

# Ownership Structure and Share Repurchases in an Emerging Market: Incentive Alignment or Entrenchment?

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## Abstract

This paper examines how control and ownership structure affect share repurchases in an emerging market where controlling families derive large private benefits. Whereas firms with concentrated ownership often pay cash dividends, firms with weak control rights often repurchase shares. The magnitude of repurchase increases with weak control rights, but decreases with strong foreign ownership. These results hold even after controlling for M&A threats and managerial stock options. Additionally, stock returns are lower when share repurchase announcements are made by firms where controlling families have lower ownership and lower control rights. These results suggest that insiders can repurchase shares to protect control positions.

JEL classification: G35, G32, G34

Key words: share repurchases, control rights, entrenchment, ownership structure, cash dividends

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Stock repurchases have recently become an important component of corporate payout in many countries including emerging markets as well.<sup>1</sup> In some countries, time series data show that more firms have increasingly adopted stock repurchase programs to distribute earnings to shareholders, while the ratio of firms which have continued to use cash dividends only decreases.<sup>2</sup> Given these changes, many have tried to identify the determinants of and effects from these corporate payout policies, in addition to factors related to corporate financial characteristics<sup>3</sup> and corporate taxes. Previous studies suggest some factors generate conflicting effects on corporate payout choice and/or firm value as they mitigate and exacerbate incentive problems.

Share repurchases can yield positive effects on stock returns if a corporate motive is to send a signal that the firm has good future prospects or that the firm is currently undervalued (Dann (1981), Vermaelen (1981), and Stephens and Weisbach (1998)). When a firm repurchases shares to lower agency costs of free cash flows, it also can generate a positive stock return (Nohel and Tahan (1991)). However, share repurchases can be motivated by managerial incentives. For example, firms with high managerial stock options often repurchase shares to counter the dilution effects of stock options (Fenn and Liang (2001) and Weisbenner (2000)). In addition, firms facing takeover threats are more likely to buy stocks from shareholders with lower valuations while shareholders with higher valuations would keep their shares. By raising share prices for corporate raiders to pay, share repurchase may deter takeovers and help protect incumbents from takeover attempts (Bagwell (1991), Billet and Xue (2007) and Denis (1990)).

In addition to the aforementioned factors, we argue that controlling families' ownership and control rights also affect corporate payout decisions in an emerging market. In an emerging market, many controlling families with low ownership can maintain their control rights through pyramid ownership structure or interlocking ownership among subsidiaries in business groups.<sup>4</sup> In some firms, direct ownership of families and interlocking ownership can be weak as they are not uniformly distributed across subsidiaries.

Since controlling families likely bequeath corporate control from one generation to the next generation thereby deriving private benefits over a long period of time<sup>5</sup>, their incentive to keep control would be greater than those of professional managers. In firms where controlling families have weak control rights, the firms might engage in share repurchases to deter potential external threats as discussed before. Share repurchases strengthen the control positions of the families and secure their future private benefits. On the other hand, when controlling families have high ownership and high control, their interest and incentives are closely aligned with those of outside shareholders, as Jensen and Meckling (1976) argue. Therefore, firms with concentrated ownership are more likely to choose payout policies which increase firm value. This argument suggests that share repurchases of firms with concentrated ownership would yield positive return.<sup>6</sup> In short, due to ownership and control issues, share repurchases in an emerging market can exacerbate incentive problems even though managerial stock option plans or immediate M&A threats are not frequently observed.

This paper analyzes the effects of control rights and ownership concentration on firms' payout policies in an emerging market. After controlling for all firm characteristics and for managerial incentives such as takeover threats or managerial stock options discussed in previous studies, we investigate whether firms with weak controlling rights by controlling families are more likely to engage in share repurchases.

In addition, we also test how the stock market responds to repurchase announcements. The purpose of share repurchases in a firm with concentrated ownership or high control rights is less likely to entrench the current controlling family. In such a firm, the interest of the controlling family is more likely aligned with those of other shareholders. Then, the markets would react positively to share repurchase announcements in a firm with concentrated ownership and strong control rights. On the other hand, suppose a firm buys back shares to secure control position of the controlling family with lower control rights. Since share repurchases in a firm with weak control rights can protect the controlling family, investors should consider the potential costs associated with management entrenchment upon the repurchase announcements. Consequently, observing share repurchase announcements, investors would bid a lower price for a firm

with weak control rights of the controlling family than for its counterpart with strong control rights. Therefore, stock returns to repurchase announcements in firms with weak control rights would be lower than those in firms with high ownership and control rights.

We analyze data from publicly traded firms in South Korea that include information on share repurchases, cash dividends, ownership, and control rights. There are several reasons why Korean firms provide an ideal case for examining whether share repurchase programs play a preemptive defensive role to protect controlling families in an emerging market. First, as Joh (2003) and Baek, Kang, and Park (2004) show, most Korean firms including large business group affiliated firms have controlling families. Many of them own minority shareholdings. While their ownership is not high, some controlling minority families maintain control through interlocking ownership among subsidiaries. For example, the average family ownership was 3.55% while interlocking ownership among subsidiaries was 47.4% in the largest business groups surveyed by Korea Fair Trade Commission (hereafter KFTC) in 2004. In some firms, the control position can be very vulnerable as direct ownership of families and interlocking ownership is near zero. Second, controlling families have great incentives to maintain their control as they derive large private benefits. Korea shows one of the highest private control benefits in cross country analyses (Nenova (2003) and Dyck and Zingales (2004)). Moreover, families bequeath their control to their children. Eight out of the top 10 largest chaebols are now controlled by the second or third generation family members of the founders. Third, Choi and Kim (2005) show that Korean firms have increased their payout activities in recent years in both cash dividends and stock repurchases. The number of firms that pay cash dividends has increased along with a rise in cash dividend yields. At the same time, with the legalization of stock repurchases in 1994, over 25% of publicly listed firms have repurchased their stock. Fourth, recently, Korean corporations are concerned about outside threats (Joh 2004) even though large hostile takeovers have never occurred until now. Since the economic crisis in 1997, the Korean government has abolished legal and administrative provisions designed to protect the control rights of incumbent controlling shareholders. It lifted a ban on foreign ownership, restrictions on buying shares and legalized hostile takeovers.

Using firm level announcement data from 1995 to 2005, we study how control rights and ownership structure affect firms' payout choice between cash dividend and stock repurchase after controlling factors examined in previous studies such as Dittmar (2000). In addition, using detailed public announcement information and an event study methodology, we examine the effect of a stock repurchase announcement on firm value.

Our results show that firms are more likely to engage in stock repurchases when controlling families have lower control rights. A decrease in control rights also tends to increase the size of these stock repurchases. In addition, an increase in foreign ownership lowers the probability of adopting share repurchases when a firm has had a payout policy. Note that foreign owners are not involved in firm management and control. The effects of control rights on payouts are robust even when other factors (such as presence of M&A's and managerial stock option plans) are controlled for. Additionally, the results show smaller stock returns when share repurchase announcements are made by firms with lower ownership and lower control rights, and vice versa.

Taken together, these results strongly support the hypothesis that control rights and ownership structure affect corporate payout policy decisions. Control and ownership issues can be an important reason why firms choose share repurchases in an emerging market where investor protection is weak. Our study also shows that a firm with weak control rights is likely to experience lower stock returns to repurchase announcements. Our results suggest that share repurchases by insiders with weak control rights can be used as an entrenchment device and worsen incentive problems.

Our study can help investors properly evaluate the impact of share repurchase on firm value in an emerging market. We provide evidence that share repurchases can exacerbate incentive problems even in a firm without M&A threats or managerial stock options. While our results are based on data in an emerging market, the results might suggest that incentive problems can occur with changes in payout composition even in a developed economy where/when stock options are not widely used<sup>7</sup> or hostile mergers do not occur often.<sup>8</sup>

The rest of the paper is organized as follows. Section 1 briefly discusses the background on the payout policy and ownership structure of Korean firms. Section 2 discusses the data and describes the methodology used in the study. Section 3 reports and discusses the results, followed by a summary and conclusion in Section 4.

## **1. Payout policy and ownership structure in Korea**

### A. Control and Ownership structure

There is evidence from around the world that controlling shareholders can extract private benefits from a firm, at the expense of firm value accruing to dispersed shareholders (Jensen and Meckling (1976), Grossman and Hart (1998), LLSV (1999)). Private benefits of control (measured through control value) vary across countries. Korea shows one of the highest control values among the countries studied by Nenova (2003) and Dyck and Zingales (2004).

The value of corporate control is high in Korea partially because of the prevalence of controlling minority ownership (Bebchuck, Kraakman, and Triantis 2000). Business groups (*chaebols*) are prevalent in Korea.<sup>9</sup> In our sample, over 20% of publicly traded firms belong to large *chaebols*. Controlling shareholders in publicly traded firms or *chaebol*-affiliated firms hold less equity shares than shareholders in privately held or independent (stand-alone) firms. For example, the average family ownership was 3.55% while interlocking ownership among subsidiaries was 47.4% in the largest *chaebols* in 2004 (KFTC, 2004). The personal stake of controlling shareholders varies across subsidiaries within a group they control. For instance, in the top ten largest business groups, controlling families do not own any shares in over 61% of subsidiaries but they still maintain their control (KFTC, 2001). Despite such a low level of ownership (and cash-flow rights) controlling shareholders in Korea can easily exercise control power. Complicated interlocking ownership structure in *chaebols* makes it possible for founders and their families to control the firms, even without large shareholdings.

Until recently, the legal system provided little protection for minority shareholders, thus allowing controlling shareholders to pursue their private interests.<sup>10</sup> Many large business groups have been reported to engage in self-dealing activities.<sup>11</sup> The private benefits extracted by controlling shareholders may explain why Korean firms showed lower performance both before (Joh 2003) and during (Baek, Kang, and Park 2004) the 1997 Asian economic crisis.

In part as a response to the economic crisis, the Korean government has abolished many legal and administrative rules protecting insiders.<sup>12</sup> Beginning from January 1998, the government has introduced many reform measures that increase the accountability of management, and transparency in financial information and business transactions. The law now requires that all listed firms have at least one outside director, and also introduced a cumulative voting system.<sup>13</sup> The Korean government lifted a ban on foreign ownership, abolished restrictions on buying shares, and legalized hostile takeovers. Before the crisis, there was a ceiling on foreign ownership such that foreign investors altogether cannot own more than 25% of the shares of any Korean firm. After the government eliminated the ceiling in April 1998, the number of foreign investors and foreign ownership has increased dramatically. Foreign ownership of many large publicly listed firms has exceeded 50% in aggregate. The government has also eliminated the mandatory administrative rule that an acquirer who has purchased more than 25% of voting shares must extend an offer for 50% +1 of all shares at a price no lower than the highest price at which the acquirer purchased shares. Such legal and institutional changes have exposed controlling shareholders to potential takeover threats that they did not face before.

#### B. Corporate payout policy in Korea

Since the end of the Asian economic crisis, Korean firms have increased their dividend payouts and stock repurchases whereas before the crisis of 1997 they paid very little or no cash dividends. For the 20 years between 1981 and 2002, the average dividend yield was only 1.72%, while the average one-year deposit interest rate was 13.79%.<sup>14</sup> Choi and Kim (2005) studied the changes in Korean cash dividend policies, and found that

although the number of firms paying cash dividends has increased, the percentage of listed firms paying cash dividends have not changed much.

Prior to 1994, share repurchases were illegal in Korea. In 1998, the ceiling was lifted on the number of shares that could be repurchased. While Korean firms in total spent 6.4 trillion Korean won on cash dividends in 2003, they spent 7 trillion won on share repurchases in the same year. On average, 5.33% of total shares were announced to be repurchased; the median repurchase was 4.11% of total shares. Ever since the end of the economic crisis, share repurchases have formed a large component of corporate payout policy in Korea.

Firms can either repurchase their shares directly from the open market, or they can invest in funds and trusts that buy back the firms' shares. Most stock repurchases in Korea are done through open market repurchases, rather than tender offers. For our study, we include both direct and indirect share repurchases. Before starting a stock buyback, the firm is required to disclose how much money it plans to spend, and the purpose of the repurchases. As <Table I> shows, on average 16.4% of publicly listed firms, and 17.7% of non-financial listed firms have adopted share repurchase programs.

<Insert Table I around here>

As shown in <Table II>, in earlier years, before the issues of corporate governance became a public concern, 14.2% of the firms with repurchase programs reported that protecting control rights was the main purpose of repurchases. However, after the 1997 economic crisis, when governance issues became a rising concern, very few firms reported protecting control rights as the main reason for stock repurchases.

<Insert Table II around here>

## **2. Data and methodology**

### **A. Data**

We have collected information on firms' announcement of share repurchase programs

from January 1995 until December 2005. Public announcement information was obtained from the Korea Investor's Network for Disclosure System (KINDS), operated by the Korea Stock and Future Exchange. Among the listed firms, we exclude financial institutions and firms with missing information on ownership structure or accounting information. When a firm has more than one announcement on share repurchases during the period of analysis, the firm-year is excluded from the sample for market reaction.

In our analysis, we focus on common stock repurchases only, and exclude preferred stock repurchases due to the reason that the frequency of preferred stock repurchases was very low, and the targeted volume was small. Excluding preferred stock repurchases does not make a significant difference in our analysis. We also exclude share repurchases when a firm buys back its shares in the process of corporate restructuring (such as post mergers, acquisitions and during split offs).

Information on share repurchase programs includes announcement dates, the value of share repurchases, and number of shares to be repurchased. For financial information, we use KIS-Line data compiled by the Korea Information Service, for ownership information, we use TS-2000 data compiled by the Korea Listed Companies Association. For stock price and foreign ownership information, we use data provided by the FN-guides. Information on hostile M&A threats is collected using newspaper articles and public announcements reported on the KINDS.

*Chaebol* classification follows the Korea Fair Trade Commission (KFTC)'s annual press releases. Before 2002, a firm is considered to be group (*Chaebol*) affiliated if it belongs to one of the thirty largest business groups identified by the commission. Since 2002, KFTC has identified the large business groups that are subject to government regulation on equity investment. We classify these groups as chaebols.

