Dividend taxes and payout policy: Evidence from Korea's 2015–2017 dividend tax cut

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Abstract

The Korean government temporarily lowered dividend tax rates for investors of firms that significantly increased dividend payments in 2015–2017. We examine how the dividend tax cut affects corporate payout policies. We found substantial dividend payment growth in the qualifying firms, mainly funded by operating cash flow; neither cash holding nor share repurchase is significantly reduced. The insider ownership is found to be an important factor in driving a continual enjoyment of the dividend tax cut. Yet, a large proportion of firms only temporarily enjoy the dividend tax cut in 2015, which argues against slow adjustments in dividend payout policy.

Keywords: Dividend tax, Dividend, Share repurchases, Corporate behavior, Propensity score matching

JEL Classification: E62, H31

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1 Introduction

In 2014, the Korean government introduced a temporary dividend tax cut that lasted three years, from 2015 through 2017. The tax bill reduced dividend income tax for any "high-dividend-company," which increases dividend payments above the criteria set by the government. By offering lower tax rates to this group of high dividend companies, this policy tried to stimulate dividend growth in Korean corporations.

This paper empirically examines the economic effects of Korea's 2015–2017 dividend tax cut on corporate payout policy. In particular, we aim to answer the following questions: (1) Do the qualifying firms increase their dividend payouts as the policy intended?; (2) If so, do these firms increase dividend payments by reducing share repurchases or cash holdings?; and (3) What firm characteristics are important in the decision of taking advantage of the tax cut?

These questions address the implications for the tax reform, as well as the evaluation of the effectiveness of this tax cut. The first question directly asks whether the tax cut achieves its goal of increasing dividend payouts among Korean corporations as the tax cut intended. The second one is related to on-going debates about taxation on cash retention in Korea. In fact, another goal of the tax cut is to decrease retained earnings by encouraging dividend payments. This goal is achieved if the qualifying firms increase dividend payments by decreasing cash holdings. A careful examination of what firms are indeed responsive to this dividend tax cut can provide not only a test of the existing theory on dividend payments but also an insight for designing the tax code.

The tax cut was announced in August 2014 and enacted as a sunset provision for 2015–2017. The Korean government decided not to extend this special tax code in August 2017, implying that it was a temporary dividend tax cut. We use a sample of Korean firms listed in the KOSPI and KOSDAQ markets from 2015 to 2016 to empirically investigate the effect of this temporary dividend tax cut. The data come from the KIS-value database, which is the collection of financial statements of the listed firms in Korea. We conduct empirical analysis for both of the entire sample of firms, and the matched sample of firms based on the PSM; the PSM is

widely used to evaluate average treatment effects of a policy because the adoption of a matched sample is known to mitigate selection biases in observational studies.

Our main empirical findings are as follows. First, we find a significant dividend payment growth of the qualifying firms. For instance, the dividend-asset ratio of the qualifying firms increases by 0.4 percentage points on an annual basis. This value implies that the annual growth rate of the dividend-asset ratio is more than 25% for these qualifying firms. The average dividend payment growth rate is 48% for the qualifying firms as well. This quantitative significance remains intact for the sample of matched firms based on the PSM. Our test results based on Oster (2017) also imply that our findings of the effect of the tax cut on dividends are robust to the unobservable. We further show that excess dividend payments are substantial in the qualifying firms, which is defined as the excess amount of dividend above the level predicted by a firm's historical dividend payout propensity. The excess dividends of the qualifying firms accounted for 14.2% of their total dividends in 2015, and 45.4%, in 2016. Furthermore, the excess dividends take account of 2.1% and 15.4% of aggregate dividends in 2015 and 2016, respectively.

Second, we find that current cash flow was a major financing source for additional dividend payments. Neither a reduction of share repurchases nor a liquidation of cash holding is widely used for the financing source of dividend payment growth. In fact, our binary choice model robustly shows the profitability of a firm as a key economic determinant in satisfying the dividend payout criteria set by the tax code. These findings are robust to our choice of the entire sample and the matched sample. Based on this large cash flow generation, the qualifying firms are mostly shown to increase cash holdings. Liquidation of cash stock for dividend growth does not occur; accordingly, the policy objective of this tax cut appears to be partially accomplished. The qualifying firms make no significant changes in their share repurchases to asset ratio as well. In other words, this tax cut does not seem to cause substitution between two payout methods: share repurchases and dividends. It achieves overall payout growth as the policy intended, and cash flow in the current period almost exclusively finances the additional dividend payments.

Third, we find that a large number of firms enjoyed the tax cut only temporarily. Around half of the qualifying firms in 2015 failed to meet the

criteria in 2016. Their change in the dividend-asset ratio and dividend growth rate are even lower than those of the control group in 2016. Their excess dividends also become negative in 2016. This swift adjustment of dividend payments is not properly aligned with the slow adjustment of dividend payout policy widely accepted in the literature (Lintner 1956).

Finally, our empirical results suggest the insider shares as an important factor leading to a continual enjoyment of the tax cut. Unlike other groups that only temporarily took advantage of lower dividend tax rates, the firms that enjoy tax advantage both in 2015 and 2016 have a significantly larger proportion of inside shareholdings. Our binary choice models robustly confirm this tendency even after controlling for a set of firm characteristic variables. With such large shares, the insiders appear to receive substantial tax benefits from the dividend tax cut based on their actual control power in deciding the firm's dividend payout policy.

This paper contributes to the literature in the following four aspects. First, we provide new empirical evidence supporting the effect of the dividend tax cut on payout policy. Our results suggest that the dividend tax cut from 2015 to 2017 induce the growth of dividend payouts in Korean corporations. This finding is precisely in line with the existing studies that confirm the significant role of dividend tax reforms in affecting corporate payout policies. The representative studies include Chetty and Saez (2005) for the United States, Alstadsæter and Jacob (2016) for Sweden, Pattenden and Twite (2008) for Australia, and Chan and Lin (2017) for Taiwan.

Moreover, we also have empirical evidence against the Lintner (1956) model of dividend payouts, which highlights the rigidity in dividend payout policy. A significant proportion of qualifying firms only temporarily enjoy tax benefits in 2015. Their dividend payout propensity and dividend payments drop substantially in 2016. Such a temporal adjustment of dividend policy is not properly aligned with the rigidities in dividend policy. This finding is not in line with the signaling theory of dividend payments, which provides a theoretical background of gradual adjustment in dividend payout policy (Bhattacharya 1979; Miller and Rock 1985).

Our result also adds a new dimension to the literature emphasizing the role of agency frictions in shaping corporate dividend policy. Chetty and Saez (2005) provided cross-sectional evidence that dividend increases are positively related to the manager's shareholdings. Similarly, Blouin *et al.*

(2004) documented the positive relationship between dividend increases and insider ownership. Brown, Liang, and Weisbenner (2007) indicated that the managers with significant stock options, which are rarely protected by dividend changes, are reluctant to increase dividend payment after the dividend tax cut of 2003 in the US. As insider ownership enlarges, the benefits from lower dividend tax rates for insiders arise as well. Consistent with existing studies, we find a close relationship between insider shares and continual enjoyment of tax benefits.

Our findings do not support the widely accepted substitution effect between dividend payments and share repurchases. For instance, Grullon and Michaely (2002) found that some of the increase in share repurchases in the 1980s and 1990s came at the expense of a reduction (or lack of increase) in dividend payments in the US. Brown, Liang, and Weisbenner (2007) also confirmed that an increase in dividends was accompanied by a decrease in share repurchases in the dividend tax cut of 2003 in the US. We find no significant substitution effect between dividend and share repurchases during this dividend tax cut, which argues against these studies.

The rest of the paper is organized as follows. Section 2 documents Korea's 2015–2017 Dividend Tax Cut. Section 3 reviews literature on dividend taxes and corporate behaviors. Section 4 describes our sample and empirical methods. Regression results are in section 5. We conclude with summary and discussion.

2 Korea's 2015-2017 dividend tax cut

In 2014, the Korean government introduced a temporary dividend tax cut as a part of a tax reform package to boost household income. The package consists of three tax changes: lowering tax burden for larger dividend payments, lowering tax burden for higher wages, and raising tax burden for retained earnings. The tax cut was announced in August 2014 and applied for three years from 2015 to 2017 as a sunset provision. The main purpose of the tax cut posited by the government is to increase household income by reducing cash holdings of firms. If the 2015-2017 dividend tax cut can induce larger dividends which can last even after the

sunset of the tax cut, it may be beneficial for the Korean economy. Dividends in Korea have been significantly smaller than those in other developed countries, and there also exists a phenomenon called 'the Korea discount,' indicating low stock price due to potential entrenchment by managers and controlling shareholders. Larger and stable dividends can be seen as moving to a better equilibrium, where firms' value increases, entrenchment by controlling shareholders reduces, and small shareholders rights are better served.[1]

The Korean government decided not to renew this special dividend tax cut in August 2017, citing that the benefit of the dividend tax cut concentrated on high-income earners. Unlike dividend tax changes in other countries, Korea's 2015–2017 dividend tax cut was temporary, which limits the scope and interpretation of research. However, it still allows us to pursue interesting questions, such as whether a temporary dividend tax cut leads to a permanent dividend increase as predicted by the signaling model.[2] This dividend tax cut provides an interesting opportunity to investigate the effect of a temporary dividend tax cut on payouts, financing, and investments.

Korea's 2015–2017 dividend tax cut lowers the withholding tax rate on dividend income earned on stocks held in listed corporations (from 14% to 9%) and allows financial income, which had been taxed at the progressive rate of personal income taxes, to be taxed separately and flat at a 25% rate. To qualify for this dividend tax cut, dividend payments should come from firms satisfying the criteria for "high-dividend-company." There are two types of the criteria. "Type 1" is applied to listed stocks whose dividend payout ratios or dividend yields are more than 120% of the market average, and total dividend payouts increase by more than 10% from the previous year. "Type 2" is applied to listed stocks whose dividend payout ratios or dividend yields are more than 50% of the market average, and total dividend payouts increase by more than 30% compared to the previous year. Newly listed stocks and stocks with no previous dividend payouts are required to issue dividends larger than 130% of the market

[1] Kalcheva and Lins (2007) found that firm values are lower when controlling managers hold more cash and that firm values are higher when controlling managers pay dividends.

