Institutional Holdings and Payout Policy – From the Perspective of Lifecycle Theory

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Abstract

This paper examines the role of financial lifecycle on the relation between payout policy and institutional ownership using a data set of US listed firms over the 1986-2013 period. We find that a firm's financial lifecycle plays a significant role in its decision to distribute earnings both in the form of cash dividends and share-repurchase. However, financial lifecycle has the positive impact only on the dividend payout ratio but not on magnitude of share-repurchase activity. We also find that the relation between institutional holdings and payout policy varies with different stages of firm financial lifecycle. Payout policy appears to follow lifecycle theory, where firms do not pay or pay less during growth phases, and more firms make distribution to shareholders or have higher payout ratios in the mature lifecycle phase. Institutional investors, on the other hand, prefer to invest in firms at growth stages of their lifecycle. This helps explain the findings of Grinstein and Michaely (2005) that institutional investors prefer firms which pay dividends but, among them, prefer firms that pay fewer dividends. Overall, our findings are consistent with the lifecycle theory and reveal some novel evidence on institutional investors' payout preferences and monitoring roles.

JEL classification: G14, G35 ……

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1. Introduction

The link between payout policy and institutional ownership has been documented in established literature (see Allen et al. (2000), Allen and Michaely (2003) for tax clienteles theory, Baker and Wurgler (2004) for catering theory, Eckbo and Verma (1994) for agency/free cash flow theory, and Zeckhauser and Pound (1990) for signaling theory). Empirical studies have also well covered the topic, including Short et al. (2002) for the UK market, Grinstein and Michaely (2005), Amihud and Li (2006), Desai and Jin (2011) for the US market, and Henry (2011) for the Australian market. However, to the best of our knowledge, the role of firm lifecycle in this relation has not been examined, though some studies, for example DeAngelo et al. (2006), have reported the relation between firm's propensity to pay dividends, levels of payout and its financial lifecycle.

From the prior literature, we know that institutional investors "self-sort into firms with different payout policies depending on their tax status (or the tax status of their clients)" (see Desai and Jin (2011)). However, without tax consideration, Grinstein and Michaely (2005) find that institutional investors prefer the firms which pay dividends, but among them, they prefer firms that pay relatively fewer dividends. This means that institutions invest in firms not only for the optimal mix of capital gain and dividends income based on their tax characteristics, they may consider other factors which are also important such as growth potential, profitability, investment opportunities, stability and risk diversification. As firm characteristics change a lot with their lifecycle, and especially if there is a trade-off between greater profit accumulation and declining investment opportunities over time, our research conjectures that lifecycle can be an important factor that drives institutional holdings, and provides a better explanation for the relation between institutional ownership and payout policies.

In the US, institutional investors differ from retail ones as they are regulated and have comparative tax advantage (some are tax-exempted, others are considered long-term investors and are taxed at lower rates). Moreover, as referred to in Grinstein and Michaely (2005), institutions manage large pools of funds, and have larger amounts invested in each stock. They also have better access to private information and well prepared analyses. Additionally, they have "several coordination mechanisms to increase their effectiveness in monitoring" (Grinstein and Michaely (2005)). For all of those reasons, they are expected to have a greater incentive and capability to involve themselves in firm monitoring.

Despite the fact that "executives make no effort to use payout policy as a tool to alter the proportion of institutional investors among their investors" which was identified by Brav et al. (2005), firms may need to take into account institutions' demand when forming their payout

policy, especially when firms believe that institutional investors can help to increase firm value if they exercise their monitoring power. At the extreme, firms will be forced to follow some pattern of payout that best suits the desire of those large strategic shareholders if they do have payout preferences. On the other hand, in situations where institutions have no incentive to monitor (free rider) or have only a "short term investment horizon" in the firms, institutional investors may choose the firms that have payout policies (at least during their investment horizon) that are suitable to their targets and characteristics. This two-way relation has been examined thoroughly by Grinstein and Michaely (2005) with the identified preference of institutions being towards the firms that pay dividends and make share-repurchases. Beyond this underlying distribution preference, they demonstrate that institutions prefer firms that pay relatively fewer dividends but undertake more share-repurchases. However, their study fails to prove that higher institutional holdings cause firms to increase/alter their dividend, repurchase, or total payout distributions. The later study of Desai and Jin (2011) employs the heterogeneity in institutional shareholder tax characteristics and finds that tax incentives provide an explanation for the appetite of institutional investors toward different firm payout policies, and that "managers adapt their payout policies to the interest (tax preference) of their institutional shareholders".

Following DeAngelo et al. (2006), we test the role of lifecycle theory in the relation between payout policy and institutional holdings, using the mix of earned and contributed capital as a proxy for lifecycle. The level of firm lifecycle is measured by the proportion of retained earnings out of total equity (RE/TE), referring to "the extent to which the firm is self-financing or reliant on external capital". We also use another proxy of lifecycle measured by the proportion of retained earnings out of total assets (RE/TA) for robustness analysis. Based on a large data set of US listed firms over the years 1986-2013, we set up single linear regressions for both institutional holdings and payout variables (including a pay or not pay dummy, and the payout ratio for earnings distribution in the form of cash dividends, share-repurchases, or both), using the fixed effect panel data approach as the primary analysis model. This approach provides the most conservative outcomes compared to the other estimations that we also use for robustness analyses, including the Fama-McBeth estimation process and OLS estimation with standard errors clustered by firm and year (time). We use random effect logit model estimation in equations for pay/not pay decision to avoid loss of observations in our sample due to the stickiness in firms' payout, especially in regards to the dividend payment decision, where firms rarely change from dividend paying status in a certain year to notpaying status in the following year, or vice versa, without significant changes in firms' fundamentals. The panel

tobit model is used for equations where payout ratio is the dependent variables to avoid the selection bias in our sample, where a large number of observations exhibit zero values when firms choose not to payout in the form of cash dividends and/or repurchases. We also carry out simultaneous equation estimations as an additional robustness test of our findings to overcome the possible issue with endogeneity, and to identify the potential direction of causation of the two-way relation between institutional holdings and payout policy.

Our study, on the contrary to the study by Grinstein and Michaely (2005), finds that institutional investors do have an impact on the decision by firms to pay cash dividends or make share-repurchases, as do the firm lifecycle and age attributes. These new results offer implications for the validity of some of the above-mentioned payout theories.

First of all, we find that institutions prefer dividend paying firms generally but, among them, they prefer the firms that pay fewer dividends. These results are consistent with Grinstein and Michaely (2005). Moreover, institutional investors also prefer to invest in firms with higher financial lifecycles – measured by the ratio of retained earnings to total equity (or total assets) and in relatively mature firms – representing by firm age. The effects of financial lifecycle and firm age are independent, which suggests that financial lifecycle is potentially influenced by other firm-level attributes such as firm industry, management structure, corporate governance, investment quality, and business diversity. Interestingly, institutions' preference for lower dividends holds for all lifecycle levels and follows a consistent pattern that is supported by the lifecycle theory: institutional investors select the firms that pay lower dividends, especially firms situated at the growth phase, as growing firms tend to pay lower dividends and invest more in profitable projects.

Second, higher institutional ownership, in general, leads to a higher propensity of firms to pay dividends, but only at the lowest and the highest quintile levels of the lifecycle group; and especially with institutional holdings being related to a lower probability of firms to pay dividends in their growth phase. The results can be explained by the preference of institutional investors for investment in dividend-paying firms: institutions invest in firms at their initial stage of financial lifecycles if the firms pay dividends (likely to meet the prudent regulation), in this stage most of firms do not pay dividends; and at the mature phase, due to limited investment opportunities and huge free cash flow, institutions may pressure firms to begin paying or to pay higher dividends in order to reduce agency costs. In their growth phase, firms are less likely to payout as they need capital for further investment. This is especially true when financial lifecycle has a positive impact on the decision of the firms to pay dividends (see DeAngelo et al. (2006)) and also on the level of institutional ownership (our previous finding).

Third, in general, higher institutional ownership is not found to lead to higher or lower dividend payments, but lifecycle does a have positive impact on the dividend payout ratio. This contrasts from the monitoring theory point of view, with the expectation that institutional ownership acts as a substitute agency mechanism for greater dividend payment. This also contradicts with the lifecycle or agency cost theory as, when the firms reach their maturities with less attractive investment opportunities and more stable free cash flow, they are able to pay out more, and institutions would be expected to urge the firms to increase dividends to reduce agency costs. We may explain this fact, following Grinstein and Michaely (2005), that "a small number of institutions might be strong monitors and they might affect dividend policy", but in a large group of investors and firms we might not observe this consistent effect due to the heterogeneity among institutions. However, institutional holdings are associated with lower dividend payout ratios when firms are in their growth phase, consistent with the lifecycle theory where firms need funds for their investment and growth, they will not increase their dividend payment during growth stage, and institutional investors' preference for firms at growth phase, which results in the association between institutional holdings and lower dividend payments.

Fourth, institutions prefer firms that distribute to shareholders in the form of share-repurchases, or either of dividends and/or repurchases. They invest more in firms that have higher repurchase ratios, but the total payout ratio is not a determinant for their investment (due to the conflicting preference of institutions to dividends and repurchases). However, the preference for repurchasing or paying firms, and for firms with higher repurchase ratios, is weak for firms at the growth phase. These results highlight the fact that institutional investors sort themselves across firms with different payout policies, and are especially attracted to firms in their growth phase with a lot of investment opportunities.

Fifth, repurchase ratios and total payout ratios have a positive relation with institutional holdings, and the relation becomes stronger with higher financial lifecycle levels. However, lifecycle is not a significant driver of repurchases, as it is for dividends or total payouts. The simultaneous equation system that we use to test the causation of the relation between institutional holdings and payout policy does not provide evidence for any dominant direction for the two-way relation of our interest. That means we cannot conclude implicitly that institutional investors push firms to distribute more in the form of share-repurchases, and less in the form of dividends; or that firms make more share-repurchases, and pay lower dividends when they have higher institutional ownership.

Our findings highlight relevant payout theories, like catering, clientele, signaling or lifecycle explanations, in an evolving context. In short, though the relation between institutional ownership and payout policy have been well documented among theories and empirical studies, the role of lifecycle on this relation has been neglected. Literature has also shown the link between dividend payout and firm lifecycle, but the link between firm lifecycle and institutional ownership and how this influences payout, is still missing or has not been directly examined. Our study fills this gap and provides a clearer picture about this relation.

The paper is organized as follows. Section 2 develops our hypotheses based on the related literature, while Section 3 describes our data and methods employed. Section 4 reports the two-way relation between institutional holding and firm payout from our empirical analyses. Finally, our conclusions are presented in Section 5.

2. Hypothesis development

This paper relates to the literature on the determinants of Institutional Holdings and the determinants of Payout Policies when institutional ownership and payout are likely inter-related, and in some cases (especially dividends), can be used as alternative tools to signal to the market about the firms' performance and prospects (see the explanation about the information content of institutional holdings and dividend in Amihud and Li (2006)).

Firstly, some recent papers examine the preference of institutional investors toward firm payout policy. Prudent man rules and the dividend tax advantage (compared to capital gain for some institutions) of institutional investors that we mentioned earlier can be the reasons for institutions 'preference toward firms who pay dividends, and especially the firms that pay more dividends. However, since share repurchases became available, Grinstein and Michaely (2005) show that, though institutions prefer paying firms, they, in fact, prefer the firms which pay lower dividends and make more repurchases. Brav et al. (2005) report that firm managers believe that individual investors are more attracted to dividend increases than institutions, despite their tax disadvantage, which suggests that tax reasons may not provide a proper explanation for investors' preference of payout. Nevertheless, based on the tax characteristics of institutional investors (or of their clients), Desai and Jin (2011) demonstrate that "dividend-averse" institutions gravitate towards low dividend paying firms and "managers adapt their payout policies to the interest of their institutional shareholders". This study also explains the failure of previous literature in finding significant evidence of a tax-related clientele effects, due to the broad classification among institutional investors and individual investors, or among different sub-groups of institutions. In the same view, the Ferreira et al.

(2010) findings also suggest the existence of dividend clienteles around the world, highlighting that taxes and transaction costs are important determinants of firms' payout decisions, where the firms tailor their payout depending on the desire of institutional investors, and especially foreign ones.

According to DeAngelo et al. (2006), firms with low lifecycle (represented by the earned/contributed capital mix) "tend to be in the capital infusion stage", whereas firms with high lifecycle "tend to be more mature with ample cumulative profits". Firms at the more mature stage of their lifecycle may have lower risk, and be more stable and, therefore, may attract more institutional holdings that primarily invest money on behalf of other investors and are regulated by the "prudent man rule". Therefore, though Grinstein and Michaely (2005) suggest that institutions may be more attracted to growth firms (lower lifecycle) than to the mature firms (higher lifecycle) in their explanation for the lower-dividend appetite of institutional investors, high lifecycle firms may attract more institutional holdings for stability and risk aversion reasons. Moreover, taking into account the effect of lifecycle on the relation between institutional holdings and dividend/repurchase payout ratios, firms at higher levels of lifecycle have more free cash-flows, higher profit accumulation, less lucrative investment opportunities and, as a consequence, need to pay higher dividends and/or repurchases to reduce agency costs.

According to Jagannathan et al. (2000), there is "financial flexibility" maintained when firms distribute their higher "temporary, non-operating cash flows" using repurchases, and "dividends are paid by firms with higher permanent operating cash flows". In their research, dividends grow smoothly while share repurchases vary considerably with the business cycle. Therefore, institutional investors may rely on dividends as a source of stable income, and prefer firms to make share-repurchases when firms have redundant free cash-flows without profitable investment projects.

We form the following hypothesis:

H1A: Institutions prefer firms with higher lifecycle.

H1B: Institutions prefer firms that elect to pay dividends, and for dividend-paying firms those that pay relatively fewer dividends; the relationships are expected to be stronger for firms with lower lifecycle (growth phase) and weaker for firms with higher lifecycle (mature phase).

H1C: Institutions prefer firms that elect to distribute in the form of share-repurchases, and for share-repurchasing firms those that repurchase at higher ratios; the relationships are

expected to be stronger for firms with higher lifecycle (the higher the lifecycle, the stronger the relationship).

Secondly, there are two possible explanations, in the literature, for the impact of institutional holdings on payout policy. One the one hand, payout policy of the firms may be affected by their institutional investors when they desire to exercise their monitoring power or involve themselves in the firms' management. On the other hand, firms may follow some particular payout policies to cater to their strategic institutional investors with their desire towards firm payout policy.