Our measure of share repurchases, based on public announcements, has advantages over using the dollar volume of stock repurchases obtained from financial statements. As Stephens and Weisbach (1998) argued, data obtained from financial statements tend to overstate stock repurchases, as they include the conversion of other securities into

stocks. In addition, they might also understate the true size of share repurchase over market value, when there is a seasoned equity issuance.

<Table III> shows the summary statistics of all firms with financial information between 1995 and 2005. About 70 percent of all firms in the sample have either cash dividends or share repurchases. About 67 percent of all firms have cash dividends and 18 percent of all firms have share repurchases. Fewer than 11 percent of firms with share repurchases adopt share repurchases only, not paying cash dividends.

<Insert Table III around here>

Firms with cash dividend programs tend to be larger in asset size than firms without cash dividends. They also show a lower market to book ratio, more free cash flows, less financial volatility, higher ownership rights and control rights by controlling shareholders (hereafter CS), and higher foreign ownership. Firms with share repurchase programs tend to be larger, show higher free cash flows, less financial volatility, lower interlocking ownership and lower control rights than firms without such programs. The differences between firms with and without cash dividends programs are similar to those firms with and without share repurchase programs. There are however major differences in ownership and control rights. While firms with cash dividends show more ownership concentration and more control rights than firms without cash dividends, firms with share repurchase programs show lower affiliated firms' interlocking ownership and control rights (that is, sum of ownership that CS can directly or indirectly control) than firms without such programs.

## B. Methodology

Our study consists of three parts. First, using a Logit model, we examine the factors that affect a firm's decision to engage in a payout policy. In addition, we also examine whether a firm decides to adopt share repurchase programs or not. Second, using the Tobit model, we examine the factors affecting the size of share repurchases. We use the ratio of stock repurchase cost over total corporate payouts, the ratio of number of shares

repurchased over total outstanding shares, and the ratio of stock repurchase cost over firm's market value. Lastly, we examine the market's reaction to the repurchase announcement.

Using panel data, we examine whether and how firm characteristics affect firm payout decisions. In our empirical analyses, we examine two cases separately: cash dividend program and share repurchase program. We assume that each firm's probability to adopt a payout policy is independent of other firms. Each firm is treated as a single draw from a Bernoulli distribution. When a firm 'i' has a payout policy,  $y_i$  takes a value of one, otherwise it is zero. Firm i's probability to adopt a payout policy is represented by  $F$ , which depends on coefficient vector  $\beta$  and vector of explanatory variables  $\mathbf{X}_i$ . The logit model maximizes the joint probability or likelihood function as follows.

$$\ln L = \sum_{i=1}^n \{ y_i \ln F(\beta \mathbf{X}_i) + (1 - y_i) \ln[1 - F(\beta \mathbf{X}_i)] \}$$

Following the previous literature such as Dittmar (2000), included explanatory variables are firm size, free cash flows, capital structure, market to book value, financial volatility as well as a constant term and other variables explained later. We use a log value of total asset as a proxy for firm size (Firm\_size) and debt ratio over total asset for capital structure (Debt\_Asset). Free cash flow (Free\_cash) represents the sum of ordinary income and depreciation divided by total asset, and it measures whether firms with high free-cash flow adopt a payout program to reduce agency problems. Market value to book value (MTB) measures the value of future growth option and it tests whether a payout program is adopted to reduce under valuation or to signal future firm performance. Financial volatility (STD\_RET) is measured through the standard deviation of stock returns in the previous year and represents the corporate need for financial flexibility.

In the equation above, we also include ownership information and other governance related information such as whether a firm faces a credible outside M&A threat or whether it adopts a managerial stock option plan. In addition we also control whether a firm belongs to a chaebol. We use three variables to measure ownership and control. First is controlling shareholders' ownership (CS\_own), representing the controlling

shareholder and family members' cash flow rights. Second, we use subsidiaries' interlocking ownership (Aff\_own). Third, we also use controlling shareholders' control rights (CS\_control) which is derived as the sum of all ownership under the influence of CS such as own ownership (CS\_own) and subsidiaries' interlocking ownership (Aff\_own). In order to analyze the influence of foreign shareholders, we use the sum total of ownership by foreign shareholders (Foreign\_own).<sup>15</sup>

The second part of our statistical analysis uses a Tobit model to examine the factors affecting the magnitudes of stock repurchases. Since many firms have not adopted a share repurchase program, a large proportion of the firms would report a zero ratio. Firms with repurchase programs would show a positive ratio for the measures described above. Conventional least squares would not account for the qualitative difference in observations with a zero value and observations with a continuous non-zero positive value; it is therefore not appropriate to use OLS. To resolve this problem, we use the following Tobit log likelihood function. The function consists of two parts: a regression for non-zero observations and the relevant probabilities for the zero observations. For more discussion on Tobit analysis, see Greene (1993).

$$\ln L = \sum_{y_i > 0} -\frac{1}{2} \left\{ \ln (2 \pi) + \ln \sigma^2 + \frac{(y_i - \beta X_i)^2}{\sigma^2} \right\} + \sum_{y_i = 0} \left\{ \ln \left[ 1 - \Phi \left( \frac{\beta X_i}{\sigma} \right) \right] \right\}$$

Compared to the earlier equation, when a firm adopts a share repurchase program,  $y_i$  takes a ratio value described below. In the equation above,  $\Phi$  is a standard normal probability density function with standard deviation  $\sigma$ . We examine the magnitude of stock repurchases using three ratios: SRR, REP, and STP. SRR is the number of shares to be repurchased over the total number of shares, REP is the value of stock repurchases divided by the prior year-end market value of equity, and STP is the value of stock repurchases divided by the lagged value of total corporate payout (the sum of prior year cash dividends and share repurchases).

The third part of our analysis examines the market reaction to share repurchase announcements using a typical event study method. The exact announcement dates are identified using information from KINDS. We first estimate the constant term and

“beta” in the market model for each firm, by using daily stock returns and market portfolio returns for the 200 day period from 220 days prior to 20 days prior to the announcement date. Then, for each firm, we estimate the abnormal returns around the announcement date.

$$AR_{i,t} = (R_{i,t} - R_{f,t}) - [\alpha_i + \beta_i(R_{m,t} - R_{f,t})]$$

Using OLS, we examine factors that affect cumulative average abnormal returns (CAAR). Following previous literature, we control for firm size (Firm\_size), free cash flows (Free\_cash), capital structure (Debt\_asset), market to book value (MTB), standard deviation of return (Std\_ret), compounded excess return (EXRET), and ownership variables. We also control for the relative size of share repurchase in three ways: STP, REP, and SRR

$$\begin{aligned} CAAR_i = & \alpha_0 + \alpha_1 Size\_repurchase + \alpha_2 Firm\_size + \alpha_3 Free\_cash + \alpha_4 Debt\_Asset \\ & + \alpha_5 MTB + \alpha_6 STD\_RET + \alpha_7 EXRET + \alpha_8 Ownership + YEAR\ dummies \\ & + Industry\ dummies \end{aligned}$$

### 3. Results and Discussion

In this section, we present the empirical results from our study on corporate payout policy. First, we report on the factors affecting a firm’s decision to adopt a payout program. Second, we present our results on the determinants of the size of stock repurchases. Third, we report on the market response to share repurchase announcements.

#### A. Factors affecting decision to pay cash dividends

<Table IV> summarizes the Logit regression results on firms’ probability to make a cash-dividend decision using pooled data. Panel A reports results from using the full sample, while Panel B reports results from the sub-sample of firms that have had a payout program (either by cash dividends or share repurchases).

<Insert Table IV around here>

Using all sample observations, Panel A shows the factors that affect a firm's decision to pay cash dividends to shareholders. Column one shows that the following attributes significantly increase the likelihood that firms adopt cash dividend programs: larger firms, firms with more free cash flows, firms with lower debt to asset ratio, firms with lower financial volatility, and firms with lower market value. Column two shows that chaebol affiliation lowers the likelihood of paying cash dividends. Also, after controlling for firms' financial conditions, the adoption of managerial stock options has weak significance, and M&A threats do not have a statistically significant effect. Column three shows that controlling shareholders' ownership concentration (CS\_own) increases the likelihood that firms adopt a cash dividend policy. Column 4 shows that subsidiaries' ownership (Aff\_own) does not yield a significant effect when included alone. However, both CS\_own and Aff\_own when included together yield a significant, positive effect, as shown in Column 5. Column 6 shows that total control rights under the influence of CS (CS\_control) derived by the sum of CS\_own and Aff\_own increases the probability to adopt cash-dividend policy. Foreign ownership (Foreign\_own) yields a statistically significant positive effect. Columns 7 and 8 show that the effects of control-ownership related variables are still significant even after including other governance related variables such as M&A threats, chaebol affiliation and managerial stock options. The odds-ratio for control rights is 7.21 when all other variables are controlled for, meaning that a one unit increase in control rights increases the log of odds that firms adopt cash dividends by 7.21 times.

Using sub-sample of firms which have had at least one type of payout policy, Panel B shows the factors that affect a firm's decision to pay cash dividends to shareholders. The dependent variable takes one when a firm has a cash dividend policy. Because the sample in Panel B consists of firms with either cash dividends or share repurchases and some firms have both cash dividend policy and share repurchase program, the results show the factors affecting firms' choice between cash dividends and share repurchases only. Column one shows that the following attributes significantly increase the likelihood that firms adopt cash dividend programs: firms with more free cash flows,

firms with lower debt to asset ratio and firms with lower financial volatility. Compared to the results in Panel A, firm size and market to book ratio do not show their significance. Column three shows that controlling shareholders' ownership concentration (CS\_own) increases the likelihood that firms adopt a cash dividend policy. Columns 4 and 5 show that subsidiaries' ownership (Aff\_own) does not yield a significant effect on firms' decision to pay cash dividends. Column 6 shows that total control rights under the influence of CS (CS\_control) derived by the sum of CS\_own and Aff\_own increases the probability to adopt cash-dividend policy. Foreign ownership (Foreign\_own) yields a statistically significant positive effect at a 10 percent significance level. Columns 7 and 8 show that the effects of control rights are still significant even after including other governance related variables such as M&A threats, chaebol affiliation and managerial stock options. The odds-ratio for control rights is 5.90 when all other variables are controlled for, meaning that a one unit increase in control rights increases the log of the probability that firms adopt cash dividends by 5.90 times. In short, firm with less financial volatility, more free-cash flows and lower debt ratios are more likely to choose cash dividends. Moreover, firms with higher controlling family ownership and higher control rights would choose cash dividends.

#### **B. Factors affecting the decision to adopt a repurchase program**

<Table V> reports the results from Logit regressions on firms' likelihood to make share repurchases, using pooled data. Panel A reports results from using the full sample, while Panel B reports results from the sub-sample of firms that have had a payout program. Since many firms in our data set have not had any share repurchase programs, the logit regression may underestimate the probability of share repurchases, and the effects of determinants. In order to resolve these problems, we also separately analyze firms that have at least had a payout policy.

<Insert Table V around here>

Using all sample observations, Panel A shows that financial variables significantly affect firms' decision to adopt share repurchase programs. Column one shows that there

is a higher probability of share repurchases with: larger firms, firms with more free cash flows, less financial volatility and lower debt to asset ratio. Column two shows that after controlling for firms' financial conditions, *chaebol* affiliation lowers the probability, while the adoption of stock options increases the probability of share repurchases. Columns 3 and 4 show that firms with high CS\_own are more likely to adopt share repurchase programs, but firms with high Aff\_own are less likely to do so. The effect of foreign ownership is negative, although not significant. Firms with insiders' high control rights (CS\_control) are less likely to repurchase shares. When CS\_own and Aff\_own are included together along with other governance related variables, the positive effects of CS\_own disappears, but the negative effects of Aff\_own remain. Also, the negative effects of CS\_control remain.

Using firms which adopt a payout program, Panel B of <Table V> reports financial variables that affect firms' decision to pay dividends through share repurchase programs. Unlike the results in Panel A, the effects of firms' volatility and debt structure are no longer significant. However, the results on ownership and control are very similar to those in Panel A. When CS\_own and Aff\_own are included together along with other governance related variables, both CS\_own and Aff\_own have negative effects. And the coefficient on CS\_Control is also negative and significant. In addition, the effect of foreign ownership is negative and significant, when other variables are all controlled for. The odds-ratio is 0.28, and 0.32 for control rights and foreign ownership, respectively when all other variables are controlled for. Odds-ratio below 1 means that a one unit increases in control rights, or foreign ownership lowers the probability that firms buy back shares.

The results in <Table IV> show positive effects of both ownership and control variables on cash dividend policy. Firms with high ownership concentration or control rights by controlling shareholders are more likely to adopt cash dividend programs. In addition, ownerships by foreign investors are correlated with higher probability of adopting cash dividend policy. In contrast, the results in <Table V> show the negative effects of both ownership and CS\_control on share repurchase programs. Firms with high ownership concentration or control rights of CS are less likely to adopt share repurchase programs.

This difference suggests that control and ownership structure differently affect a firm's decision to adopt a share repurchase program. Since controlling shareholders with low ownership or low control rights are exposed to outside threats, while CS with high ownership and high control rights are protected from outside threats, the difference may result from the need for CS to secure their controlling position. In addition, the results show that firms with high foreign ownership are more likely to adopt payout programs but not share repurchase programs.

### **C. Determinants of the magnitude of share repurchases**

#### C.1. Number of shares to be purchased over total shares

<Table VI> summarizes the Tobit regression results on firms' target number of shares repurchased over total number of shares, using pooled data. As before, Panel A reports regression results using all sample firms, while Panel B reports results from firms that have had a payout policy.

<Insert Table VI around here>

Using all sample observations, Panel A shows that financial variables affect the target number to be purchased over total shares. Column 1 shows that firm size, free cash flow, and cash dividend yield all affect firms' share purchase positively and significantly. On the other hand, negative coefficients for Std\_ret and Debt\_Asset indicate that firms in need of financial flexibility and firms with high debt have lower share repurchases. These results are consistent with previous studies that share repurchases are preferred to cash dividend due to its financial flexibility. Column 2 shows that, after controlling for firms' financial conditions, chaebol affiliation lowers the number of shares repurchased. On the other hand, the adoption of managerial stock options increases shares repurchased. Columns 3 and 4 show that the coefficient for CS\_own is not significant while Columns 4 and 5 show that the coefficient for Aff\_own is significant and negative. Column 6 shows that the coefficient for CS\_control is also significant and negative. Again, firms whose controlling shareholders do not have high control rights will buy

more shares.

