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Ask of National Pension Service for Higher Dividend and Firm Value: Evidence from Korea

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Abstract

In this chapter, we examine the effect of ask of Korea's National Pension Service for higher dividend on the firm value. There is a conflicting view on the dividend pressure of the National Pension Service. First, the dividend pressure of the National Pension Service contributes not only to reducing the agency problem, which is a disadvantage for Korean companies' ownership management, but also to reducing the Korea discount, which is a low dividend. The other hand, it is the so-called pension socialism that National Pension Service engages in the dividend policy which is the essence of corporate management with a high stake. This study is conducted on Korean listed companies from 2011 to 2016 and has constructed a test sample using propensity score matching. The results show that the dividend pressure of National Pension Service doesn't have a significant effect on the firm value. This study is expected to provide useful information for pension funds to exercise voting rights. Also, this study is expected to provide further evidence of a study that verifies the relationship between dividend and firm value by examining the effect of external pressures on dividend policy on firm value.

Keywords: National Pension Service, dividend policy, firm value, pension funds, voting rights

1. Introduction

The purpose of this study is to analyze the effect of the demand for higher dividends of Korea's National Pension Service (NPS) on firm value. The NPS is one of the top three pension funds in the world, together with Japan's public pension fund and Norwegian sovereign fund. At the same time, it is one of the fastest growing pension funds in the world. The NPS is expected to grow to \$ 1.21 trillion by 2025, from \$ 0.54 trillion in the first quarter of 2017. According to the

investment portfolio of the NPS, the portion of bonds invested in the first quarter of 2017 is 53.3% and the share of equity investments is 35.1%. Domestic equity investment accounted for 19.6% of total assets, and it reaches about 6.83% of the total amount. As of the second quarter of 2017, the NPS is the largest or the second largest shareholder of Korea's major conglomerates, including Samsung Electronics, Naver, and Hyundai Motor, and has more than 5% stake in more than 20% of the top 10 listed companies.

As the funding of the NPS grows, the returns of the pension funds become more important. This is because the yield of the national pension is linked to the welfare level of the people and the old age. As the low interest rate policy and the low growth trend have prolonged since the financial crisis, the NPS has been steadily demanding to increase the dividend to major domestic corporations in order to improve the pension management profit rate. Moreover, as the Enforcement Decree of the Capital Market Law was revised at the end of 2014 in Korea, NPS could demand dividends from invested companies even if the purpose of holding them is not management participation. This means that the government has provided legal grounds for the NPS to ask domestic companies to increase their dividends. In addition, the government has also encouraged companies to increase their dividends by introducing corporate taxation system for reserves for a limited period starting from 2014 in order to increase household incomes and stimulate investment of companies.

Although the dividend payout ratio and dividend ratio still do not reach the global level, cash dividends of Korean companies have increased sharply since 2014. The increase in dividend size is attributed to the increased demand from shareholders for dividends, including the NPS, and the government's policy to increase dividends. According to a recent survey of wealth management experts, more than half of the respondents said they should raise their dividend pressure levels above current levels. In addition, among some companies, dividends are considered to be effective in improving corporate image and investment, and companies are expected to participate in additional dividends.

In the meantime, Korean companies have been criticized by shareholders for their low-dividend payout ratio. In 2017, the global dividend yield is 2.48%, 2.46% in advanced economies, and 2.6% in emerging economies. However, in Korea, the average dividend yield of 522 companies, which made cash dividends in December 2016, is only 1.8%. According to market researcher Thomson Reuters, Korean listed companies' dividend levels in the first half of 2016 were 16th among 17 major countries. It has been pointed out that the dubious propensity of Korean companies to pay dividends in the global market hinders investment sentiment in the Korean market, resulting in "Korea discount." Under this circumstance, dividend pressure of the NPS contributes to resolving Korea discounts and realizes the high value of shareholder return through active voting rights and shareholder rights exercises.

Moreover, the top 30 of Korean companies recorded the highest surplus in 2017. In the case of firms with high free cash flow, it is known that active cash distribution is favorable for shareholders because it can suppress managerial pursuit of private interests and enhance the monitoring function of capital markets [1, 2]. In this situation, the increase of the dividend of Korean companies can contribute to reducing the agency cost and strengthening the distribution function of profit. In addition, in the prolonged low-interest-rate framework, firms'

dividend increases can transform investors who have made short-term investments into long-term investors, which can increase the investment assets of companies and create jobs through investment.

On the other hand, there are opinions that it is not appropriate for the NPS to exercise dividend pressure with the voting rights as a weapon when management risks are high due to its opaque management environment. Determination of the dividend rate is one of the core management decisions of the enterprise. If the NPS directly demands the high dividend, companies will be severely constrained by financial strategy. At present, the investment tendency of Korean companies is considerably high compared with developed countries, and facility investment has also slowed down during the financial crisis but has steadily increased since 2002. Therefore, the increase of corporate dividend by NPS can reduce the entrepreneurial motivation of companies and lead to decrease of firm value.

In addition, the industrial structure of Korea is highly composed of industries with low dividend payout such as IT, automobile, and industrial goods, while the ratio of industries with high dividend payout such as finance, utility, and consumer goods is relatively low. Since the industrial structure is very sensitive to the global economy compared to developed countries with high dividend payout ratio, simple comparison of dividend payout ratio between countries may not be appropriate. Also, if free cash flow is cash dividend payable, other companies except the top 10 Chaebol group's companies cannot afford dividends. Therefore, it is unreasonable for the pension fund to make long-term investment decisions to pursue short-term high returns by high dividends.