[2] We examine this question partially by investigating firms that take advantage of the tax cut only in 2015. In 2016, most of these firms turn out to be cash-constrained due to a low profit in 2016. To examine both not-cash-constrained firms and cash-constrained firms, we need the data of dividend payments of year 2018 and after. We leave this research question for future research.

average (MOSF 2014 Revision to Tax Enforcement Decree).

3 Literature review

Changes in dividend taxes can affect various corporate behaviors, including payouts, financing, and investments. Since a dividend tax cut raises the after-tax return to shareholders, a dividend tax cut leads to higher equity prices (see, e.g., Auerbach and Hassett, 2006) and larger equity-financing. Twite (2001) provided evidence of an increase in the level of external equity financing after the introduction in 1987 of dividend imputation system in Australia. If the marginal source of investment is external equity (e.g., Poterba and Summers 1985) due to constrained cash, dividend tax cut leads to a larger investment. Alstadsæter *et al.* (2017) found that cash-constrained firms increased investment after Sweden's 2006 dividend tax cut relative to cash-rich firms.

There are many existing studies on the effect of dividend taxes on payouts, the topic of this paper. The most studied country is the US. Chetty and Saez (2005) found that dividend payments and the number of firms paying dividends significantly increased after the US's 2003 dividend tax cut. Brown, Liang, and Weisbenner (2007) argued the significant role of managerial stock option holdings in shaping heterogeneous effects on corporations from the dividend tax cut of 2003. Many international studies confirm the effect of dividend tax and dividend imputation system on dividend payments, including Alstadsæter and Jacob (2016) for Sweden, Pattenden and Twite (2008) and Abraham (2014) for Australia, and Chan and Lin (2017) for Taiwan. More generally, there are studies examining the determinants of dividends using firm-level data from various sets of countries, including La Porta et al. (2000) for dividends of 4,000 companies from 33 countries; Cha and Lee (2007) for dividends of 15,813 firms from 67 countries; Denis and Osobov (2008) for dividends in the US, Canada, UK, Germany, France, and Japan; Ho (2003) for dividends in Australia and Japan; and Kaźmierska-Jóźwiak (2015) for those in Poland.

To examine the effect of dividend taxes on payouts carefully, we must control for determinants of corporate dividend policy. While the seminal work of Miller and Modigliani (1961) proposed their famous dividend

irrelevance theory and Modigliani and Miller (1963) added a distortionary effect of corporate income taxes, their propositions may not explain why firms make large amounts of dividend payments, and why investment analysts and investors are so interested in dividend announcements. To reconcile this puzzling empirical regularity, some economic arguments have been proposed and tested. One strand of literature highlights the importance of asymmetric information between managers and shareholders (e.g., Bhattacharya 1979; Miller and Rock 1985), focusing on the signaling effect of dividend payments. This approach is based on Lintner's (1956) earlier observation on dividend policy, wherein he argued that managers aim to stabilize the dividend with a long-term target payout ratio. His survey results confirm that companies are indeed concerned about the stability of the dividends. Another strand of literature incorporates the lifecycle theory of a firm. In fact, DeAngelo *et al.* (2006) noted that the mix of earned versus contributed capital in a firm's equity capitalization is a key determinant of dividend policy. They found that larger dividend payments were made by mature firms whose equity capitalization was largely composed of their retained earnings. Agency conflict is also considered a critical determinant of corporate dividend policy. Easterbrook (1984) and Jensen (1986) highlighted the role of dividend payout as a device to reduce overinvestment by managers; by paying out large and steady dividends, a firm's free cash flow decreases significantly. Using the Korean stock market data, Cho (1990) investigates and finds supportive evidence of the effect of agency conflict on dividend policy. Consistent with the agency model, La Porta et al. (2000) find that stronger minority shareholder rights are associated with higher dividend payouts.

The existing studies also emphasize a significant role of insider share or managerial shares in the determination of dividend policy. For instance, Chetty and Saez (2005) provided cross-sectional evidence that dividend increases show a positive relationship with the managerial shareholdings. They find that large outside (nondirector) individual shareholders do not affect the response to the tax cut. Blouin, Raedy, and Shackelford (2004) also confirmed that dividend growths are positively related to insider ownership. Brown, Liang, and Weisbenner (2007) documented that managerial stock options, rarely protected by dividend changes, appear to hinder increases in dividend payments from the dividend tax cut of 2003

in the US.

Several papers examine how tax policy changes affect the payout policy of Korean corporations. For instance, Hong and Ju (2006) examined how the introduction of the financial income composite taxation on net income influences the payout policy of Korean corporations. Hwang and Kim (2014) investigated the response of investors and dividend-paying firms to the 2012 tax amendment to lower the threshold of global taxation on financial income. The effect of the dividend tax cut 2015–2017 on corporate payout policy has not been examined in the literature so far.

4 Data and empirical model

This study examines the payout policy of firms listed in the KOSPI and KOSDAQ markets in 2015 and 2016. We use the KIS-Value database to obtain financial statements of the sample firms. We exclude financial and utility firms due to their distinctive regulatory environments, which may affect dividend payouts. To properly capture the life cycle aspect of the firms, we exclude the firm year-observations reporting negative earned equity in its financial statement. We winsorize each variable at a 1% level.

This paper adopts the following variables for the empirical analysis. As dependent variables, we measure the growth of dividend payments by using the change in the dividend-asset ratios (ΔDV) and dividend growth rates (DVG). The dividend-asset ratio is defined as the ratio of cash dividends to the total book values of assets. The dividend growth rate is the percentage growth of cash dividends compared to the prior period. To control for a different trajectory of dividend growth, which is not explained by the observable firm characteristic variables, we calculate "excess dividends." For the estimation of excess dividends, we employ a historical dividend payout propensity. Our dividend payout propensity is defined as the ratio of cash dividends to net income. We calculate the average of a firm's dividend payout propensity from 2011 to 2013 and use it as the benchmark for the excess dividend calculations in 2015 and 2016. The constant growth of dividend propensity, 3%, is used to set another scenario.

We also use as dependent variables, change in the share repurchases and

change in cash holdings to examine the substitution effect between dividend payments, share repurchases, and cash holdings. The substitution hypothesis predicts that the qualifying firms tend to reduce their share repurchase under the dividend tax cut. If the qualifying firms liquidate cash to finance dividend payments, the dummy variable of qualifying firms has negative coefficients in the regressions using the change of cash holdings as the dependent variable.

As determinants of dividend policies, we include variables of the following seven categories as previous studies on dividends suggest.[3]

4.1 Liquidity

There exists two-way causality between liquidity and dividend policies of firms. Firms with larger cash holdings are more likely to pay dividends (Kaźmierska-Jóźwiak, 2015). Signaling theory of dividend is consistent with this positive association between cash and dividends because the theory suggests that the informational signal must be costly to be effective and cost of signaling is low in firms with larger cash holdings. We expect that cash-asset ratio ($\Delta CASH$) be positively associated with dividends. The total asset growth (ΔTA) also represents liquidity, which is calculated as the difference between current and prior period book value of the asset divided by the prior period book value of the asset. Large investment reduces a firm's free cash flow and potentially hinders dividend growth.

4.2 Profitability

The signaling theory (Bhattacharya, 1979) predicts a positive correlation between the return on assets (*ROA*) and dividend payout propensity. This theory argues that a firm maintain high dividend payout to signal good projects with large cash flow generations in the future. Due to the persistence in profit generation, current period return on assets is widely used as a proxy variable for future profitability. *ROA* is defined as the ratio of earnings before interest and tax to the total assets.

[3] The categorization of determinants used here is slightly revised from that in Kaźmierska-Jóźwiak (2015), which categorizes variables into 5 groups: leverage, liquidity, profitability, size, and risk.

4.3 Ownership

Insider ownership can affect dividend policy because insiders are often a member of the board which decides dividend policy. Chetty and Saez (2005), Blouin et al. (2004), and Brown, Liang, and Weisbenner (2007) report evidence of the importance of insider ownership.

Three types of ownership variables are included in our empirical examinations. To reflect the importance of insider ownership, we incorporate the proportion of controlling shareholders holdings as an independent variable (*INSIDER*). The controlling shareholders consist of the equity holder with the largest shareholdings and his/her related parties.[4] To capture the potential effects of foreign shareholders on dividend payout decisions, we also include the proportion of foreign shareholders as another control variable (*FOREIGN*). The indicator variable, *LARGE*, has the value of one if the firm is included in the largest 30 Korean conglomerates. This group of large companies, "Chaebol," is widely known to have different internal financing structure, which may affect dividend policy significantly.

4.4 Growth potential of firms

Growth potential of firms lower the cost of signaling and raise the possibility of managers' entrenchment, both of which increase dividends. The market to book asset ratio (*M/B*) captures the firm's growth opportunities. The market firm value is defined as the total assets minus the book value of equity plus the market value of equity. The sales growth rate (*SALEG*), defined as current period's sales minus the prior period's sales divided by the prior period's sales, also capture the firm's growth opportunities as well.

[4] This definition implies that the Korean National Pension Service might be included as a party of controlling shareholders if it has the largest shareholdings. Yet, we do not discern the role of Korean National Pension Service against other controlling shareholders in the empirical analysis; national pension funds, which is exempted from dividend taxes, favor large dividend payments as much as other controlling shareholders do.

4.5 Leverage

A large leverage ratio implies a significant interest burden to the firm, which potentially reduces its dividend payments. The agency cost theory, on the other hand, implies that dividends should be larger in firms with a higher possibility of entrenchment from larger debt. Hence, theoretically the sign of association between debt and dividend payments can be determined, and it becomes an interesting empirical question. We include the leverage ratio (*LEVERAGE*), which is defined as the sum of current and long-term debt divided by the total assets.