For the sub-sample of firms that have adopted any payout policies, Panel B of <Table VI> reports that financial variables and governance related variables affect the ratio of shares repurchased. Compared with the results in Panel A, firm's volatility, capital structure and free cash flows do not appear to be significant any longer. The results on ownership and control variables are similar to those in Panel A, although some variables have stronger effects. For example, CS\_own yields a negative and significant effect on the ratio of shares to be purchased. Again, both ownership by affiliated firms (Aff\_own) and control rights (CS\_control) affect the ratio of shares to be purchased negatively. In addition, firms with high foreign ownership show a negative effect on shares to be repurchased.

In short, firms with high ownership concentration and high control rights purchase fewer shares compared to the total number of shares. The significant, negative effects of ownership and control rights show that firms where controlling shareholders have weak control positions tend to buy back more shares. This result implies that share repurchase programs are motivated by the desire to secure controlling positions.

## C.2. Value of shares to be purchased over market value

<Table VII> summarizes the Tobit regression results on the value of shares repurchased over market value, using pooled data. Panel A reports results using the full sample and Panel B, result from a sub-sample of firms with a payout program. Both samples have similar results. Columns 1 and 2 show positive coefficients for firm size and more free cash flows. This implies that large firms and firms with high free cash flows will spend more firm resources on share repurchases. Firms with lower dividend yields spend more money on repurchases. Firms with chaebol affiliation, the presence of M&A threats and managerial stock option programs have similar effects on share repurchase programs as in <Table VI>. Chaebol affiliated firms will spend less on share repurchase, while firms with M&A threats and managerial stock option programs will spend more on share repurchases.

<Insert Table VII around here>

In Column 3, the coefficient for CS\_own is positive and significant while the coefficient for Aff\_own is negative and significant in Column 4. However, when these two variables are used together in Column 5, the coefficient for CS\_own becomes negative (although not significant) and the negative coefficient for Aff\_own is still significant. As Column 6 shows, CS\_control, the sum of CS\_own and Aff\_own, is negative and significant. The negative effects of Aff\_own and CS\_control are still significant when other governance related variables are controlled for.

The results using the sub-sample of firms that have paid out earnings are summarized in in Panel B of <Table VII>. The effects of ownership and control are still similar to those in Panel A.

### C.3. Value of shares to be purchased over total payout amount

<Table VIII> summarizes the Tobit regression results on value of shares to be repurchased over total payout amount, measuring how firms allocate their resources between share repurchases and cash dividends. Since we need information on payout to calculate the ratio, we use the sub-sample of firms with payout programs

<Insert Table VIII around here>

The results show that among firms with payout programs, large firms and firms with lower dividend yields, and firms with high market to book ratios exhibit a higher ratio of share repurchase over total payout amount. Cash flows and debt structure do not appear to affect the payout allocation between shares repurchased and cash dividends. Firms with managerial stock options allocate more money for share repurchases. The negative coefficient for chaebol affiliation is significant only if subsidiaries' ownership information is not controlled for. As shown in Columns 5 and 6, CS\_own and Aff\_own generate negative, significant effects on allocation. The negative and significant effects

of CS\_control in Columns 7 and 8 indicate that firms with lower control rights allocate more money to share repurchases. In addition, firms with high foreign ownership also spend less money on share repurchase and spend on more cash dividends. These results suggest that firms whose controlling shareholders have lower ownership or lower control rights will allocate more of the payout to share repurchases.

In summary, using all three measures for the magnitude of share repurchases, we have found that firms with lower ownership concentration and lower control rights buy more shares, and spend more money on share repurchases. Among firms that have distributed money to their shareholders, firms spend more on share repurchases when controlling shareholders' ownership and control rights are weak. These results are consistent with our hypothesis that firms are likely to engage in share repurchases in order to secure the position of the controlling shareholders when the position of controlling shareholders is weak.

#### **D. Market reaction to stock repurchase announcement**

We analyze market reaction to share repurchase announcement using a typical event study method. Among 1133 firms which announce share repurchases, we exclude firms with multiple announcement during the analysis periods. After deriving cumulative returns for the period around the announcement day, we examine the factors affecting CAR (-1,1) using OLS.

<Insert Table IX around here>

The size of share repurchases is measured in three ways: the number of shares repurchased over total number of shares outstanding (SRR), the ratio of value of shares repurchased over market value of the firm (REP), the ratio of value shares repurchased over total payout (STP).

<Table IX> summarizes the results on the analyses of market reaction. Panels A, B, and C show the results of using these three measures, SRR, REP, and STP, respectively. Similar results are shown for all three measures in Panels A, B and C. The results

consistently show that on average the markets react positively to the announcements as shown in a positive and significant coefficient for constant term in all regressions. Moreover, stock returns are higher when the size of share repurchases is larger. The tests also show that higher stock returns are associated with concentrated ownership and high control rights by controlling shareholders, or vice versa.

## **E. Discussion**

The empirical results show that a firm is less likely to adopt a stock repurchase program when its controlling family has higher ownership and control rights. And if adopted, the size of the program tends to be smaller. Stock repurchases are more likely to occur in firms where controlling shareholders have lower ownership and lower control rights. In addition, firms with high foreign ownership also are less likely to adopt share repurchase programs. Moreover, the size of the stock repurchases will tend to be larger (more shares will be repurchased, and more corporate payout will be spent on share repurchases) in firms where controlling shareholders have lower ownership and lower control rights. In addition, the event study on stock returns around share repurchase announcement periods shows positive and significant coefficients for controlling families' ownership concentration and control rights. The results suggest that stock returns are lower to share repurchase announcements in firms where controlling shareholders have lower ownership share or lower control rights, or vice versa.

These results imply that share repurchase programs may play two different roles. They signal an increase in firm value when controlling shareholders have a high ownership share. Or share repurchase can lower free cash flows and thereby lowering agency problems as well. However, when controlling shareholders have lower ownership share and weak control rights, they often manipulate corporate payout policy to benefit themselves. They adopt share repurchase programs as a way to protect their position of control. Upon the repurchase announcements in a firm with weak control rights, investors appear to consider the potential costs associated with entrenchment. When a controlling family is more secured from potential external threats and entrenched, the family is more likely to engage in value destroying activities. Therefore, investors bid a

lower price for a firm with weak control rights of the controlling family than for its counterpart with strong control rights. A lower stock return to the repurchase announcement in a firm with weak control rights is consistent with our argument that share repurchases can be used to strengthen control position of controlling families.

#### **4. Summary and conclusion**

Share repurchases can be used to signal firm performance, or to secure the position of corporate insiders. Using information on cash dividends and share repurchase announcements between 1994 and 2005, this study investigates the effects of control and ownership structure on payout decisions and the stock market's response to those decisions in an emerging market. We show whether and how control and ownership structure affects firm's pay out policies; and that control and ownership structure also affect the market's response to announcements of these payouts.

When the controlling shareholders (CS) have high ownership, their interests are more closely aligned with that of other shareholders. In this situation, share repurchases are more likely adopted to signal firm value. Cumulative abnormal returns are greater if a firm with high ownership or high control rights announces a share repurchase.

However, CS with weak control rights have an incentive to protect their control position as they can derive private benefits at the cost of other shareholders. Such incentive is larger for controlling families in an emerging market where private benefits of corporate control are high. Moreover, when controlling families have low control rights, they may need to protect their control. A firm controlled by CS with low ownership or low control rights is more likely to adopt share repurchase program, which can change ownership structure and strengthen their control. In addition, the size of these share repurchases is likely to be larger, as CS with low ownership or low control rights increase share repurchases while lowering cash dividends.

The market differentiates firms' payout policies depending on ownership structure. Stock returns are higher to a share repurchase announcement by firms where CS have

high ownership, compared to those to an announcement by firms with weak ownership and control rights. This result implies that investors consider potential costs of entrenchment when share repurchase programs are adopted in a firm where CS have lower ownership or lower control rights. In summary, firms may choose share repurchase programs to benefit controlling families with weak control rights, and lower stock returns reflect the investors' perception that the controlling families are entrenched through share repurchases.

Our results strongly support the hypothesis that share repurchase programs can play two different and contrary roles, depending on corporate control and ownership structure. In the future, this research can be extended to examine whether payout policies are affected by stronger investor protection and corporate governance. When value of corporate control is small as firm management is better monitored, the effects of control and ownership structure on share repurchase would decrease.

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- 1 Lasfer(2000), Kim, Jaemin, Ralf Schremper, and Nikhil Varaiya (2004), Huh and Park (2007) have studied share repurchase in European countries, twelve largest stock markets, Japan, respectively.
- 2 In the US, such changes trigger a debate whether stock repurchase replaces cash dividends which have been a traditional payout method, see Fama and French (2001) and Grullon and Michaely (2002)
- 3 Bagwell and Shoven (1988) and Opler and Titman (1996) show that firms consider their target leverage ratio in determining share repurchase. Jagannathan, Stephens, and Weisbach(2000), Guay and Harford (2000) show that stock repurchases are more sensitive to transitory shock in cash flows while cash dividends respond to changes in permanent components of earnings.
- 4 LLS(1999) show that outside America, family ownership and controlling minority structure are widespread. Bebchuck, Kraakman, and Triantis (2000) call such ownership structure as controlling minority structure.
- 5 It is not difficult to find second generation or third generation of founders' children in control of large business groups (chaebols) in Korea. For example, among the largest five business groups, children of the founder and former chairman are in control in four groups (Samsung, LG, SK, Hyundai), and the founder himself is in control in the rest (Lotte).
- 6 It is consistent with studies showing that share repurchase announcement returns are positively correlated with insider shareholdings in the US, see Comment and Jarrell (1991), McNally (1999), Ikenberry, Lakonishok and Vermalen (1995), Li and McNally (2003)
- 7 Murphy (1999) shows that the portion of stock options in total managerial compensation vary across countries. Analysis on components of compensation in 12 OECD countries shows that the equity based compensation proportion is the highest in the US.
- 8 According to Andrade, Mitchell and Stafford (2001), hostile mergers virtually disappeared in the US in the 1990s.
- 9 According to Joh (2003), more than 60% of all the Korean firms in her sample (including privately held firms subject to outside auditing) belong to business groups small or large.
- 10 Joh (2003) and Bae, Kang, Kim (2002)
- 11 Many studies document tunneling activities in Chaebol affiliated firms. See Joh (2003, 2004) Bae, Kang, Kim (2002)
- 12 In 1995, the government amended a law that prohibited the acquisition of more than 10% of voting shares by an outsider unless the current largest shareholder approved (See Chung and Kim 1999) Still, there was a ceiling on the acquisition that outsider can buy. For more see Nam et al. (2000)
- 13 Companies can choose to adopt a cumulative voting system in their charter.
- 14 Choi and Kim (2005)
- 15 The results do not change when we use information on ownership by large foreign investors.

**<Table I> Annual Trends of Share Repurchase in Korea**

This Table reports the number of firms which made a public announcement on share repurchase, and target ratio of repurchase. We exclude firms with missing financial statement or ownership. We also exclude share repurchase in the process of mergers, acquisitions, split offs, and preferred share purchases.

| Year | Number of listed,<br>non-financial firms<br>(A) | Number of listed,<br>non-FI firms with<br>share repurchase<br>program<br>(B) | Number of listed,<br>non-FI firms with<br>share repurchase<br>program and<br>financial<br>information<br>(C) | (C/A)<br>(%) | Target shares/total shares among firms in<br>(C) |        |                       |
|------|---|--|--|--------------|--|--------|-----------------------|
|      |   |  |  |              | Mean   | Median | Standard<br>deviation |
| 1995 | 590   | 115  | 98   | 16.61        | 3.36   | 3      | 1.9                   |
| 1996 | 654   | 138  | 119  | 18.20        | 4.21   | 3.16   | 2.83                  |
| 1997 | 669   | 163  | 144  | 21.52        | 4.41   | 3.35   | 3.91                  |
| 1998 | 656   | 95   | 93   | 14.18        | 4.8  | 3.95   | 3.33                  |
| 1999 | 637   | 74   | 63   | 9.89         | 4.67   | 3.95   | 3.31                  |
| 2000 | 628   | 177  | 169  | 26.91        | 7.28   | 5.81   | 5.6                   |
| 2001 | 624   | 93   | 93   | 14.90        | 6.79   | 5.59   | 5.4                   |
| 2002 | 620   | 94   | 88   | 14.19        | 6.21   | 4.98   | 5.8                   |
| 2003 | 623   | 123  | 119  | 19.10        | 5.96   | 4.17   | 5.3                   |
| 2004 | 627   | 102  | 95   | 15.15        | 4.98   | 3.82   | 4.82                  |
| 2005 | 649   | 58   | 52   | 8.01         | 3.74   | 2.69   | 4.02                  |

**<Table II> Official objectives for share repurchase**

This Table summarizes the official objectives of share repurchase programs in the public disclosure and the number of firms in each category. Firms are allowed to report multiple goals.

| Year | Incentive Provision | Strengthening Control rights | Signaling firm value | Others <sup>a</sup> | Sum |
|------|---------------------|------------------------------|----------------------|---------------------|-----|
| 1995 | 1                   | 10                           | 46                   | 70                  | 115 |
| 1996 | 1                   | 26                           | 93                   | 51                  | 138 |
| 1997 | 3                   | 9                            | 113                  | 56                  | 163 |
| 1998 | 3                   | 15                           | 81                   | 12                  | 95  |
| 1999 | 6                   | 7                            | 66                   | 2                   | 74  |
| 2000 | 4                   | 7                            | 173                  | 5                   | 177 |
| 2001 | 8                   | 3                            | 83                   | 8                   | 93  |
| 2002 | 13                  | 4                            | 75                   | 12                  | 94  |
| 2003 | 16                  | 3                            | 93                   | 24                  | 123 |
| 2004 | 15                  | 2                            | 73                   | 27                  | 102 |
| 2005 | 14                  | 1                            | 40                   | 10                  | 58  |

a: Employ stock ownership program, and other incentive provisions.

