimate	p-Value	ME	Estimate	p-Value	ME
Excess shareholder base	0.03	(0.01)	0.84	0.03	(0.01)	0.76
Log (Market cap)	0.09	(0.01)	2.70	0.07	(0.01)	2.02
Log (B/M)	0.17	(0.01)	4.93	0.04	(0.04)	0.99
D/E	-0.02	(0.32)	-0.51	-0.01	(0.40)	-0.40
P/E	-0.00	(0.06)	-0.01	-0.00	(0.11)	-0.01
Operating income	2.64	(0.01)	76.02	2.70	(0.01)	76.30
R&D	0.13	(0.19)	3.82	0.17	(0.01)	4.76
Dividend-to-earnings	-0.16	(0.10)	-4.62	-0.15	(0.01)	-4.35
Repurchase-to-earnings	0.15	(0.01)	4.36	0.15	(0.01)	4.22
Past year return	-0.13	(0.01)	-3.61	-0.15	(0.01)	-4.25
Volatility	-14.72	(0.01)	-424.36	-21.28	(0.01)	-601.71
Capex	-1.83	(0.01)	-52.86	-1.98	(0.01)	-56.11
Institutional ownership	0.29	(0.01)	8.26	0.24	(0.01)	6.68
Industry concentration	0.13	(0.25)	3.80	0.17	(0.29)	4.77
Stock liquidity	-0.05	(0.01)	-1.45	-0.04	(0.01)	-1.26
Misvaluation (RRV)				-0.39	(0.04)	-10.99
Whited-Wu index				-0.49	(0.01)	-13.94
Log(Firm age)	0.07	(0.01)	2.11	0.08	(0.01)	2.38
Industry dummies		Yes			Yes	
Time dummies		Yes			Yes	
Clustering		SIC2			SIC2	
Adj R^2		0.101			0.112	
N		52526			38450	

Panel C. Shareholder Base and the Choice of Special Distribution (Share Repurchase vs Special Dividend)

	Estimate	p-Value	ME	Estimate	p-Value	ME	Estimate	p-Value	ME
Excess shareholder base	0.12	(0.02)	0.59	0.09	(0.09)	0.39	0.13	(0.10)	0.07
log (Market cap)	0.13	(0.10)	0.66	0.03	(0.82)	0.11	0.19	(0.06)	0.10
log (B/M)	0.09	(0.55)	0.44	-0.14	(0.44)	-0.56	0.00	(1.00)	0.00
D/E	0.05	(0.31)	0.27	0.09	(0.24)	0.33	0.28	(0.18)	0.15
P/E	0.00	(0.37)	-0.01	0.00	(0.26)	0.00	0.00	(0.03)	0.00
Operating income	0.66	(0.77)	3.26	-2.85	(0.16)	-11.32	0.21	(0.91)	0.12
R&D	5.68	(0.01)	28.17	7.43	(0.01)	29.75	2.38	(0.28)	1.33
Dividend-to-earnings	-0.43	(0.01)	-2.12	-0.27	(0.03)	-1.07	-0.22	(0.01)	-0.93
Repurchase-to-earnings	0.32	(0.01)	1.59	0.20	(0.10)	0.79	0.12	(0.17)	0.47
Past year return	-0.53	(0.01)	-2.61	-0.37	(0.01)	-1.49	-0.31	(0.17)	-0.17
Volatility	7.72	(0.39)	38.30	30.22	(0.06)	119.82	18.75	(0.75)	10.46
Capex	-0.60	(0.75)	-3.00	1.53	(0.34)	6.07	-0.20	(0.91)	-0.11
Institutional ownership	0.95	(0.01)	4.72	0.55	(0.03)	2.17	1.11	(0.07)	0.62
Industry concentration	0.50	(0.40)	2.48	0.62	(0.20)	2.46	3.06	(0.13)	1.71
Stock liquidity	0.03	(0.49)	0.16	0.08	(0.16)	0.31	0.26	(0.27)	0.14
Misvaluation (RRV)				0.02	(0.83)	0.09	-0.78	(0.13)	-0.44
Whited-Wu index				0.02	(0.98)	0.06	0.67	(0.36)	0.37
Managerial ownership							-0.38	(0.85)	-0.21
OBC							1.29	(0.00)	0.72
G-index							0.07	(0.01)	0.04
Lambda	0.71	(0.70)	3.51	-0.90	(0.38)	-3.55	-0.52	(0.48)	-2.62
Industry dummies		Yes			Yes			Yes	
Time dummies		Yes			Yes			Yes	
Clustering		SIC2			SIC2			SIC2	
Adj R^2		0.195			0.235			0.296	
N		12336			8947			3330	

Table 9: VAR

We report the results of panel vector-autoregressive regressions (with 1 lag). The dependent variables are measured at the end of next year. All other variables are measured at the end of current year. All variables are described in Appendix. All estimates are multiplied by 100.