4.6 The life cycle aspect of firms

The retained earnings to total equity ratio (*RE/TE*) tend to be high in old, low-risk firms, for which both the agency cost theory and the signaling theory suggests a larger dividend. We control for the life cycle aspect of firms by introducing RE/TE in binary choice estimations for the initiation of dividend payout. DeAngelo et al. (2006) pointed out that the life-cycle aspect of a corporation is particularly important in dividend initiation decisions. Denis and Osobov (2008) also find that in the US, Canada, UK, Germany, France, and Japan, the propensity to pay dividends is higher among firms for which retained earnings comprise a large fraction of total equity.

4.7 Dividend tax

Taxes on dividends affect firms' payout policies. Empirical investigations of the effects of the tax on dividend policy by utilizing changes in tax codes have been widely conducted (e.g., Chetty and Saez, 2005; Cha and Lee, 2007; Alstadsæter and Jacob, 2016; Pattenden and Twite, 2008; Abraham, 2014; Hwang and Kim, 2014; Chan and Lin, 2017).

Our empirical examination of Korea's 2015-2017 dividend tax cut carefully utilizes the fact that there are several different subgroups of the qualifying firms. The variable, *HIGH*, indicates the entire sample of qualifying firms in 2015 and 2016. HIGH1 and HIGH2 represent, respectively, the sample firm-year observations satisfying the first (Type 1) and second (Type 2) criteria for the qualification of the dividend tax cut.

We further construct *HH*, *HL*, and *LH* groups to indicate whether a firm took advantage of tax benefits in both years or either year. The group of firms enjoying tax benefits in both years is categorized as the *HH* group. The group of firms using the tax cut only in 2015 (2016) are denoted as the *HL* (*LH*) group.

To empirically examine the effect of the dividend tax cut on payouts, we use the following empirical model:

$$Y_{i,t} = \beta_0 + \beta_1 HIGHs_{i,t} + \gamma X'_{i,t} + \varepsilon_{i,t}, \quad (1)$$

where $Y_{i,t}$ is the variable that represents the payout policy of a firm, the variable *HIGHs* is the set of dummy variables indicating whether a firm-year observation is in the qualification group or not, and $X'_{i,t}$ are control variables. We use change in the dividend-asset ratios, the dividend growth rate, the change in the ratio of cash holdings to asset, the change in the ratio of repurchases to asset, and the share repurchases out of total payouts as the dependent variable. The construction of control variables is described above.

We employ a binary choice model to identify potential economic factors affecting the decision of enjoying the tax cut. The logit regression model is adopted as our binary choice model. Throughout this analysis, we attempt to identify theoretically important factors in the decision of enjoying dividend tax advantage. In addition to a wide range of proxy variables used in the estimation of equation (1), we include two additional variables as controls in the estimation of the decision of enjoying the tax cut: lagged changes in the dividend-asset ratios to capture potential trend in dividend growth, and the retained earnings to total equity ratio to capture the life-cycle aspect of dividend payout policy.

A standard set of assumptions about ordinary least square (OLS) estimations is assumed to be satisfied when we estimate equation (1). One concern about equation (1) is that *HIGH* depends on the current and lagged value of dividend payments by the tax code, which leads to the endogeneity of *HIGH*. To cope with potential bias from the endogeneity, we conduct the test of Oster (2017) and adopt the propensity score matching method (PSM). The Oster test is a method for assessing bias from unobservable factors, which is one of the major sources causing endogeneity biases, in estimating the treatment effect of a policy. Oster

(2017) proposes two tests to assess the biases from omitted factors. The first one calculates the importance of unobserved factors relative to control variables. As argued in Oster (2017), if the treatment effect of a policy is a valid one, it is highly unlikely that the unobservables have a stronger impact on the outcome variable than the control variables. The second test provides the confidence interval for the treatment effect by taking account of unobserved factors.[5] We adopt this test to evaluate how this dividend tax cut affects dividend growth.

PSM is a statistical matching method that tries to estimate the average treatment effect of a policy or treatment by taking account of the covariates that predict receiving the treatment. The pairing of treatment and control units with similar values on the PSM allows us to have more reliable coefficient estimates. This sample matching attempts to mimic randomized trials by balancing covariates between treated and control groups, which eliminates or reduces selection biases. We conduct the same set of firm-level analysis for the matched sample as well as the entire sample of firms. To calculate the propensity score, we conduct a probit model for becoming a member of the qualified group in a specific fiscal year. The independent variables are all of the firm-level covariates used in equation (1) and two additional variables, the changes in dividend-asset ratio and the retained earnings to total equity ratio. Unlike the above two empirical models, we use the lagged firm-level covariates in estimating propensity scores. We estimate the probit model separately in 2015 and 2016 and calculate the propensity scores, predicted by the probit model estimation. Based on the propensity score, we match the pair of treatment and control samples for each fiscal year and conduct the aforementioned regression and logit models again for the matched sample.

5 Empirical results

This section presents our empirical results. We start with descriptive

[5] See Oster (2017) for the detailed information about the test statistics. We adopt the STATA code of *psacalc* in our estimations. We assume that R^2 from a hypothetical regression of the outcome on treatment with both observed and unobserved controls is equal to 130% of R^2 from the regression with only observed controls following Oster (2017).

statistics, then investigate changes in dividend payments, financing sources for dividend growth, and the choice of taking advantage of the tax cut. The last part of this section reports the results of the analysis using detailed categorization of firms depending on whether a firm takes advantage of the tax cut both in 2015 and 2016 or either year.

5.1 Descriptive statistics

Table 1. Description of sample

	Year	*HIGH*	*HIGH1*	*HIGH2*	OTHERS	Total
Number of Firms	2015	133	70	63	1,330	1,463
		(9.1%)	(4.8%)	(4.3%)	(90.9%)	(100%)
	2016	164	92	72	1,409	1,573
		(10.4%)	(5.8%)	(4.6%)	(89.6%)	(100%)
Dividends	2015	2,260	1,317	943	11,767	14,027
(in billion won)		(16.1%)	(9.4%)	(6.7%)	(83.9%)	(100%)
	2016	6,112	1,738	4,375	12,074	18,186
		(33.6%)	(9.6%)	(24.1%)	(66.4%)	(100%)

Table 1 provides the number of firms, the aggregated dividends (in billion won), and shares in the overall dividends for four subgroups of firms and for the year of 2015 and 2016, respectively. Table 1 indicates the significant role of qualifying firms in aggregate dividend payments. While the qualifying firms take only 9.1% to 10.4% of the entire sample, their contribution to aggregate dividends is 16.1% to 33.6% for the years 2015 and 2016, respectively. The role of the *HIGH2* group is particularly significant in 2016. The group pays out 24.1% of aggregate dividends, even though this group accounts for 6.7% of the entire sample. Such differences indicate that large corporations with substantial dividend payments took advantages of tax benefits in 2016 by satisfying the second qualification criterion.

Table 2. Summary statistics

	ALL			*HIGH*			*HIGH 1*			*HIGH 2*		
VARS	**Mean**	**Med**	**SD**	**Mean**	**Med**	**SD**	**Mean**	**Med**	**SD**	**Mean**	**Med**	**SD**
DV	0.6	0.2	0.9	1.9	1.5	1.3	2.3	1.9	1.4	1.4	1.2	0.8
ΔDV	0.0	0.0	0.4	0.4	0.3	0.4	0.4	0.2	0.5	0.4	0.3	0.3
DVG	6.9	0.0	29.4	47.9	35.8	40.4	38.3	24.8	39.8	59.4	44.4	38.2
ROA	2.4	3.8	10.5	9.4	8.4	5.2	8.8	7.9	5.1	10.1	9.3	5.2
M/B	1.5	1.2	1.0	1.4	1.1	0.8	1.3	1.1	0.8	1.5	1.2	0.9
ΔTA	11.4	5.0	31.5	11.5	7.8	19.5	9.2	7.3	12.3	14.1	8.1	25.3
LEVERAGE	41.5	41.2	20.7	33.9	30.8	17.5	31.6	27.4	18.3	36.6	35.2	16.2
SALEG	9.8	3.5	40.3	12.7	6.5	29.3	9.9	5.8	23.5	16.0	6.9	34.9
CASH	19.5	14.4	17.0	23.0	18.3	17.6	23.9	18.3	18.7	21.8	18.3	16.2
ΔCASH	0.5	0.5	7.8	1.9	1.2	7.0	1.2	0.6	6.3	2.8	1.6	7.7
RE/TE	0.2	0.5	3.1	0.7	0.7	0.2	0.7	0.7	0.2	0.7	0.7	0.2
LARGE	12.1	0.0	32.6	11.8	0.0	32.3	11.7	0.0	32.3	11.9	0.0	32.4
FOREIGN	7.2	2.3	11.6	11.1	5.0	14.2	10.8	3.1	15.7	11.6	7.0	12.1
INSIDER	40.5	39.3	28.3	45.0	44.3	14.7	47.8	46.6	15.0	41.6	41.4	13.7

Table 2 reports the summary statistics of the sample firms. The mean (Mean), median (Med) and standard deviation (SD) of each variable are reported. The variables of interest are the dividend-asset ratio (*DV*) and its change (*ΔDV*), dividend growth rate (*DVG*), operating income to asset ratio (*ROA*), market to book ratio (*M/B*), change in total assets (*ΔTA*), book leverage (*LEVERAGE*), sales growth (*SALEG*), cash to asset ratio (*CASH*) and its change (*ΔCASH*), conglomerates indicator (*LARGE*), foreign shareholdings (*FOREIGN*), and insider holdings (*INSIDER*). Table 2 shows that the dividend growth is significantly higher in the qualifying firms. For instance, the dividend-asset ratio increases by 0.4 percentage points for the qualifying firms, while the ratio shows no significant growth in the entire sample. This value implies 25% of annual growth rate in the dividend-asset ratio for the qualifying firms, considering their average dividend-asset ratio, 1.9%. We find that *HIGH2* subgroup has a more rapid increase in the dividend-asset ratios than HIGH1 groups. The quantitative significance slightly decreases when we use the median value rather than mean value; the calculation based on median values still implies a 20% of annual growth rate in the dividend-asset ratio for the qualifying firms. This rapidly increasing pattern of actual dividend payments and dividend-asset ratios is in line with the design of qualifications for this dividend tax cut.