**<Table III> Summary Statistics**

Depending on the adoption of cash dividend and share repurchase program, we divided the sample in two groups and compare the mean differences of these two groups. Size is log value of asset, Free\_Cash is operating income and depreciation divided by total asset, Debt\_Asset is debt over asset, MTB represents market value over book value, STD\_RET is standard deviation of rate of stock return in the previous year. CS\_own is ownership by controlling shareholders and family members, CS\_control is the sum of CS\_own and interlocking ownership by subsidiaries. Foreign\_own is the sum of all foreign shareholders' ownership. SRR is the targeted number of shares over total shares, REP represents the ratio of share repurchase over market value, STP is the ratio of share repurchase over total dividends (which is the sum of cash dividend and share repurchase). \*, \*\*,\*\*\* represents a significance level at 10%, 5% and 1%, respectively.

| Variable       | All firms |      | Firms with Payout |      | Firms with Cash dividends |      | Firms without Cash dividends |      | t -Value (A)-(B) | Firms with Stock repurchase |      | Firms without Stock repurchase |      | t-Value (C)-(D) |
|----------------|-----------|------|-------------------|------|---------------------------|------|------------------------------|------|------------------|-----------------------------|------|--------------------------------|------|-----------------|
|                | Mean      | STD  | Mean              | STD  | Mean (A)                  | STD  | Mean (B)                     | STD  |                  | Mean (C)                    | STD  | Mean (D)                       | STD  |                 |
| Firm_Size      | 5.35      | 1.42 | 5.46              | 1.38 | 5.45                      | 1.38 | 5.14                         | 1.47 | 8.06 ***         | 5.69                        | 1.49 | 5.27                           | 1.39 | 8.93 ***        |
| Free_Cash      | 0.05      | 0.08 | 0.07              | 0.05 | 0.07                      | 0.05 | 0.01                         | 0.10 | 31.24 ***        | 0.07                        | 0.05 | 0.05                           | 0.08 | 10.43 ***       |
| Debt_Asset     | 0.58      | 0.20 | 0.53              | 0.18 | 0.53                      | 0.18 | 0.69                         | 0.19 | -31.55 ***       | 0.54                        | 0.18 | 0.59                           | 0.20 | -7.04 ***       |
| MTB            | 0.92      | 1.96 | 0.76              | 0.72 | 0.76                      | 0.72 | 1.25                         | 3.25 | -9.25 ***        | 0.85                        | 0.83 | 0.93                           | 2.14 | -1.3            |
| Dividend-Yield | 0.02      | 0.03 | 0.03              | 0.03 | 0.03                      | 0.03 | 0.00                         | 0.00 | 55.81 ***        | 0.03                        | 0.03 | 0.02                           | 0.03 | 9.12 ***        |
| STD_RET        | 3.80      | 1.43 | 3.40              | 1.18 | 3.38                      | 1.17 | 4.66                         | 1.55 | -35.94 ***       | 3.50                        | 1.19 | 3.87                           | 1.48 | -7.92 ***       |
| CS_own         | 0.19      | 0.16 | 0.21              | 0.16 | 0.21                      | 0.16 | 0.15                         | 0.15 | 14.93 ***        | 0.20                        | 0.15 | 0.19                           | 0.16 | 1.08            |
| AFF_own        | 0.10      | 0.16 | 0.10              | 0.15 | 0.10                      | 0.15 | 0.09                         | 0.16 | 2.12 **          | 0.08                        | 0.13 | 0.10                           | 0.16 | -4.02 ***       |
| CS_control     | 0.29      | 0.17 | 0.31              | 0.16 | 0.32                      | 0.16 | 0.24                         | 0.17 | 16.06 ***        | 0.28                        | 0.16 | 0.29                           | 0.17 | -2.65 ***       |
| Foreign_own    | 0.06      | 0.12 | 0.08              | 0.13 | 0.08                      | 0.13 | 0.03                         | 0.07 | 17.54 ***        | 0.08                        | 0.12 | 0.06                           | 0.11 | 6.25 ***        |
| Chaebol        | 0.21      | 0.41 | 0.22              | 0.41 | 0.21                      | 0.41 | 0.20                         | 0.40 | 1.03             | 0.23                        | 0.42 | 0.20                           | 0.40 | 2.23 **         |
| M&A            | 0.00      | 0.06 | 0.00              | 0.06 | 0.00                      | 0.06 | 0.01                         | 0.07 | -0.95            | 0.01                        | 0.08 | 0.00                           | 0.06 | 1.36            |
| Stock option   | 0.11      | 0.32 | 0.10              | 0.30 | 0.10                      | 0.30 | 0.15                         | 0.35 | -5.87 ***        | 0.13                        | 0.34 | 0.11                           | 0.31 | 1.90 *          |
| N observations | 6148      |      | 4267              |      | 4142                      |      | 2006                         |      |                  | 1133                        |      | 5015                           |      |                 |

|                | Mean   | Standard Deviation |
|----------------|--------|--------------------|
| SRR            | 0.0529 | 0.0462             |
| REP            | 0.0746 | 0.1089             |
| STP            | 0.6374 | 0.2399             |
| N observations | 1133   |                    |

a: These information on SRR, REP and STP are based on the firms with share repurchase programs.

**<Table IV> Logit Regression of firms' decision to pay cash dividends**

Panel A reports the logit regression results of firms' decision to pay cash dividends using all sample observations, while Panel B reports the results using the firms which have adopted any payout program. Dependent variable takes 1 when a firm has adopted cash dividends, otherwise zero. Firm\_size is a log value of asset, Free\_cash is operating income and depreciation divided by total assets, Debt\_Asset is debt over asset, MTB is market value over book value. CS\_own is the controlling shareholders and families' ownership and Aff\_own is interlocking ownership by subsidiaries. CS\_control is the sum of CS\_own and Aff\_own. Foreign\_own is the sum of all foreign investors' ownership. STD\_RET is standard deviation of rate of stock return in the previous year. Chaebol is a dummy variable that takes 1 when a firm belongs to the large Korean business groups. M&A is a dummy variable that takes 1 when a firm faces a takeover threat in a given year. Stock option is a dummy variable that takes 1 when a firm adopts a managerial stock option plan in a given year. Numbers in parentheses show t-value and \*, \*\*, \*\*\* represents a significance level at 10%, 5% and 1%, respectively.

| Panel A                     | (1)                     | (2)                     | (3)                     | (4)                     | (5)                     | (6)                     | (7)                     | (8)                     |
|-----------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| <b>Constant</b>             | 6.5347 ***<br>(19.36)   | 6.2911 ***<br>(18.18)   | 5.2632 ***<br>(14.45)   | 6.5380 ***<br>(19.32)   | 4.9942 ***<br>(13.42)   | 5.5168 ***<br>(15.23)   | 4.8436 ***<br>(12.75)   | 5.1600 ***<br>(13.78)   |
| <b>STD_RET</b>              | -0.9624 ***<br>(-18.35) | -0.9652 ***<br>(-18.38) | -0.8936 ***<br>(-16.67) | -0.9481 ***<br>(-18.04) | -0.8831 ***<br>(-16.42) | -0.9063 ***<br>(-17)    | -0.8872 ***<br>(-16.49) | -0.9073 ***<br>(-17)    |
| <b>Firm_Size</b>            | 0.1424 ***<br>(4.46)    | 0.2249 ***<br>(5.93)    | 0.1611 ***<br>(4.48)    | 0.0867 **<br>(2.46)     | 0.1536 ***<br>(4.26)    | 0.0983 ***<br>(2.81)    | 0.2116 ***<br>(5.18)    | 0.1943 ***<br>(4.78)    |
| <b>Free_Cash</b>            | 19.6933 ***<br>(21.18)  | 19.7122 ***<br>(21.16)  | 19.5062 ***<br>(20.66)  | 19.3058 ***<br>(20.74)  | 19.4959 ***<br>(20.57)  | 19.3376 ***<br>(20.53)  | 19.4983 ***<br>(20.56)  | 19.3799 ***<br>(20.53)  |
| <b>Debt_Asset</b>           | -7.1421 ***<br>(-23.72) | -7.1525 ***<br>(-23.71) | -6.7918 ***<br>(-22.14) | -6.9218 ***<br>(-22.74) | -6.7287 ***<br>(-21.91) | -6.7371 ***<br>(-22.06) | -6.7174 ***<br>(-21.86) | -6.7185 ***<br>(-21.95) |
| <b>MTB</b>                  | -0.1141 ***<br>(-2.59)  | -0.1006 **<br>(-2.32)   | -0.1308 ***<br>(-2.83)  | -0.1424 ***<br>(-3.06)  | -0.1336 ***<br>(-2.9)   | -0.1425 ***<br>(-3.1)   | -0.1255 ***<br>(-2.73)  | -0.1331 ***<br>(-2.89)  |
| <b>Chaebol</b>              |                         | -0.3951 ***<br>(-3.53)  |                         |                         |                         |                         | -0.3194 ***<br>(-2.68)  | -0.4935 ***<br>(-4.33)  |
| <b>M&amp;A</b>              |                         | -0.5217<br>(-0.94)      |                         |                         |                         |                         | -0.3611<br>(-0.66)      | -0.4499<br>(-0.83)      |
| <b>Stock Option</b>         |                         | -0.2839 **<br>(-2.19)   |                         |                         |                         |                         | -0.2376 *<br>(-1.8)     | -0.2364 *<br>(-1.8)     |
| <b>CS_own</b>               |                         |                         | 2.5157 ***<br>(9.08)    |                         | 2.9929 ***<br>(9.6)     |                         | 2.8782 ***<br>(9.17)    |                         |
| <b>Aff_own</b>              |                         |                         |                         | -0.2358<br>(-0.91)      | 1.0020 ***<br>(3.47)    |                         | 1.1559 ***<br>(3.87)    |                         |
| <b>CS_control</b>           |                         |                         |                         |                         |                         | 1.9138 ***<br>(7.55)    |                         | 1.9761 ***<br>(7.72)    |
| <b>Foreign_own</b>          |                         |                         | 2.5665 ***<br>(5.1)     | 2.3121 ***<br>(4.57)    | 2.6094 ***<br>(5.13)    | 2.5272 ***<br>(4.89)    | 2.6868 ***<br>(5.23)    | 2.6425 ***<br>(5.06)    |
| <b>Year Dummy</b>           | Yes                     | yes                     | yes                     | yes                     | Yes                     | yes                     | yes                     | yes                     |
| <b>Industry Dummy</b>       | Yes                     | yes                     | yes                     | yes                     | Yes                     | yes                     | yes                     | yes                     |
| <b>Pseudo R<sup>2</sup></b> | 0.4941                  | 0.4968                  | 0.5094                  | 0.4975                  | 0.5111                  | 0.5056                  | 0.5128                  | 0.5091                  |
| <b>N observations</b>       | 6148                    | 6148                    | 6148                    | 6148                    | 6148                    | 6148                    | 6148                    | 6148                    |

| <b>Panel B</b>              | <b>(1)</b>             | <b>(2)</b>             | <b>(3)</b>             | <b>(4)</b>             | <b>(5)</b>             | <b>(6)</b>             | <b>(7)</b>             | <b>(8)</b>             |
|-----------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| <b>Constant</b>             | 11.9821 ***<br>(8.41)  | 11.6754 ***<br>(8.09)  | 10.8039 ***<br>(7.33)  | 12.0184 ***<br>(8.4)   | 10.5863 ***<br>(7.12)  | 11.1436 ***<br>(7.57)  | 10.4194 ***<br>(6.94)  | 10.7435 ***<br>(7.19)  |
| <b>STD_RET</b>              | -0.7373 ***<br>(-5.91) | -0.7383 ***<br>(-5.88) | -0.6787 ***<br>(-5.36) | -0.7276 ***<br>(-5.83) | -0.6816 ***<br>(-5.33) | -0.7142 ***<br>(-5.59) | -0.6840 ***<br>(-5.32) | -0.7119 ***<br>(-5.55) |
| <b>Firm_Size</b>            | -0.0657<br>(-0.82)     | 0.0105<br>(0.11)       | -0.0466<br>(-0.52)     | -0.1231<br>(-1.37)     | -0.0512<br>(-0.57)     | -0.1015<br>(-1.15)     | -0.0019<br>(-0.02)     | -0.0156<br>(-0.15)     |
| <b>Free_Cash</b>            | 13.7341 ***<br>(6.03)  | 13.5390 ***<br>(5.94)  | 13.5733 ***<br>(5.79)  | 13.5872 ***<br>(5.9)   | 13.4775 ***<br>(5.73)  | 13.4619 ***<br>(5.78)  | 13.3025 ***<br>(5.65)  | 13.2440 ***<br>(5.68)  |
| <b>Debt_Asset</b>           | -5.8436 ***<br>(-6.83) | -5.7778 ***<br>(-6.75) | -5.5448 ***<br>(-6.4)  | -5.6545 ***<br>(-6.58) | -5.5097 ***<br>(-6.34) | -5.5506 ***<br>(-6.4)  | -5.4602 ***<br>(-6.27) | -5.4676 ***<br>(-6.29) |
| <b>MTB</b>                  | -0.1549<br>(-1.16)     | -0.1338<br>(-0.97)     | -0.1809<br>(-1.36)     | -0.1919<br>(-1.46)     | -0.1725<br>(-1.29)     | -0.1734<br>(-1.32)     | -0.1551<br>(-1.14)     | -0.1538<br>(-1.14)     |
| <b>Chaebol</b>              |                        | -0.3063<br>(-1.14)     |                        |                        |                        |                        | -0.2065<br>(-0.72)     | -0.3650<br>(-1.34)     |
| <b>M&amp;A</b>              |                        | -0.0365<br>(-0.03)     |                        |                        |                        |                        | -0.0798<br>(-0.07)     | -0.1944<br>(-0.18)     |
| <b>Stock Option</b>         |                        | -0.4043<br>(-1.27)     |                        |                        |                        |                        | -0.3809<br>(-1.19)     | -0.3920<br>(-1.22)     |
| <b>CS_own</b>               |                        |                        | 2.3146 ***<br>(3.12)   |                        | 2.7816 ***<br>(3.35)   |                        | 2.6679 ***<br>(3.19)   |                        |
| <b>Aff_own</b>              |                        |                        |                        | -0.1211<br>(-0.19)     | 0.9264<br>(1.3)        |                        | 1.0412<br>(1.4)        |                        |
| <b>CS_control</b>           |                        |                        |                        |                        |                        | 1.7309 ***<br>(2.65)   |                        | 1.7752 ***<br>(2.7)    |
| <b>Foreign_own</b>          |                        |                        | 2.1861 *<br>(1.76)     | 1.9845<br>(1.55)       | 2.2329 *<br>(1.79)     | 2.1472 *<br>(1.69)     | 2.2896<br>(1.81)       | 2.2424 *<br>(1.74)     |
| <b>Year Dummy</b>           | Yes                    | yes                    | yes                    | yes                    | Yes                    | yes                    | yes                    | yes                    |
| <b>Industry Dummy</b>       | Yes                    | yes                    | yes                    | yes                    | Yes                    | yes                    | yes                    | yes                    |
| <b>Pseudo R<sup>2</sup></b> | 0.4599                 | 0.4637                 | 0.4748                 | 0.463                  | 0.4764                 | 0.4706                 | 0.4788                 | 0.4751                 |
| <b>N observations</b>       | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   |

