The Effect of Tax Incentive for Dividend Income on Corporate Payout Policy: Evidence from the Policy Experiment in Korea

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Abstract

In 2014, the Korean government introduced a temporary tax reform that provides tax incentives for dividend income to the shareholders of high dividend-yielding companies for a three-year. Considering the tax reform as an exogenous economic shock to the Korean economy, we sought to analyze and verify its impact on the corporate payout policies of listed companies. Our empirical results confirm that the reform contributes to statistically significant, but not dramatic, increases in corporate payout as well as in the amount of cash dividends. We also find that those companies with high proportion of major shareholders are more likely to satisfy the qualifying requirements of high dividend-yielding firms. This, in turn, attests to the important role of major shareholders' ownership on determining corporate payout policy.

Keywords: Tax incentive for dividend income, corporate payout policy, dividend incentive
JEL classification: E62, H31

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1. Introduction

In 2014, the Korean government introduced a temporary tax reform that provides tax incentives for the shareholders of companies that pay high levels of cash dividends ("high-dividend companies" hereinafter), with the aim of encouraging listed firms to pay out more to shareholders and thereby fostering investment in stock markets. This provisional policy program, which lasted for the three years from 2015 through 2017, lowered the taxes on dividend income payable by the shareholders of high-dividend companies, which are defined as meeting certain criteria, including the amount of dividends, dividend propensity, and dividend yield ratios. In other words, the tax reform can be considered as a natural policy experiment that provide tax incentives for dividend income, and gives us an excellent opportunity for researchers to assess the effectiveness of tax incentives for corporate dividend payout policy.

Treating the tax reform as an exogenous economic shock, we empirically test and verify its effects on the cash dividend policies of listed companies. Specifically, we set out to address the following two questions. First, what are the characteristics of companies that satisfy the qualifying requirements to be considered high-dividend companies and therefore benefitted from the tax incentive program? Second, has the reform actually contributed to increasing the cash dividends and payout of listed companies as intended?

Exploiting the financial data of companies listed on the Korea Composite Stock Price Index (KOSPI) and the Korea Securities Dealer Automated Quotation (KOSDAQ) pertaining to the fiscal years of 2013 through 2016, this paper seeks to assess the effectiveness of the tax reform, and, in the process, uncover empirical evidence supporting the relevant theory of tax incentives for dividends.

Our main findings can be summarized as follows. First, our empirical analysis on the determinants of being high-dividend companies shows the size, profitability, debt ratios, and shareholding ratios of companies as important factors in their decision-making on dividend payout. In particular, the greater the shareholding ratios of major shareholders in KOSDAQ-listed companies, the more likely those companies were to be high-dividend companies. KOSDAQ-listed companies tend to be smaller than their KOSPI-listed counterparts and were therefore more sensitive to the responses of their major shareholders to the tax incentive for dividend income.

Second, our analysis demonstrates that the amount of cash dividends paid out by companies as well as their dividend payout has increased after the introduction of the tax reform; however, the increase in the amount of cash dividends is attributable mainly to the contemporary increase in firms' net income, but partially to the tax reform. In this sense, we derive the conclusion that the tax reform exerted only a limited effect on the amount and dividend payout. On the other hand, it turns out that the shareholding ratios of major shareholders failed to show a statistically significant effect on corporate dividend payout after the tax incentive was introduced.

In sum, the aggregate amount of cash dividends paid by listed companies increased after the tax reform more as a result of the dramatic increase in those companies' net income rather than the tax incentive itself. As a result, the dividend payout of the entire market remains more or less constant. We therefore conclude that the tax reform has exerted only a limited effect on the stock market, and carried a greater cost than benefit in terms of lost tax revenue. Moreover, as the benefits of the tax incentive for dividend income were likely concentrated in already affluent individual major shareholders, it has likely hurt the vertical equity of individuals as well.

This paper contributes to the existing literature in the following two aspects. First, it provides new empirical evidence supporting the effects of tax incentives on corporate dividend payout policy. In general, companies choose how to spend their profits between investing in internal reserve funds or returning some to shareholders in the form of dividends. According to the tax preference theory, companies prefer to add their income to capital gains when the dividend income tax is higher than the capital gains tax, and prefer dividends over capital gains when the tax rates are reversed. In light of this theory, a number of studies (Poterba and Summer (1984), La Porta et al. (2000), Chetty and Saez (2005) and Auerbach and Hassett (2005)) have provided empirical evidence supporting the significant effect of dividend tax cut on increasing dividend payout. This study reaffirms the findings of earlier studies. However, unlike earlier studies, we focus not on tax cut beneficial to all companies, but particularly on a tax incentive scheme that selectively benefits the shareholders of high-dividend companies that meet certain qualifying requirements.

Second, this study re-highlights the important role of shareholders in company decisions regarding corporate dividend payout policy. Chetty and Saez (2005), analyzing the effect of the reduced American dividend income tax introduced in 2003, showed that companies with powerful major shareholders whose tax benefits significantly change

responded particularly sensitively to the tax cut, and thereby concluded that the greater the shareholding ratios of major shareholders, the greater company inclination to pay dividends. Our results also confirm that companies with the high proportion of major shareholders respond more sensitively to the tax incentive, which highlights the importance of shareholders in determining corporate payout policy.

This paper is structured as follows. In Section 2, we explain the major features of the PDIT. In Section 3, we introduce a theoretical background to tax incentives for dividend income. We explain our data and empirical models in Section 4, while in Section 5 we discuss the findings of our empirical analysis on the determinants of high-dividend companies and the effect of the tax reform on corporate dividend payout policy. Section 6 provides a summary of our findings and concluding remarks.

2. Institutional Background: A Policy Experiment

According to a press release on the Korean government's draft for reforming the tax scheme in August 2014,[1] the tax reform on dividend income was introduced out of an acknowledgment of the need to establish and strengthen a virtuous cycle of profit-sharing between companies and their shareholders in the form of dividends now that the Korean economy had transitioned from high growth to maturity. The underlying logic was that companies in the past opted to retain their profits in the form of internal reserve funds so as to reinvest them in further profitable endeavors that fueled economic growth, created jobs, and indirectly increased household income and spending. Now that low growth has become a new norm, however, companies can no longer benefit households by retaining their profits in internal reserve funds. The Korean government thus emphasized their need to share their profits more directly with the public by paying their shareholders greater dividends, which would, hopefully, increase household consumption and revitalize the economy. In this sense, the Korean government justified the tax reform as a catalyst for economic growth.

The tax reform was intended to foster investment in the stock market by providing tax incentives for dividend incomes of shareholders. More specifically, the tax incentive targeted a specific subset of individual shareholders holding stocks in companies whose dividend payout ratio, dividend yield and growth ratio of cash dividend were above

[1] Ministry of Strategy and Finance (MOSF) (2014).

thresholds.[2]

Having introduced the tax incentive for dividend incomes in 2014, the Korean government initially lowered the withholding tax rate on dividend incomes earned on stocks held in high-dividend companies from 14 percent to 9 percent and allowed taxpayers' financial income to be taxed separately and flat at a 25 percent rate instead of applying personal income tax at progressive rates. Beginning in 2016, the 25-percent flat rate on financial incomes was replaced by a five-percent tax credit, exempting each eligible taxpayer from paying up to KRW 20 million less in income tax. As the law was applied in 2015 through 2017, the dividend data used to calculate payout ratio and dividend yield for identifying high-dividend companies are therefore based on the cash dividends actually paid in 2016 through 2018.