Allen et al. (2000) justify two reasons for why institutional shareholders prefer dividends. First, due to "prudent man" regulation, institutions need to form their portfolio with stocks that pay dividends. Second, dividends attract some categories of institutions since they have a relative tax advantage in relation to dividend income in comparison with capital gains (tax-exempt shareholders such as pension funds or "nonprofit institutions" may prefer dividend income). Eckbo and Verma (1994) argue that institutional investors prefer free cash flow to be distributed in order to reduce agency costs, and they use their voting power to force firm managers to payout dividends. According to Ferreira et al. (2010), domestic institutions, which account for "more than half of institutional ownership" in the US, are more likely to favor dividend distribution as they are not affected by restrictions on repatriating dividends or the cost of reinvestments like foreign institutions.[2]

"Prudent man" rules, the free cash flow hypothesis or agency model, and reinvestment and transaction costs may explain why institutions may participate in the payout policy decision-making process to achieve their desirable payout target, and these factors formed the basis for a proposed positive relation between institutional holdings and firms' propensity to pay out dividends and/or make share-repurchases in Grinstein and Michaely (2005). Even though the proposal made by Allen et al. (2000) that firms pay dividends to attract institutional investors does not hold, and Brav et al. (2003) illustrate real-world practice where there is no evidence of managers using payout policy to attract particular "investor clientele that may monitor their actions" or to "alter the proportion of institutional investors among their investors", we believe that institutions, or at least some major shareholders, do have an impact on firm payout. In contrast, Shapiro and Zhuang (2013) assert that the "larger presence of

[2] Grinstein, Y. and Michaely, R. (2005) 'Institutional holdings and payout policy', *The Journal of Finance*, 60(3), 1389-1426. show that "institutions held more than 50% of US industrial firms, compared to around 35% a decade earlier", and "there is a trend toward more institutional holdings in both small and large firms". Ferreira, M. A., Massa, M. and Matos, P. (2010) *Dividend clienteles around the world: Evidence from institutional holdings*, Working Paper., evidence that US has the total institutional ownership of 75%, highest rate in comparison with those of other countries in their samples.

active institutional investors" means that firms' investors are less sensitive to dividend cuts, and this may be the reason for such firms being less likely to pay dividends. Amihud and Li (2006) provide evidence that "the disappearing dividend phenomenon" since 1978 in the US is due to the "decline in the information content of dividends" as the rise in institutional holdings may convey this content (about firms' performance and prospects) instead of the costly dividend payment. DeAngelo et al. (2006) suggest that dividends tend to be paid by mature firms, with higher financial lifecycle. Renneboog and Trojanowski (2011) document the same picture for the UK market, where "shareholders are more likely to receive dividend payouts from firms that are larger (for liquidity and transaction cost purpose), more profitable, and less levered, as well as from firms facing less attractive investment opportunities" (characteristics of firms at higher lifecycle). With the appetite of institutional investors towards paying firms in Grinstein and Michaely (2005), and the expectation that firms with higher lifecycle are better candidates to make payout, either in the form of dividends as in DeAngelo et al. (2006), or in the form of share-repurchases, the following hypothesis is expected:

H2: Firms with greater institutional holdings and/or higher lifecycle will have a greater propensity to distribute earnings to investors in the form of cash dividends and/or share-repurchases.

As regard to the level of dividend payout, according to Rozeff (1982), investment policy influences dividend policy with (i) firms pay a lower dividend payout ratio when they anticipate higher revenue growth, (ii) firms establish a lower dividend payout ratio when they have higher beta (meaning higher "operating and financial leverage"), and (iii) firms pay higher dividends when insiders hold a lower fraction of equity than other stockholders. By this, the author argues that firms with greater investment, as measured by higher current and prospective growth rates of revenue, have lower dividend payouts. This may support the idea in Grinstein and Michaely (2005) where they explain the dividend preference of institutional investors based on institutions being more attracted to growth firms (which pay low dividends) than to mature firms (that usually pay higher dividends).

Jagannathan et al. (2000) show that "stock repurchases and dividends are used at different times from one another, by different kinds of firms". Their analyses indicate that dividend increases "will be made by firms with higher and more stable cash flows", and are "related to permanent but not necessarily to temporary components of cash flow". The authors also demonstrate that their empirical results are consistent with other research on the relation

between dividend changes and future earnings (see Benartzi et al. (1997) and DeAngelo et al. (1996)).

The recent study by Kulchania (2013) finds that "catering plays a role in the substitution between repurchases and dividends" and the decision to repurchase shares or to pay dividends depends on the premium investors place on the stock price of the firms. Though the payout ratio depends on many factors, like investment opportunities, firms' free cash flow, or their catering purposes, we expect that institutional investors may play an important role in determining payout ratio if they hold a large enough proportion of shares and/or desire to involve in management decisions or exercise their monitoring power.

As suggested by the literature, institutional investors and dividends may be viewed as alternative signaling tools. A large institutional investor base may result in lower dividends, as dividends are a costly signal of good performance, since institutions themselves can act as a credible signal to the public; see Amihud and Li (2006) for example. On the other hand, since dividends may convey signals about firms' future prospects, a dividend cut may result in a decline in stock return as a reaction from investors. Firms are therefore reluctant to cut dividends if they are not forced to do so. Moreover, firms also will not increase dividends if they do not have sustainable fundamentals to support that decision.

Grullon et al. (2002) propose that "firms tend to increase their cash payout as they become more mature" since "mature firm generate larger free cash flows". Their study evidences "changes in profitability and risk following dividend changes" and relates change in dividend policy to change in firm's lifecycle. Based on the empirical results of their research, the authors propose a maturity hypothesis explanation for dividend changes made by firms, where dividend increases signal changes in firms' maturity (especially from a higher growth phase to a lower growth phase) with smaller investment opportunities, declining growth rate and risk, and larger free cash flows. Thus, we suggest that lifecycle can have an influence on the relation between dividend payout ratio and institutional holdings, where dividend payment can help reduce agency costs when firms have redundant cash-flow at their higher lifecycle stage, and institutional holdings sometimes can be used as an alternative signal about the firms' performance instead of dividend payment.

In agreement with Grinstein and Michaely (2005) about institutional investors' appetite for low-dividend payment[3], we propose the following:

[3] Short, H., Zhang, H. and Keasey, K. (2002) 'The link between dividend policy and institutional ownership', *Journal of Corporate Finance*, 8(2), 105-122., find positive relation between dividend payout policy and institutional holdings. However, the authors themselves already implicate that, the "institutional framework and ownership structure" of UK are different from the US's.

H3A: Firms with greater institutional holdings will payout less in the form of cash dividends. This relationship is expected to be stronger for firms with lower lifecycle (growth phase) and weaker for firms with higher lifecycle (mature phase).

In the other hand, since prior literature finds that institutions prefer firms that make share-repurchases, and have higher repurchase ratios; and firms seem to have more free cash-flows and less investment opportunities in mature phase, we propose that:

H3B: Firms with greater institutional holdings will payout more in the form of share-repurchases. This relationship is expected to be stronger for firms with higher lifecycle (mature phase) and weaker for firms with lower lifecycle (growth phase).

The nature of free cash-flows are one of the key determinants of the payout decision, where dividends are paid out by firms from permanent cash-flows, and repurchases are made by firms with high temporary cash-flows. The higher the lifecycle value, the larger the magnitude of permanent cash-flows that firms may have in order to increase their dividend payment; while repurchases can be made at any lifecycle level as long as firms have unused free cash-flows, and potentially the highest repurchase ratio will be paid when firms are at their mature phase. We then predict that:

H3C: Lifecycle will have a positive impact on the dividend payout ratio, while it will have no impact on the repurchase ratio (or will have a positive impact on the repurchase payout ratio only at higher values of lifecycle).

3. Data and methodology

In this section, we describe the sample selection, characteristics of key variables, and the methodology used in the study.

3.1. Sample selection

Our initial sample constitutes all publicly listed corporations in the United States (NYSE, AMEX, and NASDAQ firms that have CRSP exchange codes of 1, 2, and 3 respectively). The research focuses on the 1986 – 2013 period, given that Grinstein and Michaely (2005) include 1980 – 1996 in their research but they omitted the 1980-1985 period from their share-repurchase analysis due to the limited amount of activity caused by strict repurchasing rules during that time, and also because the relation between institutional holdings and dividends changed after the official introduction of repurchases in the mid-1980s. The US tax cut was

introduced in 2003 and then extended from 2008 until now. Similar to Fama and French (2001), DeAngelo et al. (2004), and DeAngelo et al. (2006), we exclude utilities (Standard Industrial Classification (SIC) codes 4910-4940), financial firms (SIC codes 6000-6999), and firms with negative book equity.

This study employs "institutional ownership" (*IOR*) data, define as the fraction of a company's stock that is owned by institutional investors. Following Gompers and Metrick (2001) and Grinstein and Michaely (2005), IOR is calculated for a specific stock in a given year as the sum of all reporting institutional holdings at that particular year end divided by the total shares outstanding for the firm. We obtain the data of institutional holdings from Thomson Reuters (which gather the information from institutional 13F filings). Institutions who exercise investment discretion over $100 million must report to the Securities and Exchange Commission (SEC) for holdings of more than 10,000 shares or investments valued in excess of $200,000. Following Yan and Zhang (2009), we exclude those observations with total institutional ownership greater than 100%.

We match the institutional ownership data with the CRSP and Compustat databases. The Dividend Payout Ratio (*Dividend*) is defined as the annual dividends (annual dividends paid on common stocks), divided by total assets, to ensure that the results are not driven by price variation. Our sample then includes only firms with non-missing values for retained earnings, dividends and earnings items (EBIT) for a given year (consistent with DeAngelo et al. (2006)), and firms with positive total equities. We also include dummy variables of pay/not pay dividends (*dv_pay*) in our analysis. In a similar setting, the Repurchase Payout Ratio (*Repurchase*) is defined as the annual share-repurchases divided by total assets, and the Total Payout Ratio (*Totalpayout*) is the sum of the Dividend and Repurchase Payout Ratios.

Following DeAngelo et al. (2006), we estimate a firm's stage in its financial life cycle based on the amount of its earned equity (retained earnings), relative to total common equity (RE/TE) and to total assets (RE/TA). The RE/TE ratio represents the percentage of earned equity to total (earned plus contributed) common equity, while RE/TA indicate the extent to which total assets are funded by earned rather than contributed capital. The main analyses use RE/TE as the proxy for *Lifecycle*, but outcomes remain unchanged from using the RE/TA variable in our robustness tests.

Where applicable, variables are winsorized at the 1% and 99% level to avoid the effect of outliers. Since we required the one year lead (forward) value for institutional ownership (IOR_{t+1}) and payout ($Dividend_{t+1}$, dv_pay_{t+1}, $Repurchase_{t+1}$, $buyback_{t+1}$, $Totalpayout_{t+1}$, pay_{t+1}) to run our estimations (to allow for realization of IOR at the end of the previous year to impact on

payout this year, and vice versus), the final sample consists of 70,895 firm year observations for financial year from 1986-2012.

3.2. Variable definition

Apart from the main variables of interest that we mentioned above, the following variables are used as determinants of either institutional holdings and/or payout (payout ratio and decision to pay or not to pay for dividends, repurchases, and total payout) as suggested by the related literature:

Firm size measured as the asset value (*NYA*) percentiles for firms listed on NYSE following DeAngelo et al. (2006); other proxies for Size are used for robustness analyses, including the logarithm of the book value of the total asset [*Log(TA*)], the logarithm of sales [4] [*Log(Sales)*], and the equity value (*NYE*) percentiles for firms listed on NYSE.

Profitability using the return on assets ratio (ROA) measured by the ratio of earnings before interest and taxes to total assets.[5]

Leverage measured as the total equity to total assets ratio (*TE/TA*) following DeAngelo et al. (2006). The logarithm of the ratio of the book value of long term debt to total assets [6] is used as the other proxy for Leverage, as used in Grinstein and Michaely (2005), for robustness testing.

Growth measured as the logarithm of the market to book ratio, which is calculated as the ratio of the market value of equity plus the book value of total assets minus the book value of equity all divided by the book value of total assets [*Log(M/B*)]. DeAngelo et al. (2006) also suggest other proxies for growth such as the sales growth rate (SGR), and asset growth rate (AGR), which do not change our analysis outcomes when used.

Cash balance measured as the ratio of cash and marketable securities to total assets.

SP is the dummy variable for S&P index inclusion, which takes the value of 1 if the firm's stock is included in S&P index constituents, and 0 otherwise.

beta coefficient taken from CRSP, to control for firm risk;

[4] Since literature has proven the relation between institutional holdings and firm size, apart from the common proxies for firm size: logarithm value of market capitalization, logarithm value of book value of total assets, Grinstein and Michaely (2005) use log sales to control for size.

[5] We also run the analysis with profitability as measured by the ratio of earnings before interests and taxes to total number of share outstanding (EPS) for robustness test. The interpretation remains unchanged.

[6] We also use TE/TA as another proxy for leverage (follow DeAngelo (2006)) in some of our estimations.

adjustedreturn is the firm's annual adjusted return measured as the difference between the return on the stock and the beta return on the stock in a given year[7]; industry as 1 digit SIC codes, and year dummy variables.

Our study also uses dummy variables to indicate lifecycle quintiles, and interaction variables between the *IOR, Dividend, Repurchase, and Totalpayout variable* with *Lifecycle* or its quintile values. Every year in the sample, firms are grouped into five different quintiles of *Lifecycle* (L_i). The interaction variables include *IOR*Lifecycle*, *Dividend*Lifecycle, Repurchase*Lifecycle, Totalpayout*Lifecycle, IOR*L_i*, *Dividend* L_i*, *Repurchase* L_i*, *Totalpayout* L_i*, *dv_pay* L_i*, *buyback*L_i*, and *pay* L_i*. The summary of variable definitions is provided in the Appendix 1.

3.3. Summary statistics and sample description

Table 1 presents the descriptive statistics summary for variables used in this research. Table 1 Panel A presents the distributions of the variables, while Panel B of Table 1 documents the mean values of the variables based on lifecycle quintiles. In each year, we sort the firms according to their lifecycle values and group them into lifecycle quintiles. We can easily see that our main variables (*Dividend, dv_pay, Repurchase, buyback, Totalpayout, pay* and *IOR*) increase with the value of lifecycle quintiles. *Age* and the three variables which proxy for firm size (*Log(TA), NYE,* and *NYA*) illustrate that older firms seem to be bigger, and in general, have higher financial lifecycle (or a higher ratio of retained earnings to total equity). Panel B of Table 1 also displays that the highest *Profitability* can be seen at firms in the lifecycle quintiles 3 and 4, not at the ones in the highest lifecycle quintile (which are at mature phase). Interestingly, *Cash* declines with *Lifecycle* which may relate to dividend payout, which we will investigate in later parts. Firms at lifecycle quintile 5 experience a drop in *Profitability*, and *Leverage* [the book value of Total Equity/Total Assets ratios (TE/TA)].

[Table 1 about here]

Panel C in Table 1 is a summary of institutional holdings and dividend payout ratios for the various lifecycle quintiles and over the sample years. It shows an increasing trend of institutional holdings (*IOR*) by lifecycle quintiles and over time (though there is a small drop in

[7] Follow Grinstein and Michaely (2005), our annual adjusted return is calculated as the company's stock return, adjusted by the return given by the CAPM using company beta (from CRSP), 10 year treasury bond yield, and the realised return on the S&P 500 index in that year.

2005). Part of the growth in institutional holdings may be due to institutions that became 13F filers only because a rising market pushed their portfolio across the nominal threshold level of $100 million (as suggested by Gompers and Metrick (2001)).

Dividend Payout Ratio (*Dividend*) shows an increasing pattern across lifecycle quintiles. However, we do not see a consistent trend for dividend payout ratio over the years in this table. It is quite interesting that there is a rise in this ratio, starting in 2002, reversing the declining trend before that (likely associated with the 2003 dividend tax cut legislation), but that dividend payout ratios continued increasing every year up to 2007, and then there was a large increase again in 2010 and 2012.[8] This suggests that there was not a one-off adjustment in response to the 2003 tax change.

Figure 1 shows that, at the initial stage (lifecycle quintiles 1-2), most of the firms do not pay dividends while at the mature phase (lifecycle quintile 5), more than 60% of the firms pay out in the form of dividends. This suggests that lifecycle status appears to be related with firms' dividend-paying likelihood.