Regarding financing condition, these qualifying firms have larger current cash flows, lower leverage ratios, and larger cash holdings. The average *ROA* of the qualifying firms is 9.4%, which is four times greater than that of the entire sample. The average leverage ratio is around 20%

smaller, and the average cash ratio is around 18% larger for the qualifying firms, compared to the corresponding values in the entire sample. The use of median values does not change these findings significantly. The HIGH1 subgroup appears to have a more stable financing condition; that is, lower *ROA*, leverage, and asset growth, than the *HIGH2* subgroup.

One noticeable feature is related to the change in cash holding variable (*ΔCASH*). Table 2 shows that the qualifying firms increase their cash holdings instead. The change in cash holding ratio is 1.9% on average for the qualifying firms. This value is almost four times larger than the corresponding value for the entire sample—0.5%. While increasing dividend payments, the qualifying firms appear to accumulate cash from large internal cash flow generation.

5.2 Changes in dividend payments

We now conduct regression analysis of firm-level dividend payment variations. Table 3 examines the relationship between the *HIGH* group dummy variables and the change in dividend asset ratios. Columns (1) through (4) use the sample of all firms, and columns (5) and (6) use the matched subsamples from the PSM. Columns (1) and (2) report the regressions results without control variables, and others report those with control variables. The results of the first and second Oster tests are reported in the last row of the table (Oster I and Oster II, respectively). In the Oster test, we do not evaluate the effect of each criterion of the tax cut separately but examine the overall effect of this dividend tax cut on dividend-asset ratio change.

Table 3 shows that the *HIGH* group firms increase their dividend payments substantially as the summary statistics indicated. The *HIGH* group increases their dividend-asset ratios by 0.4 percentage points annually compared to the control group. This value is economically significant as well; the average dividend-asset ratio of the high group is 1.88%, and an increase of 0.4 percentage points implies 25% of annual growth rate for the dividend asset ratio. This finding remains quantitatively unchanged when we examine the *HIGH1* and *HIGH2* group separately and account for other firm characteristic variables. When we use the sample of matched firms, the estimation results do not vary significantly. The coefficient slightly decreases to 0.35 in the examination of

the HIGH group but is significantly positive even in the presence of current year firm-level covariates. The coefficients on HIGH1 and HIGH2 variables are positive and statistically significant as well. The first Oster test results indicate that the unobservables would need to be 2.833 times as important as the observables to produce a treatment effect of zero, implying our results are robust to the unobservables. The second Oster test results show that the confidence interval of treatment effect lies above zero, which indicates the positive effect of dividend tax cut on changes in the dividend-asset ratio.

Table 3. Regression results: Change in the dividend-asset ratio (*ΔDV*)

	(1)	(2)	(3)	(4)	(5)	(6)
Sample	**All**		**All**		**Matched Sample**	
HIGH	0.411***		0.386***		0.349***	
	(16.36)		(14.97)		(8.18)	
HIGH 1		0.422***		0.407***		0.364***
		(10.76)		(10.33)		(7.46)
HIGH 2		0.397***		0.360***		0.328***
		(15.13)		(13.55)		(7.15)
ROA			0.004***	0.004***	0.013***	0.013***
			(4.50)	(4.54)	(2.76)	(2.79)
M/B			0.036***	0.036***	0.046	0.047
			(3.11)	(3.13)	(1.10)	(1.11)
ΔTA			-0.001***	-0.001***	-0.004***	-0.004***
			(-4.26)	(-4.25)	(-4.28)	(-4.26)
LEVERAGE			0.001***	0.001***	-0.001	-0.001
			(2.67)	(2.71)	(-0.87)	(-0.77)
SALEG			0.001***	0.001***	0.002*	0.002*
			(3.69)	(3.70)	(1.82)	(1.84)
ΔCASH			0.004***	0.004***	0.004	0.004
			(3.34)	(3.36)	(1.34)	(1.39)
LARGE			0.032	0.032	0.029	0.028
			(1.54)	(1.54)	(0.45)	(0.45)
FOREIGN			-0.001	-0.001	0.003	0.003
			(-0.80)	(-0.80)	(1.63)	(1.63)
INSIDER			0.000	0.000	0.002	0.002
			(0.34)	(0.30)	(1.40)	(1.34)
Intercept	-0.031***	-0.031***	-0.132***	-0.132***	-0.248**	-0.248**
	(-4.00)	(-4.00)	(-3.28)	(-3.29)	(-2.22)	(-2.22)
N	3037	3037	3022	3022	579	579
adj. R^2	0.082	0.082	0.106	0.105	0.226	0.226
Oster Test	Oster I: 2.833, Oster II: [0.049, 0.386]					

Note: t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 4. Regression results: Dividend growth rate (*DVG*)

	(1)	(2)	(3)	(4)	(5)	(6)
Sample	**All**		**All**		**Matched Sample**	
HIGH	*45.099****		*41.989****		*42.817****	
	(18.91)		*(17.22)*		*(13.56)*	
HIGH 1		*35.519****		*33.299****		*34.601****
		(11.26)		*(10.40)*		*(9.36)*
HIGH 2		*56.595****		*52.429****		*53.747****
		(17.12)		*(15.87)*		*(14.00)*
ROA			*0.259****	*0.245****	*0.256*	*0.150*
			(5.11)	*(4.90)*	*(0.77)*	*(0.46)*
M/B			*1.109***	*1.019**	*1.058*	*0.752*
			(2.06)	*(1.92)*	*(0.53)*	*(0.39)*
ΔTA			*0.041***	*0.041***	*0.043*	*0.040*
			(2.01)	*(2.02)*	*(0.38)*	*(0.37)*
LEVERAGE			*0.077****	*0.069****	*0.049*	*0.001*
			(2.95)	*(2.65)*	*(0.58)*	*(0.01)*
SALEG			*0.029**	*0.028*	*0.156**	*0.148*
			(1.69)	*(1.64)*	*(1.68)*	*(1.57)*
ΔCASH			*0.241****	*0.228****	*0.384*	*0.294*
			(3.54)	*(3.44)*	*(1.41)*	*(1.12)*
LARGE			*1.030*	*1.075*	*3.150*	*3.261*
			(0.60)	*(0.63)*	*(0.79)*	*(0.80)*
FOREIGN			*0.111**	*0.110**	*0.042*	*0.059*
			(1.73)	*(1.70)*	*(0.28)*	*(0.38)*
INSIDER			*0.037*	*0.046*	*0.037*	*0.095*
			(1.10)	*(1.43)*	*(0.34)*	*(0.95)*
Intercept	*2.829****	*2.829****	*-5.144***	*-5.017***	*-6.310*	*-6.250*
	(6.28)	*(6.28)*	*(-2.31)*	*(-2.26)*	*(-0.83)*	*(-0.83)*
N	*3280*	*3280*	*2888*	*2888*	*566*	*566*
adj. R^2	*0.193*	*0.205*	*0.206*	*0.215*	*0.323*	*0.349*
Oster Test	*Oster I: 1.798, Oster II: [9.055, 41.989]*					

Note: t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 4 investigates how the *HIGH* group dummy variables are related to dividend policy change by adopting the dividend payment growth rate as the dependent variable. As in Table 3, columns (1) and (2) exclusively examine the significance of *HIGH* and *HIGH1/HIGH2* groups in dividend payment growths. The rest of the columns contain the regression results with control for other firm-level variables. We use the sample of matched firms in the columns (5) and (6). The results of the first and second Oster tests are reported as in the same way as Table 3.

Table 4 confirms significantly large dividend payments growth in the *HIGH* group firms. The estimated coefficient in column (1) implies 45 percentage points higher dividend growth rate for the HIGH group of firms, compared to the remainder firms. With regard to the

HIGH1/HIGH2 subgroup categorization, we observe significantly large dividend growth rates—by more than 50 percentage points for the *HIGH2* group firms. Considering the required dividend growth rate for the qualification is 10%/30% for the first and second criterion, both the *HIGH1* and the *HIGH2* groups have actual dividend growth rates larger than the required ones by more than 20 percentage points. The inclusion of control variables does not change the quantitative results. Consistent with Table 3, the results of Oster tests suggest the existence of positive treatment effects of dividend tax cuts on dividend growth rate for the qualifying firms.

Two interesting patterns emerge in the regression results using the matched samples. The coefficients on the group of HIGH variables become larger in the matched sample. Furthermore, the coefficients on other firm-level control variables become statistically insignificant. Larger coefficients on the HIGH group dummy variables in conjunction with insignificant coefficients on other control variables highlight again that the decisions of becoming a qualifying firm could be an important factor in the growth of dividend payments. Insignificant coefficients of control variables also imply that the samples are successfully matched by the estimated propensity scores.

Control variables in Tables 3 and 4 generally take the expected sign and magnitude consistent with theories and those from previous empirical studies. First, the *ROA* is found to be significantly positively associated with dividend growth, consistent with the signaling theory. Second, we find that *M/B*, capturing the firm's growth opportunities is associated positively with dividends as predicted. Third, the estimated coefficients of *ΔTA* is negative in the regressions of change in dividend-asset ratio but positive in those of dividend growth rate. Recent large-scale investment would lead to larger assets and dividends, and the growth of the former is larger than that of the latter. Fourth, *LEVERAGE* is found to be positively associated with larger dividends. The found association supports larger leverage deepens agency cost, leading to larger dividends. This finding is in line with the free cash flow hypothesis where large interest payments and dividend payments act as disciplinary tools in limiting managerial entrenchments. Fifth, *ΔCASH*, representing liquidity of the firm, is found to be positively associated with dividends. Finally, ownership variables are not found to be significant in Tables 3 and 4. We, however, find that

INSIDER is a key determinant of being qualifying firms for the consecutive years.