	Total payout				Cash				Excess Shareholder Base			
	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value
Total payout	69.70	(0.01)	57.19	(0.01)			1.31	(0.30)	2.67	(0.66)	-1.46	(0.86)
Cash			0.52	(0.01)	73.72	(0.01)	72.29	(0.01)	1.94	(0.13)	0.19	(0.88)
Excess shareholder base	0.12	(0.01)	0.15	(0.01)	-0.08	(0.02)	-0.08	(0.06)	90.97	(0.01)	91.10	(0.01)
Controls	No		Yes		No		Yes		No		Yes	
Industry dummies	Yes		Yes		Yes		Yes		Yes		Yes	
Time dummies	Yes		Yes		Yes		Yes		Yes		Yes	
Clustering	SIC2		SIC2		SIC2		SIC2		SIC2		SIC2	
Adj R^2	0.274		0.367		0.600		0.622		0.805		0.811	
N	61043		48202		61043		48202		61043		48202	

Table 10: The Relation between Shareholder Base and Total Payout and Cash Holding: Sorting Evidence

We examine the relation between excess shareholder base and total payout and cash holdings for different size, value, institutional ownership, financial constraints (Whited-Wu), and misvaluation groups. At the end of previous year companies are sorted in 20 (5 X 2 X 2) groups based on size, book-to-market/ instutional ownership/Whited-Wu index/misvaluation and excess shareholder base. In Panel A(B) we report the difference in average and median total payout (cash holdings) between high and low excess shareholder base groups. Differences in total payout and cash holdings are multiplied by 100. p-Values for 1-sided t-test and Wilcoxon test are reported in parentheses.

Panel A. Total Payout

	B/M				IO				WW				Misvaluation			
Size	Low		High		Low		High		Low		High		Low		High	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Small	0.17	0.00	0.27	0.02	0.26	0.00	0.24	0.00	0.35	0.04	0.14	0.00	0.39	0.10	0.19	0.00
	(0.10)	(0.03)	(0.01)	(0.05)	(0.02)	(0.19)	(0.03)	(0.03)	(0.01)	(0.01)	(0.11)	(0.01)	(0.01)	(0.03)	(0.07)	(0.15)
2	0.56	0.00	0.32	0.06	0.84	0.12	0.06	-0.01	0.05	-0.23	0.26	0.00	0.44	0.02	0.58	0.03
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.55)	(0.49)	(0.64)	(0.04)	(0.01)	(0.02)	(0.01)	(0.14)	(0.01)	(0.01)
3	0.70	0.42	0.34	0.26	0.51	0.48	0.34	0.20	0.32	0.09	0.25	0.00	0.41	0.28	0.50	0.34
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
4	0.91	0.85	0.47	0.56	0.79	0.82	0.34	0.32	0.70	0.39	0.49	0.26	0.48	0.67	0.63	0.68
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Large	0.79	0.80	0.43	0.61	0.20	0.64	0.24	0.06	0.06	0.18	0.67	0.63	0.26	0.39	0.28	0.36
	(0.01)	(0.01)	(0.01)	(0.01)	(0.12)	(0.01)	(0.08)	(0.02)	(0.64)	(0.20)	(0.01)	(0.01)	(0.03)	(0.01)	(0.12)	(0.01)

Panel B. Cash Holdings

	B/M				IO				WW				Misvaluation			
Size	Low		High		Low		High		Low		High		Low		High	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Small	0.02	-0.07	-0.58	-0.19	-0.10	0.44	-0.37	-0.291	-0.19	-0.17	-1.22	-1.571	-0.34	-0.47	0.62	0.64
	(0.95)	(0.30)	(0.11)	(0.26)	(0.83)	(0.11)	(0.41)	(0.19)	(0.64)	(0.47)	(0.03)	(0.02)	(0.62)	(0.23)	(0.18)	(0.01)
2	-0.56	-0.56	-1.55	-1.06	-0.15	-1.04	-1.37	-1.396	-1.00	-1.15	-0.43	-0.16	-0.55	-1.95	-0.72	-0.22
	(0.23)	(0.05)	(0.01)	(0.01)	(0.31)	(0.05)	(0.01)	(0.01)	(0.02)	(0.01)	(0.44)	(0.24)	(0.33)	(0.01)	(0.16)	(0.41)
3	-2.10	-2.43	-2.96	-1.57	-2.83	-2.36	-2.48	-2.27	-1.94	-1.30	-1.68	-2.77	-3.85	-4.62	-1.42	-0.96
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
4	-3.29	-2.86	-2.61	-1.51	-4.25	-3.13	-2.28	-1.11	-1.13	-0.11	-2.53	-2.79	-3.63	-3.12	-3.78	-2.34
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.08)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Large	-3.21	-2.14	-1.09	-0.88	-3.10	-1.48	-2.50	-1.76	-0.17	0.10	-2.54	-2.07	-2.08	-0.93	-4.43	-2.75
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.53)	(0.35)	(0.01)	(0.01)	(0.53)	(0.01)	(0.01)	(0.01)