The tax reform did not apply to all listed companies. Rather, it targeted only a small portion that qualified as "high-dividend companies" in terms of dividend payout ratio, dividend yield, and the growth rate of cash dividend they paid out. Investment companies (including ship investment companies and restructuring companies) and companies owned by foreign investors were excluded from the scope of the beneficiaries of the tax reform. As the tax incentive applied only to individual shareholder residents in Korea, foreign investors taxed in Korea under tax treaties and corporate and institutional investors subject to corporate income taxes were also excluded.

Table 1. Qualifying Requirements of High-Dividend Companies

Criteria	Type I	Type II	Type IIII (newly listed companies)
Dividend payout	120% or more of market average	50% or more of market average	130% or more of market average
Dividend yield			
Growth rate in total dividends	10% or higher	30% or higher	N/A

Source: Paragraphs (1) and (3), Article 104-24, Enforcement Decree to the Tax Reduction and Exemption Control Act (TRECA), as quoted in Kim and Lee (2016), p. 57.

[2] Tax incentives were to be provided for shareholders pursuant to Article 104-27 ("Special Taxation on Dividend Income from Stocks of High-Dividend Companies") of the TRECA, and Article 104-24 of the Enforcement Decree to and Article 47-2 of the Enforcement Rules of the same Act.

In order to qualify as a high-dividend company under the law, a company had to satisfy the qualifying requirements summarized in Table 1. Type I included companies whose dividend payout ratio and dividend yield were 120 percent or more of the market average and whose total cash dividends increased by 10 percent or more over the previous year. Companies in this category already boasted quite high dividend payout ratio and dividend yield before the law was introduced, and were therefore required to increase their total dividends by the relatively small 10-percent margin. Type II included companies whose dividend payout ratio and dividend yield were 50 percent or more of the market average, and whose total cash dividends increased by 30 percent or more over the previous year. Because these companies' dividend payout ratio and dividend yield were low before the law, they had to increase their dividends more dramatically, at 30 percent or more, in order to be eligible for the tax program. Type III was made up of companies newly listed on the stock market and/or that had not paid any dividends in the three years. These companies thus had to offer dividend payout ratio and dividend yield that were at least 130 percent of the market average in order to qualify as high-dividend companies. The Korea Exchange (KRX) was required to calculate and disclose the market average of dividend payout ratio and dividend yield necessary to determine whether companies qualified as high-dividend companies.[3]

We need to pay attention to the fact that the tax reform can be considered as an interesting natural experiment and was enacted with a limited timeline of application (2015 through 2017). In particular, we believe that our analysis is free from the endogeneity issues in that the change in corporate payout policy, if any, results from an exogenous tax shock added to the market. Moreover, because the program was applied for only a limited time, its effect on the dividend policies and practices of companies would be provisional and direct rather than permanent.

[3] The market-average dividend payout ratio and dividend yield disclosed by the KRX were as follows:

	Market-average dividend payout ratio		Market-average dividend yield	
	2015	2016	2015	2016
KOSPI	24.13	23.96	1.37	1.26
KOSDAQ	14.05	14.60	0.87	0.79

Sources: KRX, "Market-Average Indicators of Dividends in Relation to the Tax Incentives for High-Dividend Companies," September 30, 2015, and "Market-Average Indicators of Dividends in Relation to the Tax Incentives for High-Dividend Companies," September 27, 2016.

3. Theoretical Background

Modigliani and Miller (1961) provided a seminal study on the determinants of corporate dividend policy, demonstrating that, in a perfect capital market without any taxes, the dividend policy should hold no correlation to the value of a company. According to this theory, the value of a firm is determined solely in terms of the ability to generate profits and the investment decisions they make. Thus, how companies finance their operations and the kinds of policies they apply to dividends are therefore mere technical standards according to which the flows of company gains are to be divided between dividends and internal reserves. This theory, however, assumes a perfect capital market devoid of any frictions, such as taxes and transaction costs. The theory therefore implies that dividend policies could potentially affect the value of companies in the real world where frictions do exist.

The first and foremost factor that could possibly affect corporate dividend policy is the presence of tax incentives. According to the tax preference theory, tax incentives can influence corporate dividend policy in the presence of the difference between the dividend income tax rate and the capital gains tax rate. For example, when the dividend income tax rate is greater than the capital gains tax, firms prefer capital gains to dividend payout. In many countries, capital gains are subject to lower tax rates and more tax exemptions than dividend income, leading companies to prioritize capital gains over dividends. Despite this apparent disadvantage against dividends under the current tax scheme, innumerable companies around the world pay their shareholders dividends. Since this "dividend puzzle" was brought to attention (Black, 1976), researchers have been trying to identify its causes and effects.

A vast of literature has so far located the causes of the dividend puzzle in diverse theories, including theories on the signal effect, the agent cost, and the clientele effect. As our focus in this study is on the influence of tax incentives introduced by the tax reform, we review studies that investigate the effects of tax incentives on the corporate dividend policy.

There is no definite consensus among studies providing empirical evidence of the effects of tax incentive on corporate dividend policy. Chetty and Saez (2005, 2006, and 2010) and Jacob et al. (2016) argued that dividend taxes exerted significantly adverse effects on companies' inclination to pay dividends, while Poterba (2004), Brav et al. (2008), and Yagan (2015) argued that the effects of such taxes were minimal at best.

Chetty and Saez (2005) empirically analyzed the effect of the 2003 dividend tax cut on the dividend policies of U.S. listed firms, finding that the tax cut led to an almost 20-percent increase in the aggregate amount of dividends paid out to shareholders. In particular, dividends increased quite dramatically immediately after the dividend income tax was lowered, with companies with powerful major shareholders[4] whose tax burden changed significantly to the tax policy. On the other hand, based on an agency model in which the interests of managers and shareholders conflict, Chetty and Saez (2010) attempted to show that the corporate income tax was more efficient in increasing the government's tax revenue than was the dividend income tax. In this model, the dividend income tax causes the manager to retain company gains in internal reserves and thereby make unproductive investments, thus giving rise to the first deadweight cost. The corporate income tax, on the other hand, does not generate a similar distortion in the manager's dividend policy and leads to secondary inefficiencies only. Jacob *et al*. (2016) investigate how corporate ownership structures affect dividend payout policy responding to tax incentive, and found that the dividend income tax had significant effects on corporate dividend policies, but their sensitivity to the tax incentive decreased as the number of shareholders increased, i.e., ownership structures are diffused.