[Figure 1 about here]

In Figure 2, firms are divided every year into two groups of dividend-payers and non-dividend payers. The data illustrate that mean values of institutional holdings in, and the numbers of institutions that invest in firms classified as dividend payers were always higher than those of the non-dividend payer firm group, showing the preference of institutional investors toward dividend paying firms. However, the difference in institutional ownership between the dividend payer group and the non-dividend payer group appears to be smaller since 2005.

[Figure 2 about here]

As can be seen from Figure 3 below, there is a substantial increase in the dividend payout ratio at lifecycle quintile 4, where we suppose most of the firms enter their mature phase, while *IOR* increases at a declining rate, starting from lifecycle quintile 3.

[Figure 3 about here]

3.4. Methodology

To study the effect of payout and lifecycle on institutional holdings; and of institutional holdings and lifecycle on payout, we firstly carry out the univariate analyses and then run the

[8] The fall in dividend payout ratio in 2008 and 2009 is likely due to the global financial crisis, and the impact of this on firm profitability.

multivariate regressions with dependent variables representing institutional holdings (*IOR*), the decision to pay or not to pay dividends (*dv_pay*), and the dividend payout ratio (*Dividend*) in the main analyses (section 4.1). A similar approach is applied in the subsequent section for share-repurchases (*Repurchase, buyback*), and total payout (*Totalpayout, pay*) using the same set of control variables and methodology; although the outcomes are presented in more condense forms section 4.2 for reason of brevity in paper presentation.

a. Determinants of institutional ownership

To study the effect of payout policy and lifecycle on institutional holdings, we estimate a regression model where the dependent variable is institutional ownership (IOR), and independent variables of interest are payout (*Dividend* and *dv_pay*), financial lifecycle (*Lifecycle*). Controlling variables include *beta*, firm size [*Log(TA)*], firm age (*Age*), *Growth* [Log(M/B)], *adjustedreturn* and *industry*.

In each year, we sort the firms according to their lifecycle values and group them into lifecycle quintiles. In the following equations, the lifecycle variable can be either the RE/TE ratio or the 5 dummy variables representing 5 different quintiles, which takes the value of 1 for the lifecycle quintile that a specific firm belongs to in a particular year, and 0 otherwise (For example, all firms with lifecycle quintile in a particular year which equals 2 have the values of L_2 equals 1, and the remaining firms have the values of L_2 equal 0; at the same time, L_1, L_3, L_4, and L_5 values of the former firms equal to 0).

We are interested in the coefficients β_1, β_2, β_3 and the coefficients for the interaction variables β_4 and B_5. The model estimated is as follows:

$$IOR_{i,t+1} = \alpha + \beta_1.Dividend_{i,t} + \beta_2.dv\_pay_{i,t} + \beta_3.Lifecycle_{i,t} + \beta_4.\sum dv\_pay_{I,t}\ x\ Lifecycle_{i,t} + \beta_5.\sum Dividend_{i,,t}\ x\ Lifecycle_{i,t} + \delta_{it}\ [Control\ Variables_t] + \varepsilon_{it} \quad (1)$$

The study uses 3 different approaches for data analysis: (i) the fixed effect panel data estimations with the resulting firm-specific intercepts accounting for unobserved firm-specific characteristics (similar to Short et al. (2002)), (ii) the cross-sectional analyses, similar to Grinstein and Michaely (2005), but incorporating the two-way clustered standard errors (by time and firm). Petersen (2009) suggests that the use of standard error clustered by firm are unbiased and produce correctly sized confidence intervals whether the firm effect is permanent or temporary while the panel data fixed or random effect models also produces unbiased standard errors but only when the firm effect is permanent and (iii) the Fama and MacBeth regressions (used in DeAngelo et al. (2006)).

Outcomes from the fixed effect panel data estimations are presented in our main tables as they provide the most conservative results compared to the clustered standard error OLS, or the Fama-McBeth approaches. Therefore, our interpretations for the analysis are robust also in the OLS or the Fama-McBeth models.

Grinstein and Michaely (2005) find that institutions prefer dividend-paying firms to non-dividend-paying firms, and a negative association between institutional holdings and the magnitude of the dividend distributions.[9] Other characteristics that consistently have positive effects on institutional holdings are firm size, beta, and growth.

To test our first hypothesis (*H1*), we expect that the sign of the β_2, β_3 coefficients are positive, and for the β_1 coefficient to be negative. Moreover, hypothesis *H1B* projects that β_4 is less positive (or maybe negative) at lower levels of financial lifecycle (growth phase), and more positive at higher levels of lifecycle (mature phase). In contrast, we postulate that β_5 is more negative at the lower level of lifecycle (growth phase) and less negative at the highest level of lifecycle (mature phase). This research also expects a positive correlation for the size, beta and growth variables.

Consistent with Grinstein and Michaely (2005), in the above equations, institutional ownership is calculated at the end of year *t+1* while payout and other controlling variables are at end of year *t*, allowing for the modelling of institutional investor decision-making in response to firm's payout policy setting and changing firm characteristics.

b. Determinants of propensity to pay

To study the effect of institutional ownership and lifecycle on the firm decision to pay or not to pay, we estimate logit regression models where the dependent variable is the pay/not pay dummy variable (*dv_pay* in Section 4.1, and *buyback* and *pay* in Section 4.2), which takes the value of 1 if the firm pays dividends in a particular year and 0 otherwise. We use the random effect panel logit models approach in this estimation (the outcomes are consistent with those of the fixed effect panel logit model, but we avoid losing majority of observations in the sample compared with the fixed effect regressions, as most of the firms typically do not change their pay/not pay status over time). The Fama-McBeth modelling approach following DeAngelo et al. (2006) is also used for robustness analysis, where the logit model is estimated for every year and we report the mean coefficients from the time series results.[10] Control variables in the

[9] Except for 1980 – 1985 sub-period which is not covered in our study.

[10] Following DeAngelo et al (2006), we also run the Newey and West procedure (out to lag 10) to adjust t-statistics for serial correlation. The estimated coefficients on the variables remain at the same sign and same significance to the panel logit model regressions. We, therefore, do not report these two approaches in our results.

models include firm size [*Log(TA)*], *Profitability* (EBIT/TA), *Leverage* (TE/TA), *Growth* [Log(M/B)], and *Cash* (cash balance/TA).

$$Dv\_pay_{i,t+1} = \alpha + \beta_1.IOR_t + \beta_2.Lifecycle_{i,t+1} + \beta_3.\sum IOR_{i,t} \, x \, Lifecycle_{i,t+1} + \delta_{it} \, [Control \, Variables_{t+1}] + \varepsilon_{it+1} \quad (2)$$

Grullon and Michaely (2002) report that institutions prefer firms that pay dividends and undertake share repurchases. In our second hypothesis (*H2*), we expect that institutions will have a positive impact on the firms' decision to pay dividends (positive β_1). However, due to the fact that institutional holdings may be used as an alternative to dividend payment as a means of signaling about firms' performance to the public, we do not exclude the possibility that this coefficient may be negative and/or not statistically significant.

According to Jagannathan et al. (2000), dividends are paid by firms with higher "permanent" operating cash flows. As the firms become more mature with less lucrative investment opportunities, they tend to payout more, implying the higher the lifecycle, the higher the propensity that a firm will distribute their earnings to shareholders. Following DeAngelo et al. (2006), we expect the sign of β_2 *and* β_3 to both be positive.

In order for institutional investors to have any influence on firms' payout policy, we test the effect of the 1-year lag of IOR (value at end of year *t*) on the payout decision at the end of year *t+1*.

c. Determinants of payout ratio

To study the effect of institutional ownership and lifecycle on the dividend payout ratio in Section 4.1, and on the share repurchase ratio and the total payout ratio in Section 4.2, we use the same three approaches of the fixed effect panel data regressions, OLS analysis with clustered standard errors, and the Fama-McBeth estimation process, where the dependent variables are the payout ratios (*Dividend*). The control variables, similar to the decision to pay model in *Equation 2*, include firm size [*Log(TA)], Profitability, Leverage, Growth,* and *Cash*. In order to avoid model mis-specification of the models due to the dividend variable being bounded (many non-dividend payers resulting in the value of the *Dividend* variable equalling zero), we also estimate random effect panel Tobit regression models. The results of the fixed effect panel and the panel Tobit regressions are presented in our main tables. The model estimated is as follows:

$$Dividend_{i,t+1} = \alpha + \beta_1.IOR_t + \beta_2.Lifecycle_{i,t+1} + \beta_3.\sum IOR_{i,t} \, x \, Lifecycle_{i,t+1} + \delta_{it} \, [Control \, Variables_{t+1}] + \varepsilon_{it+1} \quad (3)$$

Based on the findings of Grinstein and Michaely (2005) where institutions are identified to prefer to invest in firms which pay fewer dividends, we expect that, if they have any influence on firms' payout policy, institutional investors will pressure the firms to pay out less in the form of dividends. Firm lifecycle status should have a positive correlation with payout ratio as the higher the ratio of retained earnings to total equity, the greater potential the firm has to pay dividends to its shareholders. Our third hypothesis in relation to the dividend payout ratio (*H3A*) projects that the sign of β_1 is negative, while the sign of β_2 is positive. However, the expected correlation between dividend payout ratio and the interaction between institutional holdings and lifecycle (β_3) is uncertain due to the conflicting impact of institutional ownership and lifecycle on dividend payout ratio outcomes. We do expect a negative sign for the interaction variable at the lower levels of lifecycle, and a positive sign for the interaction at the higher levels of lifecycle (mature phase). The underlying assumption is that at higher levels of lifecycle, firms have fewer investment opportunities and more redundant cash-flow, as a result, they are able to payout more in term of cash dividends, and institutions prefer the firms to pay at this operational stage to reduce agency costs.

In the same pattern, Hypothesis *H3B* predicts that, in the equations where *Repurchase* is the dependent variable, coefficient β_2 is insignificant, coefficient β_1 is positive (as institutions prefer repurchasing firms and firms with higher repurchase payout), and coefficient β_3 is positive (at least at the highest lifecycle level of quintile when firms have more free cash-flows).

Similar to the previous section, in order for institutional investors to have any influence on firms' payout policy, we test the effect of the 1-year lag of IOR (value at end of year *t*) on the dividend payout ratio at end of year *t+1*.

As mentioned above, our main analysis and tables are based on the fixed effect panel model estimation and, where appropriate, the random effect logit model and the panel Tobit model estimation. To make our research comparable with prior literature, the OLS and Fama-McBeth models are also used for robustness analysis (results are not presented as they provide the same interpretation for our findings).

We finally carry out the analyses using the vector autoregressive Simultaneous Equation Model for robustness purposes, and also to overcome endogeneity problems caused by the causal association between dividend payout and institutional holdings, and control for changes in our main variables over time.

The study follows estimation approach run by Hoberg and Prabhala (2009) with different models to assess the effect of additional controlling variables on dependent variables. However, only the key regressions are presented in our result tables.

4. Empirical analysis and results

4.1. Interaction between Dividend Policy and Institutional Holdings

a. Determinants of institutional ownership

The purpose of this sub-section is to outline the results for the analysis of whether dividend payout policy and lifecycle affect institutional ownership.

We start with a nonparametric test on the whole sample of **70,895** firm-years. For every year, we separate the sample into financial lifecycle quintiles. Similar to the approach of Grinstein and Michaely (2005), we separate dividend paying firms (Payers) from non-dividend paying firms (Non-Payers) in every lifecycle quintile, and calculate mean and median institutional holdings in each of the groups. We present the results in Table 2.

[Table 2 about here]

The data in Table 2 show that, in general, institutions have higher holdings in dividend paying stocks than in non-dividend paying stocks. This result is highly significant and holds for all but one lifecycle quintile. The only exception from the trend is in lifecycle quintile 3, where institutional holdings, in fact, are slightly higher in non-dividend paying stocks. The other conclusion from this table is, the higher the lifecycle quintile, the higher the magnitude of institutional holdings, with the only exception being between ownership levels for lifecycle quintile 5 for non-dividend paying firms. A possible reason for this exception may result from institutions' expectation that companies should pay dividends when they reach their mature phase of development (the highest lifecycle quintile). We can see a considerable drop in the number of non-paying firms in lifecycle quintile 4 and 5 in comparison with lower lifecycle quintiles, while the number of dividend paying firms increases dramatically for these lifecycle quintiles.

To further discover the impact of dividend payout and lifecycle on institutional holdings, taking into account other firms' characteristics, we run regressions where the dependent variable is *Institutional holdings (IOR)* at time t+1. The independent variables are *Lifecycle* (either in the form of a continuous variable, ie. RE/TE, or five different dummy variables representing the five different lifecycle quintiles), payout (in the form of either the dummy

variable representing the pay or not pay decision or the dividend payout ratio). Control variables include the firm's asset percentiles to control for firm Size (*NYA*), *beta*, natural logarithm of market to book ratio to control for Growth [*Log(M/B)*], *adjustedreturn* at the end of year t, and its industry affiliation (similar to variables used by Grinstein and Michaely (2005)). We also add *Age* as an additional controlling variable for institutional holdings (and dividend payout ratio later) in our analysis. Although the study examines the effect of financial lifecycle on institutional holdings, and on dividend policy (in the later part), *Age* is an important factor related to the lifecycle of the firm, and our analyses find a significant impact of *Age* on *Institutional Holdings*, independently from the effect of the *Lifecycle* variable.

[Table 3 about here]

Panel A of Table 3 presents the results from estimation of Equation 1 using a firm fixed effect model with standard errors clustered by firm. Column 1 replicates Grinstein and Michaely (2005) analysis for all type of institutions. Similar to their finding, the results in Panel A show that, institutional holdings are higher in dividend paying firms than non-dividend paying firms or institutional investors prefer dividend paying firms than non-dividend paying firms, which is consistent with the trend we see in Table 2 previously. Besides that, there is a negative relation between the dividend payout ratio (representing the magnitude of payout) and institutional ownership. We further develop other estimations in Column 2 – 4 where Column 3 includes the *Age, SP* and *Profitability* variable which are also important determinants of institutional holdings in prior literature, but were omitted in the Grinstein and Michaely (2005) paper. Column 3-4 extend Column 2 with the inclusion of the *Lifecycle* and its interactions with *Dividend* and *dv_pay*. The relation between institutional holdings and payout variables remain unchanged for all estimations. An increase of 1% in dividend payout ratio results in a decrease of between 0.34% to 0.43% in institutional ownership, which is significant at the 1% level. The *Lifecycle* variable consistently has a significant, positive impact on institutional holdings; although the coefficients are rather small with the coefficient values in these regressions being 0.001. We also find evidence for a positive, significant impact of *Age* on institutional holdings in all of our models, which is independent of the lifecycle impact, while *Age* and *Lifecycle* are considered to be highly correlated. A possible explanation for this phenomenon is *Lifecycle* (in this case as financial lifecycle) may depend not only on firm *Age*, but also be related to the industry in which the firms are operating.

Similar to the Grinstein and Michaely (2005) and prior literature findings, the other variables consistently and positively affect institutional holdings, including *Log(M/B), NYA*, *beta*, *adjustedreturn, Profitability* and *SP (*S&P inclusion*)*.