While the expectation and concern about the dividend pressure of the NPS coexist, we examine whether the dividend increase of Korean companies due to ask of NPS has an effect on the firm value. Specifically, firm value is measured by Tobin's Q, and the dividend pressure of the NPS is measured through the intersection of the NPS's more than 5% stake and the dividend level.

Most of the results show that NPS's dividend pressure does not have a significant effect on firm value. However, it is confirmed that there is a significant positive relation between dividend level and firm value. In other words, Korean listed companies may consider increasing dividends as one of the ways to increase corporate value. In addition, firms with large shareholdings of NPS tend to have high corporate value. This implies that the expansion of the investment of the NPS to domestic enterprises improves the corporate value and the improved corporate value results in the better performance of the NPS, the largest shareholder, that is, a virtuous cycle structure is established. On the other hand, NPS dividend pressure has a negative effect on firm value in some analyzes after controlling endogeneity and heterogeneity, however, this is not the result of consistency in all analyses, so it is appropriate to generalize it through further studies in the future.

The contribution of this study is as follows. First, I examine the relationship between corporate dividend policy and firm value. The previous study focused on verifying the relationship between firm value and dividend policy determined by the firm itself. On the other hand, this study examines the relationship between corporate value and dividend policy based on the demand of NPS rather than voluntary decisions by companies. I have noted the special

situation in Korea that pension funds can actively participate in the corporate dividend policy of their own country. The two-way causality between the dividend policy and the corporate value, which is a limitation of the existing research, is solved by the external pressure of the demand for the NPS.

Second, this study measures the main verification variables as the dividend level of a firm with a large share of the national pension. I tried to derive a more accurate empirical result by correcting the possible self-selection bias using propensity score matching (PSM). Also, I present the result of calibrating endogenous and heteroscedasticity using fixed-effect panel analysis and 2-stage least squares regression analysis (2SLS) for matched samples using PSM to mitigate self-selection bias.

Finally, the results of this study confirm that Korean companies have a positive relationship between dividend level and firm value. In addition, the fact that the NPS has a large share of corporate ownership has a positive effect on corporate value. Most of my results show that the dividend pressure of the national pension is not related to the enterprise value. However, when using 2SLS to control endogeneity, it is confirmed that the dividend pressure of the national pension has a negative effect on corporate value. The results of this study are expected to provide useful information for business executives related to corporate dividend policy or for voting right of NPS.

2. Preliminary research and hypothesis setting

2.1. The relationship between dividend and firm value

The study of the relationship between dividend and firm value has been a major research topic in finance and accounting for a long time. In this section, we introduce the major hypotheses that explain the relationship between dividend and firm value, such as free cash flow hypothesis, dividend clientele hypothesis, and dividend catering hypothesis.

First, the free cash flow hypothesis argues that dividend has the effect of decreasing free cash flow and alleviating the agency problem, thereby increasing firm value. In other words, the surplus cash flow hypothesis predicts the positive relationship between dividend and firm value. Ref. [3] shows that there is a positive relationship between dividend and firm value, and this relationship is stronger in countries where investor protection is weak. Ref. [4] finds that there is a positive relationship between dividend and firm value. They interpreted the scale of dividend as having the ability to predict future profit in the context of the signal effect hypothesis of dividend.

Second, dividend clientele hypothesis does not predict the monotonic direction of the relationship between dividend and firm value. In this hypothesis, investor groups have diverse preferences and decide dividend policy to satisfy this preference. Ref. [5] argued that investors with high marginal tax rates tended to construct portfolios based on stocks with low dividend yields. Refs. [6, 7] found that the effect of dividend size change disclosure on share price is greater for firms with higher dividend yields, suggesting the existence of a group of preferred investors.

According to the dividend catering hypothesis proposed by Ref. [8], the relationship between dividend and firm value is time varying that is not stable. Company's dividend policy depends on how the market value of a company that paid dividends is evaluated compared to a company that does not pay. They first define the dividend premium as the difference in average market value between the companies that pay dividends and those that do not, and then find that many companies pay dividends in the year with a positive dividend premium, and that many firms omit dividends in negative years. Thus, according to this hypothesis, dividend and firm value are in a time-varying relationship with positive or negative relations depending on the year.

2.2. Hypothesis setting

Ref. [9] compares the accounting characteristics of firms with large shareholdings of NPS to those that do not. Companies with a large share of the NPS are found to have higher profits and growth potentials and lower PERs than those that do not. In the case of stability, the ratio of debt to equity is reduced after the NPS has acquired a large amount of stake, suggesting that the NPS requires improvement of the financial structure of the enterprise. Companies with a large share of the NPS have lower payout ratio than those that do not, which supports the government's claim that it should strengthen the voting power of the NPS in relation to dividends.

Dividend payout ratio of corporate Korea is the lowest level in the major economies, and low payout ratio results in a "Korea discount" to undermine investor sentiment in South Korea companies in the global market. Moreover, recently, listed companies of major Chaebol groups in Korea have the highest level of reserve in history. In the case of firms with high free cash flow, it is known that active cash distribution is favorable for shareholders because it can suppress managerial pursuit of private interests and enhance the monitoring function of capital markets [1, 2]. In this context, the dividend pressure of the national pension can contribute to reducing the Korea discount, reducing the agency cost and strengthening the distribution function of profit. In addition, in the prolonged low-interest-rate framework, firms' dividends increase their investment assets by converting investors who have made short-term investments into long-term investors and the effect of job creation by expanding investment can be expected. In other words, aggressive voting rights for the expansion of the NPS can be expected to result in the elimination of the Korea discount, the reduction of agency costs, and the creation of jobs through investment expansion.