While Tables 3 and 4 confirm substantial dividend payment growth rates of the qualifying firms for the entire and matched samples, these large growth rates could be a byproduct of increasing profits, given the same dividend payout propensity. To control for a different trajectory of dividend growth, we calculate "excess dividends" for each group of firms in Table 5. The excess dividends are calculated based on the level of historical dividend payout propensity, which is defined as the ratio of cash dividends to net income. In scenario A, we assume that firms maintain their dividend payout propensity level at the three-year average value from 2011 to 2013. This scenario is based on the presumption that dividend payout propensity is stable over time because dividend policy tends to be adjusted only slowly. In scenario B, the dividend payout propensity is assumed to increase by 3% for each year. The table reports the average of assumed payout propensity, actual dividend payout propensity, aggregate excess dividend, the ratio of aggregate excess dividends to actual dividends, and the ratio of aggregate excess dividends to total cash dividends in the given year, respectively, for the four groups of firms- the *HIGH*, *HIGH1*, *HIGH2* and the control group, and *OTHERS*.

Table 5. Excess dividends

Scenario		Scenario A Dividend Payout Propensity: Maintain 3 Year Average				Scenario B Dividend Payout Propensity: 3% Yearly Growth from 3 Year Average			
	Year	*HIGH*	*HIGH1*	*HIGH2*	OTHERS	*HIGH*	*HIGH1*	*HIGH2*	OTHERS
Assumed payout propensity	2015	23.5	30.8	15.4	18.5	24.9	32.7	16.3	19.7
	2016	22.7	27.6	15.6	18.7	24.8	30.2	17.0	20.5
Actual payout propensity	2015	28.8	35.1	21.9	16.1	28.8	35.1	21.9	16.1
	2016	27.4	34.6	17.9	15.1	27.4	34.6	17.9	15.1
Excess DV	2015	320.6	157.5	163.1	2,813.2	202.4	86.9	115.5	2,336.0
	2016	2,794.0	396.4	2,397.6	928.6	2,494.9	272.9	2,222.0	166.2
Excess / Actual DV	2015	14.2	12.0	17.3	23.9	9.0	6.6	12.2	19.9
	2016	45.7	22.8	54.8	7.7	40.8	15.7	50.8	1.4
Excess / Total DV	2015	2.3	1.1	1.2	20.1	1.4	0.6	0.8	16.7
	2016	15.4	2.2	13.2	5.1	13.7	1.5	12.2	0.9

Table 5 indicates that the qualifying firms pay out a significant amount of the excess dividends. For instance, the excess dividends for all the qualifying firms account for 14.2% of their actual dividends in 2015, with no changes in dividend payout propensity. The ratio even grows sharply to 45.7% in 2016. Even if we apply an annual 3% growth rate for the dividend payout propensity, the excess dividends explain a significant proportion of the qualifying firms' actual dividend payout as well. Such an increase is due to the entrance of the firms with significant excess dividend payments in 2015 into the *HIGH* group in 2016. In fact, the excess to actual dividends ratio in the *OTHERS* group decreases by 66% during the sample periods (from 23.9% to 7.7%).[6]

Noticeably, these excess dividends account for a substantial proportion of aggregate cash dividend paid out from Korean corporations, especially in 2016. For instance, the excess dividend to total aggregate dividend ratio is 15.4% in 2016 with no change in dividend payout propensity growth. If we apply a 3% growth rate for the dividend payout propensity, the excess dividends explain 13.7% of the aggregate dividend paid out in 2016.[7]

The table also shows that the group of *HIGH2* firms pay a larger amount of excess dividends. In Scenario A, the excess dividends of the *HIGH2* group take account of 17.3% of actual dividends in 2015. In 2016, this value even surges to 54.8%; the excess dividends are more than a half of actual dividends in the *HIGH2* group. This result is sufficiently aligned with the second criterion for the tax cut, which requires substantial dividend payments growth, but lower dividend payout propensity on average. By increasing dividend payment substantially in a specific year, the dividend payout propensity in the year becomes far above its historical level. Accordingly, the excess dividend payments tend to be significantly large for the *HIGH2* group.

Tables 3, 4, and 5 suggest that the tax cut generates strong incentives to increase dividend payments. The qualifying firms show large increases in

[6] We examined whether the firm-level dividend payout policy of the non-qualifying firms change substantially in 2015 or 2016 compared to that of 2014. The estimation results are not reported in the paper because they decreased dividend payment only slightly in 2016 and the estimated coefficients of covariates are very similar to those in the entire sample, Tables 3 and 4. The detailed results are available upon request.

[7] The entrance of large size firms drives the significant increase of excess dividends in 2016. As a result of such entrance, the remainder group shows a large sum of excess dividends in 2015 and its excess dividends decreases significantly in 2016. A detailed analysis is conducted later in this section.

their dividend-asset ratio and dividend growth rate even for the matched samples by using the PSM. Their excess dividend payments are quantitatively significant even relative to the total amount of dividend paid. These findings point to the significant dividend payment growth resulting from this dividend tax cut. These findings are also in line with the literature that verifies a significant role of the dividend tax cut on a firm's payout policy (Chetty and Saez, 2005; Alstadsæter and Jacob, 2016; Pattenden and Twite, 2008; Chan and Lin, 2017).

5.3 Financing sources for dividend growth

We turn to identify the financing sources for the dividend growth. For this purpose, we first investigate the substitution effect between dividends payments and share repurchases. As several prior studies have argued (e.g., Chetty and Saez 2005), firms may respond to new government policy encouraging dividend payout by keeping the total payouts with larger dividend payments and smaller share repurchases. If this substitution between dividend payments and share repurchases dominates, the net effect of the dividend tax cut on total payout becomes less significant compared to our quantitative results from Tables 3–5.

Table 6. Regression results: Changes in share repurchases-asset ratio

	(1)	(2)	(3)	(4)	(5)	(6)
Sample	**All**		**All**		**Matched Sample**	
HIGH	0.031		0.013		-0.016	
	(1.05)		(0.44)		(-0.37)	
HIGH 1		-0.022		-0.044		-0.065
		(-0.66)		(-1.27)		(-1.38)
HIGH 2		0.094*		0.082*		0.049
		(1.95)		(1.71)		(0.86)
ROA			0.002**	0.002**	0.007*	0.006
			(2.52)	(2.44)	(1.65)	(1.51)
M/B			0.025**	0.024**	0.038	0.036
			(2.28)	(2.23)	(1.05)	(1.00)
ΔTA			-0.001**	-0.001**	-0.004***	-0.004***
			(-2.42)	(-2.43)	(-3.14)	(-3.14)
LEVERAGE			-0.001***	-0.001***	-0.002	-0.002
			(-2.90)	(-3.02)	(-1.24)	(-1.47)
SALEG			-0.000	-0.000	0.001	0.001
			(-0.84)	(-0.88)	(0.90)	(0.83)
ΔCASH			-0.004***	-0.004***	-0.005	-0.006
			(-3.33)	(-3.38)	(-1.34)	(-1.47)
LARGE			0.020	0.020	0.118**	0.118**
			(0.91)	(0.92)	(2.00)	(1.99)

FOREIGN			0.000	0.000	0.001	0.001
			(0.56)	(0.55)	(0.59)	(0.65)
INSIDER			-0.000	-0.000	-0.004***	-0.004**
			(-0.83)	(-0.70)	(-2.65)	(-2.43)
Intercept	0.028***	0.028***	0.061	0.062*	0.206*	0.206*
	(3.26)	(3.26)	(1.64)	(1.66)	(1.85)	(1.86)
N	3037	3037	3022	3022	579	579
adj. R^2	0.000	0.001	0.013	0.015	0.039	0.043

Note: t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Tables 6 and 7 analyze how the qualifying firms change their share repurchases decisions. The change in share repurchases to asset ratio (*ΔRepurchases*) and the change in share repurchases to total payout ratio (*ΔRepurchases/Payout*) are used as the dependent variables. The significance of *HIGH* group dummy variables is examined with or without firm characteristic variables. We also use the sample of matched firms based on the PSM in the last two columns. The tables report the estimated coefficients and corresponding t-values (in parenthesis).

In Table 6, the estimated coefficients of the *HIGH* group dummy variables are statistically insignificant and even show positive signs. Both of these coefficients are not properly aligned with the substitution hypothesis that predicts a smaller amount of share repurchase in the presence of substantial dividend payment growth. The inclusion of other firm characteristic variables does not alter this finding. The coefficients are still insignificant even when we examine the matched sample of firms based on the PSM.

Table 7. Regression results: Changes in share repurchases-total payout ratio

	(1)	(2)	(3)	(4)	(5)	(6)
Sample	**All**		**All**		**Matched Sample**	
HIGH	0.066		-1.026		-1.045	
	(0.05)		(-0.69)		(-0.41)	
HIGH 1		-0.924		-2.408		-2.178
		(-0.64)		(-1.57)		(-0.87)
HIGH 2		1.254		0.634		0.464
		(0.55)		(0.27)		(0.14)
ROA			0.135	0.133	0.164	0.150
			(1.64)	(1.62)	(0.68)	(0.62)
M/B			-0.287	-0.301	1.953	1.910
			(-0.37)	(-0.39)	(1.01)	(0.99)
ΔTA			0.010	0.010	-0.085	-0.086
			(0.33)	(0.33)	(-1.05)	(-1.05)

LEVERAGE			-0.090***	-0.091***	-0.091	-0.097
			(-2.61)	(-2.64)	(-1.14)	(-1.21)
SALEG			-0.019	-0.019	0.033	0.032
			(-0.77)	(-0.78)	(0.81)	(0.78)
ΔCASH			-0.312***	-0.314***	-0.298	-0.310
			(-3.24)	(-3.26)	(-1.47)	(-1.52)
LARGE			2.020	2.027	3.836	3.844
			(1.28)	(1.28)	(1.53)	(1.52)
FOREIGN			-0.017	-0.017	-0.032	-0.029
			(-0.36)	(-0.37)	(-0.36)	(-0.33)
INSIDER			-0.020	-0.018	-0.048	-0.040
			(-0.51)	(-0.47)	(-0.58)	(-0.48)
Intercept	0.028	0.028	4.841*	4.860*	3.063	3.072
	(0.04)	(0.04)	(1.77)	(1.77)	(0.53)	(0.53)
N	3037	3037	3022	3022	579	579
adj. R^2	-0.000	-0.001	0.007	0.007	0.000	-0.001

Note: t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

The estimation results in Table 7 do not support the substitution hypothesis either. In fact, the changes in the share repurchases to the total payout ratio do not show any significant correlation with the set of *HIGH* group dummy variables. This conclusion is robust to the consideration of firm characteristic variables. The size of the estimated coefficients is almost unchanged when we use the matched sample of firms in columns (5) and (6). The qualifying firms appear to make no substantial changes in the relative composition between share repurchases and dividend payments.