Panel B in Table 3 estimates a similar model to that in Column 4 of Panel A, using the firm fixed effect approach, except the *Lifecycle* variable is specified in dummy form, representing the lifecycle quintile that sample firms belonged to in each of the year comprising the sample period. Institutions show a preference for greater investment in firms at lifecycle quintile 3 and 4 – which may be interpreted as institutions having an underlying preference for firms at growth phase.

In Column 4 of Panel A, we do not see a significant impact of the interaction between *Lifecycle* and payout variables (*Dividend* and *dv_pay*) on institutional holdings (*IOR*). However, in Panel B of Table 3, we observe significant differences in the association between institutional holdings and payout variables across lifecycle levels. The interaction terms dv_pay*L_i show that, although institutional investors prefer the firms that pay dividends, they only prefer dividend paying firms in lifecycle quintile 1 (significant at 10% level – probably due to the small number of dividend paying firms in this lifecycle quintile), lifecycle quintile 2 and lifecycle quintile 5 (significant at 1% level). For the interaction terms incorporating lifecycle quintile 3 and 4, we document an insignificant relation. This finding can be interpreted as institutional investors being increasingly indifferent to dividend paying firms if they are at their growth phases (lifecycle quintile 3, 4) and accumulating their capital for further investment. These outcomes are also in agreement with the non-parametric results provided in Table 2, where institutional holdings are in fact higher in non-dividend paying firms than dividend payers at lifecycle quintile 3. The test of difference among these interaction terms emphasize that institutions do not prefer firms positioned at the growth phase (lifecycle quintile 3 and 4) to pay dividends, but expect firms at their mature phase (lifecycle quintile 5) to pay out in the form of cash dividends.

The interaction terms $Dividend*L_i$, consistently indicate lower levels of institutional investment in firms that pay higher dividends. The coefficient is highest at lifecycle quintile 4 (absolute value), although our post-estimation F-tests fail to provide a significant difference in coefficients among the different lifecycle quintiles.

Overall, the regression results in this part suggest a positive relation between firm *Lifecycle* variable and institutional holdings, consistent with our first hypothesis (*H1A*).

However, the impact of Lifecycle on the relation between institutional holdings and payout variables reveals that institutions prefer the firms which pay dividends (*hypothesis H1B*), but have weaker preference for dividend paying firms in their growth phase. Similarly, institutions prefer firms which pay fewer dividends, and the effect is strongest for firms at their growth phase. These outcomes are consistent with the theory of lifecycle where firms at their growth phase need more capital, and have more profitable investment.

b. Determinants of propensity to pay

In this part, we follow DeAngelo et al. (2006) to use a logit model to test the effect of lifecycle, institutional holdings and other controlling variables on the decision of the firms to pay or not to pay dividends. We apply the random effect logit regression, which provides similar outcomes as the fixed effect logit estimations (but avoids losing observations in the sample) and the Fama-McBeth statistical methodology that DeAngelo et al. (2006) use for robustness purposes. In our analyses, the dummy variable indicating payment or non-payment of dividends (*dv_pay*) is used as the dependent variable; with RE/TE (*Lifecycle*), *Profitability, Log(M/B)* [Growth]*, NYA* [Size]*, Cash, Age*, and *TE/TA* (Leverage) are included as explanatory variables. We also compute but do not report, t-statistics adjusted for serial correlation using the Newey and West procedure for our robustness test. The sign and significance of all key variables remain unchanged, compared to the panel logit and the FMB approaches.

Table 4 reports the results from the random effect panel logit estimations. Similar to the finding of DeAngelo et al. (2006) and our prediction in Hypothesis 2 (*H2*), *Lifecycle* has a consistent positive influence on the decision of the sample firms to pay dividends across all of the models. The higher the lifecycle (the higher lifecycle quintile), the higher the propensity of firms to pay dividends. Independently, *Age* also consistently has positive association with the propensity of the firms to pay dividends. Columns 3 and 4 show the positive relation between *IOR* and *dv_pay,* suggesting that, the higher the institutional ownership within a firm, the lower the propensity of that firm to pay dividends. This is in agreement with our expectation in the second hypothesis (*H2*) where institutional investors prefer to invest in firms which pay dividends; and they may exercise their monitoring influence and force the firms to pay dividends. However, the positive coefficients only imply an association between institutional holdings and the propensity of the firms to pay dividends, we cannot conclude about the direction of the relation, and especially whether institutional investors lead to a higher propensity of firms to pay dividends, or firms will be more likely to pay dividends when they have higher institutional ownership (catering theory).

The interaction terms between the *IOR* and lifecycle quintiles (*IOR*L$_i$*) variables in Column 5 of Table 4 provide interesting findings. The interactions (*IOR*L$_i$)* are significantly negative in lifecycle quintile 3, significantly positive in lifecycle quintile 1 and 5, and insignificant at lifecycle quintile 2 and 4. These outcomes again illustrate that institutions do not prefer firms in their growth phase (lifecycle quintile 3) to pay dividends. At this stage, institutional holdings can be used as an alternative signal about the firms' performance, instead of dividend payment.

The positive coefficient in lifecycle quintile 1 indicates that, although not many firms elect or have the ability to pay dividends when they are young, institutional investors only invest in these firms if they pay dividends, consistent with their preference for paying firms to meet prudent regulation; or higher levels of IOR increase the likelihood of these firms paying dividends. The positive coefficient in lifecycle quintile 5 may convey different meaning, however as when the firms are mature, either they have more free cash-flows to pay out in the form of cash dividends or institutional investors may push the firms to pay dividends if they did not do so in their growth phase. This is consistent with the results in Table 2 where not many firms pay dividends at the lower lifecycle quintiles and most of firms paying dividends at the higher end of lifecycle (lifecycle quintile 4 and 5).

In summary, Lifecycle status has a positive impact on probability that a firm will pay dividends, while institutional holdings also have to positive relation with the propensity that a firm will pay dividends, however, the direction of causality is unclear. The interaction terms between these two variables vary with the firms' lifecycle. Firms at their growth phase and with higher institutional ownership tend to have a lower propensity to pay dividends. Firms at the mature phase and with higher institutional holdings tend to have a higher propensity to pay dividends.

Apart from the influence of *Lifecycle* and *IOR*, the other variables, including *Log(M/B)* [Growth], NYA [Size]*,TE/TA* [Leverage], *Age, Profitability* and *SP,* also consistently have a positive association with the decision to pay dividends.

Overall, the regressions in this section indicate that Institutional Holdings (*IOR*) has a positive and significant association with *dv_pay*, implying that the higher the institutional holdings, the higher the propensity of the firms to pay dividends. This finding is consistent with the preference of institutions towards the firms that pay dividends that we identify earlier, and proposed in our second hypothesis. However, the analyses may suggest that firms use institutional holdings as a substitute signal about firms' performance and prospects, instead of

the costly dividends, at their growth phase, and/or institutions themselves do not prefer firms at the growth phase to pay dividends. Lifecycle is also identified to be positively associated with the propensity to pay, and the higher the lifecycle, the greater the perceived influence on payout likelihood.

c. Determinants of dividend payout ratio

In this part, we will examine the impact of institutional holdings and lifecycle on dividend payout ratios.

We start with a descriptive table on the sample of **70,895 firm** year observations**.** For every year, we separate the sample into financial lifecycle quintiles, and institutional holdings quintiles.

As can be seen from Panel A of Table 5, for the sample of all firms, the higher the lifecycle, the higher the dividend payout ratios. However, in the sample of only dividend paying firms (24,399 firm year observations), firms at the lowest lifecycle quintiles have the highest dividend payout ratio. The payout ratios tend to reduce with lifecycle and increase only at the highest lifecycle quintile (quintile 5).

For the repurchase ratio and total payout ratio in Panel B and Panel C of Table 4, we see a consistent trend, the higher the lifecycle, the higher the repurchase ratio or the total payout ratio. This is true for both the whole sample and only the repurchasing/paying firms. We discuss the relation between lifecycle and repurchase/total payout ratio in a later part (Section 4.2).

[Table 5 about here]

In Table 6, we present the regression results for the effect of institutional holdings and lifecycle on dividend payout ratio for the sample of all firms, using two different modelling approaches, including the Firm Fixed Effects model (Column 1-2), and the random effect panle Tobit estimation (Column 3-4). Other models such as OLS with standard errors clustered by year and by firm, the Fama McBeth estimations, and the Tobit OLS, are used for robustness purposes. Our tobit estimations use the lower limit for dividend payout ratio of zero (left censored at the value of 0) to avoid the bias associated with, many observations having a dividend payout ratio equal to 0 as the firm chose not to pay out in the form of cash dividends. In their paper, Grinstein and Michaely (2005) use the sample of only dividend paying firms to test the relation between institutional holdings and dividend payout ratio. However, we believe that, to capture the complete relation between these two, we need to take also into account the

decision of the firm to pay or not pay dividends (dividend payout ratio equals to 0 if the firms choose not to pay); and the most appropriate model to use in this case is a panel Tobit model. For consistency with the prior literature, we also run the same regressions for the sample of dividend-paying firms only, but do not report the outcomes in this paper. In general, the sign and significance of the key variables of interest remain unchanged.

[Table 6 about here]

In Table 6, Column 1 and 3 report the effect of institutional holdings and lifecycle as continuous variables (ratio), and Column 2 and 4 report the effect of institutional holdings and lifecycle with lifecycle as represented dummy variables (quintiles).

In Table 6, the coefficients of the effect of *IOR* on Dividend Payout Ratio (*Dividend*) are not significant in both the firm fixed effect and panel Tobit approach. Our robustness regressions using the OLS (standard errors clustered by firm and year), the Fama-McBeth, and the Tobit OLS Models document a significant negative relation. Because of this, we cannot draw any conclusion that Institutional Holdings have an impact of Dividend Payout Ratio, or that firms alter their dividend payout ratio to accommodate the change in institutional ownership, which is in agreement with Grinstein and Michaely (2005). *Lifecycle* does not have a consistent sign across the two main models; especially it is negative and not significant in the firm fixed effect estimations. However, *Lifecycle* is always positive and significant in the panel Tobit models (for the whole sample as well as the sample of only dividend paying firms). We believe this finding reflects the true relation between Lifecycle and Dividend as Tobit models appropriately account for the decision of the firms to pay (Dividend>0) or not to pay dividends (Dividend=0). Similar to IOR, the interaction term between *IOR* and *Lifecycle* also does not show a significant association with *Dividend* in the fixed effect regression (Column 1), but it exhibits a negative, significant relation in the panel Tobit model (Column 3).

In Column 2 and 4 of Table 6, we test the influence of Institutional Holdings and Lifecycle quintiles. These models confirm the positive relation between *Lifecycle* and dividend payout ratio, with the relationship increasing in strength with the higher level of lifecycle quintiles. The interaction terms between institutional holdings and lifecycle quintiles ($IOR*L_i$) are mostly not significant in the fixed effect model (except at the lifecycle quintile 3). In the panel Tobit model, they are significantly negative at the lifecycle quintile 3, 4 and 5, and significantly positive at lower lifecycle levels (quintile 1 and 2). These outcomes imply that, at the early stages (where most of the firms do not pay dividends), institutions tend to lead to higher payout ratio as institutions only invest in young firms if these firms pay dividends, to

meet their prudent regulation requirement). With firms in growth phase and mature phase (higher lifecycle levels), the negative relation between dividend payout ratio and institutional holdings imply that institutional investors prefer to invest in firms at growth phase, even when they do not pay or pay lower dividend payout ratio, as the firms need capital for investment, and in these stage, the firms can use institutional holdings as an alternative signal about firms' performance and prospects, instead of the costly dividend payment. Therefore, although, over all we cannot conclude about any relation between institutional holdings and dividend payout ratio, we can see the preference trend of institutional investors towards the firms in growth phases, which normally do not pay higher dividends.

In terms of the control variables, *Log(M/B)* [Growth], *Profitability*, and *SP* consistently have positive impact of the dividend payout ratio.

In general, although the findings do not totally support our expectation in Hypothesis 3 (*H3B*), they do emphasize the role of lifecycle on dividend payout ratio (*H3A*), and confirm that firms do not alter their dividend payment to cater their institutional shareholders or institutional investors do not show any monitoring influence on dividend payout ratio. Institutional investors, however, have a strong investment preference for firms at the growth stage of their lifecycle.

d. Endogeneity

To overcome endogeneity problems which may come from the causal effect between institutional holdings and payout policy, and also the autoregressive relation in payout and institutional holdings through time, we use the vector autoregressive simultaneous specification, similar to Grinstein and Michaely (2005). We introduce the system of two equations (relation between dividend payout ratio and institutional holdings) and also the system of three equations (relation between dividend payout ratio, institutional holdings, and lifecycle). In both approaches, the lagged values of dependent variables are used as instrument variables to control for the assumed endogeneity as institutional holdings in year *t* are expected to be highly determinative of institutional holdings in year *t+1*, dividend payout ratios in year *t* are expected to be correlated with the dividend payout ratios in year t+1 (autoregressive relation through time); but institutional holdings in year *t* does not affect dividend payout ratio in year *t*, and vice versa.

We present the vector autoregressive simultaneous specification of the three equation models in Table 7.

In our estimations, consistently, dividend payout ratios have a negative association with institutional holdings and institutional holdings have a negative relation with dividend payout ratios; and *Lifecycle* has a positive impact on both institutional holdings and dividend payout ratios.

Interestingly, although the interaction between dividend payout ratio and Lifecycle as a continuous variable is not significantly associated with institutional holdings, the interaction terms between *Dividend* and the lifecycle quintiles have a consistent and negative impact on institutional holdings (not significant at lifecycle quintile 1), and have the strongest negative relationship at lifecycle quintile 3 and 4, suggesting that institutional investors especially do not like firms during growth phases paying more dividends. This fact is consistent with the picture we see in Table 2 previously where, in fact, IOR is higher in non-dividend paying firms than dividend paying firms at lifecycle quintile 3.

The interaction term between Institutional Holdings and Lifecycle does have a positive (though small) relation with the dividend payout ratio, suggesting that greater retained earnings build-up moderates the negative influence of institutional ownership on dividend payout ratios. On the other hand, the interaction terms between institutional holdings and lifecycle quintiles ($IOR*L_i$) consistently have a negative relation with dividend payout ratio. However, we cannot conclude about the direction of causation between dividend payout ratio and institutional holdings, either (i) firms pay fewer dividends when they have higher institutional holdings (signaling theory), or (ii) investors push the firms to pay fewer dividends (monitoring theory) as institutions do not prefer firms that pay high dividends (likely when institutional investors choose to invest in firms at the growth phase, where the firms need to use their capital for investment and expansion rather than paying dividends, and dividend payment may imply a restriction in investment opportunities).

[Table 7 about here]

The equation for the *Lifecycle* variable shows the positive relation between Lifecycle and institutional holdings and dividend payout ratio. Other variables that are consistently associated with *Lifecycle* are *Age* and *Profitability*.

In summary, the simultaneous equations help to confirm the positive relation of Lifecycle with both Institutional Holdings and Dividend Payout Ratio, and show that the

association of Lifecycle with these two variables and the interaction between them varies with the level of lifecycle. However, the equations also shows that the *IOR* and *Dividend* significantly influence *Lifecycle,* so the causation, in this case, is difficult to draw.

4.2. The interaction between Share-Repurchase and Institutional Holdings

The purpose of this section is to find out the relation between share-repurchase payout policy and institutional ownership, taking into account the presence of lifecycle.

a. Determinants of institutional ownership

We start with a nonparametric test on the institutional holdings in the repurchasing firms (Repurchasers) and non-repurchasing firms (Non-Repurchasers). The results are presented in Table 8.

