경영학석사학위논문

Corporate characteristics and cash policy: Stand-alone vs. corporate group firms

기업 특성과 현금보유정책에 대한 실증 연구: 독립 기업과 그룹사 소속기업의 비교를 중심으로

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이 논문을 경영학 석사 학위논문으로 제출함

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오병준의 석사학위논문을 인준함

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Abstract

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I first show that private (unlisted) stand-alone firms hold more cash reserves than private corporate group firms do. This result attributes to presence of internal capital market within corporate group firms. By combining evidence from across public and private firms as well as within public firms across different qualities of governance, I also show that stand-alone firms' cash policy reflects much higher agency costs than group firms' in public (listed) firm samples. Specifically, agency problems not affect not only the target level of cash, but also how managers react to cash in excess of the target.

Keywords: Cash holdings, Stand-alone firms, Internal capital market, Agency conflicts
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1. Introduction

Corporate cash holding have received considerable social and academic interest. At the end of 2013, Korean public firms held, on average, 13.80% of their assets in cash or analogous to cash instruments. Korean media are criticizing excessive cash holding amounts of firms and government of Korea attempts to suppress cash holding amount and increase investment by introducing new legislation. Work explaining cash holdings have focused mainly on financing frictions and agency conflicts. Financing frictions lead firms to have a precautionary demand for cash reserves. Since 2008 financial crisis, developed countries including U.S firms have increased their cash holding amounts to deal with world economy's uncertainty. Precautionary demand for cash holdings has been studied as early as Keynes (1936). Harford (1999), Opler, Pinkowitz, Stulz, and Williamson (1999) find evidence in favor of financial friction which is derived from information asymmetry. Bates, Kahle, and Stulz (2009) shows that increasing amounts of U.S firms' cash holding is primarily from precautionary demands.

Agency Conflicts should also affect cash holding policies. Dittmar, Mahrt-Smith, and Servaes (2003) examine cash holdings across countries and find that in countries with low-investor protection, firms hold more cash, while in countries with high-investor protection, they use that power to force firm's managers to discharge excess cash. Niklov and Whited (2001) estimate that typical agency problems increase cash holdings by 22%, resulting in a 6% drop in shareholder value. Alternatively,

Harford, Mansi, and Maxwell (2008) find that firms with more entrenched managers actually hold less cash than otherwise similar firms and conclude that managers would desire to overinvest rather than sustain high cash holding levels.

In this study I exploit database of private firms to help understand public firms' cash policies especially by highlighting stand-alone and non-stand-alone firms. In Korea, there are mixed firms with stand-alone firms and non-stand-alone firms which are belongs to business group. Gong (2006), Yon and Park (2009) shows that there exist internal capital market mechanism in Business group (Chaebol) firms so that Chaebol owned firms don't have to pile huge cash for precautionary demand. Stand-alone firms would maintain more cash due to lack of internal capital market mechanism when they are in financial friction status. I expect that the stand-alone firms would hold more cash than group firms. And variation in agency conflicts across public stand-alone and pubic group firm at least as substantial as the variation within public firms. Further, the differences across these two groups of firms in agency conflicts allow me to explore the relative importance of agency problem effect on cash levels, the speed of adjustment to target cash, the dissipation of excess cash, and investment performance.

Using a sample of public and private Korean firms over the period 1999-2013, I first show that, on average, private group firms hold about 90% as much as private stand-alone firms do. This is the fact that they arguably have more likely to access to internal capital market and would be expected to have a weaker precautionary motive due to financing frictions. I examine how

excess cash influence firm investment and performance across public stand-alone and public group firms on the assumption that public firms have variation of agency conflicts attribute to governance quality. As compared to public group firms, public stand-alone firms tend to spend excess more aggressively via investment in a myopic way and in ways that reduce firm operating performance. These result suggest that more severe agency problems make public stand-alone firm managers spend excess cash in a less efficient way. I find similar evidence for well versus poorly governed public firms.

The plan of the paper is as follows. I review the literature and develop my hypotheses in the next section. I describe my sample and present descriptive statistics in Section 3. I examine difference in cash policies between public and private Korean firms in Section 4. Then I conclude in Section 5.

2. Literature review and hypothesis development.

2.1 Related research

Firms hold cash to protect themselves against unfavorable cash flow events that might force them to give up profitable investment projects due to costly external financing. Empirical research on cash holdings has generally found support for the precautionary motive-especially among firms with greater information asymmetry with external capital providers (for

example, Opler, Pinkowitz, Stulz, and Willanson, 1999 and Kong, 2006). Paper by Bates, Kahle, and Stulz (2009) has provided partial explanation for the increasing cash holding trend by public U.S firms, finding support for precautionary views, but not for agency-based explanation. Duchin (2010) provides further explanation that increasing cash flow uncertainty can help explain the build-up in cash holding by public firms, and McLean (2011) shows that share issuance has become an increasingly important source of cash for firms with high precautionary motives as captured by large R&D expenditures and high cash flow volatility. Several works provide evidence of greater financing frictions for private firms. Brav (2009) shows that cash holdings of private U.K firms are more sensitive to operating cash flows than those of public firms. Lins, Servaes, and Tufano(2010) show that private firms rely more on non-operational (excess) cash instead of lines of credit for their corporate liquidity.

In addition to the precautionary motive of cash holdings, Jensen (1986) insists that entrenched managers would rather pile cash than increase payouts to shareholders when their firms have poor investment opportunities. Stulz (1990) characterizes the shareholders' problem as providing sufficient internal slack go avoid underinvestment while not providing too much so as to fund overinvestment. These discretionary cash holdings derived from models controlling for the transaction and precautionary motives for holding cash. A number of recent works by Dittmar, Mahrt-Smith, and Servaes (2003), Pinkowitz, Stulz and Williamson (2006), Dittmar and Mahrt-Smith (2007), and Harford, Mansi, and Maxwell(2008) have provided support for the agency

perspective of corporate cash policies: Excess cash reserves aggravate agency problems by providing a pool of accumulated free cash flow. Harford, Mansi, and Maxwell (2008) find that firms with poor governance spend more cash than those with better governance, often to the effect that their accumulated cash reserves are actually lower. In contrast, studies such as Bertrand and Mullainathan (2003) suggest a slightly more benign form of agency problems－CEO's desire for a quiet life, would lead to a higher-than-optimal buffer stock of cash holdings.

Gao, Harford, and Li (2013) show that agency conflicts affect both managers' target level of cash and how they react to excess cash by using large sample comparison between public and private firms. Generally, greater agency conflicts in public firms lead managers to choose to hold more cash on average than they otherwise would. Im (2014) applies Gao, Harford, and Li's methodology to whether Korean firms have similar characteristics and find that Korean public firms have higher cash reserves than private firms due to agency conflicts.