**<Table V> Logit Regression of firms' decision to adopt share repurchase program**

Panel A reports the results using all sample observations Panel B uses firms which have adopted any payout program. Dependent variable takes 1 when a firm has share repurchase program, otherwise zero. Firm\_size is log value of asset, Free\_cash is operating income and depreciation divided by total assets, Debt\_Asset is debt over asset, MTB represents market value over book value. CS\_own is the controlling shareholders and families' ownership, and Aff\_own is interlocking ownership by subsidiaries. CS\_control is the sum of CS\_own and Aff\_own. Foreign\_own is the sum of all foreign investors' ownership. STD\_RET is standard deviation of rate of stock return in the previous year. Chaebol is a dummy variable that takes 1 when a firm belongs to the large Korean business groups. M&A is a dummy variable that takes 1 when a firm faces a takeover threat in a given year. Stock option is a dummy variable that takes 1 when a firm adopts a managerial stock option plan in a given year. Numbers in parentheses show t-value and \*, \*\*,\*\*\* represents a significance level at 10%, 5% and 1%, respectively.

| <b>Panel A</b>              | <b>(1)</b>             | <b>(2)</b>             | <b>(3)</b>             | <b>(4)</b>             | <b>(5)</b>             | <b>(6)</b>             | <b>(7)</b>             | <b>(8)</b>             |
|-----------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| <b>Constant</b>             | -2.8321 ***<br>(-9.31) | -3.0945 ***<br>(-9.83) | -3.0799 ***<br>(-9.26) | -2.8091 ***<br>(-9.21) | -2.6922 ***<br>(-7.9)  | -2.8768 ***<br>(-8.23) | -2.3492 ***<br>(-7.12) | -2.6607 ***<br>(-7.75) |
| <b>STD_RET</b>              | -0.1646 ***<br>(-3.37) | -0.1732 ***<br>(-3.53) | -0.1553 ***<br>(-3.16) | -0.1667 ***<br>(-3.39) | -0.1717 ***<br>(-3.47) | -0.1786 ***<br>(-3.59) | -0.1859 ***<br>(-3.78) | -0.1907 ***<br>(-3.86) |
| <b>Firm_Size</b>            | 0.2412 ***<br>(8.67)   | 0.2835 ***<br>(8.65)   | 0.2649 ***<br>(8.37)   | 0.2704 ***<br>(8.74)   | 0.2647 ***<br>(8.32)   | 0.2847 ***<br>(8.01)   | 0.2334 ***<br>(7.58)   | 0.2753 ***<br>(7.81)   |
| <b>Free_Cash</b>            | 4.5334 ***<br>(7.11)   | 4.5919 ***<br>(7.18)   | 4.6019 ***<br>(7.03)   | 4.6301 ***<br>(7.05)   | 4.6444 ***<br>(7.06)   | 4.7041 ***<br>(7.14)   | 4.6872 ***<br>(7.14)   | 4.7418 ***<br>(7.21)   |
| <b>Debt_Asset</b>           | -1.8703 ***<br>(-7.81) | -1.7903 ***<br>(-7.42) | -1.8603 ***<br>(-7.55) | -1.8943 ***<br>(-7.69) | -1.9147 ***<br>(-7.73) | -1.8728 ***<br>(-7.52) | -1.9831 ***<br>(-8.04) | -1.904 ***<br>(-7.66)  |
| <b>MTB</b>                  | 0.0179<br>(0.95)       | 0.0158<br>(0.81)       | 0.0199<br>(1.06)       | 0.0226<br>(1.22)       | 0.0224<br>(1.2)        | 0.0203<br>(1.08)       | 0.0195<br>(1.04)       | 0.0177<br>(0.93)       |
| <b>Dividend yield</b>       | 6.561 ***<br>(4.48)    | 7.018 ***<br>(4.7)     | 6.380 ***<br>(4.34)    | 7.1359 ***<br>(4.75)   | 7.2276 ***<br>(4.79)   | 7.4824 ***<br>(4.89)   | 7.0462 ***<br>(4.72)   | 7.3767 ***<br>(4.86)   |
| <b>Chaebol</b>              |                        | -0.3552 ***<br>(-3.4)  |                        |                        |                        | -0.2027 *<br>(-1.85)   |                        | -0.3209 ***<br>(-3.05) |
| <b>M&amp;A</b>              |                        | 0.6419<br>(1.32)       |                        |                        |                        | 0.6204<br>(1.28)       |                        | 0.5867<br>(1.21)       |
| <b>Stock Option</b>         |                        | 0.3264 ***<br>(2.77)   |                        |                        |                        | 0.3033 **<br>(2.54)    |                        | 0.2901 **<br>(2.44)    |
| <b>CS_own</b>               |                        |                        | 0.461 *<br>(1.9)       |                        | -0.2093<br>(-0.77)     | -0.1511<br>(-0.55)     |                        |                        |
| <b>Aff_own</b>              |                        |                        |                        | -1.4613 ***<br>(-5.59) | -1.5548 ***<br>(-5.39) | -1.3874 ***<br>(-4.68) |                        |                        |
| <b>CS_control</b>           |                        |                        |                        |                        |                        |                        | -0.8621 ***<br>(-3.71) | -0.7292 ***<br>(-3.1)  |
| <b>Foreign_own</b>          |                        |                        | -0.1415<br>(-0.42)     | -0.1528<br>(-0.45)     | -0.1846<br>(-0.54)     | -0.2298<br>(-0.67)     | -0.3241<br>(-0.97)     | -0.3411<br>(-1.01)     |
| <b>Year Dummy</b>           | yes                    | Yes                    | yes                    | yes                    | yes                    | yes                    | yes                    | yes                    |
| <b>Industry Dummy</b>       | yes                    | Yes                    | yes                    | yes                    | yes                    | yes                    | yes                    | yes                    |
| <b>Pseudo R<sup>2</sup></b> | 0.1367                 | 0.1413                 | 0.1377                 | 0.145                  | 0.1451                 | 0.1477                 | 0.1402                 | 0.1438                 |
| <b>N observations</b>       | 6148                   | 6148                   | 6148                   | 6148                   | 6148                   | 6148                   | 6148                   | 6148                   |

| <b>Panel B</b>              | <b>(1)</b>             | <b>(2)</b>             | <b>(3)</b>             | <b>(4)</b>             | <b>(5)</b>             | <b>(6)</b>             | <b>(7)</b>             | <b>(8)</b>             |
|-----------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| <b>Constant</b>             | -2.9668 ***<br>(-9.05) | -3.2002 ***<br>(-9.38) | -2.9022 ***<br>(-8.13) | -3.0000 ***<br>(-9.13) | -2.4688 ***<br>(-6.76) | -2.6214 ***<br>(-6.98) | -2.2332 ***<br>(-6.3)  | -2.4836 ***<br>(-6.72) |
| <b>STD_RET</b>              | 0.0282<br>(0.53)       | 0.0247<br>(0.46)       | 0.0187<br>(0.35)       | 0.0282<br>(0.52)       | 0.0154<br>(0.28)       | 0.0104<br>(0.19)       | 0.0069<br>(0.13)       | 0.0047<br>(0.09)       |
| <b>Firm_Size</b>            | 0.193 ***<br>(6.54)    | 0.2326 ***<br>(6.61)   | 0.2278 ***<br>(6.66)   | 0.2524 ***<br>(7.54)   | 0.225 ***<br>(6.53)    | 0.2467 ***<br>(6.37)   | 0.2043 ***<br>(6.1)    | 0.2409 ***<br>(6.25)   |
| <b>Free_Cash</b>            | 1.073<br>(1.48)        | 1.1786<br>(1.62)       | 1.4954 **<br>(2.01)    | 1.4548 *<br>(1.94)     | 1.4947 **<br>(1.99)    | 1.6021 **<br>(2.13)    | 1.5275 **<br>(2.04)    | 1.6286 **<br>(2.17)    |
| <b>Debt_Asset</b>           | -0.0229<br>(-0.08)     | 0.0336<br>(0.12)       | -0.1712<br>(-0.62)     | -0.149<br>(-0.54)      | -0.2187<br>(-0.78)     | -0.1907<br>(-0.68)     | -0.2514<br>(-0.9)      | -0.201<br>(-0.72)      |
| <b>MTB</b>                  | 0.1793 ***<br>(3.22)   | 0.1671 ***<br>(2.98)   | 0.2082 ***<br>(3.62)   | 0.2117 ***<br>(3.64)   | 0.2052 ***<br>(3.51)   | 0.1949 ***<br>(3.32)   | 0.2009 ***<br>(3.46)   | 0.1925 ***<br>(3.29)   |
| <b>Dividend yield</b>       | -8.213 ***<br>(-4.36)  | -7.8392 ***<br>(-4.15) | -8.6836 ***<br>(-4.58) | -7.9214 ***<br>(-4.15) | -7.8319 ***<br>(-4.09) | -7.6753 ***<br>(-4.00) | -8.1372 ***<br>(-4.27) | -7.8824 ***<br>(-4.12) |
| <b>Chaebol</b>              |                        | -0.3153 ***<br>(-2.87) |                        |                        |                        | -0.1908 *<br>(-1.65)   |                        | -0.262 **<br>(-2.36)   |
| <b>M&amp;A</b>              |                        | 0.6632<br>(1.22)       |                        |                        |                        | 0.6776<br>(1.24)       |                        | 0.6491<br>(1.19)       |
| <b>Stock Option</b>         |                        | 0.2796 **<br>(2.21)    |                        |                        |                        | 0.2298 *<br>(1.79)     |                        | 0.2224 *<br>(1.74)     |
| <b>CS_own</b>               |                        |                        | -0.136<br>(-0.53)      |                        | -0.9596 ***<br>(-3.3)  | -0.9238 ***<br>(-3.14) |                        |                        |
| <b>Aff_own</b>              |                        |                        |                        | -1.3807 ***<br>(-5.1)  | -1.8177 ***<br>(-6.02) | -1.6712 ***<br>(-5.4)  |                        |                        |
| <b>CS_control</b>           |                        |                        |                        |                        |                        |                        | -1.3773 ***<br>(-5.52) | -1.2758 ***<br>(-5.05) |
| <b>Foreign_own</b>          |                        |                        | -0.9938 ***<br>(-2.74) | -0.8849 **<br>(-2.42)  | -1.0307 ***<br>(-2.8)  | -1.0766 ***<br>(-2.91) | -1.1251 ***<br>(-3.09) | -1.1494 ***<br>(-3.14) |
| <b>Year Dummy</b>           | yes                    | Yes                    | yes                    | Yes                    | yes                    | yes                    | yes                    | yes                    |
| <b>Industry Dummy</b>       | yes                    | Yes                    | yes                    | Yes                    | yes                    | yes                    | yes                    | yes                    |
| <b>Pseudo R<sup>2</sup></b> | 0.0922                 | 0.0966                 | 0.0947                 | 0.1034                 | 0.1069                 | 0.1091                 | 0.1045                 | 0.1074                 |
| <b>N observations</b>       | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   |

<Table VI> Tobit Regression of target number of shares to be repurchased over total number of shares

Panel A reports the results using all sample observations Panel B uses firms which have adopted any payout program. Dependent variable is the ratio of target number of shares to be purchased over total shares when firm has a share repurchase program, otherwise zero. Firm\_size is log value of asset, Free\_cash is operating income and depreciation divided by total assets, Debt\_Asset is debt over asset, MTB represents market value over book value. CS\_own is the controlling shareholders and families' ownership, and Aff\_own is interlocking ownership by subsidiaries. CS\_control is the sum of CS\_own and Aff\_own. Foreign\_own is the sum of all foreign investors' ownership. STD\_RET is standard deviation of rate of stock return in the previous year. Chaebol is a dummy variable that takes 1 when a firm belongs to the large Korean business groups. M&A threat is a dummy variable that takes 1 when a firm faces a takeover threat in a given year. Stock option is a dummy variable that takes 1 when a firm adopts a managerial stock option plan in a given year. Numbers in parentheses show t-value and \*, \*\*,\*\*\* represents a significance level at 10%, 5% and 1%, respectively.