In contrast, using the U.S. corporate data, Porterba (2004) showed evidence that the dividend income tax exerted only a marginal short-term effect but not statistically significant. Brav *et al*. (2008), having surveyed 328 finance executives working for U.S. corporation to analyze the effect of the U.S. dividend tax cut on dividend payout policy, showed that the tax cut prompted some companies to start paying out and/or increase dividends at the margin. However, the majority of surveyed executives denied that the dividend income tax was not a major factor that their companies considered in making dividend-related decisions. These executives identified future cash flows, the size of cash reserves, and past levels of dividends as more important factors. Exploiting corporate income tax data from 1996 through 2008, Yagan (2015) investigated whether the U.S. dividend tax cut increased company investment and worker income in the United States, and showed that this was not the case with any statistical significance though the tax cut contributed to the increases in the aggregate amount of cash dividends only by a minute margin.

These studies sought to analyze the effect of dividend income taxes on the dividend

[4] Independent board members holding significant ratios of shares, investors with high shareholding ratios, and chief executives holding relatively small amounts of stock options appear to have demanded larger dividends in response to the drop in the dividend income tax.

policies of *all* companies and the behavior of their shareholders. The tax reform in Korea, however, selectively targeted only a small proportion of companies qualifying as "high-dividend companies" and their shareholders, and is thus expected to exert relatively smaller effects on the dividend payout policy of listed firms than those reported in earlier studies.

4. Data and Empirical Strategy

In order to determine how the tax incentive for dividend income affected the dividend policies of KOSPI- and KOSDAQ-listed companies, we collect the data—including variables used on financial statements of fiscal years 2013 through 2016—from DataGuide. The information on major and foreign shareholders is gathered from TS2000, provided by the Korea Listed Companies Association. Out data span pre and post two-year period of the tax reform in order to compare the differential effects of corporate payout policies after the reform. The data we retrieved from DataGuide, as of July 9, 2017, concern 1,894 companies, listed on either the KOSPI or the KOSDAQ, and excludes special-purpose acquisition companies (SPACs), ship investment companies, and companies owned by foreign investors.

Table 2 shows the descriptive statistics for the variables pertaining to cash dividends, the characteristics of companies, and their ownership structures. Whereas the mean of cash dividends for the two years before the tax reform was KRW 15.5 billion, this increased by 36.1 percent to KRW 21.1 billion after the reform. The mean of net profits, in the meantime, increased by 32.1 percent from KRW 28 billion to KRW 37 billion over the same period of time.

Specifically, we take the two empirical models into account in order to examine the effects of the tax reform on corporate dividend policy. First, as the tax incentive for dividend income was meant to apply only to high-dividend companies that satisfy certain criteria, we sought to determine which characteristics and factors of listed companies led them to become high-dividend companies. Afterward, we analyzed how the tax reform influenced the dividend policy of listed companies.

Table 2. Descriptive Statistics

(Units: KRW million, percentage)

	Variable	Obs.	Mean	S.D.	Min.	Max.
Pre-PDIT	Cash dividends	1,929	15,483.94	98,826.31	1.280	2,999,973
	Net profits	3,692	28,009	430,621	-2,052,601	17,900,000
	ln (market capitalization)	3,400	11.640	1.498	8.194	19.233
	Asset increase rate	3,582	9.900	54.653	-96.210	2,620.980
	Revenue increase rate	3,580	17.738	293.692	-115.490	12,740.24
	ROA	3,582	1.356	13.870	-318.880	142.000
	Lossmaker	3,788	0.263	0.441	0	1
	Profit volatility	3,642	59.212	3,580.180	- 684.914	216,054.8
	Debt ratio	3,692	156.595	337.623	0.790	12,674.97
	Retention ratio	3,539	3,027.200	86,925.96	0.680	5,159,023
	Major shareholders	3,371	40.565	16.985	0.780	100.00
	Foreign investors	3,786	6.310	11.878	0	89.733
	Market dummy(Kospi)	3,788	0.391	0.488	0	1
Post-PDIT	Cash dividends	2,050	21,680.63	140,033.3	0.609	3,991,892
	Net profits	3,749	37,243	401,570	-2,990,997	12,200,000
	ln (market capitalization)	3,721	11.989	1.329	8.598	19.461
	Asset increase rate	3,760	15.039	57.868	-80.390	1,720.860
	Revenue increase rate	3,754	14.078	124.271	-104.270	5,604.370
	ROA	3,760	1.111	14.129	-230.520	120.800
	Lossmaker	3,788	0.264	0.441	0	1.000
	Profit volatility	3,734	-0.133	30.704	-780.073	1,167.647
	Debt ratio	3,767	154.761	1,394.194	1.140	84,510.24
	Retention ratio	3,629	3,047.441	82,485.11	0.020	4,963,748.0
	Major shareholders	3,729	39.506	17.371	0	90.590
	Foreign investors	3,787	6.982	11.737	0	83.554
	Market dummy(Kospi)	3,788	0.391	0.488	0	1

To analyze the determinants of high-dividend companies, we consider the following estimation model and apply Panel Logit model for the estimation.

$$HDC_{it} = X_{it}\beta + \alpha_i + \varepsilon_{it} \quad (1)$$

where HDC_{it} is a binary variable, equaling 1 if a firm qualifies the requirement of high-dividend companies and 0 otherwise. High-dividend companies were defined according

to the terms of the law as presented in Section 2. The several factors identified by the existing literature as decisive on dividend policies of companies, such as firm size, growth potential, investment opportunity, profitability, and stability are used as explanatory variables. The estimation model also includes the shareholding ratios of major and foreign shareholders as proxy for ownership structures of firms, and industry fixed effects controlling for heterogeneous effects by the difference in industry.

The natural logarithms of market capitalization (in million KRW) were used as a proxy variable for firm size.[5] In general, larger corporations have better access to capital markets and are able to finance their operations at lower costs than smaller firms. Therefore, the larger the company, the more likely it is to be high-dividend companies. In other words, we expect that company size bears a positive relation with dividend payouts. As for growth potential, we used the growth rate of total assets. Companies with growth potential are generally expected to prefer investment to dividend payouts. Accordingly, companies with high growth potential are less likely to be high-dividend companies.

As a proxy for Tobin's q, representing investment opportunity, we used the revenue growth rate instead of the book-to-market ratio (Fama and French, 2001). Companies with greater growth rates of revenue are more likely to invest their gains than distribute them as dividends. We thus expect that the higher the revenue growth rate, the smaller the likelihood to be high-dividend companies. As for profitability, we used the return on assets (ROA = net incomes/total assets), with the expectation that increases in profitability would increase the likelihood to become high-dividend companies. High profitability gives companies more tools to generate internal funds and therefore enable firms to save greater amounts of cash for dividend payouts. We use net income volatility as a proxy for the risks of companies, with the expectation that greater net income volatility would make companies more inclined to reserve cash than distribute it as dividends.

The higher the debt ratio, the smaller the likelihood of companies to be high-dividend, as debt tends to discourage dividend distribution. The retention ratio, which we used as a proxy variable for firm lifecycle, is expected to bear a positive correlation to preference for dividends.