2.2 Hypothesis development

One of the primary reasons given for being public firm is to have lower cost of capital. Being listed provides liquidity and a market price for a firm's equity that substantially lowers its cost of equity capital. Saunders and Steffen (2011), Farre-Mensa and Ljungqvist (2013) classify private firms as a financially constrained firms. Given higher costs of accessing external financing, the precautionary motive would be stronger for private firms especially for stand-alone firms because group affiliated

firms may exploit internal capital market to raise capital so that they don't have to build-up more cash than stand-alone firms.

Hypothesis 1: Private stand-alone firms hold higher cash reserves than private group affiliation firms

The story that public firms hold cash reserves that are equal to or greater than those of private firms, is motivated by the countervailing effect of agency problems. Private firms have much fewer agency problems than public firms. Private firms often have owner-managers and at a minimum have concentrated illiquid ownership and large private lenders providing greater monitoring incentives. Bhide (1993), Asker, Farre-Mensa, and Ljungqvist (2012), and Gao, Lemmon, and Li (2012) shows that the greater separation of ownership and control, along with the free-rider problem from dispersed highly liquid ownership, significantly increase agency problems in public firms. Gao, Harford, and Li (2013) confirms that there exist agency conflicts in public firms. On the assumption that existence of agency problem within public firms, I expect that there exist difference between public group firms and public stand-alone firms in terms of agency conflicts.

Hypothesis 2: Public stand alone firms have more agency costs than public group firms have.

In this empirical analysis, I test these hypotheses and attempt to distinguish magnitude of agency conflicts between stand-alone and group affiliated firms by observing cash holding behavior of

firms with different quality of governance. In the next section I describe my data and present summary statistics.

3. Sample data

3.1 Sample formation

My primary data source is the KISVALUE database offered by Korea Investors Services affiliate of Moody's. I start with Korean public firms traded on the KOSPI or KOSDAQ, and all Korean [1]private firms subjected to conduct statutory audit for the period 1999-2013. Following prior work such as Gao, Harford, and Li (2013), I remove financial and utilities firms. I also require that all sample firms have financial information for at least two consecutive years to estimate the annual changes in cash holdings; and my sample firm's operating cash flow over total assets is no less than -50%. Finally, I remove all firm-year observations associated with IPO and delisted events. Prior researches has shown that cash holdings tend to vary systematically by industry and larger firms tend to have lower cash holdings due to economies of scale in the transaction motive for cash. So I conduct industry and size-match my sample of public firms, resulting in the matched private firm sample. Especially, I match each public firm in the sample with a private firm in the same industry (as defined by KSIC-9 medium classification: 62 industries) and closest in size (total assets) for same year. In my final sample, I have 20,630 public firm-year

1) My dataset is different from Im(2014)'s because he defines private firm as stand-alone private firm.

observations representing 2,225 unique public firms, 164,720 private firm-year observations representing 26,252 unique private firms, and 20,618 matched private firm-year observations representing 5,127 unique private firms for the sample period 1999-2013. For most of my analysis, I compare results employing public and matched private firm sample.

3.2 Summary statistics

Bates, Kahle, and Stulz (2009) note that the average cash ratio (relative to assets) for U.S firms more than doubles from 1980-2006. In table 1, I present cash ratios over time for the public firm sample, the matched private firm sample, and private firm sample. Unlike U.S case, there is no trend for cash ratio for Korean firms. Korean media reports that Korean public firms' cash holding amount continue to increase and setting national record. In figure 1, total cash amount[2] of public firms has shown increasing trend, however, the cash ratio for my sample is limited for certain range (11% to 15%) when cash holding amount are scaled by total assets.

Table 2 shows summary statistics for my sample. I have two main samples for my analysis. The first is public firms for which I have data. The second is a sample of private firms matched to the public firms by industry and size. All continuous variables are winsorized at the 2.5% and 97.5% levels. Cash is the ratio of sum of cash, cash equivalent, and marketable securities and financial instrument to total assets. The first row

2) Total cash amount is not winsorized in Figure 1.

shows that public firms hold more cash. The mean (median) cash holdings is 13.70% (9.27%) for the public sample, the mean (median) cash holdings is 12.57% (7.25%) for the matched private firm sample, while the mean (median) cash holdings is 11.81% (6.00%) for the private firm sample. The two-sample t-test and Wilcoxon-test both reject the null that cash holdings in public firms is the same as that in matched or unmatched private firms at the 1% level.

It is possible that the difference in cash holdings between public and private firms is driven by the different industry representation across public and private firms. To handle that concern, I introduce industry-adjusted cash holdings as the difference between firm-specific cash holdings and its industry median based on KSIC-9 medium 62 industry classification and using full sample. By using a uniform benchmark level or cash holdings across public and private firms for a particular industry, I emphasize the importance of common industry-specific investment opportunities to both public and private firms alike. The mean (median) industry-adjusted cash holding is 5.07% (1.14%) for the public firm sample, the mean (median) 4.04% (-0.53%) for the matched private firm sample, while the mean (median) industry-adjusted cash holdings is 4.92% (-0.10%) for the private firm sample.

Change in cash is simple difference between this year's and last year's cash. I find that both public and private firms' change in cash is negative, indicating that, on average, firms subtract from their cash reserves each year. This result is quite contrast to Gao, Harford, and Li's work with U.S firm case because they

show that U.S firms add to their cash reserves each year.

The mean (median) value of total assets is 391.6 billion (91.2 billion) for the public firm sample, the mean (median) value of total asset is 105.3 billion (65.9 billion) for the matched private firms, and the mean (median) value of total asset is 41.6 billion (19.4 billion) for the private firm sample.

In terms of profitability, the two-sample t-test (Wilcoxon test) indicates that the average (Median) operating cash flow of public firm is significantly lower than that of private firms. The greater standard deviation of operating cash flow for private firms suggests greater positive skewness in that sample, explaining the differing mean and median results. I calculate cash flow volatility using the standard deviation of operating cash flow over the previous three years. The two-sample t-test (Wilcoxon test) shows that private firms have significantly higher cash flow volatility than public firms. A standard precautionary cash holdings would predict a higher average level of cash holdings in the presence of greater cash flow volatility, but this summary statistics do not support that. Private firms' sales growth and leverage are significantly higher, consistent with the fact that private firms must rely on debt and internally generated or privately placed equity, while public firms are able to tap the public equity market. Net working capital is defined as the difference between current assets and current liabilities excluding cash. According to Opler, Pinkowitz, Stulz, and Williamson (1999), Net working capital can be a substitute for cash. The table shows that net working capital for public firms is significantly higher than private firms on average.