[Table 8 about here]

The data in Table 8 show that, in general, institutional holdings have higher holdings in repurchasing firms than in non-repurchasing firms. This result is highly significant and holds for all lifecycle quintiles. Also, the higher the lifecycle level, the higher the institutional holdings in both groups of firms, with the only exception for non-repurchasing group at lifecycle quintile 5 (where IOR actually drops). The number of firms that make share-repurchase increase by lifecycle levels, but the increase is rather small, not big like in the case of dividend payment. Another interesting fact is that, even when the firms are considered young (lifecycle quintile 1), there is a fairly high number of firms that distribute to shareholders in the form of share-repurchases.

Similar to the previous section, we discover the impact of repurchase payout and lifecycle on institutional holdings by running the firm fixed effect regression where the dependent variable is *Institutional holdings (IOR)* at time *t+1*. The independent variables are *Lifecycle, Repurchase*, and *buyback*. We also use the same set of controlling variables as in the previous section. From this part onward, we present along with the tables for the *Repurchase – IOR* relation, the tables for the *Totalpayout –IOR* relation, so as to make our analyses more comprehensive in term of payout policy.

In Panel A of Table 9, *Repurchase, buyback* and *Lifecycle* consistently have a significant and positive association with *IOR*. This confirms that institutional investors prefer the firms that make share-repurchases, and make higher repurchases. They also prefer firms with higher lifecycle value. These outcomes are consistent with our Hypothesis 1 (*H1A, H1C*). We also see that institutional investors, in general, prefer the firms which pay (either in form of dividends

and/or repurchases), but have no preference for higher or lower total payout. This can be explained as, although institutions prefer firms that make higher repurchases, they prefer firms in the growth phase with lower dividend payments, and resulting in an offsetting effect of total payout on institutional holdings.

Consistent with prior literature, *Log(M/B), beta, adjustedreturn, Age, Profitability* and *SP* are all significantly and positively related to institutional holdings.

[Table 9 about here]

In Panel 6 of Table 9, we examine the relation between *Repurchase, Lifecycle*, and the interaction between them on *Institutional holdings (IOR)* using lifecycle quintiles. The findings are consistent with Section 4.1 previously, which show the preference of institutions toward firms in the growth phase (lifecycle quintile 3 and 4). Though institutions, in general, prefer firms with a higher repurchase ratio, they in fact less prefer firms in their growth phase to make share-repurchases, or to have higher repurchases. The regression analysis documents an insignificant coefficient of the interaction *buyback*L*$_i$ at lifecycle quintile 4 on IOR while the coefficients at other quintiles are all significant, and the interaction term coefficients are strongest at lifecycle quintile 5 where firms are at the mature phase and they are able to distribute more to their shareholders either in form of repurchases or dividends. Moreover, the interaction term *Repurchase*L*$_i$ is only significantly positive at lifecycle quintile 1 and 5, where firms are at the young phase/initial stage of development or at the mature phase. The outcomes can be seen as, when the firms are young, institutions only invest in them if they pay out to investors as institutions need to meet their prudent regulation requirement; when the firms are mature, either institutions prefer them to payout more of their unused cash-flows to reduce agency problems, or the firms have more free cash-flows to distribute to their shareholders.

The analyses with *Totalpayout*L*$_i$ variables provide the same story, where investors prefer paying firms, but prefer them not to pay at their growth phase. Firms at the growth phase and which do not payout (either in the form of dividends or repurchases) are probably considered, by investors, to have enough good investment opportunities.

In summary, the findings in this part support our hypothesis about institutions' preference toward repurchasing and paying firms. Institutions also prefer firms with higher repurchase payment, especially at their mature phase, but not higher repurchases for firms in the growth stage.

b. Determinants of propensity to buyback

Similar to Section 4.1, we use panel logit model estimation to examine determinants of the decision to make share-repurchases. The results are presented in Table 10 below. Like the decision of firms to pay dividends, we find that *Lifecycle* has a consistent and positive relation with the propensity that a firm will buyback shares, and the higher the lifecycle level, the greater the likelihood that a repurchasing decision will be made.

[Table 10 about here]

Institutional holdings have a significant and positive relation with the propensity of firms to make repurchases or to payout in some forms, and the coefficients have the highest values either in lifecycle quintile 1 (young stage) or quintile 5 (mature stage). We can explain the outcomes in two ways: (i) institutions push the firms to make repurchases or to payout as they prefer the firms which distribute to shareholders (to meet their prudent requirement) (monitoring theory); or (ii) the firms make repurchases or payout (either in repurchases or dividends) to cater to the needs of their institutional shareholders (catering theory). During the firms' growing period, either institutional investors do not prefer firms to pay as paying firms may convey the signal about their lack of good investment opportunities, or the institutional investors are really interested and invest more in growing firms, regardless of their pay/not pay status.

In general, the analyses suggest a positive relation between institutional holdings and lifecycle with the propensity of firms to carry out share buybacks (consistent with our *H2C*). They confirm the preference of institutional investors for firms in the growth phase, and firms that return to shareholders in the form of repurchases.

c. Determinants of repurchase ratio

In Table 11, we present the firm fixed effect model regressions and the panel tobit estimations for the relation between Lifecycle, Institutional Holdings and Repurchase.

[Table 11 about here]

Institutional holdings (*IOR*) are significantly and positively associated with the repurchase ratio (*Repurchase*), while the coefficient for the *Lifecycle* variable on *Repurchase* is not significant in the panel Tobit model. Our conclusion is that *Repurchase* does not depend significantly on *Lifecycle,* but firms with higher institutional holdings, in general, have higher

share-repurchase ratios. It is unsure if institutional investors push the firms to make more repurchases, or firms make more repurchases to cater to their institutional shareholders, or if institutional investors mostly choose to invest in firms that make higher repurchases. We also set up a vector autoregressive simultaneous equation models to test this relation, similar to our robustness analysis previously for dividend payout ratio and institutional holdings. The results of this analysis, again, do not help us to identify the direction of causation between these two factors.

5. Conclusion

The relation between institutional holdings and payout policy is not a new topic in the finance literature. However, our study aims to investigate this relation incorporating the presence of financial lifecycle and firm age, and also with some updated econometrics models on a large panel data set between 1986 and 2013. This sample period also allows for the consideration of the time trend which may change and affect the nature of the payout and institutional holdings relation.

Similar to Grinstein and Michaely (2005), we find that institutions are attracted to dividend paying firms, but among them, prefer the firms which pay less dividends. Institutional investors are also attracted to repurchasing firms, and firms with higher repurchase ratios. Interestingly, both financial lifecycle and firm age have positive and significant relation with institutional holdings. These outcomes hold for all three models employed, including the firm fixed effect panel, the cross-sectional OLS, and the Fama-McBeth regression techniques. When we introduce the five different lifecycle quintiles to our models, we observe that lifecycle has a positive impact on institutional ownership in all lifecycle quintiles, and the highest correlation is at lifecycle quintile 4 where we believe that most of the firms are in their capital accumulation phase. Institutions also show the highest reverse-preference for dividends or share-repurchases in this lifecycle quintile, reflecting their preference that the firms should use accumulated capital for investment and growth.

DeAngelo et al. (2006) find that lifecycle is an important factor that determines the decision of the firms to pay or not to pay dividends, and quantitatively has a “greater impact than measures of profitability and growth”. Apart from lifecycle, we find that institutional holdings and firm age also play an important role in the decision by firms to pay dividends, and to make share-repurchase. We believe that institutional investors are better able to monitor and control management than individual shareholders, which can be illustrated in our research

as, since institutions prefer the firms that pay dividends, and make repurchases, they may influence firms' management to make distribution to shareholders in the form of dividend or repurchases, or both, when they hold large ownership stakes in the firms.[11] Our finding is that institutional holdings, in general, have a positive relation with the decision of the firms to pay dividends, and this relation holds true at the lowest and highest lifecycle levels but become significantly negative at the middle lifecycle level. On the other hand, institutional holdings have a positive relation with the propensity that a firm will make repurchases, and the relation holds true for all lifecycle levels. These outcomes suggest that firms may use their institutional ownership presence as an alternative signal about the firms' prospect, instead of the costly dividends, when they need capital for further investment in the growth phase; and institutions only force the firms to pay out in the form of dividends when the firms enter their mature phase. The drop in institutional holdings in non-dividend paying firms at the high level of lifecycle confirms the desire for dividend payment of institutions when the firms reach their mature phase. Repurchases are made when firms have unused free cash-flows, and have different nature from that of dividends (repurchases, in fact, do not depend on firms' lifecycle in our analyses). We further test the role of financial lifecycle using the lifecycle quintiles and find that the higher the lifecycle quintile of the firms, the greater the impact it has on the payout decision.

In regards to the dividend payout ratio, we could not find consistent evidence that institutions decrease or increase payout with all the models we have run for the whole sample of all firms or for the dividend paying group only. However, institutional holdings are positively associated with the magnitude of repurchases. Therefore, it is likely that institutional investors sort themselves across firms and choose to invest in the firms which pay dividends and/or make repurchases to meet their prudent regulation; and they are especially attracted to growing firms independent of if these firms choose to pay or not pay (dividends and/or repurchases). Lifecycle, on the other hand, enhances the dividend and total payout ratios. The consistent and positive impact of lifecycle quintiles on the dividend payout ratio, and total payout ratio (but not repurchase ratio) and our robustness test with simultaneous equations confirms the validity of our findings.

The fact that institutions may monitor by encouraging the firms to pay dividends in the highest lifecycle quintile (also with the highest institutional ownership), but do not influence the magnitude of the payout ratio makes it difficult to understand the nature of their

[11] Within our research, we do not actually test the influence of individual investors on payout policy but do reasonably believe that, due to large share of ownership in the firms and their special capacity, institutional investors may be more actively involved in dividend payout matter than individual shareholders.

monitoring role. Like Grinstein and Michaely (2005) already said "a small number of institutions might be strong monitors and they might affect dividend policy, but in a large group we observe little effect". The monitoring role of institutional investors on payout ratio, therefore, still needs more in-depth research to discover its underlying nature.

Payout ratios seem fairly stable overtime, while institutional holdings have become larger (probably due to the relatively smaller threshold to file ownership reports), suggesting institutions may practice their monitoring role only when the firms alter their dividend payout policy from not paying to paying dividends, or vice versa, and in the case of dividend increase or decrease, which is not included in the scope of our research.[12]

Our research therefore suggests a venue for future research on the monitoring role of institutional investors in payout policy.

[12] Amihud, Y. and Li, K. (2006) 'The declining information content of dividend announcements and the effects of institutional holdings', *Journal of Financial and Quantitative Analysis*, 41(3), 637. find that firms are less likely to increase dividends if they have high institutional ownership.

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Table 1: Descriptive Statistics

The table reports the descriptive statistics of the variables used in the study. The sample consists of nonfinancial and nonutility firms in Compustat from 1986-2012. *Dividend* is cash dividends, which equals the cash dividend paid in year *t* divided by the book value of assets at the end of year t. *dv_pay* is the dummy variable for paying or not paying cash dividends in year t, which takes the value of 1 if the firm pays cash dividends in that year and 0 otherwise. *IOR* is institutional ownership, which is equal to the number of shares held by institutional investors divided by the shares outstanding at end of year t. *Lifecycle* is the ratio of retained earnings to the book value of total equity at the end of year *t*. Panel A shows the summary statistics of the whole sample. Panel B provides the sample statistics by lifecycle quintiles. Panel C reports the average of cash dividends and institutional ownership. Details of the variable definitions are provided in Appendix 1.

Panel A: Key variable statistics

Variable	*Mean*	*SD*	*p25*	*Median*	*p75*	*N*
Dividend	0.853%	1.902%	0	0	0.988%	70,103
dv_pay	0.3480	0.4764	0	0	1	70,103
Repurchase	1.375%	3.690%	0	0	0.574%	70,103
buyback	0.440	0.496	0	0	1	70,103
Totalpayout	2.228%	4.365%	0	0.147%	2.438%	70,103
pay	0.597	0.491	0	1	1	70,103
IOR	38.751%	28.341%	12.807%	35.261%	62.279%	70,103
Lifecycle	-0.242	3.421	-0.156	0.365	0.742	70,103
Age	14.587	14.814	4.000	10.000	20.000	70,103
Log(TA)	5.443	2.066	3.939	5.246	6.782	70,103
NYE	0.272	0.285	0.030	0.150	0.450	70,103
NYA	0.240	0.286	0.010	0.100	0.400	70,103
Growth	13.753	1.077	13.156	13.781	14.407	70,103
Profitability	0.037	0.191	0.012	0.074	0.128	70,103
Cash	0.183	0.211	0.026	0.096	0.268	70,103
Leverage	0.513	0.256	0.357	0.523	0.707	70,103

Panel B: Key Variable Statistics by Lifecycle Quintiles

Lifecycle/ Variables	*Dividend (%)*	*dv_ pay*	*Re-purchase (%)*	*Buy-back*	*Total-payout (%)*	*pay*	*IOR (%)*	*Age*	*Log(TA)*	*NYE*	*NYA*	*Growth*	*Profit-ability*	*Cash*	*Lever-age*	*N*
1	0.180	0.047	0.733	0.321	0.913	0.346	26.651	8.939	4.059	0.122	0.089	13.899	-0.144	0.299	0.505	14,030
2	0.511	0.179	0.934	0.379	1.445	0.483	36.476	9.294	5.149	0.212	0.179	13.671	0.046	0.196	0.567	14,019
3	0.678	0.317	1.121	0.413	1.798	0.589	40.904	12.364	5.633	0.281	0.248	13.699	0.091	0.157	0.543	14,019
4	1.049	0.515	1.340	0.479	2.389	0.734	43.923	17.891	6.042	0.344	0.313	13.721	0.107	0.134	0.536	14,024
5	1.849	0.683	2.751	0.607	4.600	0.832	45.813	24.452	6.332	0.401	0.369	13.774	0.087	0.131	0.414	14,011