Major shareholders are defined as shareholders capable of having significant

[5] While the natural logarithms of either total assets or total revenue may also be used as a proxy variable for company size, doing so would make little difference to our main findings. In this study, we therefore present results based on the natural logarithms of market capitalization only.

influence on company decisions on whether to pay or increase dividends.[6] Specifically, if these major shareholders are individuals, they would gain more benefits from the reduced tax burden on dividend income by making their companies to pay greater dividends. Thus, we expect that the greater their shareholding ratio, the greater the likelihood of their companies to be high-dividend. While we did include the shareholding ratio of foreign shareholders as a variable in our analysis, there appears no straightforward relation between this variable and the likelihood to be high-dividend companies. The law grants tax incentives for individual resident in Korea only, and therefore would not have significant effect on Korean companies via foreign shareholders. Nevertheless, it is possible that the tax incentive could have motivated foreign shareholders to raise their demand for greater dividends.

In order to examine the effect of the tax reform on corporate payout policy, we particularly test whether the tax incentive for dividend incomes result in increases in the cash dividends paid and/or dividend payout ratio of listed firms, especially via major and foreign shareholders. Specifically, we estimate the elasticity of cash dividends to net incomes to analyze whether dividend payout ratio of listed firms has changed due to the tax reform. For this purpose, our empirical analysis target only listed companies whose net incomes were positive and that had paid cash dividends. The following estimation model, in reference to Vianna(2017), is considered to analyze the effect of the tax reform.

$$\begin{aligned}\ln(cash\,dividends)_{it} = {} & \beta_0 + \gamma_1 post_t + \gamma_2 post_t \times \ln(net\,income)_{it} + \gamma_3 \ln(net\,income)_{it} \\ & + \gamma_4 post_t \times major\ shareholder_{it} + \gamma_5 post_t \times foreign\ investor_{it} + X_{it}\beta + \alpha_i + \varepsilon_{it}\end{aligned} \quad (2)$$

where the dependent variable is the natural logarithm of cash dividends in million KRW and $post_t$ is an indicator variable that equals one after the tax reform was enacted and zero otherwise. Because corporate dividend policies are significantly influenced by firm-specific characteristics, our estimation model also include most of independent variable considered in equation (1) such as firm size, growth potential, investment opportunity, profitability, stability (debt ratio), and reserve ratio. As for the variables of ownership structure, we again used the shareholding ratios of major and foreign shareholders. The

[6] According to the Capital Market and Financial Investment Business Act, a major shareholder is defined as a shareholder who exerts *de facto* influence on important matters of a company's management, including its management strategies and organizational changes, by holding and exercising at least 10 percent of the company's total shares with voting rights and/or by appointing and dismissing members of the company's board.

coefficient on $post_t$ measures the increment of ln(cash dividends) after the tax reform. And the coefficient on $post_t \times \ln(net\ income)$ indicates whether dividend payout ratio increased after the tax reform. To be exact, it measures by what percent cash dividends increased in response to one-percent increase in the firm's net incomes after the tax reform. We also added $post_t \times major\ shareholer_{it}$ and $post_t \times foreign\ investor_{it}$ in our empirical model to test the effect of major and foreign shareholders on corporate dividend policy responding to the tax incentives for dividend incomes.

5. Empirical Analyses

5.1. Determinants of being High-Dividend Companies

Table 3 present estimation results regarding the determinants that make listed companies high-dividend. As the KOSPI and KOSDAQ markets may fundamentally differ in structure, we made sure to analyze not only the total sample of all companies listed on KOSPI and KOSDAQ, but also the separate sample by the stock market

The results in Column (1) regarding all listed companies indicate that firm size, profitability, debt and retention ratios, and the shareholding ratio of major shareholders are statistically significant factors that influence firms' decisions on dividends payout. Specifically, we found that firm size, profitability, and shareholding ratio of major shareholders are positively associated with the likelihood of being high-dividend companies; in contrast, debt and retention ratios were adversely related to the likelihood of being high-dividend companies.

Whereas, profitability, investment opportunity, risk, shareholding ratio of foreign shareholders, type of stock market and year dummy did not show statistically significant relations. It would be understandable that the shareholding ratio of foreign shareholders is not a significant factor, in light of the fact that the tax incentives are applicable only to individual residents in Korea. The insignificant coefficient on year dummy implies that despite the reduced benefits for taxpayers subject to the General Financial Income Tax in 2016, it did not affect the likelihood of being high-dividend companies.

Column (2) present the estimation results for KOSPI-listed companies. Here firm size, profitability, and debt and retention ratios are statistically significant, indicating that they are important factors for becoming high-dividend companies. The greater the firm size,

the greater the likelihood of the company to be high-dividend, with statistical significance at a one-percent level. Profitability also bear a positive correlation, with statistical significance at a one-percent level. On the other hand, debt and reserve ratios have negative correlations to the likelihood of being high-dividend, with statistical significance at a five-percent level. Contrary to the analysis of all listed companies, the shareholding ratio of major shareholders are not statistically significant for KOSPI-listed companies.

Column (3) present the estimation results for KOSDAQ-listed companies. Here firm size, profitability, debt ratio, and shareholding ratio of major shareholders are significantly correlated to the likelihood of being high-dividend. Contrary to the case for KOSPI-listed companies, retention ratio fails to show a statistically significant influence, while shareholding ratio of major shareholders are statistically significant. In other words, the greater the ratio of shares held by major shareholders in KOSDAQ-listed companies, the greater the likelihood of being high-dividend companies. This suggests that the tax reform did encourage major shareholders of these companies to take advantage of the tax incentives by increasing their demand for dividends paid by their companies.

While the findings of analysis listed in Table 3 do not reflect the data on companies with positive net incomes, Table 4 provides outcomes including companies with net losses as well. These results overlap with those of the previous analysis. For KOSPI-listed companies, firm size and profitability are positively associated with the likelihood of being high-dividend companies, while debt ratio and retention ratio are negative. For KOSDAQ-listed companies, firm size, profitability, debt ratio, and shareholding ratio of major shareholders have statistically significant effects on the likelihood of being high-dividend.