I find that, on average, public firms spend 3.81% of total assets on capital expenditures, while matched private firms spend 5.69% of total assets on capital expenditures. This difference in capital expenditures is statistically significant at the 1% level. Private firms spend less on R&D, are less likely to pay dividends, and are younger. The former set of results supports information asymmetries/transaction costs models of cash holdings. Non-R&D investments are easier to finance externally due to their lower information asymmetry. Opler, Pinkowitz, Stulz, and Williamson (1999) argue and show that firms with low dividend payouts will hold less cash due to lower transaction demand. I find that the 29% of the public firm sample are stand-alone firm and 37% of the matched private firm sample are stand-alone firm, while 13% of the public and matched private firms are belongs to Chaebol.

Table 3 shows summary statistics for my sample with more detail to highlight my research focus. I divide public and private sample with stand-alone and group firms. On average, Public group firms hold less cash, have higher profitability than public stand-alone firms. Private stand-alone firms hold more cash and spend more in investment such as R&D and CAPEX. Majority of characteristics are significantly different between two groups (stand-alone versus group affiliated)

Table 4 presents the correlation matrix for the explanatory variables used in this paper. None of the correlations are high enough to present collinearity problems for multivariate analyses. In the next section, I will run multiple regression to test my hypotheses

4. Main results

4.1 Excess cash holdings

Table 5 panel A shows the regression results of a model for normal levels of cash holding based on the previous literature (see, for example, Opler, Pinkowitz, Stulz, and Williamson, 1999; Dittmar and Mahrt-Smith, 2007; Foley, Hartzell, Titman, and Twite, 2007; Gao, Harford, and Li, 2013;)

$$\begin{aligned}\mathrm{Ln}(cash) = \alpha + \beta_1 Public + \beta_2 Alone + \beta_3 \mathrm{Ln}(Totalassets) + \beta_4 CF \\ + \beta_5 CFvolatility + \beta_6 Sales\,growth + \beta_7 Leverage + \beta_8 NWC \\ + \beta_9 CAPEX + \beta_{10} R\&D + \beta_{11} Dividend + \beta_{12} \mathrm{Ln}(Firmage) \\ + IndustryFEs + \epsilon \end{aligned} \tag{1}$$

The dependent variable is the natural logarithm of the cash ratio. I also include the industry-year fixed effects to control for the effect of time varying industry factors on cash policies in the regression.

The results confirm the univariate findings from Table 2 and previous literature (Im, 2014). Specifically, public firm cash holdings are still abnormally high, controlling for a host of factors from the cash literature. I present results using the full sample (columns 1-2) as well as the combination of the public firms and matched private firms (columns 3-4). The results are the same for the two samples. It is informative to compare the primary drivers of cash within public firms to the primary drivers within matched private firms. In column 5-6 I estimate the cash model separately using the public firm sample and matched private firm sample, respectively. The coefficient on the

stand-alone firm indicator variable is positive and significant in private firm samples. This result indicate that private stand-alone firms hold 11% (more cash than private group firms. However, stand-alone firm indicator is not significant in public firm samples. These findings would be evidences for group-affiliated firm's internal capital market and less precautionary motive for cash holdings.

The coefficients on the control variables are consistent with prior findings except for cash flow volatility: Large firms hold less cash holdings, while firms with greater cash flow, net working capital, and R&D expenditures hold more. Leverage, capital expenditures, log firm ages have negative effects on cash holdings, while cash flow volatility shows positive effect on private firm sample, and negative effects on public firm sample in terms of cash holdings. Positive coefficient on cash flow volatility suggests that precautionary motive is stronger for private firm samples. In column 8, I report the F-statistics associated with the Chow-test for different coefficients on the same firm characteristics across the samples. Table 4 Panel A imply the general conclusion, discussed in the introduction, that private stand-alone firms manage their cash as a buffer against a shortfall, while private group firms hold less cash than private stand-alone firms.

The excess cash of public group/stand-alone firms estimated in Panel A would be biased because in pooled regressions, I assume the coefficients on firm characteristics to be the same across different samples. To allow these coefficients to vary across samples I apply each individual firm characteristic to the

regression model estimated by Fama-MacBeth regression using only the matched private firm sample (Column 6 of Panel A) and obtain the predicted cash ratio for each firm with different sample group. Excess cash is the difference between firm's actual cash ratio and predicted cash ratio. This measure not only removes the agency problems but also predicts the cash ratio of firms with different subsample as if these firms needed the same level of precautionary saving as private firms. As reported in Panel B, the average (median) excess cash of public firms in the public group firm sample is 7.03% (3.38%); the average (median) excess cash of public stand-alone firm sample is 7.54% (3.46%). These results suggest that public firms would hold much less cash if they were the same firm but private, and public stand-alone firms' agency conflicts would be higher than that of public group firms.

Having established how stand-alone and group firm cash policies differ and the resulting higher average holdings of private stand-alone firms, in Panel C, I further study how, within public firms, different qualities of governance affect firms' cash holdings. Based on the sample of public firms with available information on insider ownership. Governance index is not publicly available in Korea, so I should rely on insider ownership data for variation in governance. I first find that public firms with insider ownership in the bottom quartile have significantly higher excess cash than the public firms with insider ownership in the top quartile. Insider ownership data for Korean public firms are available from TS-2000 database offered by Korea Listed Companies Association. This finding is consistent with

existing literature, which find evidence on the relation between severity of agency problem and the level of cash holdings when studying only public firms.

In summary, my result confirm Hypothesis 1 that financing friction and existence of internal capital market would lead private stand-alone firms to hold more cash and partially support the hypothesis 2 that public stand-alone firm has more agency conflicts by comparing with Panel C results.

4.2. Excess cash, investment, and performance

I am still left with difficulty of reconciling the clear effect of agency conflicts on cash level between public stand-alone and public group firms. In this section, I explore more evidence by examining firm's speed of adjustment to cash targets as well as how firms react to excess cash. My motivation in doing so is that by combining a comparison of public stand-alone and group firms with a within-public comparison by governance quality, I have insight into a consistent explanation for how agency conflicts affect cash policies.

I start with the speed of adjustment (SOA). In Table 6 Panel A and B, I use the following partial adjustment model to estimate the SOA of cash holdings across public and private firms:

$$\triangle Cash = \alpha + \beta_1 Alone \times (Cash^* - Lagged\,cash) + \beta_2 (Cash^* - Lagged\,cash) + \beta_3 Alone + \epsilon \quad (2)$$

The dependent variable is the change in the cash ratio, Cash* is

the predicted cash ratio based on column 6 of Table 5 Panel A, and thus (Cash*-Lagged cash) measures the deviation of a firm's cash holdings from its target level of cash holdings. The coefficient captures the SOA, and the coefficient captures the difference in SOA across public and private firms or stand-alone and group firms.