Such a weak substitution effect might be closely related to the minor role of share repurchases as a payout method in Korean corporations. Korean firms do not widely adopt share repurchases as their payout tool. For instance, the share repurchases to asset ratios are only 0.3% on average, and the share of repurchases in the total payout is around 12% on average, which also points to the infrequent use of share repurchases across Korean corporations. Due to such an insignificant role of share repurchases in a Korean firm's policy, these qualifying firms may leave their share repurchases policy intact and seek other financing sources to support dividend growth. This weak substitution effect is not properly aligned with the existing studies arguing for the substitution between dividends and share repurchases (Grullon and Michaely, 2002; Brown *et al.*, 2007).

Next, we examine whether the qualifying firms liquidate their cash holdings to fund dividend growth. This examination is closely associated with the goal of this dividend tax cut. Korean firms accumulated massive cash stocks after the Asian crisis of 1997. In fact, there has been an ongoing

public debate on the introduction of retention tax on excess cash holdings in Korea. By lowering dividend taxes, the Korean government tried to provide incentives to liquidate the excess cash holdings to shareholders in the form of dividend payments.

Note that the use of accumulated cash holding for dividend payments might have different implications compared to the use of operating cash flow, from the perspective of agency theory. Excess cash holding inside a corporation could be particularly value-destructive in the view of shareholders, considering the fact that a large sum of cash holdings allows CEOs to easily "build empires," increasing size and scope beyond the level maximizing shareholder values. In fact, cash holdings are widely known as a major source of financing for large acquisitions, which are more likely to be value destructive ones. Moreover, by carrying large cash holdings, CEOs could avoid outside monitoring involved in raising external funds for long periods. With large cash holdings, CEOs may delay or avoid the use of external financing in the face of poor operating performances. Operating cash flow generation is less significantly correlated with large acquisition plans compared to cash holdings. Furthermore, large operating cash flow in the current period does not help CEOs avoid outside monitoring in the future. Accordingly, dividends payments from the liquidation of excess cash holdings are probably more value-enhancing from the perspective of shareholders than those payments from the operating cash flow.

Table 8. Regression results for change in cash holdings

	(1)	(2)	(3)	(4)	(5)	(6)
Sample	**All**		**All**		**Matched Sample**	
HIGH	1.536***		1.233***		1.136*	
	(3.54)		(2.76)		(1.94)	
HIGH 1		0.787		0.535		0.405
		(1.51)		(1.01)		(0.62)
HIGH 2		2.437***		2.069***		2.088***
		(3.60)		(3.03)		(2.66)
ROA			0.053**	0.052**	0.119*	0.109
			(2.35)	(2.30)	(1.69)	(1.55)
M/B			0.108	0.101	-0.214	-0.239
			(0.49)	(0.45)	(-0.47)	(-0.53)
ΔTA			0.003	0.003	0.024	0.024
			(0.26)	(0.26)	(0.68)	(0.67)
LEVERAGE			-0.004	-0.004	-0.018	-0.022
			(-0.49)	(-0.57)	(-1.09)	(-1.32)
SALEG			-0.014**	-0.014**	-0.026	-0.027
			(-2.20)	(-2.21)	(-1.41)	(-1.46)

LARGE			-0.155	-0.152	-1.081*	-1.068*
			(-0.44)	(-0.43)	(-1.66)	(-1.68)
FOREIGN			0.010	0.010	0.024	0.026
			(0.85)	(0.84)	(1.25)	(1.33)
INSIDER			-0.019**	-0.018**	-0.007	-0.002
			(-2.16)	(-2.07)	(-0.34)	(-0.10)
Intercept	0.374**	0.374**	1.048	1.056	0.780	0.779
	(2.50)	(2.50)	(1.56)	(1.57)	(0.52)	(0.52)
N	3026	3026	3022	3022	579	579
adj. R^2	0.003	0.004	0.009	0.010	0.030	0.035

Note: t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 8 reports the regression results for the change in cash holdings. We adopt the ratio of cash to the total assets as a representative measure of cash holdings. The first two columns report the regression results without firm characteristic variables, and the remaining columns document the regression results with these control variables. In the last two columns, we employ the sample of matched firms based on the PSM. The estimated coefficients and t-values (in parenthesis) are reported.

In Table 8, the *HIGH* group dummy variables are positively associated with the changes in cash holdings, especially for the group of firms satisfying the second criterion. The coefficients on the *HIGH* group are 1.233 and 1.536, respectively, for our empirical models with/without the firm characteristic variables, both being statistically significant at the 99% level. When we separately analyze the *HIGH1* and *HIGH2* groups, the coefficients of the *HIGH2* group are statistically significant and positive. The coefficients on the *HIGH1* variable show positive signs, though not significant. Similar to the results of prior tables, the use of matched sample does not alter these coefficients significantly. Note that all other coefficients on control variables become statistically insignificant in the matched sample analysis, which implies successful sample matching procedures.

This finding indicates that the qualifying firms do not liquidate cash holdings to finance dividend payment growth. In all empirical models, the coefficients on the qualifying firm dummy variables are positive, and most of them are statistically significant. In other words, these qualifying firms tend to accumulate cash stock, while raising dividend payment rapidly. Considering superior *ROA* observed in the qualifying firms, the accumulation of cash stock is not incompatible with significant dividend payment growth. By using current cash flow generation as a source, these firms are stockpiling cash at the same time, while increasing dividend payments.

5.4 Choice of taking ddvantage of the tax cut

We now characterize the economic determinants related to the decision of enjoying the dividend tax cut. This procedure helps us examine how the existing theories in dividend policy are related to the corporate decision of becoming a qualifying firm. For this purpose, we estimate the logit model of binary choices; the binary variable has the value of one if a firm is qualified for the dividend tax benefits and zero otherwise. In columns (2) and (3) the dependent variables are the binary choices of satisfying the first (Type 1) and second criteria (Type 2) of the dividend tax cut. In the last three columns, we use the matched sample based on the PSM. The lagged dividends-asset ratio (*L.DV*) is excluded in the examination because the variable is already controlled in the sample matching procedure using firm covariates in the previous fiscal year.

Table 9. Qualifying firms: Logit analysis

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. variables	**HIGH**	**HIGH1**	**HIGH2**	**HIGH**	**HIGH1**	**HIGH2**
Sample	**All**			**Matched Sample**		
ROA	0.130***	0.099***	0.135***	0.126***	0.057***	0.114***
	(9.87)	(6.25)	(7.91)	(6.19)	(2.78)	(4.87)
M/B	-0.114	-0.180	-0.068	-0.118	-0.171	-0.029
	(-1.31)	(-1.59)	(-0.61)	(-0.91)	(-1.26)	(-0.20)
ΔTA	-0.000	-0.003	0.001	-0.010*	-0.009	-0.006
	(-0.12)	(-0.56)	(0.15)	(-1.69)	(-1.39)	(-0.83)
LEVERAGE	-0.006	-0.016***	0.007	0.006	-0.010	0.021***
	(-1.60)	(-3.22)	(1.24)	(1.05)	(-1.62)	(3.21)
SALEG	0.003	0.002	0.003	0.007*	0.003	0.007
	(1.20)	(0.57)	(0.95)	(1.93)	(0.67)	(1.51)
ΔCASH	0.015	-0.004	0.030**	0.026*	-0.007	0.042***
	(1.58)	(-0.35)	(2.30)	(1.90)	(-0.48)	(2.69)
LARGE	-0.193	-0.118	-0.239	0.473	0.342	0.280
	(-0.91)	(-0.44)	(-0.78)	(1.52)	(1.06)	(0.77)
FOREIGN	0.003	0.004	0.002	-0.002	0.004	-0.007
	(0.53)	(0.62)	(0.30)	(-0.33)	(0.49)	(-0.84)
INSIDER	0.012***	0.022***	-0.002	0.001	0.016**	-0.018**
	(2.84)	(3.97)	(-0.31)	(0.22)	(2.41)	(-2.39)
RE/TE	0.313**	0.313*	0.222	-0.536	-0.473	-0.226
	(2.25)	(1.83)	(1.19)	(-1.58)	(-1.24)	(-0.56)
L.ΔDV	0.899***	0.714***	0.856***			
	(5.73)	(4.12)	(4.97)			

Intercept	-3.617***	-3.937***	-4.536***	-0.679	-1.257**	-1.986***
	(-11.07)	(-9.67)	(-10.03)	(-1.37)	(-2.34)	(-3.32)
N	2771	2771	2771	579	579	579
Psuedo R^2	0.170	0.137	0.143	0.080	0.036	0.091

Note: z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 9 shows that the *ROA* is a key economic determinant of satisfying the criteria. For all six empirical models examined here, the *ROA* shows a positive and statistically significant association with the dependent variable. If the persistence in profit generation is presumed, this result is in line with the signaling theory prediction, which expects a positive correlation between *ROA* and dividend payout propensity. More importantly, this positive association suggests that the qualifying firms fund dividend payments growth by using their cash flow generations. Hence, the qualifying firms were able to finance dividend payment growth without the liquidation of cash holdings and the reduction of share repurchases as shown in Tables 6, 7 and 8.