In sum, our results show that the major factors that decide whether a company becomes a high-dividend company eligible for tax incentives are firm size, profitability, debt ratio, and shareholding ratio of major shareholders. Especially, it turned out that shareholding ratio of major shareholders have significant effect on the likelihood of being high-dividend companies, implying that major shareholders play an important role on company decisions regarding dividends

Table 3. Determinants of Being a High-Dividend Company(Profitable Firms Only)

Net incomes > 0	All	KOSPI-listed	KOSDAQ-listed
	(1)	(2)	(3)
ln(market capitalization) (Size)	0.237***	0.188**	0.297**
	(0.0712)	(0.0873)	(-0.123)
Asset growth rate (Growth potential)	-0.00334	-0.00218	-0.00372
	(0.00216)	(0.00507)	(0.00256)
Revenue growth rate (Investment opportunity)	-5.24E-05	-6.75E-05	0.00023
	(0.00073)	(0.00077)	(0.00135)
ROA (Profitability)	0.0381***	0.0530***	0.0316***
	(0.00951)	(0.019)	(0.0113)
Net income volatility (Risk)	0.000381	-0.00742	0.000835
	(0.00219)	(0.0113)	(0.00233)
Debt ratio (Stability)	-0.00133**	-0.00138**	-0.00315**
	(0.00054)	(0.00066)	(0.00137)
Retention ratio	-5.81e-05**	-6.66e-05**	-1.41E-05
	(2.71E-05)	(2.98E-05)	(7.60E-05)
Major shareholders	0.0197***	0.0091	0.0287***
	(0.00453)	(0.00654)	(0.00641)
Foreign investors	0.00883	0.00513	0.00797
	(0.00655)	(0.00829)	(0.0108)
Market dummy (KOSPI)	-0.277	-	-
	(0.172)		
Year dummy (2016)	-0.0191	-0.0212	-0.00936
	(0.118)	(0.174)	(0.162)
Constant	-7.106***	-5.611***	-7.852***
	(1.681)	(1.917)	(1.975)
Industry Fixed Effects	Yes	Yes	Yes
Observations	2,614	1,135	1,460
Number of id	1,541	647	883
Log-Likelihood	-1173.06	-516.682	-643.32

Note: The asterisks, *, **, and ***, represent statistical significance at 10-percent, five-percent, and one-percent levels, respectively. The figures in parentheses indicate standard errors.

Table 4. Determinants of Being a High-Dividend Company(All Firms Including Lossmakers)

All firms	Total	KOSPI-listed	KOSDAQ-listed
	(1)	(2)	(3)
ln(market capitalization) (Size)	0.239***	0.196**	0.279**
	(0.0695)	(0.0865)	(0.118)
Asset growth rate (Growth potential)	-0.00367*	-0.00244	-0.00395
	(0.00216)	(0.005)	(0.00254)
Revenue growth rate (Investment opportunity)	1.45E-06	4.59E-06	0.000183
	(0.00066)	(0.00068)	(0.00132)
ROA (Profitability)	0.0409***	0.0572***	0.0347***
	(0.00945)	(0.019	(0.0111)
Lossmaker indicator	-2.941***	-2.822***	-2.967***
	(0.445)	(0.763)	(0.549)
Net income volatility (Risk)	0.000389	-0.00736	0.000795
	(0.00216)	(0.0112)	(0.00227)
Debt ratio (Stability)	-0.00133**	-0.00141**	-0.00294**
	(0.00053)	(0.00065)	(0.00132)
Retention ratio	-5.81e-05**	-6.80e-05**	-1.27E-05
	(2.67E-05)	(2.99E-05)	(7.34E-05)
Major shareholders	0.0186***	0.00815	0.0273***
	(0.00441)	(0.00647)	(0.00615)
Foreign investors	0.00907	0.00556	0.00828
	(0.00643)	(0.00826)	(0.0105)
Market dummy (KOSPI)	-0.278*	-	-
	(0.168)		
Year dummy (2016)	0.0164	-0.0168	0.0526
	(0.116)	(0.173)	(0.159)
Constant	-7.131***	-5.743***	-7.614***
	(1.651)	(1.909)	(1.917)
Industry fixed effects	Yes	Yes	Yes
Observations	3,479	1,381	2,070
Number of id	1,802	707	1,081
Log-likelihood	-1207.43	-526.861	-667.39

Note: The asterisks, *, **, and ***, represent statistical significance at 10-percent, five-percent, and one-percent levels, respectively. The figures in parentheses indicate standard errors.

5.2. Effects of the Tax Reform on Cash Dividends

Table 5 presents the estimation results of equation (2) for all companies listed on both stock markets. Model 1 estimates the coefficient on $post_t$ only, controlling for the firm fixed effects. In Model 2, market size, profitability (asset increase rate), investment opportunity (revenue increase rate), logarithm of net incomes, risk (net income volatility), debt and retention ratios, and shareholding ratios of major and foreign shareholders are used as additional control variables. In Model 3, $post_t \times \ln(net\ income)$ was added to Model 2. Whereas the coefficient on $post_t$ of Models 1 and 2 simply measures to what extent ln(cash dividends) increase after the tax reform, the coefficient on $post_t \times \ln(net\ income)$ indicates whether the dividend propensities of listed firms increase after the tax reform. Specifically, it measured by what percent the amount of cash dividends increases in response to one-percent increase in net incomes. Model 4 considers the post x shareholding ratio of major shareholders and post x shareholding ratio of foreign shareholders as additional independent variables. The coefficients of these variables estimate the effects of major and foreign shareholders' shareholding on company decisions regarding dividends after the tax reform.

The results in Model 1 show that the estimated post coefficient is 0.182 and statistically significant at a one-percent level, indicating that ln(cash dividends) increased by 0.182 after the tax reform. Although statistically significant, the magnitude of the effect is rather marginal. The coefficient on $post_t$ of Model 2, with more control variables added, is 0.0975, exactly one-half of that of Model 1, but still significant at a one-percent level.

Our main interest of this study is to test whether the tax reform induces firms to significantly increase corporate dividend payout ratio. Our results in Models 3 and 4 report the affirmative empirical evidence. Model 3 shows that cash dividends increase by 0.124 percent in response to one-percent increase in net profits before the tax reform was enacted and grow to 0.1826 (0.124 + 0.0582) percent after the tax reform. However, the elasticity of cash dividends to net incomes increases merely by a 0.06 percentage point, suggesting that the positive effect of the tax reform on corporate dividend propensity was quite limited. For example, suppose that before the tax reform, a firm paid out 20 cash dividend out of 100 net income, i.e., had a dividend propensity of 20 percent. If the firm's net income also increased by 10 percent and become 110 after the tax reform, then the amount of cash dividends would

have increased additionally by 0.1162 (0.582 percent), which implies only a 0.106-percentage-point increase in its dividend propensity. This exercise makes us to derive a conclusion that the magnitude of the effect is extremely small though the tax reform has a statistically significant effect on company dividend propensity.

Model 4 shows that cash dividends increase by 0.123 percent in response to one-percent increase in net incomes prior to the tax reform, and that cash dividends increase by 0.185 (0.123 + 0.0615) percent in response to the one-percent increase in net incomes after the tax reform. These results are similar to those of Model 3. The tax incentive for dividend income have a statistically significant effect on company dividend propensity, but the effect itself is marginal. The results also show that firm size, investment opportunity, net incomes, debt ratio, and shareholding ratio of foreign shareholders affect cash dividends significantly, but growth potential (asset increase rate), profitability (ROA), risk (net profit volatility), retention ratio, shareholding ratio of major shareholders, $post_t \times major\ shareholer_{it}$ and $post_t \times foreign\ investor_{it}$ do not.