In panel A, I use the full sample (public + matched private) in column 1 and find that the coefficient on both (Cash*-Lagged cash) or are positive and significant at the 1% level. These result indicate that both public and private firms are actively adjusting their cash holdings towards target levels and that the SOA for public firms is faster than that of private firms. In columns 2 and 3, I separately estimate Eq. (2) using a subsample of public and private firms with actual levels of cash falling above and below target levels, respectively. To mitigate the concern that I do not know the true model of target cash, I follow Gao, Harford and Li (2013)'s definition with the "excess cash" subsample and the "cash shortfall" subsample using the bottom quartile (P25) and top quartile (P75) of population by the measure of (Cash*-Lagged cash). In this way, my classification is less sensitive to errors in Cash*, since I am only selecting firms in the extremes of the distribution.

Using the subsample of firms with a cash surplus in column 2, I find that the coefficient on is positive and significant at the 1% level. This result indicates that public firms are faster than are private firms when more cash is held than the target cash levels. In contrast, examining the subsample of firms with a cash deficit in column 3, I find a negative and significant coefficient

on the , suggesting that public firms adjust their cash holdings much slower toward their target levels than do private firms when holding less cash than target cash levels.

In Panel B, I use the public and private samples separately to examine effect of firm's stand-alone status. I apply same methodology as Panel A and find that the stand-alone firms adjust their cash holdings much faster than do group firms in public excess cash subsample. In contrast, examining the subsample of private firms with a cash deficit in column 6, I find a negative and significant coefficient on the suggesting that private stand-alone firms adjust their cash holding much slower toward their target levels than do private group firms. This would be evidence that stand-alone firms can't exploit internal capital market and their cash adjustment speed should be slower than group firms' SOA. In Panel C, I further sort the subsample of public firms with excess cash by insider ownership and examine how governance quality, within public firms, influences a firm's speed of adjusting down to target cash levels. Consistent with Dittmar and Mahrt-Smith (2007), I find that well-governed public firms are slower in adjusting down to their target levels of cash than poorly governed public firms. SOA for public stand alone firms with excess cash shows similar pattern to low quality governance firm's cash adjusting behavior.

4.2.1. Dissipation of excess cash

The evidence in Table 6 suggests that agency conflicts affect how firms spend excess cash. The differences in SOA are suggestive, but far from conclusive. Next, I investigate how

firms disgorge their excess cash by comparing their payout, investment, and financing policies using the subsample of firms with excess cash. Specifically, I estimate a multinomial logit regression to examine whether firms with excess cash increase payout (the sum of dividends and stock repurchases), increase investment (the sum of Capex and R&D), or increase debt repayment, with doing nothing as the baseline. I also control for firm size, operating cash flow, cash flow volatility, and other drivers of firms; financing and investment policies. The variable of interest is the stand-alone firm indicator variable.

I define the subsample with excess cash by computing the excess cash using the private firm cash model in column 6 of Table 5 Panel A. The private firm cash model tells us how firms should behave absent agency problems and access to the external stock market, and so I use it as a benchmark estimate of cash holdings based on the private firm level precautionary demand with only minimal effect of agency conflicts. Table 7 Panel A shows that conditional on having excess cash, public stand-alone firms are less likely to increase payout and increase debt repayment than are public group firms, while the investment policies are similar across these two groups of firms. Private stand-alone firms are less likely to increase debt repayment than are private group firms, while investment and payout policies are similar across these two groups of firms. Stand-alone firms and group firms react to excess cash differently.

In Panel B, I repeat the analysis in Panel A by focusing on public firms only, and I find that, conditional on having excess cash, firms with high governance quality are less likely to

increase debt payment and investment, as compared to poorly governed public firms. This result is not consistent with stand-alone vs group firm frame work. However, it is true that public stand-alone firm's payout and debt policy are not good for both shareholder s and creditors. It would be an alternative view of agency problem.

4.2.2. Investment quality

Investment quality by poorly governed firms with excess cash is suggestive of poor decision from agency problem. Bushee (1998) and Bhojraj, Hribar, Picconi, and Mclnnis (2009) suggest that myopic investment decision leads to underinvesting in long-term, intangible projects such as R&D. To confirm that interpretation, I examine managerial myopia with respect to R&D spending. In particular, I measure lack of managerial myopia using R&D/Investment, which captures the expenditure on R&D as a proportion of total investment.

In column 1 of Table 8, I compare investment in R&D between public stand-alone firms and group firms. The coefficient on the stand-alone firm indicator variable is -0.022 and is significant at the 5% level. As the public stand-alone firms execute investment in response to excess cash, they are less likely to spend that excess cash on long-term projects as compared to public group firms. In column 2, I examine how operating performance change after accumulating excess cash. The dependent variable ROA is return on assets, computed as earnings before interest and taxes (EBIT)0.8/total assets by assuming that average corporate tax

rate for Korean firms is 20%[3] (1-0.8). The coefficient on the public stand-alone firm indicator variable is -0.043 and is significant at the 1% level. In column 3 and 4, there are no significant evidence related to private stand-alone firm status. These results indicate that Public stand-alone firms dissipate excess cash in ways that significantly reduce operating performance relative to the way public group firms use the cash.

Comparing public stand-alone and public group firms provides a baseline for how agency problems affect excess cash investment and subsequent performance. To verify my understanding of public firms, I now repeat the analysis within public firms, varying their governance quality. In Panel B, I compare public firms divided along insider ownership. I find some evidence that better-governed firms are less likely to spend excess cash on R&D. It is inconsistent evidence that better-governed public firms spend excess cash in a way that improves operating performance relative to poorly governed firms. In terms of performance, I find consistent result to Panel A suggesting that firms with poor governance quality reduce their performance. Thus, public stand-alone versus public group differential response to excess cash is quite similar and is replicated in the badly versus well-governed public subsample and would be driven by the badly governed public firms.

3) The basic Korean Corporate Income TAX rates for FY 2012 thereafter, the rates will be 10% on the first KRW 200 million, 20% for the tax base between KRW 200 million and 20 billion, and 22% for the excess.