Table 9 also shows that the insider share has a positive and statistically significant correlation in becoming a qualifying firm, especially by satisfying the first criterion. Columns (1) and (2) show positively significant coefficient of the insider shares in contrast to column (3). When we use the matched sample, the insider share is estimated to have a statistically positive coefficient in the decision of becoming *HIGH1* group. This finding is generally in line with the literature that emphasizes the role of insiders in deciding dividend payout policy (Chetty and Saez, 2005; Blouin et al., 2004; Brown et al., 2007).

5.5 Analysis using detailed categorization of firms

In this section, we utilize the categorization of firms depending on whether a firm takes advantage of the tax cut in both years or either year. Since our sample covers two years we construct *HH*, *HL*, and *LH* groups to indicate whether a firm takes advantage of the tax cut in both years or either year. The group of firms that enjoy the tax cut in both years is categorized as the *HH* group. The group of firms that qualified for the tax benefits only in 2015 (2016) is denoted as the *HL* (*LH*) group.

This categorization helps us to address a couple of interesting questions.

First, it allows us to test whether a firm's dividend policy shows rigidities; if the proportion of the *HL* group is economically significant and its dividend policy changes significantly from 2015 to 2016, we can conclude that this group of firms only temporarily changes their dividend policy to take advantage of lower dividend tax rates. Moreover, this group construction allows us to examine firm characteristics associated with continually enjoying tax benefits compared to only temporarily taking advantages of tax benefits.

There are benefits and costs associated with taking advantage of the tax cut earlier rather than later related to qualification rules. Since it raises the three-year-average of the firm's dividend, it will make qualification in later periods easier. Furthermore, if the tax cut induces other firms to increase dividend payments, it is easier to satisfy the qualification rule in an earlier period than to do so later. However, taking advantage of the tax cut by increasing dividend payments makes it harder for the firm to increase dividends in subsequent periods because it raises the base. Since there are benefits and costs associated with taking advantage of the tax cut earlier and what is not used for dividend payment can be retained in firms, there exists the optimal amount of dividend payments and retained cash for dividend payments in later periods.[8]

If cash flows in both periods are adequate, firms will choose *HH* rather than *HL*. A firm may partly decrease dividend payout in the current period and accumulate cash to enjoy the benefit from the tax cut the next year. By adopting this policy, a firm may enjoy tax advantages in both years; it may enjoy tax advantages from a large sum of dividends in the current period and in the next period by liquidating cash stocks the next year. This kind of policy not only maintains dividends payments growth but also makes all of the current and subsequent periods dividends benefit from tax advantages. In other words, with temporary enjoyment of tax advantages in early stages, the dividend tax cut does not apply for the later stage dividend payments. If cash flow turns out to be much worse than expected in the latter period, the firms are forced not to be qualified for the tax cut. Table 10, which summarizes the firm characteristics and excess dividends

[8] Since the tax dividend expired in 2017, there is no need to leave cash in firms to qualify for the tax cut later. We, therefore, expect that more firms take advantage of the tax cut more aggressively in 2017 by utilizing the cash flow and the cash holdings. We left the test of this expectation for future work.

of the *HH*, *HL*, and *LH* groups, shows that the average *ROA* of the HL group decreased from 8.4 in 2015 to 6.6 in 2016.

If firms face cash constraint and there is no uncertainty, firms would prefer HL to LH. Our data show that many firms belong to the *LH* group, which can be explained by an unexpected improvement in cash flow in 2016. Table 10 shows that *ROA* of the *LH* group increased from 6.8 in 2015 to 9.1 in 2016.

Table 10. Summary statistics: HH, HL, and LH groups

Panel A. Firm Characteristics

Group	Year	HH	HL	LH
Number of Firms		**60**	**73**	**102**
DV	2015	2.14	1.61	1.24
	2016	2.48	1.31	1.58
ROA	2015	9.89	8.43	6.78
	2016	10.76	6.64	9.11
CASH	2015	23.4	19.2	22.3
	2016	25.2	19.9	24.4
LEVERAGE	2015	30.6	35.4	37.0
	2016	30.1	35.5	36.5
SIZE	2015	1.00	1.11	2.88
	2016	1.09	1.18	3.13

Panel B. Excess Dividends

Scenario		ΔDividend Payout Propensity: 0%		
Group	**Year**	**HH**	**HL**	**LH**
Assumed propensity	2015	26.9	20.7	19.7
	2016	26.9	20.7	19.7
Excess DV	2015	165.6	155.0	1,745.3
	2016	428.4	-46.1	2,358.0
Excess / Actual DV	2015	15.4	13.1	53.4
	2016	24.4	-4.0	54.5

Panel A of Table 10 reports the number of firms included in each category of firms. It also documents the mean of *DV*, *ROA*, *CASH*, *LEVERAGE*, and *Size* for 2015 and 2016. Panel B documents the aggregate excess dividends for the *HH*, *HL*, and *LH* groups. As in Table 4, the excess dividends are estimated based on the historical dividend payout propensity, which is defined as the ratio between cash dividends and net income. We only consider the benchmark case of zero dividend propensity growth. The average of assumed dividend payout propensity and excess

dividends to total dividends ratios are also documented.

Panel A shows that a large fraction of firms enjoy tax advantage only temporarily. More than 50% of qualifying firms in 2015 are identified as the *HL* group and do not take advantage of tax benefits in 2016. Furthermore, more than 100 new firms receive tax benefits in 2016. Only 60 companies are qualified for the dividend tax cut in both years.

The change in dividend policy of the *HL* group is particularly interesting. This group of firms decreased their dividend asset ratio significantly to 1.3 in 2016 after enjoying the tax benefits in 2015 with the average dividend asset ratio 1.6. In other words, this group of firms temporarily increase dividend payments in 2015 and does not maintain the level of dividends in 2016. Such a temporal adjustment is not properly aligned with the literature that emphasizes the slow adjustment policy (Lintner 1956) and the importance of signaling components in dividend payout decisions (Bhattacharya 1979; Miller and Rock 1985). To enjoy the low dividend tax rate, this group of firms increases their dividend payments without paying much attention to the signaling role of dividend payments.

The panel also indicates that the *HH* group firms are financially solid and make substantial dividend payments. They have lower leverage, higher profitability, and larger cash holdings, all of which point to the financial healthiness of these firms. For instance, the average leverage ratio for this group of firms is lower than that of all other groups, and their *ROA* has always been the largest among the three groups in both years of sample periods. The average dividend-asset ratio is 2.1 (2.5) for the *HH* group, which is far higher than the other groups of firms.

Panel A also shows that relatively large size firms take advantage of tax benefits in 2016. The average asset size of *LH* group is 2.9, which is far above the corresponding asset size of other groups. This finding is directly connected with the quantitative significance of the qualifying firms' dividend payments in the total dividend payouts. In 2016, the dividend payments in the qualifying firms explain more than 33% of the aggregate dividend payment of Korean corporations (Table 1), which is more than two times larger than the corresponding value in 2106, 16.1%. This group of large firms became qualified in 2016, and sharply raise the contribution of dividend payments of the qualifying firms to the overall dividend payouts.

Panel B confirms that firms in the *HL* group indeed decrease their

dividend payments even in terms of excess dividends. We assume no growth in dividend payout propensity in the calculation of excess dividends. This group pays dividends 4% less than the expected level in 2016, while it makes significantly larger dividend payments than its expected level in 2015 (>13%). Even after controlling for dividend payout propensity, the *HL* group firms significantly reduce their dividend payments in 2016. Such a drop in excess dividends supports the temporal changes in dividend policy of the *HL* group in response to the tax incentives.

Table 11. Dividend payment changes: HH, HL and LH groups

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. variables		***ΔDV***			***DVG***	
Year	**ALL**	**2015**	**2016**	**ALL**	**2015**	**2016**
HH	0.402***	0.469***	0.337***	33.150***	38.986***	27.886***
	(8.91)	(6.83)	(5.87)	(10.07)	(7.54)	(7.17)
HL	0.030	0.361***	-0.299***	17.811***	47.530***	-12.051***
	(0.68)	(7.78)	(-5.69)	(4.52)	(9.22)	(-3.81)
LH	0.137***	-0.051	0.335***	26.949***	6.614	47.977***
	(4.49)	(-1.22)	(9.73)	(8.27)	(1.56)	(11.64)
ROA	0.005***	0.005***	0.003***	0.291***	0.331***	0.192***
	(5.14)	(4.03)	(2.70)	(5.60)	(4.21)	(3.03)
M/B	0.034***	0.030*	0.038**	1.116**	0.502	1.747**
	(2.92)	(1.96)	(2.15)	(2.08)	(0.64)	(2.37)
ΔTA	-0.002***	-0.002***	-0.001**	0.038*	0.016	0.066**
	(-4.27)	(-3.43)	(-2.44)	(1.71)	(0.51)	(2.42)
LEVERAGE	0.001**	0.001**	0.001	0.073***	0.091**	0.051
	(2.40)	(2.35)	(1.15)	(2.71)	(2.28)	(1.47)
SALEG	0.001***	0.001**	0.001***	0.036**	0.031	0.026
	(3.91)	(2.55)	(2.67)	(1.96)	(1.33)	(1.10)
ΔCASH	0.004***	0.005***	0.003*	0.280***	0.265**	0.227**
	(3.56)	(3.00)	(1.87)	(3.87)	(2.58)	(2.57)
LARGE	0.029	0.054	0.003	1.175	1.368	1.232
	(1.37)	(1.62)	(0.11)	(0.68)	(0.50)	(0.61)
FOREGIN	-0.001	-0.002	0.001	0.110	0.189*	0.046
	(-0.65)	(-1.32)	(0.91)	(1.64)	(1.66)	(0.70)
INSIDER	0.000	-0.000	0.001	0.039	0.006	0.088**
	(0.27)	(-0.52)	(1.22)	(1.15)	(0.12)	(2.27)
Intercept	-0.115***	-0.096*	-0.146**	-5.130**	-3.870	-6.877**
	(-2.87)	(-1.78)	(-2.51)	(-2.27)	(-1.19)	(-2.30)
N	3022	1456	1566	2888	1387	1501
adj. R^2	0.073	0.123	0.112	0.139	0.188	0.249

Note: t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 11 reports the results of regression analysis with the dummy variables indicating *HH*, *HL*, and *LH* groups. Three different sample periods are considered: the first with all the observations in 2015 and 2016; the second with the observations in 2015; and finally, with the observations in 2016. We adopt two different measures of dividend payout, dividend to asset ratio and dividend growth rate, in line with Tables 3 and 4.