On the other hand, it is not right for the NPS to participate in the dividend policy, which is one of the key decision-makings of companies. If the NPS directly demands a high dividend, companies will be severely constrained by capital management plans. The dividend pressure of the NPS may help to improve short-term profitability, but it does not know how it will affect corporate value in the long run. Focusing on short-term profits is not consistent with NPS's intentions, namely, its responsibility to the old age and future of the people. Currently, the investment level of Korean companies is considerably higher than that of developed countries, and the proportion of consumer discretionary and industrial materials such as IT and automobiles, which have a low dividend payout ratio, is high among all industries. Therefore, an

increase in dividends due to the external pressure of NPS may reduce the investment motivation of companies, leading to a decrease in investment, which may adversely affect the firm value. While the opposite effect of NPS dividend pressure is expected, we will examine how the dividend pressure of NPS affects the firm.

3. Research design

3.1. Definition of variables

In this study, Tobin's Q is used as a measure of firm value. Tobin's Q is the market value of assets divided by the replacement cost. The higher the value, the higher the firm value because the market value of the enterprise is evaluated higher than the replacement cost in the market. The market value of assets is measured as the sum of the market value of equity and the book value of debt, and the replacement cost is calculated as the book value of the asset.

Dividend pressure of NPS is measured by the following method. First, because NPS does not directly disclose a list of low dividend companies, it uses the level of cash dividend and whether or not NPS owns more than 5% stake because it sees a baseline stake, typically 5%, that can control management and influence the company. In addition, in Korea, it is obligatory to report related contents when holding more than 5% of the shares of a listed corporation, so information on the proportion of NPS's investment can be obtained. We consider the dummy variable (NPF) which distinguishes the cases where NPS has more than 5% stake. The dividend level is measured by cash dividend to total asset ratio (DIVTA), cash dividend to net income ratio (DIVOUT), and cash dividend to paid-in capital ratio (DIVRATE). In addition, if a company with a high NPS stake increases its cash dividend level in the following period, it is highly likely that NPS has given dividend pressure to the company. Therefore, we also consider the change variable of the dividend levels (Δ DIVTA, Δ DIVOUT, Δ DIVRATE). In this chapter, we use the intersection term between the dividend level variables (DIVTA, DIVOUT, DIVRATE, Δ DIVTA, Δ DIVOUT, Δ DIVRATE, and the dummy variable (NPS)) to measure the probability of NPS dividend pressure.

3.2. Research model

In this study, the dividend pressure of NPS is measured using whether NPS invests in equity of 5% or more. Therefore, the nature of a company that NPS has invested in a large amount can affect the outcome. We use propensity score matching (PSM) to control self-selection bias. PSM has the advantage of reducing the impact of certain variables and providing more accurate statistics when analyzing groups [10]. Ref. [9] found some accounting variables that significantly differed between firms with large shareholdings in NPS and those without. These variables are profitability (ROA), debt ratio (LEV), price-earnings ratio (PER), net income growth rate (NIR), dividend payout ratio (DIVOUT), and market. Therefore, in this study, PSM is performed using these variables. The concrete model is as follows.

First logistics model for propensity score matching:

$$NPF_{i,t} = \beta_0 + \beta_1 LEV_{i,t} + \beta_2 ROA_{i,t} + \beta_3 NIR_{i,t} + \beta_4 Market_{i,t} + \beta_5 PER_{i,t} + \beta_6 DIVOUT_{i,t} + \epsilon_{i,t} \quad (1)$$

NPF is an indicator variable equal to 1 if NPS owns more than 5% of the company's stake and 0 otherwise. LEV is debt ratio and ROA is net income divided by average total assets. NIR is growth rate of net income. Market is an indicator variable equal to 1 if the company is listed on the KOSPI and 0 otherwise. PER is price-earnings ratio and DIVOUT is cash dividend divided by net income.

In order to analyze the effect of NPS's dividend pressure on firm value, we analyze the following equation, Eq. (2), using the sample matched in Eq. (1).

Second OLS regression model for main analysis:

$$Q_{i,t} = \beta_0 + \beta_1 DIV_{i,t} + \beta_2 DIV_{i,t} * NPF_{i,t-1} + \beta_3 NPF_{i,t-1} + \sum \beta_{ii} Controls_{i,t-1} \quad (2)$$

Q is Tobin's Q, which measures firm value. DIV is the dividend level of the company, measured by DIVTA, DIVOUT, DIVRATE, $\Delta DIVTA$, $\Delta DIVOUT$, and $\Delta DIVRATE$. The main interest variable of this study is the cross-section of Eq. (2), which is the variable indicating the dividend pressure of NPS. If β_2 has a statistically significant positive (+) value, then NPS's dividend pressure will increase the firm value. On the other hand, if β_2 has a statistically significant negative (−) value, the dividend pressure of NPS would decrease the firm value.

We use variables that are known to affect investment in previous studies as control variables [11, 12]. Since the firm size and profitability affect investment, SIZE, which takes natural logarithm of total assets, and ROA, which shows profitability, are used as control variables. In the case of firms with high debt ratios, investment activity decreases due to the high bankruptcy risk [13]. We use LEV, which represents the debt ratio and Z, which measures the bankruptcy risk by Altman's Z-score. We use CFO, which divides cash flow from operating activities into total assets, and TANG, which divides the tangible assets into total assets, LOSS, which means net loss. We use MB, which is the market-to-book value ratio of equity, OPCYLCE, which takes natural logarithm of operating cycle, and volatility (STD_CFO, STD_SALES) as control variables.

3.3. Sample selection

The sample in this study is all companies listed on the Korean Stock Exchange from 2011 to 2016 which meet the following criteria.