| Panel A                     | (1)                    | (2)                     | (3)                    | (4)                    | (5)                    | (6)                    | (7)                    | (8)                    |
|-----------------------------|------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| <b>Constant</b>             | -0.1465 ***<br>(-9.69) | -0.1585 ***<br>(-10.15) | -0.1540 ***<br>(-9.32) | -0.1450 ***<br>(-9.64) | -0.1362 ***<br>(-8.14) | -0.1453 ***<br>(-8.48) | -0.1221 ***<br>(-7.54) | -0.1368 ***<br>(-8.11) |
| <b>STD_RET</b>              | -0.0069 ***<br>(-3)    | -0.0074 ***<br>(-3.19)  | -0.0067 ***<br>(-2.87) | -0.0069 ***<br>(-3)    | -0.0073 ***<br>(-3.14) | -0.0077 ***<br>(-3.3)  | -0.0080 ***<br>(-3.45) | -0.0083 ***<br>(-3.57) |
| <b>Firm_Size</b>            | 0.0108 ***<br>(7.81)   | 0.0126 ***<br>(7.74)    | 0.0121 ***<br>(7.62)   | 0.0125 ***<br>(8.15)   | 0.0121 ***<br>(7.65)   | 0.0130 ***<br>(7.37)   | 0.0107 ***<br>(7.03)   | 0.0125 ***<br>(7.17)   |
| <b>Free_Cash</b>            | 0.1953 ***<br>(6.22)   | 0.1965 ***<br>(6.27)    | 0.2015 ***<br>(6.27)   | 0.2000 ***<br>(6.24)   | 0.2012 ***<br>(6.28)   | 0.2041 ***<br>(6.38)   | 0.2049 ***<br>(6.41)   | 0.2069 ***<br>(6.47)   |
| <b>Debt_Asset</b>           | -0.0851 ***<br>(-7.18) | -0.0813 ***<br>(-6.85)  | -0.0868 ***<br>(-7.13) | -0.0873 ***<br>(-7.21) | -0.0887 ***<br>(-7.29) | -0.0868 ***<br>(-7.12) | -0.0915 ***<br>(-7.53) | -0.0881 ***<br>(-7.23) |
| <b>MTB</b>                  | 0.0002<br>(0.13)       | -0.0001<br>(-0.06)      | 0.0003<br>(0.29)       | 0.0005<br>(0.44)       | 0.0005<br>(0.42)       | 0.0003<br>(0.24)       | 0.0003<br>(0.27)       | 0.0001<br>(0.11)       |
| <b>Dividend yield</b>       | 0.4036 ***<br>(5.65)   | 0.4236 ***<br>(5.94)    | 0.3935 ***<br>(5.49)   | 0.4232 ***<br>(5.9)    | 0.4291 ***<br>(5.97)   | 0.4390 ***<br>(6.12)   | 0.4223 ***<br>(5.88)   | 0.4352 ***<br>(6.07)   |
| <b>Chaebol</b>              |                        | -0.0167 ***<br>(-3.26)  |                        |                        |                        | -0.0102 *<br>(-1.9)    |                        | -0.0149 ***<br>(-2.9)  |
| <b>M&amp;A</b>              |                        | 0.0318<br>(1.33)        |                        |                        |                        | 0.0311<br>(1.3)        |                        | 0.0301<br>(1.26)       |
| <b>Stock Option</b>         |                        | 0.0191 ***<br>(3.35)    |                        |                        |                        | 0.0180 ***<br>(3.13)   |                        | 0.0178 ***<br>(3.1)    |
| <b>CS_own</b>               |                        |                         | 0.0142<br>(1.18)       |                        | -0.0157<br>(-1.18)     | -0.0127<br>(-0.95)     |                        |                        |
| <b>Aff_own</b>              |                        |                         |                        | -0.0634 ***<br>(-5.09) | -0.0700 ***<br>(-5.12) | -0.0609 ***<br>(-4.33) |                        |                        |
| <b>CS_control</b>           |                        |                         |                        |                        |                        |                        | -0.0426 ***<br>(-3.78) | -0.0356 ***<br>(-3.13) |
| <b>Foreign_own</b>          |                        |                         | -0.0174<br>(-1.03)     | -0.0179<br>(-1.06)     | -0.0203<br>(-1.19)     | -0.0242<br>(-1.42)     | -0.0253<br>(-1.5)      | -0.0281 *<br>(-1.66)   |
| <b>Year Dummy</b>           | Yes                    | yes                     | Yes                    | yes                    | yes                    | Yes                    | yes                    | yes                    |
| <b>Industry Dummy</b>       | Yes                    | yes                     | Yes                    | yes                    | yes                    | Yes                    | yes                    | yes                    |
| <b>Pseudo R<sup>2</sup></b> | 0.3618                 | 0.3767                  | 0.3637                 | 0.3814                 | 0.3823                 | 0.3918                 | 0.3726                 | 0.3848                 |
| <b>N observations</b>       | 6148                   | 6148                    | 6148                   | 6148                   | 6148                   | 6148                   | 6148                   | 6148                   |

| <b>Panel B</b>              | <b>(1)</b>             | <b>(2)</b>             | <b>(3)</b>             | <b>(4)</b>             | <b>(5)</b>             | <b>(6)</b>             | <b>(7)</b>             | <b>(8)</b>             |
|-----------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| <b>Constant</b>             | -0.1443 ***<br>(-9.41) | -0.1539 ***<br>(-9.67) | -0.1358 ***<br>(-8.15) | -0.1450 ***<br>(-9.49) | -0.1150 ***<br>(-6.84) | -0.1219 ***<br>(-7.07) | -0.1068 ***<br>(-6.55) | -0.1174 ***<br>(-6.9)  |
| <b>STD_RET</b>              | 0.0031<br>(1.25)       | 0.0028<br>(1.13)       | 0.0025<br>(1)          | 0.0032<br>(1.29)       | 0.0024<br>(0.99)       | 0.0021<br>(0.83)       | 0.0021<br>(0.85)       | 0.0018<br>(0.74)       |
| <b>Firm_Size</b>            | 0.0080 ***<br>(5.79)   | 0.0095 ***<br>(5.78)   | 0.0093 ***<br>(5.82)   | 0.0107 ***<br>(6.9)    | 0.0091 ***<br>(5.72)   | 0.0099 ***<br>(5.55)   | 0.0084 ***<br>(5.4)    | 0.0097 ***<br>(5.45)   |
| <b>Free_Cash</b>            | 0.0243<br>(0.71)       | 0.0287<br>(0.84)       | 0.0447<br>(1.29)       | 0.0397<br>(1.14)       | 0.0428<br>(1.24)       | 0.0482<br>(1.39)       | 0.0450<br>(1.3)        | 0.0499<br>(1.44)       |
| <b>Debt_Asset</b>           | 0.0063<br>(0.5)        | 0.0084<br>(0.67)       | -0.0015<br>(-0.12)     | 0.0003<br>(0.03)       | -0.0031<br>(-0.24)     | -0.0023<br>(-0.18)     | -0.0042<br>(-0.33)     | -0.0027<br>(-0.21)     |
| <b>MTB</b>                  | 0.0042 *<br>(1.67)     | 0.0032<br>(1.3)        | 0.0052 **<br>(2.06)    | 0.0053 **<br>(2.1)     | 0.0048 *<br>(1.91)     | 0.0041<br>(1.62)       | 0.0047 *<br>(1.87)     | 0.0040<br>(1.59)       |
| <b>Dividend yield</b>       | -0.2749 ***<br>(-3.34) | -0.2524 ***<br>(-3.08) | -0.2975 ***<br>(-3.61) | -0.2580 ***<br>(-3.13) | -0.2520 ***<br>(-3.06) | -0.2409 ***<br>(-2.93) | -0.2638 ***<br>(-3.21) | -0.2487 ***<br>(-3.03) |
| <b>Chaebol</b>              |                        | -0.0139 ***<br>(-2.72) |                        |                        |                        | -0.0086<br>(-1.63)     |                        | -0.0110 **<br>(-2.15)  |
| <b>M&amp;A</b>              |                        | 0.0292<br>(1.18)       |                        |                        |                        | 0.0292<br>(1.19)       |                        | 0.0285<br>(1.16)       |
| <b>Stock Option</b>         |                        | 0.0172 ***<br>(2.95)   |                        |                        |                        | 0.0151 ***<br>(2.58)   |                        | 0.0150 ***<br>(2.56)   |
| <b>CS_own</b>               |                        |                        | -0.0163<br>(-1.35)     |                        | -0.0535 ***<br>(-3.97) | -0.0510 ***<br>(-3.77) |                        |                        |
| <b>Aff_own</b>              |                        |                        |                        | -0.0596 ***<br>(-4.81) | -0.0834 ***<br>(-6.05) | -0.0758 ***<br>(-5.37) |                        |                        |
| <b>CS_control</b>           |                        |                        |                        |                        |                        |                        | -0.0682 ***<br>(-5.91) | -0.0627 ***<br>(-5.4)  |
| <b>Foreign_own</b>          |                        |                        | -0.0494 ***<br>(-2.93) | -0.0436 ***<br>(-2.59) | -0.0516 ***<br>(-3.05) | -0.0549 ***<br>(-3.23) | -0.0547 ***<br>(-3.26) | -0.0572 ***<br>(-3.39) |
| <b>Year Dummy</b>           | Yes                    | yes                    | yes                    | Yes                    | yes                    | Yes                    | yes                    | yes                    |
| <b>Industry Dummy</b>       | Yes                    | yes                    | yes                    | Yes                    | yes                    | Yes                    | yes                    | yes                    |
| <b>Pseudo R<sup>2</sup></b> | 0.5314                 | 0.5621                 | 0.5499                 | 0.5917                 | 0.6218                 | 0.6406                 | 0.6135                 | 0.6354                 |
| <b>N observations</b>       | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   |

<Table VII> Tobit Regression of announced share repurchase over total market value

Panel A reports the results using all sample observations Panel B uses firms which have adopted any payout program. Dependent variable is the ratio of share repurchase amount over total market value when firm has a share repurchase program, otherwise zero. Firm\_size is log value of asset, Free\_cash is operating income and depreciation divided by total assets, Debt\_Asset is debt over asset, MTB is market value over book value. CS\_own is the controlling shareholders and families' ownership, CS\_control is the sum of CS\_own and interlocking ownership by subsidiaries (Aff\_own). Foreign\_own is the sum of all foreign investors' ownership. STD\_RET is standard deviation of rate of stock return in the previous year. Chaebol is a dummy variable that takes 1 when a firm belongs to the large Korean business groups. M&A is a dummy variable that takes 1 when a firm faces a takeover threat in a given year. Stock option is a dummy variable that takes 1 when a firm adopts a managerial stock option plan in a given year. Numbers in parentheses show t-value and \*, \*\*,\*\*\* represents a significance level at 10%, 5% and 1%, respectively.

| Panel A                     | (1)                    | (2)                    | (3)                    | (4)                    | (5)                    | (6)                    | (7)                    | (8)                    |
|-----------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| <b>Constant</b>             | -0.2374 ***<br>(-8.61) | -0.2601 ***<br>(-9.13) | -0.2626 ***<br>(-8.7)  | -0.2352 ***<br>(-8.56) | -0.2320 ***<br>(-7.59) | -0.2487 ***<br>(-7.94) | -0.2017 ***<br>(-6.8)  | -0.2301 ***<br>(-7.46) |
| <b>STD_RET</b>              | -0.0116 ***<br>(-2.73) | -0.0124 ***<br>(-2.91) | -0.0104 **<br>(-2.42)  | -0.0113 ***<br>(-2.66) | -0.0114 ***<br>(-2.66) | -0.0121 ***<br>(-2.82) | -0.0129 ***<br>(-3.03) | -0.0134 ***<br>(-3.13) |
| <b>Firm_Size</b>            | 0.0148 ***<br>(5.84)   | 0.0183 ***<br>(6.16)   | 0.0158 ***<br>(5.49)   | 0.0160 ***<br>(5.72)   | 0.0159 ***<br>(5.51)   | 0.0176 ***<br>(5.48)   | 0.0130 ***<br>(4.65)   | 0.0167 ***<br>(5.23)   |
| <b>Free_Cash</b>            | 0.4048 ***<br>(7.01)   | 0.4087 ***<br>(7.07)   | 0.3950 ***<br>(6.71)   | 0.3939 ***<br>(6.72)   | 0.3944 ***<br>(6.72)   | 0.4009 ***<br>(6.83)   | 0.4033 ***<br>(6.87)   | 0.4080 ***<br>(6.94)   |
| <b>Debt_Asset</b>           | -0.1566 ***<br>(-7.24) | -0.1494 ***<br>(-6.9)  | -0.1501 ***<br>(-6.75) | -0.1528 ***<br>(-6.9)  | -0.1533 ***<br>(-6.89) | -0.1495 ***<br>(-6.71) | -0.1593 ***<br>(-7.16) | -0.1524 ***<br>(-6.84) |
| <b>MTB</b>                  | -0.0054<br>(-1.53)     | -0.0067 *<br>(-1.79)   | -0.0054<br>(-1.5)      | -0.0051<br>(-1.41)     | -0.0052<br>(-1.41)     | -0.0063 *<br>(-1.66)   | -0.0057<br>(-1.57)     | -0.0069 *<br>(-1.79)   |
| <b>Dividend yield</b>       | 0.6232 ***<br>(4.73)   | 0.6570 ***<br>(4.99)   | 0.6196 ***<br>(4.69)   | 0.6816 ***<br>(5.15)   | 0.6837 ***<br>(5.16)   | 0.6989 ***<br>(5.28)   | 0.6667 ***<br>(5.03)   | 0.6884 ***<br>(5.2)    |
| <b>Chaebol</b>              |                        | -0.0326 ***<br>(-3.48) |                        |                        |                        | -0.0199 **<br>(-2.04)  |                        | -0.0302 ***<br>(-3.21) |
| <b>M&amp;A</b>              |                        | 0.0545<br>(1.25)       |                        |                        |                        | 0.0523<br>(1.2)        |                        | 0.0501<br>(1.15)       |
| <b>Stock Option</b>         |                        | 0.0353 ***<br>(3.36)   |                        |                        |                        | 0.0327 ***<br>(3.1)    |                        | 0.0325 ***<br>(3.07)   |
| <b>CS_own</b>               |                        |                        | 0.0465 **<br>(2.12)    |                        | -0.0056<br>(-0.23)     | -0.0009<br>(-0.04)     |                        |                        |
| <b>Aff_own</b>              |                        |                        |                        | -0.1215 ***<br>(-5.3)  | -0.1239 ***<br>(-4.91) | -0.1066 ***<br>(-4.12) |                        |                        |
| <b>CS_control</b>           |                        |                        |                        |                        |                        |                        | -0.0636 ***<br>(-3.08) | -0.0506 **<br>(-2.44)  |
| <b>Foreign_own</b>          |                        |                        | 0.0215<br>(0.71)       | 0.0185<br>(0.61)       | 0.0177<br>(0.58)       | 0.0118<br>(0.38)       | 0.0064<br>(0.21)       | 0.0027<br>(0.09)       |
| <b>Year Dummy</b>           | Yes                    | yes                    | yes                    | yes                    | yes                    | Yes                    | yes                    | Yes                    |
| <b>Industry Dummy</b>       | Yes                    | yes                    | yes                    | yes                    | yes                    | Yes                    | yes                    | Yes                    |
| <b>Pseudo R<sup>2</sup></b> | 0.1737                 | 0.1826                 | 0.1756                 | 0.1852                 | 0.1852                 | 0.1906                 | 0.1775                 | 0.1849                 |
| <b>N observations</b>       | 6148                   | 6148                   | 6148                   | 6148                   | 6148                   | 6148                   | 6148                   | 6148                   |