5. Conclusion

In this paper, I provide one of the first large sample comparisons of cash policies in Korean public and private stand-alone/group firms. The comparison allows me to gain insights into theories of stand-alone firm cash holdings by comparing with group affiliated firms. The cash policies of private and public stand-alone firms are interesting in their own right given lack of data before my study. Adding my evidence to the findings in the extant literature clarifies the drivers of observed cash levels in public and private Korean firms. I find that there may exist internal capital market for group firms, therefore private stand-alone hold higher cash reserves than private group firms. I also show that agency problems affect both manager's target level of cash and how they react to excess cash. Normally, greater agency problems in firms lead managers to choose to hold more cash on average than they otherwise would. However, there is still cross-sectional variation in the control of those conflicts and it affects how managers react to levels of cash far in excess of that target cash level. Worse-governed firms tend to invest and avoid increasing payout to shareholders and show lower performance. Poorly governed firms simply trade the cash for other assets through low quality investment, retaining the scale of the firm. By comparing public stand-alone firm's cash policies with that of worse-governed public firms, I suggest that agency cost of public stand alone firms is much greater than the cost of public group firms because stand-alone firms' behavior patterns are similar to poorly-governed firms' behavior. I believe further research on

public/private stand-alone firm's cash holding behavior would find more evidence on precautionary motives and agency conflicts theory about firm's cash holding policies.

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국문 초록

본 연구에서는 한국 상장, 비상장 기업 (외감법인) 자료를 이용하여 기업의 그룹사 소속유무가 현금보유 정책에 어떤 영향을 미칠 수 있는지 테스트 하였다. 그 결과, 독립 비상장기업이 내부 자본시장 이용의 제약으로 인하여 그룹사 소속 비상장기업보다 현금보유를 많이 하는 결과를 얻었다. 그리고 상이한 기업지배 수준을 가진 상장기업 자료와의 비교를 통하여 상장 독립기업이 그룹 소속 상장기업보다 더 심한 대리인 문제를 가지고 있는 것으로 나타났다. 특히 대리인 문제는 기업의 현금보유수준 뿐만 아니라 초과 현금의 소모경로에도 유의한 영향을 미친다는 것을 확인 할 수 있었다.

주요어: 현금보유, 독립기업, 내부 자본시장, 대리인 문제
학 번: 2013-20495

Table 1

Cash ratios over time

The sample consists of 20,630 public firm-year observations and 164,720 private firm-year observations from 1999 to 2013, obtained from KISVALUE. For each public firm, I match it to a private firm in the same KSIC-9 medium level industry and closest in total assets, resulting in the matched private firm sample. Total assets is the book value of total assets (100 mil won). Cash is the cash and marketable securities and financial instrument scaled by total assets. All continuous variables are winsorized at the 2.5% and 97.5% levels.

Year	Public firms				Matched private firms				Private firms			
	# of firms	Median total assets	Mean cash	Median cash	# of firms	Median total assets	Mean cash	Median cash	# of firms	Median total assets	Mean cash	Median cash
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1999	862	1080	11.60%	7.96%	862	517	12.17%	7.99%	4477	153	14.01%	8.60%
2000	924	999	12.38%	8.66%	924	551	12.37%	7.81%	5155	157	14.19%	8.58%
2001	1073	819	14.24%	10.05%	1073	503	12.98%	8.21%	5702	157	13.87%	8.29%
2002	1209	672	14.58%	10.41%	1208	469	13.60%	8.30%	6300	161	13.55%	8.07%
2003	1345	618	13.89%	9.19%	1343	450	12.85%	7.91%	7120	162	12.86%	7.19%
2004	1363	616	13.05%	8.69%	1360	453	12.67%	7.28%	8016	165	12.50%	6.77%
2005	1388	698	15.10%	10.93%	1385	512	13.30%	7.83%	8991	167	12.76%	7.21%
2006	1466	726	15.07%	10.91%	1463	554	13.27%	8.08%	10391	172	12.65%	7.10%
2007	1521	795	14.10%	9.55%	1521	604	12.75%	6.81%	11937	175	11.62%	5.93%
2008	1570	851	12.48%	8.01%	1570	696	12.29%	7.12%	12798	200	11.38%	5.75%
2009	1554	978	13.92%	9.39%	1554	747	13.13%	7.78%	13795	210	11.48%	5.63%
2010	1545	1096	13.42%	8.82%	1545	851	12.66%	6.70%	15432	216	11.09%	5.22%
2011	1572	1227	13.26%	8.28%	1572	933	12.03%	6.50%	17255	214	10.90%	5.10%
2012	1617	1260	13.70%	9.16%	1617	952	11.33%	5.95%	18959	209	10.75%	4.77%
2013	1621	1290	13.80%	9.06%	1621	1039	12.26%	6.48%	18392	229	10.94%	4.86%

Table 2

Summary statistics

The sample consists of 20,630 public firm-year observations and 164,720 private firm-year observations from 1999 to 2013, obtained from KISVALUE. For each public firm, I match it to a private firm in the same KSIC-9 medium level industry and closest in total assets, resulting in the matched private firm sample. Cash is the cash and marketable securities and financial instruments scaled by total assets. Industry-adjusted cash is the industry-median-adjusted cash ratio. Delta cash is the change in the cash ratio. Total assets is the book value of total assets (100 mil won). CF is the operating cash flow scaled by total assets. I calculate CF volatility using the standard deviation of operating cash flow overt the previous three years. Sales growth is the change in sales. Leverage is the long-term debt scaled by total assets. Net working capital is defined as (current assets-current liabilities-cash) scaled by total assets. Capex is the capital expenditures scaled by total assets. R&D is the R&D expenditures scaled by total assets. Dividend is an indicator variables that takes the value of one if the firm is stand-alone, and zero otherwise. Firm age is the number of years since a firm's incorporation. Stand alone is an indicator variables taking the value of one if the firm is stand alone, and zero otherwise. Chaebol is an indicator variables that takes the value of one if firm is member of chaebol, and zero otherwise. All continuous variables are winsorized at the 2.5% and 97.5% leels. Test statistics of the t-test and the Wilcoxon-test of the difference in cash holdings and other characteristics between public firms and matched private(private) firms are given in superscript ***,**,and * denoting statistical significance at the 1%, 5%, and 10% levels, respectively.