1. non-financial companies.
2. excluding companies with negative net assets.
3. companies with more than 5% shares of NPS and controlled groups matched using PSM.
4. companies that can obtain relevant financial information from data guide.

Of the original 11,350 firm-year observations from 2011 to 2016, we lose 616 for financial companies and 182 for companies with negative net assets. 1039 observations are companies that have more than 5% shares of NPS and the control group matched using PSM has 2978 observations. In order to exclude the effect of extreme values, 1% of the upper and lower values are winsorized. The final company-year observations, including all financial information required for the analysis, are identified as 2194.

4. Empirical results

4.1. Descriptive statistics and correlation analysis

Panel A of **Table 1** shows the yearly distribution and ownership percentage of companies with NPS shares of more than 5%. In 2000, NPS had more than 5% shares of only one company but it has increased gradually since then and has increased sharply since the 2008 financial crisis. In 2016, NPS owns more than 5% stake in 231 Korean companies with an average stake of 8.46%, with a maximum stake of 13.5%. Panel B provides yearly statements on NPS's objections to the shareholders' meeting at the shareholders' meeting for reasons of lower dividend. NPS's voting rights were manually extracted from the NPS fund management website since 2005. The number of cases in which NPS exercised its voting rights on the grounds of a lower dividend was only 1 or 2 before 2010 but soared to 16 in 2011, again dropping to 26 in 2014. This seems to be due to the revision of the Enforcement Decree of the Capital Markets Act at the end of 2014 and the legal basis for NPS to invest in the company.

Table 2 presents descriptive statistics for the variables used in this study. Panel A is for a test sample that matches 1:2 PSM to companies with NPS's over 5% stake (treated group) and to those whose does not (control group). We use this sample to verify the effect of NPS dividend pressure on firm value. The mean value of Q is 1.37 and the median is 1.01. The top 1% of Q is 6.57, indicating that some of the firms in the test sample have a very high Q value. Since the treated group and the control group are matched 1:2, the NPF has a value of 1 from the 75th percentile. In observations that account for about 2% of the test sample, NPS's have exercised a negative voting right at the shareholders' meeting for reasons of low dividend. Panel B provides descriptive statistics of the variables used in the logistic regression analysis for PSM. Panel A is descriptive statistics of the test sample constructed through PSM, but Panel B is for the entire sample. Korea's listed companies have an average debt ratio of 44% from 2011 to 2016, ROA of 1%, and net profit growth of negative values. The average PER is 14.8x and the average dividend payout ratio is 12.5%. **Table 3** shows the result of Pearson correlation analysis. Q has a positive correlation with NPF. The correlation between Q and the variables representing the dividend level is inconsistent. However, the correlation does not take into account other factors that affect the relationship between the two variables. It is more appropriate to draw conclusions through the regression analysis described below.

Panel A of the table is descriptive statistics of variables used in main analysis and Panel B is descriptive statistics of variables used in logistic regression analysis for PSM. Q is Tobin's

Panel A: Annual distribution of companies with NPS of more than 5% shares

Year	n	Ownership owned by NPS			
		Mean	Min	Median	Max
2000	1	6.47	6.47	6.47	6.47
2001	4	6.78	5.37	6.56	8.63
2002	4	7.01	5.37	6.89	8.89
2003	12	6.46	5.04	6.23	8.75
2004	18	7.56	5.18	6.89	12.21
2005	19	8.16	5.73	8.20	11.28
2006	29	7.53	5.02	6.35	15.67
2007	30	7.65	5.06	6.60	15.81
2008	53	7.61	5.01	6.71	15.73
2009	65	6.67	5.01	6.40	12.20
2010	97	6.65	5.00	6.30	9.66
2011	117	7.55	5.00	7.50	11.02
2012	159	7.66	5.02	7.89	11.08
2013	195	8.01	5.03	7.71	13.41
2014	210	8.35	5.00	8.10	14.82
2015	225	8.65	5.00	8.06	14.20
2016	231	8.46	5.00	8.04	13.50

Panel B: Number of companies for which NPS exercised a negative voting right at the shareholders' meeting due to a lower dividend

Year	2006	2008	2010	2011	2012	2013	2014	2015	2016	2017
Obs	2	1	1	18	1	7	26	16	21	18

Table 1. Distribution of NPS shares (5% or more) and voting exercise (reason for less dividend).

which means firm, and NPF is a dummy variable indicating whether the NPS owns more than 5% stake. DIVOUT is the cash dividend rate relative to the net income, DIVTA is the cash dividend rate relative to total assets, and DIVRATE is the cash dividend rate relative to the paid-in capital. SIZE is the natural log of total assets, LEV is the debt ratio, ROA is the returns on assets, CFO is the ratio of operating cash flow to total assets, and σ (CF) and σ (SALES) is volatility. Z is the risk of bankruptcy of Altman's Z-score, OPCYCLE is the natural log of the operating cycle, MB is the market-to-the-book value ratio of equity, TANG is the ratio of tangible assets to total assets, and LOSS is 1 if the company has net loss otherwise 0. In Panel B, NIR is the growth rate of net income, PER is the ratio of stock price to EPS, and the rest is the same as Panel A definition.

The definitions of the variables are the same as those in **Table 2**.