| <b>Panel B</b>              | <b>(1)</b>             | <b>(2)</b>             | <b>(3)</b>             | <b>(4)</b>             | <b>(5)</b>             | <b>(6)</b>             | <b>(7)</b>             | <b>(8)</b>             |
|-----------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| <b>Constant</b>             | -0.2255 ***<br>(-7.89) | -0.2445 ***<br>(-8.24) | -0.2234 ***<br>(-7.16) | -0.2263 ***<br>(-7.93) | -0.1870 ***<br>(-5.93) | -0.2004 ***<br>(-6.19) | -0.1652 ***<br>(-5.4)  | -0.1874 ***<br>(-5.88) |
| <b>STD_RET</b>              | 0.0058<br>(1.26)       | 0.0052<br>(1.12)       | 0.0057<br>(1.22)       | 0.0066<br>(1.43)       | 0.0057<br>(1.22)       | 0.0049<br>(1.05)       | 0.0047<br>(1.01)       | 0.0042<br>(0.9)        |
| <b>Firm_Size</b>            | 0.0100 ***<br>(3.86)   | 0.0128 ***<br>(4.18)   | 0.0104 ***<br>(3.49)   | 0.0122 ***<br>(4.22)   | 0.0101 ***<br>(3.39)   | 0.0116 ***<br>(3.46)   | 0.0081 ***<br>(2.8)    | 0.0110 ***<br>(3.3)    |
| <b>Free_Cash</b>            | 0.1546 **<br>(2.44)    | 0.1628 ***<br>(2.57)   | 0.1609 **<br>(2.49)    | 0.1531 **<br>(2.37)    | 0.1577 **<br>(2.44)    | 0.1678 ***<br>(2.6)    | 0.1639 **<br>(2.54)    | 0.1729 ***<br>(2.68)   |
| <b>Debt_Asset</b>           | -0.0075<br>(-0.32)     | -0.0035<br>(-0.15)     | -0.0100<br>(-0.41)     | -0.0081<br>(-0.34)     | -0.0125<br>(-0.52)     | -0.0111<br>(-0.46)     | -0.0156<br>(-0.65)     | -0.0123<br>(-0.51)     |
| <b>MTB</b>                  | -0.0093 *<br>(-1.95)   | -0.0112 **<br>(-2.34)  | -0.0090 *<br>(-1.86)   | -0.0091 *<br>(-1.88)   | -0.0097 **<br>(-2.02)  | -0.0111 **<br>(-2.31)  | -0.0100 **<br>(-2.07)  | -0.0114 **<br>(-2.35)  |
| <b>Dividend yield</b>       | -0.6338 ***<br>(-4.1)  | -0.5877 ***<br>(-3.8)  | -0.6409 ***<br>(-4.12) | -0.5663 ***<br>(-3.64) | -0.5596 ***<br>(-3.6)  | -0.5363 ***<br>(-3.45) | -0.5925 ***<br>(-3.81) | -0.5597 ***<br>(-3.6)  |
| <b>Chaebol</b>              |                        | -0.0276 ***<br>(-2.88) |                        |                        |                        | -0.0168 *<br>(-1.68)   |                        | -0.0235 **<br>(-2.44)  |
| <b>M&amp;A</b>              |                        | 0.0526<br>(1.14)       |                        |                        |                        | 0.0494<br>(1.07)       |                        | 0.0475<br>(1.03)       |
| <b>Stock Option</b>         |                        | 0.0351 ***<br>(3.2)    |                        |                        |                        | 0.0306 ***<br>(2.77)   |                        | 0.0304 ***<br>(2.75)   |
| <b>CS_own</b>               |                        |                        | -0.0043<br>(-0.19)     |                        | -0.0708 ***<br>(-2.8)  | -0.0660 ***<br>(-2.6)  |                        |                        |
| <b>Aff_own</b>              |                        |                        |                        | -0.1198 ***<br>(-5.11) | -0.1514 ***<br>(-5.81) | -0.1367 ***<br>(-5.12) |                        |                        |
| <b>CS_control</b>           |                        |                        |                        |                        |                        |                        | -0.1101 ***<br>(-5.07) | -0.0992 ***<br>(-4.54) |
| <b>Foreign_own</b>          |                        |                        | -0.0153<br>(-0.49)     | -0.0075<br>(-0.24)     | -0.0183<br>(-0.59)     | -0.0246<br>(-0.79)     | -0.0273<br>(-0.88)     | -0.0318<br>(-1.03)     |
| <b>Year Dummy</b>           | Yes                    | yes                    | yes                    | yes                    | yes                    | yes                    | yes                    | yes                    |
| <b>Industry Dummy</b>       | Yes                    | yes                    | yes                    | yes                    | yes                    | yes                    | yes                    | yes                    |
| <b>Pseudo R<sup>2</sup></b> | 0.1101                 | 0.1207                 | 0.1102                 | 0.1259                 | 0.1305                 | 0.1367                 | 0.1253                 | 0.1330                 |
| <b>N observations</b>       | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   |

**<Table VIII> Tobit Regression of announced share repurchase over total payout amount**

Dependent variable is the ratio of share repurchase amount over total payout amount when firm has a share repurchase program, otherwise zero. Firm\_size is log value of asset, Free\_cash is operating income and depreciation divided by total assets, Debt\_Asset is debt over asset, MTB represents market value over book value. CS\_own is the controlling shareholders and families' ownership, CS\_control is the sum of CS\_own and interlocking ownership by subsidiaries (Aff\_own). Foreign\_own is the sum of all foreign investors' ownership. STD\_RET is standard deviation of rate of stock return in the previous year. Chaebol is a dummy variable that takes 1 when a firm belongs to the large Korean business groups. M&A threat is a dummy variable that takes 1 when a firm faces a takeover threat in a given year. Stock option is a dummy variable that takes 1 when a firm adopts a managerial stock option plan in a given year. Numbers in parentheses show t-value and \*, \*\*,\*\*\* represents a significance level at 10%, 5% and 1%, respectively.

|                             | (1)                    | (2)                    | (3)                    | (4)                    | (5)                    | (6)                    | (7)                    | (8)                    |
|-----------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| <b>Constant</b>             | -1.4423 ***<br>(-8.45) | -1.5267 ***<br>(-8.63) | -1.3480 ***<br>(-7.29) | -1.4447 ***<br>(-8.51) | -1.1241 ***<br>(-6.03) | -1.1808 ***<br>(-6.18) | -1.0395 ***<br>(-5.74) | -1.1305 ***<br>(-6)    |
| <b>STD_RET</b>              | 0.0318<br>(1.17)       | 0.0283<br>(1.04)       | 0.0246<br>(0.9)        | 0.0321<br>(1.18)       | 0.0242<br>(0.89)       | 0.0200<br>(0.73)       | 0.0205<br>(0.75)       | 0.0174<br>(0.64)       |
| <b>Firm_Size</b>            | 0.0835 ***<br>(5.48)   | 0.0961 ***<br>(5.33)   | 0.0985 ***<br>(5.58)   | 0.1133 ***<br>(6.62)   | 0.0961 ***<br>(5.47)   | 0.1018 ***<br>(5.18)   | 0.0884 ***<br>(5.17)   | 0.0995 ***<br>(5.08)   |
| <b>Free_Cash</b>            | 0.2753<br>(0.73)       | 0.3240<br>(0.86)       | 0.5111<br>(1.34)       | 0.4554<br>(1.19)       | 0.4895<br>(1.28)       | 0.5492<br>(1.44)       | 0.5136<br>(1.35)       | 0.5690<br>(1.49)       |
| <b>Debt_Asset</b>           | 0.2182<br>(1.57)       | 0.2377 *<br>(1.71)     | 0.1299<br>(0.92)       | 0.1486<br>(1.05)       | 0.1126<br>(0.8)        | 0.1175<br>(0.83)       | 0.1010<br>(0.72)       | 0.1134<br>(0.8)        |
| <b>MTB</b>                  | 0.0564 **<br>(2.07)    | 0.0478 *<br>(1.75)     | 0.0683 **<br>(2.47)    | 0.0694 **<br>(2.52)    | 0.0642 **<br>(2.33)    | 0.0577 **<br>(2.09)    | 0.0629 **<br>(2.29)    | 0.0567 **<br>(2.05)    |
| <b>Dividend yield</b>       | -8.2129 ***<br>(-8.68) | -8.0011 ***<br>(-8.46) | -8.4802 ***<br>(-8.93) | -8.0402 ***<br>(-8.48) | -7.9997 ***<br>(-8.45) | -7.8997 ***<br>(-8.35) | -8.1346 ***<br>(-8.6)  | -7.9972 ***<br>(-8.46) |
| <b>Chaebol</b>              |                        | -0.1257 **<br>(-2.24)  |                        |                        |                        | -0.0683<br>(-1.17)     |                        | -0.0948 *<br>(-1.69)   |
| <b>M&amp;A</b>              |                        | 0.4244<br>(1.56)       |                        |                        |                        | 0.4269<br>(1.58)       |                        | 0.4181<br>(1.55)       |
| <b>Stock Option</b>         |                        | 0.1635 **<br>(2.52)    |                        |                        |                        | 0.1407 **<br>(2.17)    |                        | 0.1396 **<br>(2.15)    |
| <b>CS_own</b>               |                        |                        | -0.1781<br>(-1.34)     |                        |                        | -0.5716 ***<br>(-3.85) |                        | -0.5431 ***<br>(-3.63) |
| <b>Aff_own</b>              |                        |                        |                        | -0.6314 ***<br>(-4.61) |                        | -0.8865 ***<br>(-5.82) |                        | -0.8214 ***<br>(-5.26) |
| <b>CS_control</b>           |                        |                        |                        |                        |                        |                        | -0.7257 ***<br>(-5.69) | -0.6743 ***<br>(-5.25) |
| <b>Foreign_own</b>          |                        |                        | -0.5597 ***<br>(-3.01) | -0.4949 ***<br>(-2.67) | -0.5778 ***<br>(-3.1)  | -0.6131 ***<br>(-3.28) | -0.6111 ***<br>(-3.3)  | -0.6393 ***<br>(-3.44) |
| <b>Year Dummy</b>           | Yes                    | yes                    | Yes                    | yes                    | Yes                    | yes                    | yes                    | yes                    |
| <b>Industry Dummy</b>       | Yes                    | yes                    | Yes                    | yes                    | Yes                    | yes                    | yes                    | yes                    |
| <b>Pseudo R<sup>2</sup></b> | 0.0536                 | 0.0558                 | 0.0553                 | 0.0587                 | 0.0611                 | 0.0625                 | 0.0605                 | 0.0620                 |
| <b>N observations</b>       | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   | 4267                   |

**<Table IX> Regression results of cumulative abnormal returns CAAR(-1,1) around announcement period**

Firm\_size is log value of asset, Free\_cash is operating income and depreciation divided by total assets, Debt\_Asset is debt over asset, MTB represents market value over book value. CS\_own is the controlling shareholder and family's ownership and Aff\_own is interlocking ownership by subsidiaries. CS\_control is the sum of CS\_own and Aff\_own. Foreign\_own is the sum of all foreign investors' ownership. STD\_RET is standard deviation of rate of stock return in the previous year. Chaebol takes 1 when a firm belongs to the large Korean business groups. M&A takes 1 when a firm faces a takeover threat in a given year. Stock option takes 1 when a firm adopts a managerial stock option plan in a given year. SRR, REP, STP are the ratio of target number of shares over total shares, target share repurchases over market value, target repurchase over total dividends, respectively. Panels A, B, C show the results using SRR, REP, and STP, respectively.