	Public firms			Matched Private firms			Private firms		
	Mean	Median	StdDev	Mean	Median	StdDev	Mean	Median	StdDev
1 Cash	13.70%	9.27%	13.07%	12.57%***	7.25%***	13.71%	11.81%***	6.00%***	14.23%
2 Ind-adjusted cash	5.07%	1.14%	12.55%	4.04%***	-0.53%***	12.92%	4.92%*	-0.10%***	13.43%
3 ⊿Cash	-0.78%	-0.31%	7.91%	-0.22%***	-0.05%***	7.25%	-0.24%***	-0.023%***	7.54%
4 Total assets	3916	912	9304	1053***	659***	952	416***	194***	600
5 CF	3.41%	3.86%	9.94%	6.76%***	5.90%***	11.20%	5.34%***	4.35%***	12.65%
6 CF volatility	10.51%	7.81%	9.08%	11.50%***	8.71%***	9.68%	13.92%***	9.41%***	13.95%
7 Sales growth	9.83%	5.95%	35.57%	20.94%***	9.61%***	49.92%	25.23%***	8.14%***	72.01%
8 Leverage	12.79%	8.72%	12.67%	14.32%***	8.73%	15.86%	19.16%***	10.36%***	22.95%
9 NWC	1.48%	1.96%	18.17%	-3.88%***	-2.76%***	21.33%	-8.24%***	-4.78%***	28.41%
10 Capex	3.81%	1.92%	4.87%	5.69%***	2.47%***	7.95%	6.62%***	1.82%***	11.27%
11 R&D	0.81%	0.05%	1.53%	0.53%***	0%***	1.22%	0.43%***	0%***	1.17%
12 Dividend	0.53	1	0.50	0.31***	0***	0.46	0.18***	0***	0.38
13 Firm age	26.00	24	15.39	17.69***	15***	12.47	14.57***	12***	10.95
14 Stand alone	0.29	0	0.45	0.37***	0***	0.48	0.59***	1***	0.49
15 Chaebol	0.13	0	0.34	0.13	0	0.34	0.05***	0***	0.22

Table 3

Summary statistics

The sample consists of 20,630 public firm-year observations and 20,618 matched private firm-year observations from 1999 to 2013, obtained from KISVALUE. For each public firm, I match it to a private firm in the same KSIC-9 medium level industry and closest in total assets, resulting in the matched private firm sample. Cash is the cash and marketable securities and financial instrument scaled by total assets. Industry-adjusted cash is the industry-median-adjusted cash ratio. Delta cash is the change in the cash ratio. Total assets is the book value of total assets (100 mil won). CF is the operating cash flow scaled by total assets. I calculate CF volatility using the standard deviation of operating cash flow overt the previous three years. Sales growth is the change in sales. Leverage is the long-term debt scaled by total assets. Net working capital is defined as (current assets-current liabilities-cash) scaled by total assets. Capex is the capital expenditures scaled by total assets. R&D is the R&D expenditures scaled by total assets. Dividend is an indicator variables that takes the value of one if the firm is stand-alone, and zero otherwise. Firm age is the number of years since a firm's incorporation. Chaebol is an indicator variables that takes the value of one if firm is member of chaebol, and zero otherwise. All continuous variables are winsorized at the 2.5% and 97.5% leels. Test statistics of the t-test and the Wilcoxon-test of the difference in cash holdings and other characteristics between public firms and matched private(private) firms are given in superscript ***,**,and * denoting statistical significance at the 1%, 5%, and 10% levels, respectively.

	Public group firms		Public alone firms		Matched Private group firms		Matched Private alone firms	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
1 Cash	13.39%	9.08%	14.47%***	9.80%***	12.08%	6.85%	13.40%***	8.05%***
2 Ind-adjusted cash	4.91%	1.15%	5.48%***	1.12%	3.52%	-0.76%	4.91%***	0%***
3 ⊿Cash	-0.71%	-0.29%	-0.97%**	-0.35%	-0.25%	-0.06%	-0.18%	-0.04%
4 Total assets	4946	1197	1364***	506***	1202	808	799***	465***
5 CF	4.38%	4.50%	0.99%***	1.99%***	6.78%	5.95%	6.73%	5.81%
6 CF volatility	9.68%	7.31%	12.56%***	9.24%***	10.93%	8.23%	12.48%***	9.55%***
7 Sales growth	10.34%	6.35%	8.58%***	4.68%***	20.77%	9.55%	21.23%	9.69%
8 Leverage	12.33%	8.69%	13.94%***	8.84%**	14.41%	9.02%	14.16%	8.28%***
9 NWC	0.94%	1.18%	2.82%***	4.20%***	-4.69%	-3.45%	-2.52%***	-1.58%***
10 Capex	3.75%	1.98%	3.95%***	1.79%	5.42%	2.41%	6.14%***	2.62%***
11 R&D	0.77%	0.05%	0.90%***	0.05%	0.46%	0.00%	0.65%***	0%***
12 Dividend	0.60	1	0.38***	0***	0.33	0	0.27***	0***
13 Firm age	27.54	26	22.19***	19***	18.33	16	16.60***	14***
14 Chaebol	0.18	0	0***	0***	0.21	0	0***	0***

Table 4

Correlation matrix

The sample consists of 20,630 public firm-year observations and 20,618 matched private firm-year observations from 1999 to 2013, obtained from KISVALUE. Variable definitions are provided in Table 2. All continuous variables are winsorized at the 2.5% and 97.5% levels. p-values are reported in brackets.

	1	2	3	4	5	6	7	8	9	10	11	12
1 Public	1											
2 Ln(Total assets)	0.40	1										
	[0.00]											
3 CF	-0.04	-0.02	1									
	[0.00]	[0.00]										
4 CF volatility	-0.08	-0.15	0.00	1								
	[0.00]	[0.00]	[0.34]									
5 Sales growth	-0.05	-0.02	0.06	0.03	1							
	[0.00]	[0.00]	[0.00]	[0.00]								
6 Leverage	-0.10	0.03	-0.11	-0.04	0.06	1						
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]							
7 NWC	0.12	0.08	0.00	0.03	-0.02	-0.01	1					
	[0.00]	[0.00]	[0.55]	[0.00]	[0.00]	[0.00]						
8 Capex	-0.07	-0.09	0.10	-0.09	0.09	0.19	-0.13	1				
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]					
9 R&D	0.10	-0.06	0.04	0.02	0.00	-0.09	0.13	-0.01	1			
	[0.00]	[0.00]	[0.00]	[0.00]	[0.72]	[0.00]	[0.00]	[0.00]				
10 Dividend	0.28	0.26	0.19	-0.12	-0.05	-0.18	0.19	-0.05	0.04	1		
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]			
11 Ln(firm age)	0.22	0.24	0.03	-0.14	-0.31	-0.18	0.10	-0.20	-0.01	0.21	1	
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]		
12 Stand alone	-0.19	-0.32	-0.03	0.07	0.01	0.09	-0.03	0.04	0.02	-0.14	-0.12	1
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	

Table 5

Correlation matrix

The sample consists of 20,630 public firm-year observations and 164,720 private firm-year observations from 1999 to 2013, obtained from KISVALUE. For each public firm, I match it to a private firm in the same KSIC-9 medium level industry and closest in total assets, resulting in the matched private firm sample. Panel A represents the baseline cash model where the dependent variable is the natural logarithm of cash ratio. Panel B presents the excess cash for public firm samples. Specifically, I apply each individual public firm's characteristics to the regression model estimated using only he matched private firm sample (reported in column 6 of Panel A) and obtain the predicted cash ratio for each public firm. Excess cash is the difference between a firm's actual cash ratio and predicted cash ratio. All continuous variables are winsorized at the 2.5% and 97.5% levels. Industry times year fixed effects are included in the regressions and the heteroskedasticity-consistent standard errors account for possible correlation within a firm cluster. Standard errors are reported in brackets. Superscripts ***, **, * correspond to statistical significance at the 1%, 5%, and 10% levels, respectively.