Type	n	mean	std	a1	a25	a50	a75	a99
Panel A: descriptive statistics for main analysis								
Q	3105	1.37	1.37	0.39	0.81	1.03	1.44	6.57
NPF	3117	0.33	0.47	0.00	0.00	0.00	1.00	1.00
Divout	3117	20.52	26.64	−29.98	2.82	14.19	27.59	125.05
Δ Divout	3117	3.37	34.41	−143.57	−2.36	0.00	6.06	134.10
Divta	3117	0.92	1.15	0.00	0.17	0.58	1.22	6.91
Δ Divta	3090	0.01	0.64	−2.15	−0.10	0.00	0.09	2.69
Divrate	3117	0.26	0.34	0.00	0.04	0.15	0.32	1.50
Δ Divrate	3117	0.02	0.12	−0.40	0.00	0.00	0.04	0.50
D_LOW	3117	0.01	0.11	0.00	0.00	0.00	0.00	1.00
SIZE	3117	26.94	1.63	23.91	25.78	26.72	27.82	31.34
LEV	3117	0.44	0.19	0.07	0.28	0.44	0.59	0.88
ROA	3117	0.05	0.06	−0.11	0.02	0.04	0.07	0.30
CFO	3117	0.07	0.09	−0.15	0.03	0.06	0.11	0.37
σ(CFO)	2947	0.06	0.06	0.01	0.03	0.05	0.08	0.30
σ(SALES)	2947	0.22	0.26	0.01	0.08	0.14	0.26	1.50
Z	3021	3.53	2.98	0.27	1.89	2.75	4.17	17.53
OPCYCLE	2681	4.56	0.60	2.58	4.24	4.63	4.93	5.83
MB	3022	1.44	3.14	0.06	0.57	0.92	1.51	9.07
TANG	3026	0.33	0.18	0.01	0.20	0.33	0.45	0.80
LOSS	3026	0.08	0.28	0.00	0.00	0.00	0.00	1.00
Panel B: descriptive statistics of logistic model for PSM								
LEV	10,552	0.44	0.21	0.05	0.27	0.44	0.60	0.92
ROA	10,482	0.01	0.12	−0.48	−0.01	0.03	0.06	0.26
NIR	10,480	−0.39	4.67	−26.93	−0.84	−0.17	0.38	16.78
PER	10,223	14.80	106.96	−240.76	−2.79	8.42	19.17	442.48
DIVOUT	10,550	12.50	23.63	−31.82	0.00	0.00	18.46	125.05

Table 2. Descriptive statistics.

4.2. Results of PSM and OLS regression

Table 4 shows the results of Eq. (1), a logistic regression for PSM. The dependent variable of the logistic regression model is whether NPS owns more than 5% stake. We used LEV (debt ratio), ROA (return on assets), NIR (growth rate of net income), market (KOSPI or KOSDAQ), PER, and DIVOUT (dividend payout) and yearly dummy as independent variables. The results show that debt ratio, ROA, market, and dividend payout are related to whether NPS owns a large amount of stakes. However, net income growth and PER are not related to NPS

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Q	1.00									
(2) NPF	0.06	1.00								
(3) DIVOUT	−0.06	−0.01	1.00							
(4) ΔDIVOUT	−0.02	−0.03	0.59	1.00						
(5) DIVTA	0.29	0.05	0.39	0.07	1.00					
(6) ΔDIVTA	0.13	−0.02	0.06	0.12	0.27	1.00				
(7) DIVRATE	0.21	0.24	0.22	0.03	0.61	0.13	1.00			
(8) ΔDIVRATE	0.22	0.08	0.07	0.09	0.34	0.67	0.44	1.00		
(9) SIZE	−0.10	0.46	−0.01	0.00	−0.11	−0.04	0.24	0.06	1.00	
(10) LEV	−0.04	0.01	−0.15	0.01	−0.37	0.02	−0.25	−0.03	0.33	1.00
	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(11) Q	1.00									
(12) ROA	0.15	1.00								
(13) CFO	0.15	0.47	1.00							
(14) $\sigma(\text{CFO})$	0.24	0.08	0.02	1.00						
(15) $\sigma(\text{SALES})$	0.11	0.02	−0.02	0.48	1.00					
(16) Z	0.43	0.42	0.29	0.15	0.02	1.00				
(17) OPCYCLE	−0.11	−0.14	−0.22	−0.05	−0.13	−0.11	1.00			
(18) MB	0.24	−0.14	−0.01	0.05	0.01	0.05	−0.02	1.00		
(19) TANG	−0.12	−0.10	0.07	−0.18	−0.16	−0.25	0.01	−0.02	1.00	
(20) LOSS	−0.02	−0.59	−0.26	0.02	0.03	−0.21	0.07	0.10	0.04	1.00

Table 3. Pearson correlation.

holdings more than 5% stake. Panel B shows the results of the PSM, with 1039 observations of firm-year observations that have more than 5% stake in NPS, with 1:2 matching and 2078 controls.

Table 5 shows the results of OLS regression analysis of Eq. (2) that analyzed the effect of NPS's dividend pressure on firm value. The dividend pressure of NPS is measured by the intersection term ($DIV_{i,t} * NPF_{i,t-1}$) between the level of cash dividend and whether the NPS invested more than 5%. Columns (1)–(6) show different definitions of cash dividend level, respectively. First, the relationship between cash dividend level (DIV) and firm value has a statistically significant positive value in columns (3), (4), (5), and (6). This suggests that Korean firms tend to have higher firm value as cash dividends are paid more. In addition, in the columns (1), (2), (3), (4), and (5), it is confirmed that the NPF has a statistically significant positive value with the enterprise value. This indicates that a firm with more than 5% stake in NPS has a higher enterprise value. However, the $DIV_{i,t} * NPF_{i,t-1}$ variable, which indicates the dividend pressure of the NPS, is not significantly related to firm value. To summarize, the dividend pressure of the NPS does not directly affect firm value. However, it has been shown that the holding of