Panel C: Institutional Holdings and Dividend Payout Ratio by Lifecycle Quintiles

Year/Lifecycle quintiles	**Institutional Holdings (IOR)**						**Dividend Payout Ratio (Dividend)**					
	1	*2*	*3*	*4*	*5*	*Total*	*1*	*2*	*3*	*4*	*5*	*Total*
1986	11.85%	20.92%	25.41%	30.03%	30.37%	23.72%	0.11%	0.51%	0.70%	1.38%	2.11%	0.96%
1987	10.91%	21.09%	24.83%	30.90%	31.81%	23.91%	0.15%	0.44%	0.63%	1.25%	2.13%	0.92%
1988	11.29%	21.23%	26.47%	32.63%	33.45%	25.01%	0.17%	0.55%	0.72%	1.25%	2.19%	0.97%
1989	12.95%	23.38%	27.67%	33.25%	35.15%	26.48%	0.29%	0.53%	0.83%	1.31%	2.27%	1.05%
1990	14.55%	24.37%	27.62%	34.35%	36.31%	27.44%	0.27%	0.68%	0.79%	1.17%	2.21%	1.02%
1991	18.29%	27.89%	29.93%	35.49%	36.32%	29.59%	0.25%	0.56%	0.79%	1.27%	2.12%	1.00%
1992	17.97%	29.12%	32.13%	36.00%	37.25%	30.49%	0.26%	0.79%	0.68%	1.09%	2.11%	0.99%
1993	20.37%	27.95%	33.14%	33.39%	37.10%	30.38%	0.18%	0.56%	0.72%	1.00%	2.10%	0.91%
1994	21.07%	29.54%	33.98%	36.52%	39.10%	32.04%	0.18%	0.69%	0.51%	0.99%	1.90%	0.85%
1995	22.21%	31.89%	34.75%	38.44%	39.60%	33.37%	0.15%	0.50%	0.44%	0.97%	1.82%	0.78%
1996	22.04%	30.00%	33.33%	36.91%	38.92%	32.24%	0.12%	0.57%	0.50%	0.82%	1.88%	0.78%
1997	22.46%	32.90%	37.01%	39.97%	42.03%	34.87%	0.11%	0.40%	0.54%	0.86%	1.80%	0.74%
1998	21.74%	31.43%	37.36%	40.30%	42.85%	34.73%	0.06%	0.33%	0.51%	0.76%	1.66%	0.66%
1999	21.94%	32.24%	37.17%	40.29%	43.66%	35.06%	0.06%	0.21%	0.45%	0.70%	1.63%	0.61%
2000	23.35%	34.19%	38.75%	41.16%	43.48%	36.18%	0.09%	0.21%	0.35%	0.74%	1.40%	0.56%
2001	26.31%	36.31%	42.04%	44.32%	43.49%	38.49%	0.06%	0.20%	0.50%	0.71%	1.32%	0.56%
2002	26.44%	40.24%	44.93%	45.76%	47.58%	40.99%	0.14%	0.27%	0.46%	0.75%	1.29%	0.58%
2003	30.90%	43.40%	50.79%	51.51%	50.73%	45.46%	0.12%	0.19%	0.52%	0.82%	1.36%	0.60%
2004	35.79%	48.91%	54.35%	56.74%	57.21%	50.60%	0.09%	0.22%	0.65%	0.87%	1.66%	0.70%
2005	35.30%	48.77%	51.01%	52.17%	56.00%	48.65%	0.15%	0.53%	0.81%	1.28%	1.85%	0.93%
2006	37.68%	48.36%	51.19%	54.03%	55.35%	49.32%	0.15%	0.63%	0.81%	1.32%	2.06%	0.99%
2007	44.00%	50.71%	55.48%	58.07%	59.19%	53.49%	0.25%	0.78%	1.03%	1.28%	2.09%	1.09%
2008	43.49%	50.22%	54.29%	56.35%	60.12%	52.89%	0.27%	0.79%	1.07%	1.41%	1.98%	1.10%
2009	43.13%	50.38%	54.97%	58.74%	61.07%	53.65%	0.27%	0.66%	0.91%	1.28%	1.88%	1.00%
2010	43.69%	50.81%	55.84%	58.69%	61.07%	54.02%	0.38%	0.83%	1.11%	1.33%	2.05%	1.14%
2011	43.99%	51.54%	56.23%	58.02%	61.70%	54.29%	0.44%	0.87%	0.97%	1.21%	1.92%	1.08%
2012	34.56%	49.72%	62.07%	57.23%	65.43%	53.78%	0.72%	0.97%	1.01%	1.78%	1.90%	1.28%
Total	26.65%	36.48%	40.90%	43.92%	45.81%	38.75%	0.18%	0.51%	0.68%	1.05%	1.85%	0.85%

Table 2: Institutional Ownership with Dividend Payment and Lifecycle

This table reports the means and medians of institutional ownership according to the firm lifecycle and whether the firm pays cash dividends or not. Each year, sample firms are grouped into those that pay dividends (Payers) and those that do not pay dividends (Non-Payers); and into five different quintiles of the lifecycle (*Lifecycle*). The symbols *** denote significance at the 1% level.

Lifecycle Quintiles	Non-Payers			Payers			All firms			Test for difference Non-Payers vs Payers	
	Mean (%)	*Median (%)*	*N*	*Mean (%)*	*Median (%)*	*N*	*Mean (%)*	*Median (%)*	*N*	*t-Test*	*Wilcoxon Rank Test*
1	26.06	18.01	13,365	38.44	34.72	665	26.65	18.55	14,030	-12.393***	-10.363***
2	36.03	30.87	11,515	38.53	33.96	2,504	36.48	31.50	14,019	-4.076***	-4.443***
3	41.20	37.45	9,574	40.27	38.00	4,445	40.90	37.66	14,019	1.793	1.847*
4	42.88	40.34	6,807	44.90	46.38	7,217	43.92	43.50	14,024	-4.197***	-3.983***
5	39.44	34.22	4,443	48.77	51.39	9,568	45.81	47.39	14,011	-19.229***	--18.671***
Total	**35.55**	**29.19**	**45,704**	**44.75**	**45.92**	**24,399**	**38.75**	**35.26**	**70,103**	**-41.422*** **	**-42.204** **

Table 3: Effect of Dividend Payout and Lifecycle on Institutional Holdings

This table reports the estimates of regressions of institutional holdings on dividend payments and lifecycle as follows. Panel A presents the firm fixed effects with standard errors clustered by firm for the impact of lifecycle on Institutional Holdings. Panel B documents the results where lifecycle is measured as five dummies corresponding to five lifecycle quintiles (*Li*). In both Panels A and B, lifecycle is the retained earnings to total equity ratio (*Lifecycle*). Details of the variable definitions are provided in Appendix 1. The symbols, *, **, *** denote significance at the 10%, 5%, and 1% level, respectively.

PANEL A: EFFECT OF LIFECYCLE ON INSTITUTIONAL HOLDINGS				
IOR(t+1)	*1*	*2*	*3*	*4*
Log(M/B)	0.031***	0.027***	0.027***	0.027***
	(20.99)	(18.60)	(18.60)	(18.62)
beta	0.013***	0.012***	0.012***	0.012***
	(9.71)	(8.92)	(8.90)	(8.90)
dv_pay	0.018***	0.017***	0.016***	0.017***
	(4.05)	(3.79)	(3.73)	(3.86)
Dividend	-0.340***	-0.423***	-0.421***	-0.432***
	(-4.53)	(-5.73)	(-5.72)	(-5.87)
NYA	0.314***	0.269***	0.268***	0.268***
	(18.09)	(15.43)	(15.37)	(15.37)
adjustedreturn	0.008***	0.007***	0.007***	0.007***
	(9.69)	(9.20)	(9.43)	(9.44)
Age		0.025*	0.025*	0.025*
		(1.65)	(1.66)	(1.66)
SP		0.033***	0.033***	0.033***
		(7.56)	(7.55)	(7.54)
Profitability		0.110***	0.106***	0.106***
		(16.36)	(15.96)	(15.96)
Lifecycle			0.001***	0.001***
			(4.95)	(4.82)
Lifecycle*dv_pay				-0.001
				(-0.96)
Lifecycle*Dividend				0.025
				(1.01)
Constant	-0.273***	-0.249***	-0.249***	-0.249***
	(-12.38)	(-7.53)	(-7.53)	(-7.53)
Industry FE	N	N	N	N
Firm FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Observations	70,103	70,103	70,103	70,103
R-squared	0.346	0.356	0.357	0.357

PANEL B: EFFECT OF LIFECYCLE QUINTILES ON INSTITUTIONAL HOLDINGS				
IOR(t+1)				
Log(M/B)	0.025***			
	(17.96)			
beta	0.012***			
	(9.05)			
NYA	0.244***			
	(13.95)			
adjustedreturn	0.008***			
	(9.71)			
Age	0.026*			
	(1.73)			
SP	0.033***			
	(7.68)			
Profitability	0.093***	**Test of difference**		
	(14.07)			
L2	0.029***		*F_value*	*Prob>F*
	(8.11)			
L3	0.054***	L2=L3	48.77	0.0000
	(11.14)			
L4	0.069***	L3=L4	12.26	0.0005
	(12.09)			
L5	0.030***	L4=L5	49.72	0.0000
	(5.13)			
dv_pay*L1	0.020*			
	(1.75)			
dv_pay*L2	0.029***	dv_pay*L1=dv_pay*L2	0.61	0.4342
	(4.51)			
dv_pay*L3	0.006	dv_pay*L2=dv_pay*L3	11.38	0.0007
	(0.95)			
dv_pay*L4	0.001	dv_pay*L3=dv_pay*L4	0.51	0.4754
	(0.22)			
dv_pay*L5	0.024***	dv_pay*L4=dv_pay*L5	9.59	0.0020
	(3.47)			
Dividend*L1	-0.293			
	(-1.44)			
Dividend*L2	-0.313***	Dividend*L1=Dividend*L2	0.01	0.9250
	(-2.81)			
Dividend*L3	-0.368***	Dividend*L2=Dividend*L3	0.12	0.7275
	(-2.86)			
Dividend*L4	-0.528***	Dividend*L3=Dividend*L4	0.99	0.3191
	(-3.87)			
Dividend*L5	-0.445***	Dividend*L4=Dividend*L5	0.28	0.5957
	(-3.59)			
Constant	-0.259***			
	(-7.97)			
Observations	70,103			
R-squared	0.363			

Table 4: Effect of Institutional Holdings and Lifecycle on Decision to Pay Dividends

This table reports the logit regression results of the decision to pay dividends (*dv_pay*) on institutional ownership (*IOR*) and lifecycle (*Lifecycle*) and other control variables. Details of the variable definitions are provided in Appendix 1. We use the panel data random effect regressions in calculating the coefficients. The symbols, *, **, *** denote significance at the 10%, 5%, and 1% level, respectively.

dv_pay(t+1)	*1*	*2*	*3*	*4*	*5*
Log(M/B)	0.396***	0.399***	0.399***	0.400***	0.424***
	(11.12)	(11.16)	(11.16)	(11.17)	(11.55)
Profitability	5.921***	5.693***	5.667***	5.663***	5.275***
	(21.64)	(20.60)	(20.47)	(20.45)	(18.54)
Cash	-1.451***	-1.420***	-1.409***	-1.413***	-1.410***
	(-7.02)	(-6.85)	(-6.79)	(-6.81)	(-6.59)
NYA	9.540***	9.425***	9.371***	9.368***	8.708***
	(44.64)	(44.22)	(43.42)	(43.40)	(40.78)
TE/TA	2.601***	2.612***	2.581***	2.593***	2.469***
	(16.22)	(16.41)	(16.14)	(16.20)	(15.29)
Age	0.155***	0.151***	0.152***	0.152***	0.120***
	(29.88)	(29.41)	(29.33)	(29.34)	(24.43)
SP	0.766***	0.756***	0.728***	0.731***	0.620***
	(9.84)	(9.73)	(9.22)	(9.25)	(7.61)
L2					1.642***
					(9.81)
L3					2.947***
					(16.97)
L4					3.783***
					(20.82)
L5					4.341***
					(22.46)
IOR*L1					1.419***
					(4.23)
IOR*L2					-0.122
					(-0.54)
IOR*L3					-0.656***
					(-3.20)
IOR*L4					-0.218
					(-1.03)
IOR*L5					0.421*
					(1.76)
IOR			0.348**	0.361**	
			(2.38)	(2.47)	
Lifecycle		0.126***	0.125***	0.150***	
		(10.06)	(9.95)	(7.43)	
IOR*Lifecycle				-0.060	
				(-1.61)	
Constant	-12.917***	-12.876***	-12.954***	-12.972***	-14.774***
	(-26.69)	(-26.52)	(-26.62)	(-26.64)	(-28.17)
Observations	70,103	70,103	70,103	70,103	70,103
Wald chi2	4819.98	4810.89	4816.39	4810.2	5186.78
Prob> chi2	0.0000	0.0000	0.0000	0.0000	0.0000

Table 5: Payout Ratio with Lifecycle

This table shows the mean, median of cash dividend payment (Panel A), share repurchase (Panel B) and total payout ratio (Panel C). For each of the Panels, the data include the whole sample (both paying and non-paying firms) and the sample of only dividend-paying firms in Panel A, only repurchasing firms in Panel B, and only paying firms (either dividend or repurchase or both) in Panel C. Firms are categorized into quintiles according to financial lifecycle.

PANEL A. Lifecycle and Dividend Payout Ratio

Lifecycle Quintiles	All firms			Dividend Paying Firms		
	Mean	*Median*	*N*	*Mean*	*Median*	*N*
1	0.0018	0	14,030	0.0379	0.0188	665
2	0.0051	0	14,019	0.0286	0.0145	2,504
3	0.0068	0	14,019	0.0214	0.0134	4,445
4	0.0105	0.0019	14,024	0.0204	0.0145	7,217
5	0.0185	0.0127	14,011	0.0271	0.0210	9,568
Total	**0.0085**	0.0000	**70,103**	**0.0245**	**0.0167**	**24,399**

PANEL B. Lifecycle and Repurchase Ratio

Lifecycle Quintiles	All firms			Repurchasing Firms		
	Mean	*Median*	*N*	*Mean*	*Median*	*N*
1	0.0073	0	14,030	0.0228	0.0009	4,505
2	0.0093	0	14,019	0.0246	0.0050	5,319
3	0.0112	0	14,019	0.0271	0.0079	5,794
4	0.0134	0	14,024	0.0280	0.0104	6,714
5	0.0275	0.0017	14,011	0.0453	0.0216	8,501
Total	**0.0138**	0	**70,103**	**0.0313**	**0.0093**	**30,833**

PANEL C. Lifecycle and Total Payout Ratio

Lifecycle Quintiles	All firms			Paying Firms		
	Mean	*Median*	*N*	*Mean*	*Median*	*N*
1	0.0091	0	14,030	0.0264	0.0018	4,854
2	0.0144	0	14,019	0.0299	0.0106	6,767
3	0.0180	0.0014	14,019	0.0305	0.0143	8,253
4	0.0239	0.0103	14,024	0.0325	0.0180	10,294
5	0.0460	0.0254	14,011	0.0553	0.0337	11,653
Total	**0.0223**	0.0015	**70,103**	**0.0374**	**0.0180**	**41,821**

Table 6: Effect of Institutional Holdings and Lifecycle on Dividend Payout Ratio

This table reports the regression results of dividend payout ratio (*Dividend*) on financial lifecycle and institutional ownership. Columns 1 document the results where institutional ownership and lifecycle are measured as continuous variables (ratios). Columns 2 present the results where lifecycle is measured as dummy variables. Detailed of variable definitions are provided in Appendix 1. Models include the firm fixed effect regressions with standard errors clustered by firm (columns 1-2), and the Tobit model for Panel (left censored at dividend payout ratio equal 0) (columns 3-4). The symbols, *, **, *** denote significance at the 10%, 5%, and 1% level, respectively.