	Full sample		Public firms and matched private firms		Public firms	Matched private firms	Private firms	F-statistic of Chow test (5)-(6)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: The baseline model of cash								
Public	0.280***	0.169***	0.326***	0.285***				
	[0.014]	[0.013]	[0.013]	[0.014]				
Stand alone		0.052***		0.052***	-0.012	0.105**	0.066***	12.81***
		[0.008]		[0.014]	[0.019]	[0.021]	[0.010]	
Ln(total assets)	-0.013***	-0.067***	-0.100***	-0.111***	-0.090***	-0.111***	-0.042***	13.74***
	[0.004]	[0.004]	[0.006]	[0.007]	[0.008]	[0.013]	[0.005]	
CF		2.776***		2.735***	2.207***	3.185***	2.863***	18.52***
		[0.034]		[0.065]	[0.088]	[0.095]	[0.037]	
CF volatility		0.354***		0.295***	-0.205**	0.678***	0.393***	12.58***
		[0.031]		[0.072]	[0.097]	[0.106]	[0.033]	
Sales growth		-0.040***		-0.024	-0.034	0.003	-0.037***	11.00***
		[0.007]		[0.016]	[0.023]	[0.023]	[0.007]	
Leverage		-1.077***		-1.441***	-1.600***	-1.255***	-1.002***	9.62***
		[0.021]		[0.051]	[0.074]	[0.072]	[0.023]	

NWC		1.006***		0.700***	0.781***	0.575***	0.979***	9.36***
		[0.016]		[0.035]	[0.049]	[0.050]	[0.017]	
Capex		-0.910***		-1.849***	-1.982***	-1.852***	-0.862***	10.53***
		[0.054]		[0.110]	[0.175]	[0.147]	[0.057]	
R&D		8.249***		5.358***	5.830***	3.866***	8.612***	10.75***
		[0.335]		[0.481]	[0.569]	[0.834]	[0.391]	
Dividend		0.378***		0.257***	0.169***	0.342***	0.433***	9.11***
		[0.010]		[0.015]	[0.019]	[0.022]	[0.011]	
Ln(firm age)		0.102***		-0.070***	-0.197***	0.037**	0.142***	15.43***
		[0.006]		[0.010]	[0.014]	[0.014]	[0.006]	
Industry*year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Constant	-3.55***	-1.86***	-0.005	0.204	-0.838**	1.103**	-2.584***	12.47***
	[0.109]	[0.123]	[0.316]	[0.305]	[0.387]	[0.508]	[0.141]	
Observations	185,350	185,350	41,248	41,248	20,630	20,618	164,720	
Adj R2	11%	22%	8%	20%	20%	21%	21%	

Panel B: Excess cash for public/private and group/stand-alone firm samples

	Public group	Public alone	Matched Private group	Matched Private alone
Mean	7.03%	7.54%	5.45%	5.78%
Median	3.38%	3.46%	1.21%	1.42%

Panel C: Excess cash across public firms with different qualities of governance: Insider ownership

	Subsample A (1)	Subsample B (2)	Test of difference (1)-(2)
Insider ownership bottom quartile (Subsample A) versus top quartile (Subsample B)			
Mean	8.26%	6.61%	1.65%***
Median	4.62%	2.59%	2.04%***

Table 6

Speed of adjustment to target cash

The sample consists of 20,630 public firm-year observations and 20,618 matched private firm-year observations from 1999 to 2013. Obtained from KISVALUE. Panel A represents the speed of adjustment to target cash where the dependent variable is the change in cash ratio, delta Cash. Cash* is the predicted cash ratio from column 6 of Table 5 Panel A. In column 2 and 3, the sample consists of the bottom quartile (P25) and top quartile (P75) of the sample firms by the measure of (Cash* - Lagged cash), respectively. In panel B, I use the public and private subsample and Panel B reports the effect of stand-alone instead of public dummy used in Panel A. In Panel C, I use the subsample of public firm with (Cash* - Lagged cash)$\leq$P25 and estimate the regression $\triangle Cash = \alpha + \beta(Cash^* - Lagged cash) + \epsilon$. Panel C reports the coefficient estimates across public firms with different qualities of governance. Standard errors are reported in brackets. Superscripts ***, **, * correspond to statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Estimating the speed of adjustment to target cash (Full sample: Public + Matched private)

	Full sample (1)	Subsample of firms with excess cash (Cash*-Lagged cash)<= P25 (2)	Subsample of firms with cash shortfall: (Cash*-Lagged cash)>= P75 (3)
Public X (Cash*-Lagged cash)	0.044***	0.053***	-0.079**
	[0.005]	[0.016]	[0.037]
Cash*-Lagged cash	0.210***	0.160***	0.495***
	[0.005]	[0.012]	[0.021]
Public	0.003***	0.004	0.008***
	[0.001]	[0.005]	[0.002]
Constant	0.011***	-0.003	-0.001
	[0.001]	[0.004]	[0.001]
Observations	39,524	9,789	9,789
Adj R2	18%	5%	7%

Panel B: Estimating the speed of adjustment to target cash (Public firms vs Matched private firms)

	Public sample (1)	Excess cash subsample (2)	Cash shortfall subsample (3)	Private sample (4)	Excess cash subsample (5)	Cash shortfall subsample (6)
Alone X (Cash*-Lagged cash)	0.049***	0.048*	-0.057	-0.001	-0.006	-0.117***
	[0.008]	[0.026]	[0.063]	[0.007]	[0.022]	[0.044]
Cash*-Lagged cash	0.240***	0.197***	0.396***	0.210***	0.158***	0.549***
	[0.005]	[0.015]	[0.036]	[0.004]	[0.014]	[0.030]
Public	0.004***	0.003	0.008**	0.001	-0.003	0.005
	[0.001]	[0.008]	[0.003]	[0.001]	[0.006]	[0.003]
Constant	0.012***	-0.0002	0.007***	0.010***	-0.003	-0.004**
	[0.001]	[0.004]	[0.002]	[0.001]	[0.004]	[0.002]
Observations	19,768	4,938	4,938	19,756	4,850	4,850
Adj R2	19%	6%	4%	16%	4%	10%

Panel C: Estimating the speed of adjustment to target cash within public firms with excess cash

	(low insider ownership) Subsample A (1)	(high insider ownership) Subsample B (2)	F-statistics of Chow test (1)-(2) (3)
Insider ownership bottom quartile (Subsample A) versus top quartile (Subsample B)	0.280	0.145	15.79***

Table 7

Disgorging excess cash via payout, investment and debt repayment.