Panel A: The results of logistic regression for PSM:			
$NPF_{i,t} = \beta_0 + \beta_1 LEV_{i,t} + \beta_2 ROA_{i,t} + \beta_3 NIR_{i,t} + \beta_4 Market_{i,t} + \beta_5 PER_{i,t} + \beta_6 DIVOUT_{i,t}$			
Parameter	Estimate	Wald Chi ²	P-value
Intercept	−0.30	2.45	0. 12
LEV	0.53***	7.44	0.01
ROA	7.31***	185.81	<.0001
NIR	0.01	0.50	0.48
Market	−2.22***	626.78	<.0001
PER	−0.00	1.54	0.21
DIVOUT	0.01***	17.08	<.0001
Year dummy	Included		
Panel B: The result of PSM			
Difference statistic	Propensity Score		
Method	Optimal Variable Ratio Matching		
Min Control/Treated Ratio	1		
Max Control/Treated Ratio	3		
Matched Sets	1039		
Matched Obs. (Treated)	1039		
Matched Obs. (Control)	2078		
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The definitions of the variables are the same as those in Table 2.			

Table 4. Results for logistic regression for PSM.

large stakes by the NPS positively affects corporate value. There is also a significant relation between dividend levels and firm value. This suggests that if listed companies in Korea are able to pay dividends, raising dividend levels can be a way to increase corporate value.

In robustness analysis, 2SLS and fixed-effect panel analysis are applied to control endogeneity and heterogeneity problems. Tables 6 and 7 are estimated by fixed-effect panel analysis on unbalanced panel data and control industrial effects. In order to control endogeneity, 2SLS estimates the endogenous variables using the instrument variables in the first step. The main test variable of this study is $DIV_{i,t} * NPF_{i,t-1}$ which is composed of the intersection of two variables, and the endogenous variable is $DIV_{i,t}$. According to the previous study [14], the endogeneity of the cross term ($DIV_{i,t} * NPF_{i,t-1}$) is not simply corrected by the intersection term of $DIV_{i,t}$ estimated in the first step and $NPF_{i,t-1}$. In the first step, not only $DIV_{i,t}$ but also $DIV_{i,t} * NPF_{i,t-1}$ are estimated together and the estimated variables of the two variables ($DIV_{i,t}$, $DIV_{i,t} * NPF_{i,t-1}$) are input in the second step. In this study, I use the dividend level of previous year ($DIV_{i,t-1}$) as an appropriate instrument variable for the current dividend level ($DIV_{i,t}$). This is because the dividend level of the previous year is not a direct causal

Var.	(1) DIVOUT	(2) ΔDIVOUT	(3) DIVTA	(4) ΔDIVTA	(5) DIVRATE	(6) ΔDIVRATE
Intercept	1.66*** (2.43)	1.65*** 2.41	1.12*** 1.80	1.57*** 2.33	2.66*** 3.87	1.96*** 2.92
$DIV_{i,t}$	0.00 (-1.74)	0.00 -0.41	0.26*** 9.72	0.27*** 7.00	0.71*** 7.08	1.99*** 8.77
$DIV_{i,t} * NPF_{i,t-1}$	0.00 (-0.04)	0.00 -0.25	-0.06 -1.42	0.14 1.63	-0.16 -1.24	-0.39 -1.09
$NPF_{i,t-1}$	0.14** (2.06)	0.14*** 2.53	0.19*** 2.66	0.15*** 2.61	0.18*** 2.47	0.14 2.41
$SIZE_{i,t-1}$	-0.08*** (-4.76)	-0.09*** 13.90	-0.08*** -4.55	-0.08*** -4.72	-0.13*** -7.19	-0.10*** -5.46
$LEV_{i,t-1}$	2.16*** (13.62)	2.19*** 13.90	2.38*** 15.28	2.23*** 14.37	2.40*** 15.26	2.20*** 14.25
$ROA_{i,t-1}$	1.13*** (2.42)	1.27*** 2.67	0.48 1.03	1.47*** 3.16	0.78 1.67	1.22*** 2.66
$CFO_{i,t-1}$	0.18*** (2.63)	0.82*** 2.66	0.06** 1.97	0.79*** 2.62	0.62** 2.05	0.62** 2.04
$\sigma(CF)_{i,t-1}$	3.35*** (7.60)	3.37*** 7.65	3.45*** 7.99	3.31*** 7.61	3.25*** 7.47	3.21*** 7.42
$\sigma(SALES)_{i,t-1}$	-0.04 (-1.25)	-0.04 -0.37	-0.02 -0.17	-0.06 -0.57	0.01 0.14	-0.03 -0.35
$Z_{i,t-1}$	0.21*** (20.91)	0.21*** 20.91	0.19*** 18.72	0.22*** 21.61	0.20*** 19.56	0.21*** 20.98
$OPCYCLE_{i,t-1}$	-0.09* (-1.81)	-0.09* -1.84	-0.06 -1.17	-0.08 -1.58	-0.07 -1.40	-0.07 -1.52
$MB_{i,t-1}$	0.01*** (4.24)	0.01*** 4.25	0.01*** 4.18	0.01*** 4.41	0.01*** 4.15	0.01*** 4.24
$TANG_{i,t-1}$	0.06 (0.42)	0.06 0.37	0.06 0.41	0.07 0.48	0.06 0.36	0.08 0.53
$LOSS_{i,t-1}$	0.13 (1.62)	0.18** 2.13	0.15** 1.97	0.14 1.81	0.15 1.92	0.12 1.58
Adj.R ²	0.32	0.32	0.35	0.34	0.34	0.35
Year/industry dummy	Included	Included	Included	Included	Included	Included
Obs.	2615	2615	2615	2615	2615	2615

The upper part of each cell represents the estimation coefficient and the lower part represents the t value. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The definitions of the variables are the same as those in Table 2.