Dividend (t+1)	**Firm Fixed Effects**		**Panel Tobit**	
	1	*2*	*3*	*4*
Log(M/B)	0.002***	0.002***	0.004***	0.005***
	(13.86)	(13.77)	(18.54)	(19.23)
Profitability	0.005***	0.005***	0.063***	0.059***
	(7.34)	(6.94)	(32.82)	(31.08)
Cash	0.003***	0.003***	0.001	0.001
	(3.21)	(3.13)	(0.32)	(0.88)
NYA	0.002	0.001	0.041***	0.037***
	(1.19)	(0.90)	(29.61)	(26.85)
TE/TA	0.000	0.001	0.009***	0.007***
	(0.44)	(1.20)	(8.65)	(6.47)
Age	0.001	0.001	0.001***	0.001***
	(0.72)	(0.72)	(22.41)	(19.26)
SP	0.002***	0.002***	0.003***	0.003***
	(5.21)	(4.90)	(7.03)	(6.04)
L2		-0.000		0.013***
		(-0.43)		(10.50)
L3		0.001**		0.022***
		(2.55)		(18.24)
L4		0.002***		0.027***
		(3.10)		(21.52)
L5		0.004***		0.031***
		(4.73)		(24.52)
IOR*L1		-0.001		0.016***
		(-1.19)		(6.52)
IOR*L2		-0.000		0.003*
		(-0.48)		(1.70)
IOR*L3		-0.002*		-0.005***
		(-1.94)		(-3.67)
IOR*L4		-0.002		-0.005***
		(-1.49)		(-4.08)
IOR*L5		-0.001		-0.006***
		(-1.00)		(-3.95)
IOR	-0.001		-0.000	
	(-1.46)		(-0.36)	
Lifecycle	-0.000		0.001***	
	(-0.55)		(8.87)	
IOR*Lifecycle	0.000		-0.001***	
	(1.24)		(-4.05)	
Constant	-0.024***	-0.025***	-0.114***	-0.130***
	(-5.23)	(-5.54)	(-34.95)	(-37.84)
Industry FE	N	N	N	N
Firm FE	Y	Y	N	N
Year FE	Y	Y	Y	Y
Observations	70,103	70,103	70,103	70,103
R-squared/Wald chi2	0.046	0.050	6365.69	7195.13

Table 7: Endogeneity between Dividend Payout Ratio and Institutional Holdings

This table reports the regression results of the following simultaneous equation

$$IOR_{i,t+1} = a_{0,t+1} + a_{1,t+1} IOR_{i,t} + a_{2,t+1}\, Dividend_{i,t} + a_{3,t+1}\, Lifecycle_{i,t} + \psi_{t+1} f_i + u_{it+1} \text{ and}$$

$$Dividend_{i,t+1} = b_{0,t+1} + b_{1,t+1}\, Dividend_{i,t} + b_{2,t+1}\, IOR_{i,t} + a_{3,t+1}\, Lifecycle_{i,t+1} + e_{t+1} g_i + v_{it+1},$$

$$Lifecycle_{i,t+1} = c_{0,t+1} + c_{1,t+1} Lifecycle_{i,t} + c_{2,t+1} IORi_{i,t} + c_{3,t+1}\, Dividend_{i,t+1} + k_{t+1} h_i + w_{it+1},$$

where *Dividend* is the dividend payout ratio ; IOR is the percentage holdings of institutional investors. The factors f_i, g_i *and* h_i are latent firm-fixed effects, and ψ_{t+1}, e_{t+1}, *and* k_{t+1} are latent time coefficients. Detailed of variable definitions are provided in Appendix 1. The symbols, *, **, *** denote significance at the 10%, 5%, and 1% level, respectively. The above equations control for other variables which are used in previous regressions, but results are not presented in this table.

IOR(t+1)	*1*	*2*	*3*
IOR	*0.927****	*0.927****	*0.925****
	(538.98)	*(538.92)*	*(534.48)*
Dividend	-0.119***	-0.122***	
	(-5.34)	(-5.35)	
Lifecycle	0.001***	0.001***	
	(6.99)	(6.81)	
Lifecycle*Dividend		0.006	
		(0.61)	
L2			0.010***
			(7.60)
L3			0.012***
			(9.05)
L4			0.009***
			(6.76)
L5			0.009***
			(6.14)
Dividend*L1			-0.011
			(-0.15)
Dividend*L2			-0.155***
			(-3.29)
Dividend*L3			-0.194***
			(-3.86)
Dividend*L4			-0.177***
			(-3.63)
Dividend*L5			-0.083**
			(-2.12)
Constant	-0.050***	-0.050***	-0.058***
	(-2.65)	(-2.64)	(-3.04)
Control variables	Y	Y	Y
Observations	70,103	70,103	70,103
R-squared	0.873	0.873	0.873

Dividend(t+1)	*1*	*2*	*3*
Dividend	*0.708****	*0.708****	*0.699****
	(272.76)	*(272.69)*	*(266.27)*
IOR	-0.003***	-0.003***	
	(-13.92)	(-13.77)	
Lifecycle	0.000***	0.000***	
	(5.35)	(3.59)	
IOR*Lifecycle		0.000***	
		(6.10)	
L2			-0.000*
			(-1.69)
L3			0.001***
			(3.27)
L4			0.002***
			(7.04)
L5			0.003***
			(11.65)
IOR*L1			-0.003***
			(-7.26)
IOR*L2			-0.002***
			(-5.44)
IOR*L3			-0.003***
			(-8.21)
IOR*L4			-0.003***
			(-9.32)
IOR*L5			-0.003***
			(-6.85)
Constant	-0.018***	-0.017***	-0.017***
	(-7.97)	(-7.90)	(-7.88)
Control variables	Y	Y	Y
Observations	70,103	70,103	70,103
R-squared	0.610	0.610	0.613

Lifecycle(t+1)	*1*	*2*	*3*
Lifecycle	*0.415****	*0.415****	*0.414****
	(106.76)	*(107.10)*	*(106.62)*
IOR	0.229***	0.225***	0.237***
	(4.67)	(4.55)	(4.82)
Dividend	3.309***	4.209***	4.633***
	(3.33)	(4.24)	(4.72)
Log(M/B)	-0.011	0.022	-0.014
	(-0.76)	(1.64)	(-0.97)
Profitability	4.036***	4.015***	4.024***
	(54.72)	(54.36)	(54.58)
Cash	-0.219***	-0.270***	-0.217***
	(-2.86)	(-3.57)	(-2.84)
TE/TA	-1.153***	-1.195***	-1.155***
	(-20.16)	(-21.10)	(-20.19)
NYA	0.036	0.017	0.023
	(0.66)	(0.31)	(0.41)
Age	0.004***	0.004***	0.004***
	(4.49)	(4.36)	(4.15)
Constant	0.370	-0.031	0.408
	(0.61)	(-0.05)	(0.67)
Firm FE	N	N	N
Industry FE	Y	Y	Y
Year FE	Y	Y	Y
Observations	70,103	70,103	70,103
R-squared	0.255	0.255	0.255

Table 8: Institutional Ownership with Share-Repurchase and Lifecycle

This table reports the means and medians of institutional ownership according to the firm lifecycle and whether the firm carry out share repurchase or not. Each year, sample firms are grouped into those that make share-repurchase (Repurchasers) and those that do not make share-repurchase (Non-Repurchasers); and into five different quintiles of the lifecycle (*Lifecycle*). The symbols *** denote significance at the 1% level.

Lifecycle Quintiles	**Non-Repurchasers**			**Repurchasers**			**All firms**			**Test for difference Non-Repurchasers vs Repurchasers**	
	Mean (%)	*Median (%)*	*N*	*Mean (%)*	*Median (%)*	*N*	*Mean (%)*	*Median (%)*	*N*	*t-Test*	*Wilcoxon Rank Test*
1	23.56	15.81	9,525	33.19	26.70	4,505	26.65	18.55	14,030	-21.437***	-19.984***
2	33.41	27.59	8,700	41.49	37.98	5,319	36.48	31.50	14,019	-16.853***	-16.490***
3	36.56	31.70	8,225	47.07	47.20	5,794	40.90	37.66	14,019	-21.729***	-21.322***
4	38.96	35.76	7,310	49.32	51.89	6,714	43.92	43.50	14,024	-21.826***	-21.658***
5	37.38	34.44	5,510	51.28	54.22	8,501	45.81	47.39	14,011	-30.615***	-29.506***
Total	**33.27**	**27.16**	**39,270**	**45.73**	**46.26**	**30,833**	**38.75**	**35.26**	**70,103**	**-59.250*** **	**-58.252*** **

Table 9: Effect of Repurchase, Total payout and Lifecycle on Institutional Ownership

This table reports the estimates of regressions of institutional holdings on share repurchase, total payout and lifecycle as follows. Panel A presents the firm fixed effects with standard errors clustered by firm for the impact of lifecycle on Institutional Holdings. Panel B documents the results where lifecycle is measured as five dummies corresponding to five lifecycle quintiles (*Li*). In both Panels A and B, lifecycle is the retained earnings to total equity ratio (*Lifecycle*). Details of the variable definitions are provided in Appendix 1. The symbols, *, **, *** denote significance at the 10%, 5%, and 1% level, respectively.

Panel A: Effect of Repurchase and Totalpayout on Institutional Holdings

IOR(t+1)	Effect of Repurchase				IOR(t+1)	Effect of Totalpayout			
	1	*2*	*3*	*4*		*5*	*6*	*7*	*8*
Log(M/B)	0.031***	0.027***	0.027***	0.027***	Log(M/B)	0.031***	0.026***	0.026***	0.026***
	(20.60)	(18.25)	(18.24)	(18.25)		(20.56)	(18.25)	(18.25)	(18.25)
beta	0.014***	0.013***	0.013***	0.013***	beta	0.014***	0.013***	0.013***	0.013***
	(10.12)	(9.30)	(9.27)	(9.26)		(10.18)	(9.30)	(9.28)	(9.29)
buyback	0.008***	0.007***	0.007***	0.007***	pay	0.015***	0.014***	0.014***	0.015***
	(4.40)	(3.99)	(3.97)	(3.97)		(7.20)	(6.86)	(6.82)	(6.87)
Repurchase	0.088***	0.047**	0.046**	0.047**	Totalpayout	0.035*	-0.011	-0.012	-0.012
	(4.04)	(2.23)	(2.17)	(2.20)		(1.70)	(-0.54)	(-0.59)	(-0.60)
NYA	0.318***	0.275***	0.274***	0.274***	NYA	0.313***	0.271***	0.270***	0.269***
	(18.30)	(15.74)	(15.67)	(15.67)		(18.01)	(15.46)	(15.40)	(15.39)
adjustedreturn	0.008***	0.007***	0.007***	0.007***	adjustedreturn	0.008***	0.007***	0.007***	0.007***
	(9.81)	(9.36)	(9.60)	(9.60)		(9.92)	(9.44)	(9.67)	(9.65)
Age		0.026*	0.026*	0.026*	Age		0.026*	0.026*	0.026*
		(1.71)	(1.72)	(1.72)			(1.70)	(1.71)	(1.71)
SP		0.032***	0.032***	0.032***	SP		0.032***	0.032***	0.032***
		(7.23)	(7.22)	(7.22)			(7.30)	(7.28)	(7.28)
Profitability		0.106***	0.103***	0.102***	Profitability		0.106***	0.103***	0.103***
		(15.84)	(15.44)	(15.44)			(15.95)	(15.56)	(15.54)
Lifecycle			0.001***	0.001***	Lifecycle			0.001***	0.001***
			(4.95)	(4.64)				(4.93)	(4.03)
Lifecycle*buyback				-0.000	Lifecycle*pay				0.000
				(-0.04)					(0.89)
Lifecycle*Repurchase				-0.002	Lifecycle*Totalpayout				-0.002
				(-0.33)					(-0.33)
Constant	-0.268***	-0.248***	-0.247***	-0.247***	Constant	-0.271***	-0.251***	-0.251***	-0.251***
	(-12.10)	(-7.45)	(-7.45)	(-7.45)		(-12.26)	(-7.55)	(-7.56)	(-7.55)
Observations	70,103	70,103	70,103	70,103	Observations	70,103	70,103	70,103	70,103
R-squared	0.347	0.356	0.356	0.356	R-squared	0.347	0.356	0.357	0.357

Panel B: Effect of Repurchase and Totalpayout by Lifecycle Quintiles

	Effect of Repurchase			Effect of Totalpayout	
IOR(t+1)	*1*	*2*	IOR(t+1)	*3*	*4*
Log(M/B)	0.027***	0.025***	Log(M/B)	0.026***	0.025***
	(18.24)	(17.49)		(18.25)	(17.49)
beta	0.013***	0.013***	beta	0.013***	0.013***
	(9.27)	(9.39)		(9.28)	(9.44)
NYA	0.274***	0.250***	NYA	0.270***	0.245***
	(15.67)	(14.31)		(15.40)	(13.97)
adjustedreturn	0.007***	0.008***	adjustedreturn	0.007***	0.008***
	(9.60)	(9.82)		(9.67)	(9.93)
Age	0.026*	0.027*	Age	0.026*	0.027*
	(1.72)	(1.81)		(1.71)	(1.79)
SP	0.032***	0.032***	SP	0.032***	0.032***
	(7.22)	(7.35)		(7.28)	(7.38)
Profitability	0.103***	0.090***	Profitability	0.103***	0.088***
	(15.44)	(13.74)		(15.56)	(13.54)
L2		0.031***	L2		0.029***
		(8.17)			(7.45)
L3		0.052***	L3		0.054***
		(10.71)			(10.40)
L4		0.064***	L4		0.071***
		(11.82)			(11.68)
L5		0.032***	L5		0.018***
		(5.76)			(2.74)
buyback*L1		0.008**	pay*L1		0.010**
		(2.05)			(2.49)
buyback*L2		0.009**	pay*L2		0.016***
		(2.41)			(4.54)
buyback*L3		0.007**	pay*L3		0.010***
		(2.05)			(2.80)
buyback*L4		0.001	pay*L4		0.001
		(0.34)			(0.20)
buyback*L5		0.010***	pay*L5		0.033***
		(2.63)			(5.27)
Repurchase*L1		0.116**	Totalpayout*L1		0.091*
		(2.45)			(1.92)
Repurchase*L2		0.076	Totalpayout*L2		0.025
		(1.47)			(0.55)
Repurchase*L3		-0.000	Totalpayout*L3		-0.062
		(-0.00)			(-1.49)
Repurchase*L4		0.016	Totalpayout*L4		-0.060
		(0.38)			(-1.54)
Repurchase*L5		0.080**	Totalpayout*L5		0.021
		(2.57)			(0.71)
buyback	0.007***		pay	0.014***	
	(3.97)			(6.82)	
Repurchase	0.046**		Totalpayout	-0.012	
	(2.17)			(-0.59)	
Lifecycle	0.001***		Lifecycle	0.001***	
	(4.95)			(4.93)	
Constant	-0.247***	-0.257***	Constant	-0.250***	-0.257***
	(-7.45)	(-7.85)		(-7.56)	(-7.87)
Observations	70,103	70,103	Observations	70,103	70,103
R-squared	0.356	0.363	R-squared	0.357	0.364

Table 10: Effect of Institutional Holdings and Lifecycle on Decision to Buyback or to Payout

This table reports the logit regression results of the decision to make share repurchase (*buyback*) or to payout (*pay* – either on the form of dividend or repurchase or both) on institutional ownership (*IOR*) and lifecycle (*Lifecycle*) and other control variables. Details of the variable definitions are provided in Appendix 1. We use the panel data random effect regressions in calculating the coefficients. The symbols, *, **, *** denote significance at the 10%, 5%, and 1% level, respectively.