The sample consists of the bottom quartile of the sample firms by the measure of (Cash*-Lagged cash), where Cash* is the predicted cash ratio from column 6 of Table 5 Panel A. In Panel A, I estimate a multinomial logit regression to examine how firms disgorge excess cash. Increase payout is an indicator variable taking the value of one if a firm increases the sum of dividend payment and stock repurchases in he next year, and zero otherwise. Increase investment is indicator variable taking the value of one if a firm increases the sum of Capex and R&D in the next year, and zero otherwise. Increase debt repayment is an indicator taking the value of one if a firm increases debt repayment in the next year, and zero otherwise. The base case is doing nothing. In Panel B, I use the subsample of public firms with (Cash*-Lagged cash) $\leq$ P25 and employ the same multinomial logit regression as in Panel A, except that I replace the alone firm indicator variable with the indicator variables for the insider ownership top/bottom quartile (columns 1-3). Panel B reports the coefficient estimation the insider ownership top/bottom quartile indicator variables. The heteroskedasticity-consistent standard errors account for possible correlation within a firm cluster. Standard errors are reported in brackets. Superscripts ***, **, * correspond to statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Public firms vs private firms sample

	Public firm sample			Matched private firm sample		
	Increase Payout (1)	Increase Investment (2)	Increase Debt repayment (3)	Increase Payout (4)	Increase Investment (5)	Increase Debt repayment 6)
Alone	-0.188**	-0.099	-0.148**	-0.040	-0.023	-0.203**
	[0.082]	[0.069]	[0.075]	[0.097]	[0.068]	[0.083]
Ln(total assets)	0.130***	-0.034	0.067*	0.323***	-0.192***	0.122**
	[0.036]	[0.032]	[0.035]	[0.058]	[0.042]	[0.052]
CF	2.254***	1.076***	-2.376***	1.154***	0.490*	-2.660***
	[0.377]	[0.318]	[0.344]	[0.398]	[0.279]	[0.356]
CF volatility	0.305	0.72**	-0.386	0.374	0.26	-0.589
	[0.425]	[0.354]	[0.382]	[0.473]	[0.317]	[0.402]
Sales growth	0.062	0.112	0.19**	0.091	0.026	0.275***
	[0.094]	[0.079]	[0.083]	[0.105]	[0.073]	[0.085]

Leverage	-1.062***	-0.764***	0.645**	-1.185***	-1.192***	1.492***
	[0363]	[0.287]	[0.299]	[0.448]	[0.266]	[0.298]
Dividend	0.506***	0.048	-0.175**	0.871***	-0.099	-0.182**
	[0.083]	[0.072]	[0.078]	[0.093]	[0.068]	[0.085]
Industry*year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-5.168	0.786	-3.455	-14.056	4.876	-6.631
	[26.86]	[13.83]	[24.87]	[61.53]	[13.74]	[43.87]
Observations	4,938	4,938	4,938	4,857	4,857	4,857
Pseudo R2	18.4%	4.4%	15.2%	17.3%	3.5%	19.1%

Panel B: Examining how public firms with different qualities of governance disgorge excess cash

	Increase Payout (1)	Increase Investment (2)	Increase Debt repayment (3)
Insider ownership bottom quartile indicator	-0.127	0.132*	-0.079
	[0.089]	[0.074]	[0.080]
Insider ownership top quartile indicator	-0.042	-0.012	-0.179**
	[0.082]	[0.072]	[0.080]

Table 8

Excess cash and investment quality

The sample consists of the bottom quartile of the sample firms (public and private) by the measure of (Cash*-Lagged cash), where Cash* is the predicted cash ratio from column 6 of Table 5 Panel A. In column 1 of panel A, the dependent variable is R&D divided Investment, computed as R&D/(Capex+R&D). In column2 of Panel A, the dependent variable is return on assets (ROA), computed by EBIT×0.8/total assets by assuming that average corporate tax rate is 20%. In Panel B, I use the subsample of public firms with (Cash*-Lagged cash)≤P25 and employ the same regression as in Panel A, except that I replace the alone firm indicator with the indicator variables for the insider ownership top/ bottom quartiles (columns 1-2). Panel B reports the coefficient estimates on the insider ownership top/bottom quartile indicator variables. The heteroskedasticity-consistent standard errors accounts for possible correlation within a firm cluster. Standard errors are reported in brackets. Super scripts ***, **, * correspond to statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Public firms vs private firms sample

	Public firm sample		Private firm sample	
	R&D/Investment (1)	ROA (2)	R&D/Investment (3)	ROA (4)
Alone	-0.022**	-0.043***	0.007	-0.009
	[0.001]	[0.007]	[0.008]	[0.007]
Ln(total assets)	-0.018***	0.036***	-0.002	0.016***
	[0.004]	[0.003]	[0.005]	[0.004]
Sales growth	-0.023**	0.079***	-0.009	0.032***
	[0.010]	[0.008]	[0.007]	[0.006]
Lagged R&D/Investment	0.418***		0.412***	
	[0.013]		[0.013]	
Lagged ROA		0.149***		0.393***
		[0.014]		[0.013]
Industry*year FEs	Yes	Yes	Yes	Yes
Constant	0.623***	-0.910***	0.1	-0.403***
	[0.122]	[0.087]	[0.145]	[0.124]
Observations	4,938	4,938	4,857	4,857
Adj R2	31.8%	15.2%	25.7%	19.2%

Panel B: Examining how public firms with different qualities of governance disgorge excess cash		
	R&D/Investment (1)	ROA (2)
Insider ownership bottom quartile	0.0184*	-0.100***
indicator	[0.010]	[0.007]
Insider ownership top quartile	-0.022**	0.040***
indicator	[0.010]	[0.007]

Figure 1

Total cash amount, mean and median of cash ratio of public firms

The sample consists of 20,630 public firm-year observations. The figure shows that total cash amount of public firms and cash ratio. Cash amount is not winsorized.