Table 5. The effect of dividend pressure of NPS on firm value: main analysis.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	1st step		2nd step	1st step		2nd step
	$DIVTA_{i,t}$	$DIVTA_{i,t} * NPF_{i,t-1}$	$Q_{i,t}$	$\Delta DIVTA_{i,t}$	$\Delta DIVTA_{i,t} * NPF_{i,t-1}$	$Q_{i,t}$
$\widehat{DIV}_{i,t}$			-0.08			0.05
			(-1.03)			(1.58)
$DIV_{i,t} * \widehat{NPF}_{i,t-1}$			-0.06**			0.06
			(-2.55)			(0.83)
$NPF_{i,t-1}$	0.07	0.23***	0.07**	0.08	0.03	0.01
	(1.41)	(7.74)	(2.54)	(1.48)	(1.25)	(0.34)
$SIZE_{i,t-1}$	-0.21***	-0.20***	-0.13***	-0.44***	-0.17***	-0.07*
	(-2.85)	(-4.48)	(-3.75)	(-4.65)	(-3.70)	(-1.86)
$LEV_{i,t-1}$	-0.91***	-0.30**	-0.44***	-1.12***	-0.40***	-0.29***
	(-3.56)	(-2.00)	(-3.52)	(-3.49)	(-2.60)	(-2.69)
$ROA_{i,t-1}$	0.24	-0.01	0.13	-1.24***	-0.37*	0.17
	(0.73)	(-0.03)	(0.87)	(-2.99)	(-1.85)	(1.12)
$CFO_{i,t-1}$	-0.20	-0.15	0.04	-0.96***	-0.24*	0.14
	(-1.00)	(-1.27)	(0.48)	(-3.80)	(-1.94)	(1.51)
$\sigma(CF)_{i,t-1}$	-0.56	-0.41*	0.01	-0.65	-0.43*	0.12
	(-1.36)	(-1.66)	(0.06)	(-1.25)	(-1.70)	(0.70)
$\sigma(SALES)_{i,t-1}$	-0.07	0.02	-0.06	0.02	0.04	-0.06
	(-0.73)	(0.31)	(-1.56)	(0.21)	(0.78)	(-1.48)
$Z_{i,t-1}$	0.01	-0.01	-0.01	-0.01	-0.01	-0.01*
	(0.62)	(-0.87)	(-1.58)	(-0.70)	(-1.26)	(-1.68)
$OPCYCLE_{i,t-1}$	-0.17***	-0.10**	-0.04	0.07	-0.09**	-0.02
	(-2.60)	(-2.44)	(-1.04)	(0.89)	(-2.31)	(-0.59)
$MB_{i,t-1}$	0.00	0.00	0.00	0.00	0.00	0.00
	(1.39)	(0.91)	(0.58)	(1.20)	(1.04)	(0.18)
$TANG_{i,t-1}$	-0.90***	-0.19	-1.09***	-0.54	-0.12	-0.97***
	(-3.30)	(-1.17)	(-7.95)	(-1.56)	(-0.73)	(-8.59)
$LOSS_{i,t-1}$	-0.03	0.02	0.04	-0.02	-0.00	0.04
	(-0.47)	(0.71)	(1.64)	(-0.30)	(-0.03)	(1.60)
$DIV_{i,t-1}$	0.16***	-0.08***		-0.27***	0.01	
	(6.11)	(-5.56)		(-11.06)	(0.56)	
$DIV_{i,t-1} * NPF_{i,t-1}$	-0.05	0.83		-0.10*	-0.33***	
	(-1.64)	(47.37)		(-1.72)	(-12.35)	
Adj.R)	0.09	0.76	0.10	0.18	0.15	0.1

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	1st step		2nd step	1st step		2nd step
	$DIVTA_{i,t}$	$DIVTA_{i,t} * NPF_{i,t-1}$	$Q_{i,t}$	$\Delta DIVTA_{i,t}$	$\Delta DIVTA_{i,t} * NPF_{i,t-1}$	$Q_{i,t}$
# of obs	2631	2631	2194	2631	2631	2194
# of groups	1215	1215	1027	1215	1215	1027
F-statistics	9.36***	313.46***	9.28***	22.67***	18.21***	9.22***

The upper part of each cell represents the estimation coefficient and the lower part represents the t value. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The definitions of the variables are the same as those in Table 2.

Table 6. Robustness test using 2SLS and panel analysis (1).

Variable	(1) DIVOUT	(2) Δ DIVOUT	(3) DIVRATE	(4) Δ DIVRATE
$\widehat{DIV}_{i,t}$	-0.00 (-1.20)	-0.00 (-0.69)	-0.23 (-1.11)	0.19 (0.84)
$\widehat{DIV}_{i,t} * \widehat{NPF}_{i,t-1}$	-0.02* (-1.79)	0.00 (0.35)	0.00 (0.04)	-0.06 (-0.08)
$NPF_{i,t-1}$	0.36* (1.86)	0.01 (0.70)	0.02 (0.75)	0.01 (0.32)
$SIZE_{i,t-1}$	0.03 (0.37)	-0.10*** (-3.11)	-0.08* (-1.86)	-0.11*** (-2.81)
$LEV_{i,t-1}$	-0.69*** (-3.05)	-0.37*** (-3.54)	-0.40*** (-3.68)	-0.36*** (-3.32)
$ROA_{i,t-1}$	0.24 (1.37)	0.12 (0.75)	0.08 (0.55)	0.11 (0.76)
$CFO_{i,t-1}$	-0.06 (-0.49)	0.06 (0.63)	0.08 (0.88)	0.07 (0.80)
$\sigma(CF)_{i,t-1}$	-0.10 (-0.50)	0.06 (0.35)	0.04 (0.20)	0.08 (0.49)
$\sigma(SALES)_{i,t-1}$	-0.02 (-0.51)	-0.05 (-1.23)	-0.05 (-1.38)	-0.05 (-1.30)
$Z_{i,t-1}$	-0.01** (-2.39)	-0.01* (-1.77)	-0.01* (-1.67)	-0.01 (-1.51)
$OPCYCLE_{i,t-1}$	-0.07 (-1.56)	-0.01 (-0.34)	-0.02 (-0.76)	-0.01 (-0.31)
$MB_{i,t-1}$	0.00 (0.30)	0.00 (0.25)	0.00 (0.35)	0.00 (0.26)