Concerning other control variables, we confirmed that firm size has a positive effect on cash dividends, while investment opportunity is negatively associated. Cash dividends also increase in proportion to net incomes, while the debt ratio affects cash dividends adversely. Interestingly, we find that the greater the shareholding ratio of foreign shareholders, the greater the cash dividends. This suggests that foreign investors prefer companies that pay out large amount of cash dividends. However, it turns out that ownership structure has little effect on cash dividends even if the tax incentives for dividend income are given after the tax reform. This would be attributable to the fact that the tax incentives for dividend incomes are applicable with quite a limited scope, benefitting shareholders of companies qualified as high-dividend only. For this reason, we expect that the effects of major shareholders on corporate dividend policy after the tax reform are ‘on average’ not significant, though they have significant effects for ‘limited’ companies to become high-dividends as we found in the earlier results.

Table 6 presents the estimation results for KOSPI-listed companies only. Contrary to our previous results for all listed companies, ROA are negatively associated with cash dividends with a statistically significance. However, other variable show similar results to those shown in Table 5. Models 3 and 4, in other words, provide empirical evidence affirming the increase in company dividend propensity after the tax reform, but the effect was extremely weak. According to Model 3, firms’ cash dividends increase by 0.116 and 0.1757

(0.116 + 0.0597) percent in response to one-percent increase in net incomes before and after the tax reform, respectively. The elasticity of cash dividends to net incomes, thus, grow by 0.06 percentage point due to the tax incentives, but this growth is marginal at best. Model 4 show that cash dividends increase by 0.117 percent in response to one-percent increase in net incomes before the tax reform. Introducing the tax reform raised this rate of increase in cash dividends to 0.1767 (0.117 + 0.0597) percent only, with no real difference from the findings of Model 3.

Table 7 presents the estimation results for KOSDAQ-listed companies only. Contrary to our results for all listed companies, the shareholding ratio of major shareholders now becomes statistically significant and negatively associated with cash dividends. However, the statistical significance and magnitudes of estimated coefficients of other variables remain similar to those of Table 5.Models 3 and 4 provide affirmative empirical evidence that the tax reform contribute to increase in company dividend propensity, but the effect is marginal at best. According to Model 3, a one-percent increase in net profits increase cash dividends by 0.138 percent before the tax reform. This rate of increase in cash dividends rise to 0.1969 (0.138 + 0.0589) percent after it. The elasticity of cash dividends to net incomes appears to increase by 0.06 percentage point, but this growth is pale and barely increase dividend propensities. According to Model 4, a one-percent increase in net incomess increased cash dividends by 0.135 percent before the tax reform. This rate of increase in cash dividends rise to 0.2015 (0.135 + 0.0667) percent after it, quite similar to the result of Model 3.

It appears that the tax reform did lead to increases in company dividend propensity by increasing the elasticity of their cash dividends to net incomes. Nevertheless, the increase in elasticity of cash dividends is so minimal, limiting the effects of the tax reform

Table 5. Effects of the Tax Reform on Cash Dividends (All Listed Firms; KOSPI+KOSDAQ)

Dependent variable	ln(cash dividends)			
(KOSPI+KOSDAQ)	Model 1	Model 2	Model 3	Model 4
Post	0.182***	0.0975***	-0.455***	-0.518***
	(0.0132)	(0.0122)	(0.0702)	(0.0835)
post × ln(net income)	-	-	0.0582***	0.0615***
			(0.00729)	(0.0086)
post × major shareholders	-	-	-	0.000837
				(0.000731)
post × foreign shareholders	-	-	-	-0.000549
				(0.00101)
ln(market capitalization)	-	0.193***	0.236***	0.236***
		(0.0216)	(0.022)	(0.022)
Asset growth rate	-	-6.15E-05	-7.30E-05	-7.62E-05
		(0.0002)	(0.000197)	(0.000197)
Revenue growth rate	-	-0.000180***	-0.000156***	-0.000154***
		(5.99E-05)	(5.92E-05)	(5.92E-05)
ROA	-	-0.00182	-0.0018	-0.00191
		(0.00161)	(0.00159)	(0.00159)
ln(net income)	-	0.159***	0.124***	0.123***
		(0.0116)	(0.0123)	(0.0125)
Risk	-	0.000109	0.000112	0.000109
		(0.000379)	(0.000375)	(0.000375)
Debt ratio	-	-0.00106***	-0.00107***	-0.00106***
		(0.000169)	(0.000167)	(0.000167)
Retention ratio	-	1.62e-05***	8.44E-06	8.58E-06
		(5.42E-06)	(5.43E-06)	(5.43E-06)
Major shareholders	-	-0.00197	-0.00286	-0.00317
		(0.00195)	(0.00193)	(0.00196)
Foreign shareholders	-	0.00800***	0.00770***	0.00804***
		(0.00164)	(0.00162)	(0.00168)
Constant	7.747***	4.113***	3.975***	3.997***
	(0.00921)	(0.291)	(0.288)	(0.288)
Firms' fixed effects	Yes	Yes	Yes	Yes
Observations	3,979	3,565	3,565	3,565
R-squared	0.0049	0.6568	0.683	0.685
Number of id	1,221	1,176	1,176	1,176

Note: The asterisks, *, **, and ***, represent statistical significance at 10-percent, five-percent, and one-percent levels, respectively. The figures in parentheses indicate standard errors.

Table 6. Effect of the Tax Reform on Cash Dividends (KOSPI-Listed Firms Only)

Dependent variable	ln(cash dividends)			
KOSPI	Model 1	Model 2	Model 3	Model 4
Post	0.188***	0.120***	-0.480***	-0.513***
	(0.0186)	(0.016)	(0.0916)	(0.112)
post × ln(net income)	-	-	0.0597***	0.0597***
			(0.00898)	(0.0106)
post × major shareholders	-	-	-	0.000647
				(0.00101)
post × foreign shareholders	-	-	-	0.00024
				(0.00125)
ln(market capitalization)	-	0.200***	0.248***	0.248***
		(0.0318)	(0.0321)	(0.0321)
Asset growth rate	-	-6.94E-05	-7.93E-05	8.01E-05
		(0.00022)	(0.000216)	(-0.000217)
Revenue growth rate	-	-0.000180***	-0.000151**	-0.000150**
		(6.01E-05)	(5.92E-05)	(5.93E-05)
ROA	-	-0.00562**	-0.00487**	-0.00490**
		(0.00243)	(0.0024)	(0.0024)
ln(net income)	-	0.152***	0.116***	0.117***
		(0.015)	(0.0157)	(-0.0159)
Risk	-	0.000219	0.000245	0.000252
		(0.000667)	(0.000656)	(0.000657)
Debt ratio	-	-0.00103***	-0.00105***	-0.00105***
		(0.000185)	(0.000182)	(0.000183)
Retention ratio	-	1.40e-05**	7.72E-06	7.76E-06
		(5.56E-06)	(5.55E-06)	(5.55E-06)
Major shareholders	-	0.000821	0.000785	0.000543
		(0.00306)	(0.003)	(0.00304)
Foreign shareholders	-	0.00908***	0.00857***	0.00847***
		(0.00204)	(0.00201)	(0.00206)
Constant	8.483***	4.470***	4.231***	4.234***
	(0.0131)	(0.449)	(0.443)	(0.444)
Firms' fixed effects	Yes	Yes	Yes	Yes
Observations	2,030	1,805	1,805	1,805
R-squared	0.0036	0.638	0.6703	0.6706
Number of id	584	563	563	563

Note: The asterisks, *, **, and ***, represent statistical significance at 10-percent, five-percent, and one-percent levels, respectively. The figures in parentheses indicate standard errors.