| Panel A                       | (1)        | (2)        | (3)        | (4)        | (5)        | (6)        | (7)        | (8)        |
|-------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| <b>Constant</b>               | 0.0412 *   | 0.0407     | 0.0148     | 0.0414 *   | 0.0087     | 0.0079     | 0.0151     | 0.0122     |
|                               | (1.69)     | (1.62)     | (0.56)     | (1.69)     | (0.33)     | (0.29)     | (0.58)     | (0.45)     |
| <b>SRR</b>                    | 0.0039 *** | 0.0038 *** | 0.0040 *** | 0.0038 *** | 0.0040 *** | 0.0040 *** | 0.0040 *** | 0.0040 *** |
|                               | (5.11)     | (5.05)     | (5.33)     | (5.09)     | (5.34)     | (5.27)     | (5.27)     | (5.22)     |
| <b>EXRET</b>                  | -0.0035    | -0.0053    | -0.0029    | -0.0040    | -0.0045    | -0.0066    | -0.0054    | -0.0072    |
|                               | (-0.32)    | (-0.48)    | (-0.27)    | (-0.37)    | (-0.41)    | (-0.59)    | (-0.5)     | (-0.65)    |
| <b>STD_RET</b>                | -0.4427    | -0.4713    | -0.3890    | -0.4482    | -0.3966    | -0.4299    | -0.4178    | -0.4534    |
|                               | (-1.2)     | (-1.27)    | (-1.06)    | (-1.22)    | (-1.08)    | (-1.16)    | (-1.14)    | (-1.23)    |
| <b>Firm_Size</b>              | -0.0036 *  | -0.0036    | -0.0015    | -0.0038    | -0.0016    | -0.0015    | -0.0023    | -0.0019    |
|                               | (-1.75)    | (-1.45)    | (-0.62)    | (-1.58)    | (-0.64)    | (-0.54)    | (-0.97)    | (-0.67)    |
| <b>Free_Cash</b>              | -0.0833    | -0.0763    | -0.0955 *  | -0.0820    | -0.0934 *  | -0.0850    | -0.0884 *  | -0.0804    |
|                               | (-1.62)    | (-1.48)    | (-1.84)    | (-1.58)    | (-1.8)     | (-1.63)    | (-1.71)    | (-1.54)    |
| <b>Debt_Asset</b>             | 0.0062     | 0.0071     | 0.0083     | 0.0061     | 0.0083     | 0.0086     | 0.0076     | 0.0084     |
|                               | (0.31)     | (0.36)     | (0.41)     | (0.3)      | (0.41)     | (0.42)     | (0.38)     | (0.41)     |
| <b>MTB</b>                    | -0.0021    | -0.0026    | -0.0016    | -0.0021    | -0.0013    | -0.0018    | -0.0014    | -0.0019    |
|                               | (-0.54)    | (-0.67)    | (-0.4)     | (-0.53)    | (-0.33)    | (-0.45)    | (-0.35)    | (-0.49)    |
| <b>Dividend yield</b>         | 0.0806     | 0.0846     | 0.0729     | 0.0755     | 0.0517     | 0.0540     | 0.0456     | 0.0497     |
|                               | (0.68)     | (0.71)     | (0.61)     | (0.63)     | (0.43)     | (0.45)     | (0.38)     | (0.41)     |
| <b>Chaebol</b>                |            | -0.0002    |            |            |            | 0.0002     |            | -0.0021    |
|                               |            | (-0.03)    |            |            |            | (0.03)     |            | (-0.27)    |
| <b>M&amp;A</b>                |            | 0.0410     |            |            |            | 0.0441     |            | 0.0443     |
|                               |            | (1.41)     |            |            |            | (1.51)     |            | (1.52)     |
| <b>Stock Option</b>           |            | 0.0018     |            |            |            | 0.0021     |            | 0.0028     |
|                               |            | (0.2)      |            |            |            | (0.23)     |            | (0.3)      |
| <b>CS_own</b>                 |            |            | 0.0495 *** |            | 0.0623 *** | 0.0633 *** |            |            |
|                               |            |            | (2.59)     |            | (3.01)     | (3.05)     |            |            |
| <b>Aff_own</b>                |            |            |            | 0.0099     | 0.0360     | 0.0370     |            |            |
|                               |            |            |            | (0.48)     | (1.6)      | (1.6)      |            |            |
| <b>CS_control</b>             |            |            |            |            |            |            | 0.0509 *** | 0.0523 *** |
|                               |            |            |            |            |            |            | (2.84)     | (2.91)     |
| <b>Foreign_own</b>            |            |            | 0.0061     | 0.0006     | 0.0076     | 0.0044     | 0.0064     | 0.0030     |
|                               |            |            | (0.22)     | (0.02)     | (0.28)     | (0.16)     | (0.23)     | (0.11)     |
| <b>Year Dummy</b>             | Yes        | Yes        | yes        | yes        | yes        | yes        | Yes        | yes        |
| <b>Industry Dummy</b>         | Yes        | Yes        | yes        | yes        | yes        | yes        | Yes        | yes        |
| <b>Adjusted R<sup>2</sup></b> | 0.0793     | 0.0784     | 0.0836     | 0.0776     | 0.0851     | 0.0845     | 0.0849     | 0.0843     |
| <b>N observations</b>         | 1022       | 1022       | 1022       | 1022       | 1022       | 1022       | 1022       | 1022       |

| <b>Panel B</b>                | <b>(1)</b>            | <b>(2)</b>           | <b>(3)</b>            | <b>(4)</b>          | <b>(5)</b>            | <b>(6)</b>           | <b>(7)</b>            | <b>(8)</b>           |
|-------------------------------|-----------------------|----------------------|-----------------------|---------------------|-----------------------|----------------------|-----------------------|----------------------|
| <b>Constant</b>               | 0.0498 **<br>(2.02)   | 0.0510 **<br>(2.02)  | 0.0277<br>(1.04)      | 0.0498 **<br>(2.02) | 0.0212<br>(0.79)      | 0.0214<br>(0.78)     | 0.0253<br>(0.96)      | 0.0245<br>(0.9)      |
| <b>REP</b>                    | 0.0768 **<br>(2.27)   | 0.0758 **<br>(2.24)  | 0.0789 **<br>(2.34)   | 0.0772 **<br>(2.28) | 0.0808 **<br>(2.39)   | 0.0797 **<br>(2.36)  | 0.0807 **<br>(2.39)   | 0.0797 **<br>(2.36)  |
| <b>EXRET</b>                  | -0.0024<br>(-0.21)    | -0.0045<br>(-0.4)    | -0.0018<br>(-0.16)    | -0.0031<br>(-0.28)  | -0.0035<br>(-0.32)    | -0.0057<br>(-0.51)   | -0.0041<br>(-0.37)    | -0.0062<br>(-0.55)   |
| <b>STD_RET</b>                | -0.3957<br>(-1.06)    | -0.4305<br>(-1.15)   | -0.3510<br>(-0.94)    | -0.4073<br>(-1.09)  | -0.3601<br>(-0.97)    | -0.4000<br>(-1.07)   | -0.3751<br>(-1.01)    | -0.4178<br>(-1.12)   |
| <b>Firm_Size</b>              | -0.0040 *<br>(-1.94)  | -0.0045 *<br>(-1.81) | -0.0022<br>(-0.85)    | -0.0041<br>(-1.7)   | -0.0022<br>(-0.88)    | -0.0024<br>(-0.87)   | -0.0027<br>(-1.1)     | -0.0027<br>(-0.96)   |
| <b>Free_Cash</b>              | -0.1034 **<br>(-1.98) | -0.0950 *<br>(-1.81) | -0.1133 **<br>(-2.14) | -0.1004 *<br>(-1.9) | -0.1113 **<br>(-2.11) | -0.1017 *<br>(-1.91) | -0.1079 **<br>(-2.05) | -0.0983 *<br>(-1.86) |
| <b>Debt_Asset</b>             | 0.0138<br>(0.69)      | 0.0142<br>(0.71)     | 0.0152<br>(0.74)      | 0.0129<br>(0.63)    | 0.0152<br>(0.74)      | 0.0150<br>(0.73)     | 0.0146<br>(0.71)      | 0.0147<br>(0.71)     |
| <b>MTB</b>                    | -0.0029<br>(-0.74)    | -0.0035<br>(-0.88)   | -0.0025<br>(-0.61)    | -0.0028<br>(-0.69)  | -0.0021<br>(-0.53)    | -0.0027<br>(-0.66)   | -0.0022<br>(-0.54)    | -0.0028<br>(-0.68)   |
| <b>Dividend yield</b>         | 0.1048<br>(0.87)      | 0.1077<br>(0.89)     | 0.0980<br>(0.81)      | 0.0958<br>(0.79)    | 0.0756<br>(0.62)      | 0.0776<br>(0.64)     | 0.0711<br>(0.59)      | 0.0741<br>(0.61)     |
| <b>Chaebol</b>                |                       | 0.0022<br>(0.29)     |                       |                     |                       | 0.0023<br>(0.28)     |                       | 0.0005<br>(0.07)     |
| <b>M&amp;A</b>                |                       | 0.0435<br>(1.48)     |                       |                     |                       | 0.0468<br>(1.59)     |                       | 0.0470<br>(1.6)      |
| <b>Stock Option</b>           |                       | 0.0029<br>(0.31)     |                       |                     |                       | 0.0035<br>(0.38)     |                       | 0.0040<br>(0.43)     |
| <b>CS_own</b>                 |                       |                      | 0.0417 **<br>(2.16)   |                     | 0.0551 ***<br>(2.64)  | 0.0566 ***<br>(2.7)  |                       |                      |
| <b>Aff_own</b>                |                       |                      |                       | 0.0143<br>(0.68)    | 0.0376 *<br>(1.65)    | 0.0374<br>(1.6)      |                       |                      |
| <b>CS_control</b>             |                       |                      |                       |                     |                       |                      | 0.0475 ***<br>(2.63)  | 0.0487 ***<br>(2.68) |
| <b>Foreign_own</b>            |                       |                      | 0.0008<br>(0.03)      | -0.0036<br>(-0.13)  | 0.0025<br>(0.09)      | -0.0013<br>(-0.05)   | 0.0017<br>(0.06)      | -0.0023<br>(-0.08)   |
| <b>Year Dummy</b>             | yes                   | yes                  | yes                   | yes                 | yes                   | yes                  | Yes                   | yes                  |
| <b>Industry Dummy</b>         | yes                   | yes                  | yes                   | yes                 | yes                   | yes                  | Yes                   | yes                  |
| <b>Adjusted R<sup>2</sup></b> | 0.06                  | 0.0594               | 0.0625                | 0.0585              | 0.0641                | 0.0639               | 0.0646                | 0.0643               |
| <b>N observations</b>         | 1022                  | 1022                 | 1022                  | 1022                | 1022                  | 1022                 | 1022                  | 1022                 |

| Panel C                       | (1)                  | (2)                  | (3)                  | (4)                  | (5)                  | (6)                  | (7)                  | (8)                  |
|-------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <b>Constant</b>               | 0.0174<br>(0.67)     | 0.0179<br>(0.67)     | -0.0096<br>(-0.34)   | 0.0178<br>(0.69)     | -0.0152<br>(-0.54)   | -0.0149<br>(-0.52)   | -0.0083<br>(-0.3)    | -0.0101<br>(-0.36)   |
| <b>STP</b>                    | 0.0534 ***<br>(4.2)  | 0.0527 ***<br>(4.13) | 0.0564 ***<br>(4.42) | 0.0532 ***<br>(4.17) | 0.0560 ***<br>(4.4)  | 0.0551 ***<br>(4.32) | 0.0549 ***<br>(4.32) | 0.0542 ***<br>(4.25) |
| <b>EXRET</b>                  | -0.0064<br>(-0.58)   | -0.0080<br>(-0.72)   | -0.0060<br>(-0.55)   | -0.0069<br>(-0.62)   | -0.0075<br>(-0.68)   | -0.0093<br>(-0.83)   | -0.0083<br>(-0.75)   | -0.0099<br>(-0.89)   |
| <b>STD_RET</b>                | -0.4449<br>(-1.2)    | -0.4792<br>(-1.29)   | -0.3930<br>(-1.06)   | -0.4488<br>(-1.21)   | -0.3996<br>(-1.08)   | -0.4381<br>(-1.18)   | -0.4199<br>(-1.14)   | -0.4612<br>(-1.24)   |
| <b>Firm_Size</b>              | -0.0036 *<br>(-1.72) | -0.0038<br>(-1.53)   | -0.0016<br>(-0.65)   | -0.0038<br>(-1.58)   | -0.0017<br>(-0.68)   | -0.0018<br>(-0.65)   | -0.0024<br>(-1)      | -0.0022<br>(-0.78)   |
| <b>Free_Cash</b>              | -0.0747<br>(-1.44)   | -0.0677<br>(-1.3)    | -0.0864 *<br>(-1.65) | -0.0740<br>(-1.41)   | -0.0845<br>(-1.62)   | -0.0761<br>(-1.45)   | -0.0798<br>(-1.53)   | -0.0716<br>(-1.37)   |
| <b>Debt_Asset</b>             | 0.0042<br>(0.21)     | 0.0050<br>(0.25)     | 0.0064<br>(0.31)     | 0.0045<br>(0.22)     | 0.0065<br>(0.31)     | 0.0066<br>(0.32)     | 0.0059<br>(0.29)     | 0.0064<br>(0.31)     |
| <b>MTB</b>                    | -0.0037<br>(-0.95)   | -0.0043<br>(-1.09)   | -0.0033<br>(-0.83)   | -0.0037<br>(-0.94)   | -0.0030<br>(-0.77)   | -0.0036<br>(-0.9)    | -0.0031<br>(-0.78)   | -0.0037<br>(-0.93)   |
| <b>Dividend yield</b>         | 0.4553 ***<br>(3.16) | 0.4547 ***<br>(3.15) | 0.4685 ***<br>(3.25) | 0.4496 ***<br>(3.09) | 0.4464 ***<br>(3.08) | 0.4430 ***<br>(3.05) | 0.4326 ***<br>(3)    | 0.4322 ***<br>(2.98) |
| <b>Chaebol</b>                |                      | 0.0005<br>(0.07)     |                      |                      |                      | 0.0011<br>(0.14)     |                      | -0.0012<br>(-0.16)   |
| <b>M&amp;A</b>                |                      | 0.0395<br>(1.35)     |                      |                      |                      | 0.0423<br>(1.44)     |                      | 0.0426<br>(1.46)     |
| <b>Stock Option</b>           |                      | 0.0036<br>(0.39)     |                      |                      |                      | 0.0039<br>(0.43)     |                      | 0.0045<br>(0.49)     |
| <b>CS_own</b>                 |                      |                      | 0.0480 **<br>(2.5)   |                      | 0.0601 ***<br>(2.89) | 0.0612 ***<br>(2.94) |                      |                      |
| <b>Aff_own</b>                |                      |                      |                      | 0.0090<br>(0.43)     | 0.0341<br>(1.51)     | 0.0347<br>(1.49)     |                      |                      |
| <b>CS_control</b>             |                      |                      |                      |                      |                      |                      | 0.0488 ***<br>(2.72) | 0.0502 ***<br>(2.78) |
| <b>Foreign_own</b>            |                      |                      | 0.0075<br>(0.27)     | 0.0021<br>(0.07)     | 0.0089<br>(0.32)     | 0.0052<br>(0.18)     | 0.0077<br>(0.28)     | 0.0037<br>(0.13)     |
| <b>Year Dummy</b>             | yes                  | yes                  | yes                  | yes                  | yes                  | yes                  | yes                  | yes                  |
| <b>Industry Dummy</b>         | yes                  | yes                  | yes                  | yes                  | yes                  | yes                  | yes                  | yes                  |
| <b>Adjusted R<sup>2</sup></b> | 0.0716               | 0.0706               | 0.0756               | 0.0699               | 0.0768               | 0.0761               | 0.0766               | 0.076                |
| <b>N observations</b>         | 1022                 | 1022                 | 1022                 | 1022                 | 1022                 | 1022                 | 1022                 | 1022                 |