Variable	(1) DIVOUT	(2) ΔDIVOUT	(3) DIVRATE	(4) ΔDIVRATE
$TANG_{i,t-1}$	−1.06*** (−8.75)	−0.99*** (−8.76)	−1.03*** (−8.64)	−0.97*** (−7.36)
$LOSS_{i,t-1}$	0.12** (2.18)	0.05* (1.68)	0.04 (1.58)	0.03 (1.41)
Adj.R ²	0.10	0.10	0.10	0.10
# of obs	2194	2194	2194	2194
# of groups	1027	1027	1027	1027
F-statistics	8.98***	8.76***	8.83***	8.81***

The upper part of each cell represents the estimation coefficient and the lower part represents the t value. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The definitions of the variables are the same as those in **Table 2**.

Table 7. Robustness test using 2SLS and panel analysis (2).

relationship with the current corporate value but is a variable that determines the present dividend level [15, 16].

First, columns (1)–(3) and columns (4)–(6) in **Table 6** are the result of using DIVTA and nDIVTA as DIV variables, respectively. Column (1) and (2) are to estimate DIVTA and DIVTA * NPF as the first steps for 2SLS, and (3) columns show the main analysis results using the variables estimated in columns (1) and (2). Similarly, columns (4) and (5) are to estimate mns (analysis results using the variables estimated in columns (6) is about main analysis. The results of the first stage, column (1) and (2), show that the dividend level of the previous period has a significant positive relationship with the dividend level of the current period at 1% level. In the second step, in contrast to the results in **Table 5**, the level of dividends does not affect the firm value. On the other hand, the dividend pressure of NPS has a negative effect on the corporate value. The results of column (6) using the variables of dividends does not affect the firm value. On the other hand, the dividend pressure of NPS has a negative effect on the corporate

Table 7 shows the results of the same analysis as **Table 6** using the remaining DIV variables. Columns (1)–(4) are the second stages of 2SLS, and definition of DIV variable is different. Only in column (1), where dividend levels are measured by DIVOUT, the dividend pressure of the NPS has been found to have a negative impact on corporate value at the 10% level. However, in the case of the remaining variables, NPS's dividend pressure and corporate value are not related. Dividend level of the current period can be determined endogenously, but it is difficult to find a precedent study that mentions the problem of endogeneity on the change of the dividend level. In the case of changes in the level of dividends, I do not use 2SLS and applied only fixed-effect panel analysis. Although it is not shown in the table, the dividend pressure of the NPS is not related to firm value. In conclusion, in a few analyses, the dividend pressure of the NPS is found to be negative for firm value. However, in order to generalize this, the evidence of empirical analysis is lacking. In this study, I conclude that the dividend pressure of the NPS is irrelevant to firm value.

5. Conclusion

This study investigated the effect of NPS dividend pressure on firm value. For the purpose of this study, we analyzed the Korean listed companies from 2011 to 2016. The dividend pressure of NPS was measured by using the intersection of the cash dividend level and whether or not NPS had a large amount of share. The level of cash dividend was measured by cash dividend rate relative to total assets, net income, and capital. The change variables of these variables were also considered. We constructed the test sample using PSM to reduce the self-selection bias.

The results show that the dividend pressure of NPS had no significant effect on firm value. However, there was a significant relation between dividend level and firm value. In addition, firms with large shareholdings of the NPS tended to have high corporate value. As a result, listed companies in Korea could consider increasing dividends as one of the ways to increase corporate value. This study is expected to provide useful information for future decision-making regarding voting rights related to dividends. It will also help guide the dividend policy of companies that are receiving investment from NPS. In recent years, as Korean corporations have increased their reserves, this research is expected to provide useful information to investors and managers who are interested in possible agency problems. This chapter analyzes the impact of cash dividend on corporate value using the external shock of NPS's dividend expansion pressure. Most of the previous studies have analyzed dividend and investment on the same line and analyzed the effect of these factors on firm value. This study solves the problem of bidirectional causality between dividend and firm value by using exogenous factors such as NPS's dividend pressure.

As a result, the dividend pressure of the NPS does not have a significant effect on firm value. On the other hand, there is a significant positive relation between dividend level and firm value and whether mass ownership of NPS has a significant positive effect on firm value. This study is meaningful to verify the direct effect of pension funds on behaviorism. In addition, this study has contributed to verifying the direct effect of corporate dividend increase on firm value using the external shock of NPS's dividend pressure.

This study has the following limitations. First, the proxy of the NPSON firm value. This study is meaningful to verify the direct effect of pension funds on behavior holdings of NPS and the cash dividend level. If a company with a large amount of the NPS pays a large dividend, it is difficult to distinguish whether the corporation voluntarily increases the dividend or increases the dividend by the pressure of the national pension. The solution to these limitations is to be handled in future research.

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Conflict of interest

The author declares no conflict of interest.

Notes/Thanks/Other declarations

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