Table 7. Effect of the Tax Reform on Cash Dividends (KOSDAQ-Listed Firms Only)

Dependent variable	ln(cash dividends)			
KOSDAQ	Model 1	Model 2	Model 3	Model 4
Post	0.176***	0.0530***	-0.460***	-0.577***
	(0.0186)	(0.0198)	(0.145)	(0.159)
post × ln(net income)	-	-	0.0589***	0.0665***
			(0.0165)	(0.0174)
post × major shareholders	-	-	-	0.00147
				(0.00111)
post × foreign shareholders	-	-	-	-0.00201
				(0.00179)
ln(market capitalization)	-	0.187***	0.215***	0.213***
		(0.0309)	(0.0317)	(0.0317)
Asset growth rate	-	0.000247	0.000233	0.000252
		(0.000471)	(0.000469)	(0.000469)
Revenue growth rate	-	-0.000304	-0.00033	-0.000316
		(0.000351)	(0.000349)	(0.00035)
ROA	-	-8.79E-05	-0.000126	-0.000365
		(0.00234)	(0.00233)	(0.00233)
ln(net income)	-	0.173***	0.138***	0.135***
		(0.0187)	(0.0209)	(0.0211)
Risk	-	4.08E-05	3.19E-05	2.22E-05
		(0.000463)	(0.000461)	(0.000461)
Debt ratio	-	-0.00119***	-0.00117***	-0.00118***
		(0.000406)	(0.000404)	(0.000405)
Retention ratio	-	0.000112***	7.87e-05**	8.02e-05**
		(3.40E-05)	(3.51E-05)	(-3.51E-05)
Major shareholders	-	-0.00610**	-0.00679***	-0.00730***
		(0.00262	(0.00261	(0.00268)
Foreign shareholders	-	0.00484*	0.00461*	0.00619**
		(0.00279)	(0.00278)	(0.00297)
Constant	6.981***	3.608***	3.663***	3.729***
	(0.013	(0.388)	(0.386)	(0.388)
Firms' fixed effects	Yes	Yes	Yes	Yes
Observations	1,949	1,760	1,760	1,760
R-squared	0.064	0.256	0.264	0.266
Number of id	637	613	613	613

Note: The asterisks, *, **, and ***, represent statistical significance at 10-percent, five-percent, and one-percent levels, respectively. The figures in parentheses indicate standard errors.

3. Robustness Check

In this section, we carry out robustness checks by examining whether the tax reform contributes to considerable increases in firm's cash dividends. Specifically, we replace the dependent variable, ln(cash dividends), with cash dividends divided by market capitalization (a proxy for dividend yield) and cash dividends divided by assets.

Table 8 presents the regression results for all listed companies, with cash dividends/market capitalization used as the dependent variable. This variable is a proxy for dividend yield. In Model 1, the significant and negative coefficient on $post_t$ indicates that dividend yield is lowered after the introduction of the tax reform; however, when firm characteristics are added as control variables, as in Model 2, the coefficient reverted to a positive value with statistical significance and indicates that the dividend yield increases by 0.112 percentage point after the tax reform.

The coefficients on $post_t \times \ln(net\ income)$ in both Models 3 and 4 are positive and statistically significant, indicating that increases in net incomes lead to additional increases in dividend yield after the tax reform. Based on the result in Model 4, the dividend yield (cash dividends/market capitalization x 100) increase by 0.00144 percent to one-percent increase in net incomes before the tax reform. After the tax reform was introduced, this rate of increase grows to 0.003 percent. Although these positive effects are statistically significant, the magnitude of the effects turns out to be marginal at best. Of other control variables added, firm size, net incomes, debt ratio, and shareholding ratio of foreign shareholders show statistically significant correlations to dividend yield. Unlike in our estimation results with the amount of cash dividends used as the dependent variable, firm size is shown here to affect the dividend yield adversely, implying that the larger a firm the lower its dividend yields. We expect that this is because smaller firms tend to be under-valued on the stock market, which has the effect of raising their dividend yield. Also, net incomes and the shareholding ratio of foreign shareholders are positively associated with dividend yield. The debt ratio, in contrast, is inversely correlated to dividend yield.

Using the dividend payout ratio, i.e., cash dividends divided by net incomes, in the estimation model could lead to a number of problems. First, as net incomes exhibit high volatility, it causes the dividend payout ratio to have too much variations with meaningless changes. Furthermore, when firms with near-zero net incomes pay out cash dividend, they

could have extremely high payout ratio, causing outliers of the data. In contrast, assets are comparatively far less volatile than net incomes. For this reason, numerous previous studies have used cash dividends divided by assets as their dependent variables. For our robustness check, we also use this dependent variable to examine the effect of the tax reform on firms' dividend payout ratio.

Table 9 presents the estimation results for cash dividends divided by assets as the dependent variable regarding all listed companies on both stock markets. The results in Models 1 and 2 show that the estimated coefficients on $post_t$ are -0.00024 and -0.0003, respectively, and both lack of statistical significance. This suggests that the tax reform fail to create any difference to cash dividends divided by assets.

The coefficients on $post_t \times ROA_{it}$ in Models 3 and 4 are -0.71×10^{-5} and -7.48×10^{-5}, respectively. While the coefficient is not significant in Model 3, it is at the 10 percent level in Model 4. Based on Model 4, the estimation results show that cash dividends divided by assets increase by 0.000305 to one-percentage-point increase in the ROA (net incomes/assets x 100) prior to the introduction of the tax reform. After it, cash dividends divided by assets increase by 0.000234 (0.000305 – 0.0000713) in response to the one-percentage-point increase in the ROA. This indicate due to the tax reform, the ROA have a negative effect on company dividend propensity, but the coefficient is so small that the effect must have been marginal. Other control variables with statistical significance are firm size, asset growth rate, debt ratio, and retention ratio. While firm size affect cash dividends positively, growth potential and debt ratio did adversely, reaffirming the findings of previous studies in the literature. In contrast, our result shows that the retention ratio to be inversely associated with dividend payout ratio, which differs from earlier studies.

Overall, our empirical findings confirm that the tax reform have significantly positive effect on dividend yield. Yet the effect itself was so small that it was almost limited. In contrast, it is difficult to decide whether the tax reform has an effect on company dividend propensity because of lack of statistical significance. In sum, we may conclude that the degrees to which the tax reform affects corporate dividend policy are very limited, supporting our previous empirical findings.