buyback	**Effect on Repurchase Decision**			**pay**	**Effect on Payout Decision**		
	1	*2*	*3*		*1*	*2*	*3*
Log(M/B)	0.007	0.006	0.003	Log(M/B)	0.136***	0.136***	0.136***
	(0.43)	(0.42)	(0.17)		(7.82)	(7.82)	(7.85)
Profitabilit	0.850***	0.851***	0.726***	Profitability	1.058***	1.057***	0.793***
	(10.83)	(10.82)	(9.29)		(12.12)	(12.09)	(9.25)
Cash	0.703***	0.704***	0.738***	Cash	0.282***	0.281***	0.379***
	(8.16)	(8.17)	(8.53)		(2.85)	(2.85)	(3.86)
NYA	1.319***	1.319***	1.209***	NYA	4.077***	4.077***	3.786***
	(15.15)	(15.15)	(13.87)		(34.59)	(34.59)	(32.59)
TE/TA	0.915***	0.914***	0.975***	TE/TA	1.449***	1.450***	1.526***
	(14.10)	(14.08)	(14.83)		(19.45)	(19.44)	(20.23)
Age	0.010***	0.010***	0.005***	Age	0.045***	0.045***	0.032***
	(6.11)	(6.10)	(2.77)		(18.27)	(18.26)	(13.45)
SP	0.450***	0.449***	0.417***	SP	0.531***	0.531***	0.482***
	(11.45)	(11.44)	(10.53)		(10.43)	(10.43)	(9.38)
L2			0.249***	L2			0.473***
			(4.04)				(7.23)
L3			0.348***	L3			1.035***
			(5.18)				(14.18)
L4			0.589***	L4			1.543***
			(8.19)				(18.69)
L5			0.725***	L5			1.400***
			(9.52)				(15.58)
IOR*L1			1.412***	IOR*L1			1.400***
			(11.88)				(10.62)
IOR*L2			0.973***	IOR*L2			0.711***
			(9.49)				(6.19)
IOR*L3			1.025***	IOR*L3			0.314***
			(10.07)				(2.67)
IOR*L4			1.071***	IOR*L4			0.461***
			(9.95)				(3.41)
IOR*L5			1.372***	IOR*L5			1.450***
			(11.26)				(8.84)
IOR	1.172***	1.172***		IOR	0.934***	0.933***	
	(17.80)	(17.79)			(11.85)	(11.82)	
Lifecycle	0.010***	0.009*		Lifecycle	0.019***	0.020***	
	(2.80)	(1.83)			(5.13)	(3.83)	
IOR*Lifecy		0.003		IOR*Lifecyc		-0.003	
		(0.25)				(-0.24)	
Constant	-1.798***	-1.796***	-2.007***	Constant	-3.190***	-3.191***	-3.753***
	(-8.65)	(-8.64)	(-9.40)		(-13.20)	(-13.20)	(-15.27)
Observati	70,103	70,103	70,103	Observation	70,103	70,103	70,103

Table 11: Effect of Institutional Holdings and Lifecycle on Repurchase Ratio and Total Payout Ratio

This table reports the regression results of repurchase ratio (*Repurchase*) in Panel A and total payout ratio (*Totalpayout*) in Panel B on financial lifecycle and institutional ownership. Control variables include Log(M/B), Profitability, Cash, NYA, TE/TA, SP, Age (coefficients are not displayed in the table). Detailed of variable definitions are provided in Appendix 1. Models include the firm fixed effect regressions with standard errors clustered by firm (columns 1-2), and the Tobit model for panel (left censored at dividend payout ratio equal 0) (columns 3-4). The symbols, *, **, *** denote significance at the 10%, 5%, and 1% level, respectively.

Panel A: Determinants of Repurchase				
Repurchase (t+1)	**Firm Fixed Effects**		**Panel Tobit**	
	1	*2*	*3*	*4*
L2		0.000		0.008***
		(0.48)		(4.53)
L3		0.002		0.013***
		(1.61)		(6.40)
L4		0.000		0.016***
		(0.24)		(7.84)
L5		0.001		0.021***
		(0.38)		(9.61)
IOR*L1		0.002		0.031***
		(0.87)		(8.84)
IOR*L2		0.008***		0.032***
		(3.98)		(11.27)
IOR*L3		0.007***		0.032***
		(3.64)		(11.71)
IOR*L4		0.013***		0.037***
		(5.43)		(13.06)
IOR*L5		0.021***		0.045***
		(6.88)		(14.63)
IOR	0.010***		0.037***	
	(6.49)		(20.53)	
Lifecycle	-0.000***		0.000	
	(-2.75)		(0.93)	
IOR*Lifecycle	0.001***		0.002***	
	(5.43)		(3.88)	
Constant	-0.040***	-0.039***	-0.081***	-0.089***
	(-5.47)	(-5.32)	(-13.63)	(-14.58)
Observations	70,103	70,103	70,103	70,103
R-squared/Wald chi2	0.049	0.051	5433.58	5799.13
Prob>chi2			0.0000	0.0000

Panel B: Determinants of Total Payout				
Totalpayout (t+1)	**Firm Fixed Effects**		**Panel Tobit**	
	1	*2*	*3*	*4*
L2		0.000		0.013***
		(0.27)		(8.06)
L3		**0.003****		**0.023*****
		(2.48)		**(14.35)**
L4		**0.003***		**0.029*****
		(1.67)		**(16.90)**
L5		**0.005*****		**0.033*****
		(2.65)		**(18.43)**
IOR*L1		0.001		0.023***
		(0.40)		(7.81)
IOR*L2		0.008***		0.020***
		(3.43)		(8.43)
IOR*L3		0.006**		0.012***
		(2.49)		(5.24)
IOR*L4		0.011***		0.016***
		(4.14)		(6.73)
IOR*L5		0.019***		0.025***
		(5.53)		(9.86)
IOR	0.009***		0.021***	
	(5.20)		(13.85)	
Lifecycle	-0.000***		0.001***	
	(-2.64)		(3.53)	
IOR*Lifecycle	0.001***		0.001***	
	(5.38)		(3.11)	
Constant	-0.064***	-0.064***	-0.111***	-0.127***
	(-7.08)	(-7.14)	(-22.35)	(-24.93)
Observations	70,103	70,103	70,103	70,103
R-squared/Wald	0.061	0.065	7978.50	8932.04
Prob>chi2			0.0000	0.0000

Appendix 1: Variable Definition

Variable Name	Definition
IOR	is the proportion of outstanding shares held by institutional investors (as reported in Form 13F)
dv_pay	is the dummy variable for pay or not pay dividend, takes the value of 1 if the firm paid dividend, and 0 otherwise
Dividend	is the dividend payout ratio, equal to the total dollar amount of annual dividend to common stock divided by book value of total assets
buyback	is the dummy variable for repurchase or not repurchase, takes the value of 1 if the firm makes repurchase, and 0 otherwise
Repurchase	is the repurchase ratio, equal to the total dollar amount of annual repurchase divided by book value of total assets
pay	is the dummy variable for pay or not pay (either in the form of cash dividend or share repurchase, or both), takes the value of 1 if the firm payout cash dividend or/and make repurchase to shareholders, and 0 otherwise
Totalpayout	is the total payout ratio, equal the sum of dividend payout ratio (*Dividend*) and repurchase ratio (*Repurchase*)
Lifecycle	is the retained earnings to total equity ratio, as a proxy for lifecycle (the other proxy used for robustness test is the retained earnings to total asset ratio)
Log(TA)	is the natural logarithm of the book value of total assets of the company at year end
NYE	is the equity size measure, equals the percentile (expressed in fraction form) in which the firms falls based on the cross-sectional distribution of market value of equity for NYSE companies in a certain year.
NYA	is the asset size measure, equals the percentile (expressed in fraction form) in which the firms falls based on the cross-sectional distribution of total assets for NYSE companies in a certain year.
Profitability	is earnings before interest and tax to book value of total assets
Growth	is the natural logarithm of the book value of total assets plus market value of total equities minus book value of equities to the book value of total assets
AGR	is the asset growth rate, equals the ratio of total assets value at the end of the year compared to its value in previous year
SGR	is the sales growth rate, equals the ratio of sales value at the end of the year compared to its value in previous year
Leverage	is the total equity to total assets ratio.
Cash	is the ratio of the book value of cash and equivalent to the book value of total assets
industry	is the dummy variable for industry, take the value from 1-9 as 1 digit SIC code number
beta	is the company beta taken from CRSP
adjustedreturn	is the annual adjusted return, equal to the difference between annual return of stock and the beta return of the stock (CAPM model with 10 year bond yield and realized return on S&P 500)
SP	is the dummy variable, takes the value of 1 if the stock of the company in a certain year belongs to S&P index constituents, and 0 otherwise
Li	is the dummy variable for each lifecycle quintiles (i=1-5), takes the value of 1 if lifecycle quintile of a particular firm in a particular year belong to lifecycle quintile i, and 0 otherwise.

Figure 1: Percentage of dividend pay/not pay firms by lifecycle

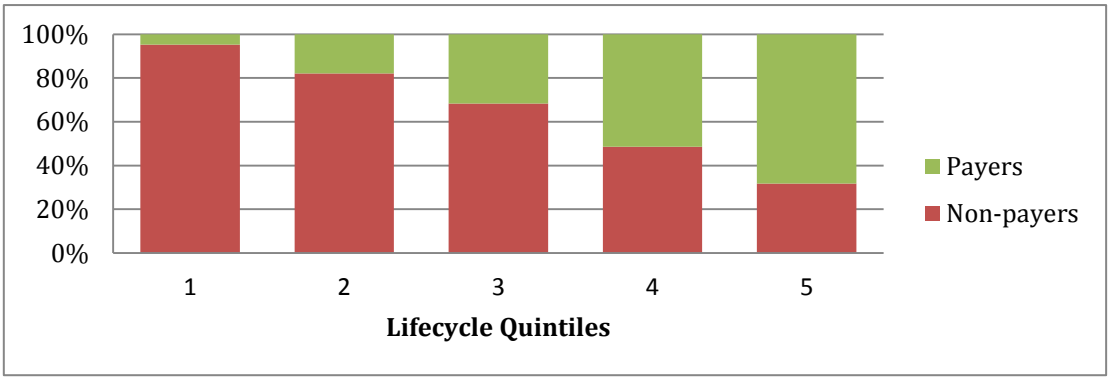

Figure 2: Institutional Holdings over time (1986-2012)

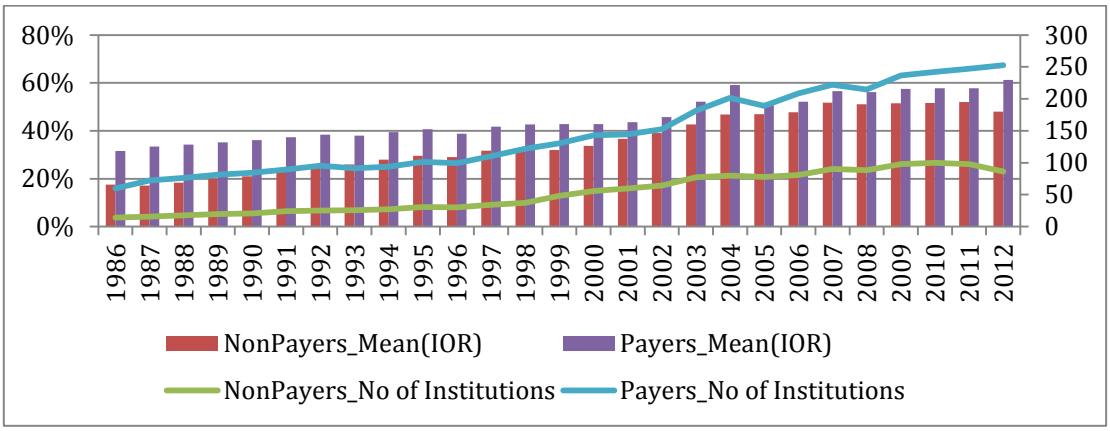

Figure 3: Dividend Payout Ratio and Institutional Holdings by lifecycle

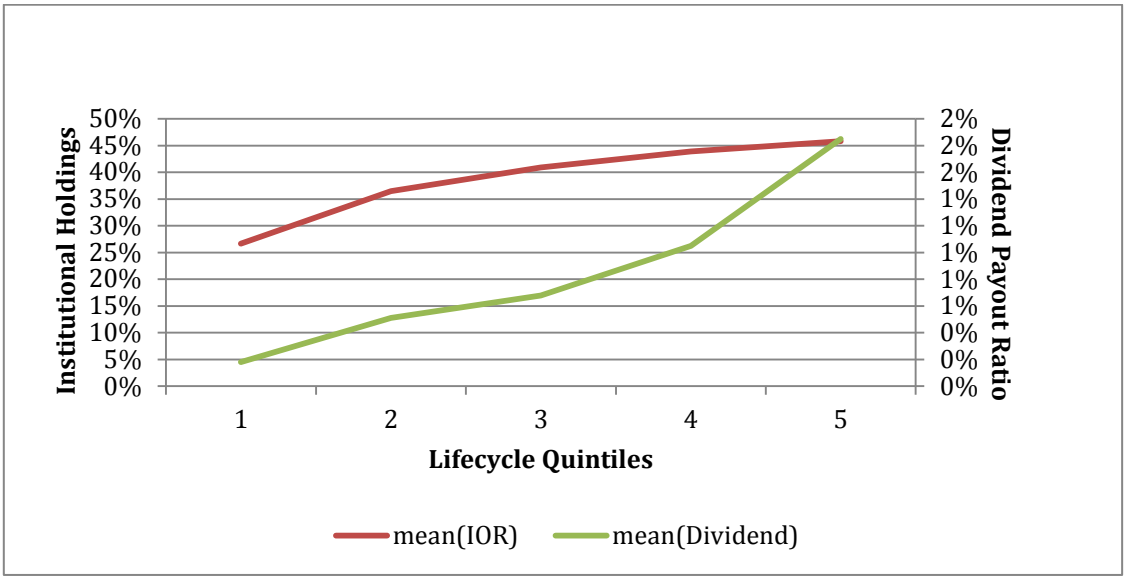

Figure 4: Dividend Payout Ratio over time (1986-2012)

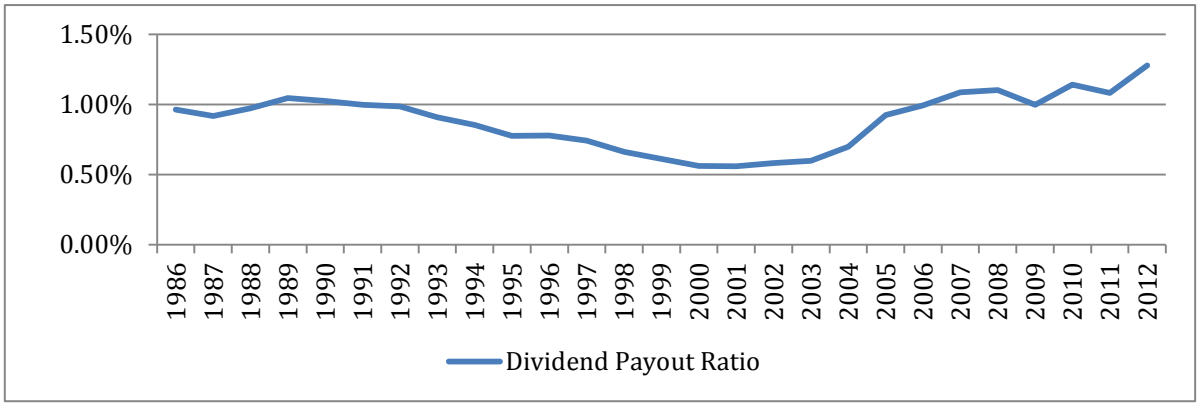

Figure 5: Payout Pattern by Lifecycle and over time (1986-2012)