Table 11 shows that the *HL* group indeed experiences negative dividend payment growth in 2016, while the overall dividend growth is slightly positive during 2015–2016. This negative correlation in 2016 is statistically significant at the 99% level. Even when we adopt the dividend growth rates that measures the absolute change in dividend payments, the correlation is still negative and statistically significant in 2016. This result suggests that the *HL* group temporarily increased dividend payments in response to the tax incentive offered in 2015. The regression using the dividend growth rate tells us that the *HL* group firms decreased dividend payments by around 12% in 2016. Based on a large cash flow generation in 2015, these firms raised dividends significantly in 2015. The drop in cash flow generation in 2016 appears to drive a significant cut in dividend payments in 2016.

It is noteworthy that the dividend payment growth of the *LH* group is not statistically significant in 2015. The change in the dividend asset ratio shows a weakly negative correlation with the *LH* dummy variable. The estimated coefficient of the *LH* group dummy is slightly positive in the regressions of dividend growth rate but is still statistically insignificant. The *LH* firms increased dividend payments substantially in 2016 in response to the substantial growth in their cash flow generations.

Table 12. Logit analysis: HH, HL, and LH groups

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. variables	**HH**	**HL**	**LH**	**HH**	**HL**	**LH**
Sample	**All**			**Matched Sample**		
ROA	0.123***	0.076***	0.076***	0.094***	0.029	0.053**
	(6.47)	(4.53)	(5.50)	(3.99)	(1.18)	(2.38)
M/B	-0.027	-0.421***	-0.081	0.115	-0.305	-0.071
	(-0.22)	(-2.95)	(-0.83)	(0.82)	(-1.59)	(-0.49)
ΔTA	-0.002	0.002	0.004	-0.011	0.001	0.001
	(-0.31)	(0.46)	(1.12)	(-1.29)	(0.18)	(0.18)

LEVERAGE	-0.013**	-0.006	-0.002	-0.006	0.006	0.009
	(-2.13)	(-1.19)	(-0.36)	(-0.87)	(0.87)	(1.42)
SALEG	0.000	0.001	0.001	0.001	0.002	0.004
	(0.03)	(0.27)	(0.23)	(0.11)	(0.36)	(0.94)
ΔCASH	0.013	0.000	0.001	0.014	0.001	0.015
	(0.91)	(0.04)	(0.13)	(0.86)	(0.08)	(0.97)
LARGE	0.082	-0.119	-0.588**	0.645*	0.719*	-0.199
	(0.27)	(-0.42)	(-2.15)	(1.86)	(1.92)	(-0.52)
FOREIGN	0.003	-0.006	0.011**	-0.001	-0.020*	0.006
	(0.45)	(-0.84)	(1.96)	(-0.15)	(-1.80)	(0.77)
INSIDER	0.030***	0.000	-0.001	0.025***	-0.011	-0.017**
	(4.56)	(0.06)	(-0.20)	(3.33)	(-1.27)	(-2.30)
RE/TE	0.774***	0.992***	0.740***	-0.249	0.819**	-0.191
	(3.86)	(4.51)	(4.73)	(-0.58)	(2.07)	(-0.47)
L.ΔDV	1.101***	0.722***	0.075			
	(6.03)	(3.87)	(0.46)			
Intercept	-5.404***	-3.121***	-3.272***	-3.085***	-1.724***	-1.241**
	(-10.66)	(-7.17)	(-9.15)	(-4.92)	(-2.68)	(-2.12)
N	2771	2771	2771	579	579	579
Psuedo R^2	0.212	0.103	0.086	0.080	0.029	0.037

Note: z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

We now examine whether the firm characteristics are different among the groups that enjoy tax advantages continually/temporarily. We conduct logit analysis to examine the firm characteristics in the decision of becoming the *HH*, *HL* or *LL* group. The entire sample of firms is used in columns (1) through (3), and the matched sample is used in columns (4) through (6) to mitigate potential selection biases.

Table 12 shows that the role of insiders is very important in the continual enjoyment of dividend tax benefits. Unlike the empirical model examining the *HL* or *LH* group, the insider shares show a statistically significant and positive correlation with the probability of becoming the *HH* group. The first logit analysis for the entire sample shows that *INSIDER* is a key determinant of keeping the qualification for the tax cut; in other words, becoming the *HH* group in our sample. The coefficients on *INSIDER* are not statistically significant for the next two empirical models, which examine the likelihood of becoming the *HL* and *LH* groups, respectively. When we use the sample of matched firms in columns (4) through (6), we find very consistent results. The insider shares are significantly positive only in the case of becoming the *HH* group.

The importance of insider shares in shaping corporate dividend policy is

in line with existing studies. For example, Chetty and Saez (2005) provided cross-sectional evidence that dividend increases are positively related to the manager's shareholdings during the dividend tax cut of 2003 in the US. Brown, Liang, and Weisbenner (2007) indicated that the managers with significant stock options, which are rarely protected by dividend changes, are reluctant to increase dividend payment in response to the US dividend tax cut in 2003.

In sum, our empirical analysis in this section confirms a temporal variation of dividend payout policy in response to the dividend tax cut, which argues against slow adjustment of dividend payout policies (Lintner 1956). Moreover, we confirm the significance of insider shares in the continual enjoyment of tax advantages consistent with the existing studies emphasizing the role of agency conflicts in shaping corporate dividend policy.

6 Conclusion and discussion

This paper examines the economic effects of the Korean dividend tax cut in 2015–2017. This policy aimed to stimulate dividend growth in Korean corporations by cutting dividend income tax rates. The tax code reduced dividend income tax for any "high-dividend-company," which pays a substantial amount of dividends above the criteria set by the government.

This paper empirically investigates the effect of the Korean dividend tax cut on corporate dividend policy. For this purpose, we selected the sample firms listed in the KOSPI and KOSDAQ markets. Then, we conducted a variety of empirical analyses at the individual firm and aggregate levels. The empirical estimation is implemented in the fiscal year of 2015 and 2016 when the dividend tax cut was effective. In the firm-level analysis, we use both of the entire sample of firms, and the matched sample based on the PSM. This adoption of the PSM reduces potential selection biases.

We first verified the quantitatively significant effect of dividend cut on corporate dividend policies. The qualifying firms indeed increase dividends substantially; their dividend-asset ratio grows by 0.4 percentage points, larger than that of the control group. The dividend payment growth rate is

40% greater than that of the control group as well. The Oster test results indicate that the positive treatment effect of the dividend tax cut cannot be rejected even though the biases from unobserved factors are considered. The excess dividends of the qualifying firms account for 45.7% of their actual one in 2016. The excess dividends explain 15.4% of the aggregate dividend in 2016 as well. All of the results suggest that this dividend tax cut provides strong incentive to increase dividend payments.

Next, we found that the qualifying firms mainly rely on current cash flow to increase dividend payments. Neither accumulated cash holdings nor the reduction of share repurchases is used to finance the dividend payment growth in the qualifying firms. This dividend tax cut does not lead to the liquidation of excess cash holdings to pay out dividends. The substitution effect between share repurchases and dividend payments also turned out to be negligible. These firms increase dividend payments substantially from a large cash flow generation but leave other financing sources untouched.

Furthermore, we found that the ownership of insiders is a key economic determinant leading to the continual enjoy of tax advantage. Our binary choice models robustly confirm that the amount of insider share increases the likelihood of enjoying this dividend tax cut consecutively in 2015 and 2016. The insider shares do not have a significant relationship with the likelihood of becoming the groups that temporarily take advantage of the dividend tax cut either 2015 or 2016.

Finally, we found that a significant proportion of firms only temporarily enjoy the tax cut. Less than half of the qualifying firms in 2015 took advantage of the tax cut again in 2016. The other qualifying firms, in fact, decrease their dividend payments in 2016 after taking advantage of lower dividend tax temporarily in 2015. Their estimated excess dividends, which takes account of net income generation, are negative as well in 2016.

Our findings contribute to the literature in a number of aspects. Most of all, we confirm the significant effect of the dividend tax cut on corporate dividend policies. This finding adds new evidence highlighting the effect of the dividend tax cut on corporate payout policy. While this tax cut significantly affects corporate dividend payments, our result implies that the share repurchases policy of Korean corporations remains intact under this dividend tax cut. This result does not properly align with the literature that highlights the substitution effect between share repurchases and

dividend payments (e.g., Grullon and Michaely, 2002; Brown *et al.*, 2007). Our finding of the importance of insiders in the continual enjoy of tax benefits is in line with literature that highlights the role of insiders in shaping corporate dividend policy (e.g., Chetty and Saez 2005; Brown, Liang, and Weisbenner 2007). However, our findings of a rather swift adjustment of dividend payout policy in response to this dividend tax cut are not properly aligned with the Lintner (1956) model of dividend payments, as well as the signaling theory of dividend payout (Bhattacharya 1979; Miller and Rock 1985).

It is an intriguing research topic to investigate how the dividend policy of Korean firms change after the sunset of this temporary dividend tax cut. The Korean firms may swiftly return to previous payout propensity before the introduction of dividend tax cut or maintain large dividend payments afterward. The data to address this research question are not available yet, and the research is left to future research. While our study provides some interesting results about coping with potential bias from the endogeneity and self-selection, including the Oster test and the PSM, more comprehensive studies about a causal relationship from the dividend tax and corporate payout policy are necessary.

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