Table 8. Effect of the Tax Refrom on Cash Dividends/Market Capitalization

Dependent variable	Cash dividends/market capitalization			
(KOSPI+KOSDAQ)	Model 1	Model 2	Model 3	Model 4
Post	-0.00103***	0.00112***	-0.0110***	-0.0126***
	(0.00026)	(0.000261)	(0.0015)	(0.00178)
post × ln(net income)	-	-	0.00127***	0.00156***
			(0.000156)	(0.000183)
post × major shareholders	-	-	-	-9.11E-06
				(1.56E-05)
post × foreign shareholders	-	-	-	-6.27e-05***
				(2.15E-05)
ln(market capitalization)	-	-0.0112***	-0.0102***	-0.0102***
		(0.000462)	(0.00047)	(0.00047)
Asset growth rate	-	-1.71E-06	-1.97E-06	-2.22E-06
		(4.27E-06)	(4.21E-06)	(4.21E-06)
Revenue growth rate	-	-1.83E-06	-1.29E-06	-1.26E-06
		(1.28E-06)	(1.26E-06)	(1.26E-06)
ROA	-	4.98E-05	5.04E-05	4.75E-05
		(3.45E-05)	(3.40E-05)	(3.40E-05)
ln(net income)	-	0.00235***	0.00158***	0.00144***
		(0.000249)	(0.000263)	(0.000267)
Risk	-	1.92E-06	1.98E-06	1.83E-06
		(8.11E-06)	(8.00E-06)	(7.99E-06)
Debt ratio	-	-1.36e-05***	-1.38e-05***	-1.31e-05***
		(3.61E-06)	(3.56E-06)	(3.57E-06)
Retention ratio	-	1.94e-07*	2.47E-08	3.14E-08
		(1.16E-07)	(1.16E-07)	(1.16E-07)
Major shareholders	-	-4.89E-06	-2.44E-05	-1.23E-05
		(4.16E-05)	(4.11E-05)	(4.18E-05)
Foreign shareholders	-	0.000266***	0.000260***	0.000287***
		(3.51E-05)	(3.46E-05)	(3.58E-05)
Constant	0.0171***	0.129***	0.126***	0.127***
	(0.000183)	(0.00622)	(0.00615)	(0.00615)
Firms' fixed effects	Yes	Yes	Yes	Yes
Observations	3,891	3,565	3,565	3,565
R-squared	0.0019	0.0337	0.0375	0.0388
Number of id	1,214	1,176	1,176	1,176

Note: The asterisks, *, **, and ***, represent statistical significance at 10-percent, five-percent, and one-percent levels, respectively. The figures in parentheses indicate standard errors.

Table 9. Effect of the Tax Reform on Cash Dividends/Assets

Dependent variable	Cash dividends/assets			
(KOSPI+KOSDAQ)	Model 1	Model 2	Model 3	Model 4
Post	-3.45E-05	-0.000277*	-7.41E-05	8.05E-05
	(0.000178)	(0.000161)	(0.000211)	(0.000519)
post × ln(net income)	-	-	-3.99E-05	-4.56e-05*
			(2.68E-05)	(2.70E-05)
post × major shareholders	-	-	-	-6.89E-06
				(9.73E-06)
post × foreign shareholders	-	-	-	1.69E-05
				(1.17E-05)
ln(market capitalization)	-	0.00171***	0.00170***	0.00176***
		(0.000279)	(0.000279)	(0.000282)
Asset growth rate	-	-8.23e-06***	-8.35e-06***	-8.35e-06***
		(2.74E-06)	(2.74E-06)	(2.74E-06)
Revenue growth rate	-	-2.39E-07	-2.73E-07	-2.64E-07
		(8.22E-07)	(8.22E-07)	(8.22E-07)
ROA	-	0.000212***	0.000238***	0.000242***
		(1.74E-05)	(2.49E-05)	(2.50E-05)
ln(net income)	-	-6.37E-07	-7.33E-07	-7.14E-07
		(4.69E-06)	(4.69E-06)	(4.69E-06)
Risk	-	-8.67e-06***	-8.67e-06***	-8.86e-06***
		(2.26E-06)	(2.26E-06)	(2.26E-06)
Debt ratio	-	-1.05E-07	-9.24E-08	-1.05E-07
		(7.47E-08)	(7.52E-08)	(7.55E-08)
Retention ratio	-	-1.35E-05	-1.26E-05	-1.28E-05
		(2.63E-05)	(2.63E-05)	(2.69E-05)
Major shareholders	-	0.000128***	0.000128***	0.000119***
		(2.22E-05)	(2.22E-05)	(2.29E-05)
Constant	0.0117***	-0.00984***	-0.00985***	-0.0104***
	(0.000125)	(0.00373)	(0.00373)	(0.00374)
Firms' fixed effects	Yes	Yes	Yes	Yes
Observations	3,979	3,843	3,843	3,843
R-squared	0.0003	0.0911	0.0923	0.0902
Number of id	1,221	1,205	1,205	1,205

Note: The asterisks, *, **, and ***, represent statistical significance at 10-percent, five-percent, and one-percent levels, respectively. The figures in parentheses indicate standard errors.

6. Summary and Concluding Remarks

In this paper, we regard the tax reform in Korea, effective on 2015, as an exogenous natural experiment to the stock market, and examine the effect of tax incentives for dividend income on corporate dividend policy of listed companies. As the tax reform provides tax incentives for targeted shareholders of certain companies that qualified as high-dividend, we expected its effect to be similar to that of lowering the dividend income tax. To empirically test these predictions, we collected the financial data of companies listed on the KOSPI and the KOSDAQ for fiscal years 2013 through 2016.

First, our empirical analyses on the determinants of being high-dividend companies show that firm size, profitability, debt ratio, and shareholding ratio of major shareholders are statistically significant factors that determined whether a company qualified as high-dividend, with company size and profitability positively related to the likelihood. Of particular importance is the finding that the likelihood of being a high-dividend company grow in proportion to the shareholding ratio of major shareholders, as these shareholders presumably have significant influence on corporate dividend policy. This pattern, however, was observed only with respect to companies listed on the KOSDAQ, and not to those listed on the KOSPI. This is most likely because the major shareholders of KOSDAQ-listed companies reacted strongly to the decreased tax burden for dividend income.

Next, we examine how the tax reform influenced the amount of cash dividends paid out by listed companies. Our results show that it indeed increased cash dividends and the dividend payout ratio of listed companies with statistical significance. The effects, however, are not dramatic in and of themselves. On the other hand, the effects of the shareholding ratio of major shareholders on cash dividends after the tax reform turns out to be insignificant.

From the data, we observed that cash dividends grew after the tax incentive for dividend income was introduced. However, we expect that this is most likely because of the increase in firms' net incomes that coincided with the period of time during which the law was in effect and not necessarily as a result of the tax reform. In general, if companies have conservative dividend policies and decide the cash dividends according to their target dividend payout ratio, then increases in net incomes would lead to increases in cash dividends paid out by companies. Therefore, we can anticipate that the dramatic increases in net income of companies would lead to increase in cash dividend without raising firms' dividend payout

ratio, while high-dividend companies unwittingly benefitted from the tax incentive by the tax reform in the meantime. In other words, the tax reform had only a limited effect on raising corporate dividend payout ratio, while causing significant loss to tax revenue that would normally have gone to the government. The tax benefits from the tax incentive for dividend incomes would be also concentrated in already affluent individual major shareholders and likely affect the vertical equity of the public adversely.

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