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Is Earnings Management in the South Korean Defense Industry Sustainable?

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Abstract: Recently, the defense industry in South Korea has been regarded with strong suspicion since a company responsible for producing parts for the aviation sector is being investigated for cost irregularities. Many people are concerned about these issues and the government is distrustful of defense industries. If the current situation continues, the defense industry market in South Korea (henceforth “South Korea”) will be hard to maintain. The South Korean government will have to rely on importing from abroad instead of buying products in the local market. This study looked at the sustainability of earnings management adopted in the defense industry of South Korea, exploring options for the government to maintain the scheme’s soundness. In particular, we used Kothari’s discretionary accrual as a proxy of earnings management and OLS method to analyze the relationship between them. The results are as follows. Firstly the firms with a high percentage of defense sales showed significant discretionary accruals; the higher the profit, the more likely it was that earnings adjustments were made; secondly, firms that had been certified by the government for defense cost-management were proven to be effective, because the earnings management activities were low compared to those of firms that did not have the defense cost-management certification; lastly, based on the accounting rules for the cost of defense products, it was found that significant results confirming defense firms were exercising their influence, through earnings management, on the improvement of the government system.

Keywords: information asymmetry; defense industry; defense cost; defense cost-management system certification

1. Introduction

In South Korea, defense scandals have recently become problematic [1]. The company that produces parts for the aviation sector is being investigated for cost irregularities. There is mounting suspicion that illegal costs in the defense industry are rising. Many people are concerned about these issues and the government is distrustful of defense industries. If the situation continues, the defense industry market in South Korea will be hard to sustain. Preventing earnings management in the defense industry is thought to be the first step to achieving transparency to help strengthen South Korean military power. The South Korean government will need to rely on importing instead of buying products in the local market. In this study, the relationship between the characteristics of domestic defense firms and earnings management in South Korea were examined.

We studied the unique cost structure of the defense industry, which compensates for profits based on the costs incurred, and examined the cost-management certification system in terms of the share of defense sales, the political cost hypothesis, and the characteristics of defense firms arising from the asymmetry of cost information between the government, which is the consumer, and the defense industry, which is the supplier.

Specifically, the following three items will be examined. First, since the defense industry produces components and products that are not available in the general market, there is information asymmetry between defense firm and the government. In particular, the cost structure of the defense industry involves a cost-compensating feature that reimburses the company for costs corresponding to the expenses incurred. Therefore, for firms that operate in both the defense and general divisions, the costs incurred in the general division are transferred to the defense division [2,3] to maximize reimbursement. Most of the firms classified as being in the defense industry engage in defense and general production at the same time, and the asymmetry of information for each company will be proportional to the ratio of defense sales to total sales. Firms with a larger portion of sales in the defense division are more motivated to make more profit adjustments because of their higher information asymmetry [4,5].

Secondly, the government is implementing the “Defense Cost-Management Certification System” in order to address the problem of cost overruns and cost transfer in the cost-compensation structure in the defense industry market. The “Defense System Cost-Management System Certification Schemes” links cost information, managed by an enterprise resource planning (ERP) system of a defense company, directly to a defense integrated cost system, and automatically submits cost information without manual work. If a defense company receives a cost-management system certification, it will receive an additional profit equal to 1% of the total cost (1.5% for small and medium enterprises) for defense materials.

In this way, firms that have been certified by the defense cost-management system, through cost information sharing with the government, will transparently manage cost information, because the information asymmetry is lower than those firms that have not been certified.

Lastly, firms that have monopolies and are regulated by the government have incentives to adjust their profits to improve their negotiating power with the government (Watts and Zimmerman, 1986). South Korean defense firms are subject to the “Regulations on Cost Accounting for Materials Costs for Defense” (Ministry of National Defense Ordinance No. 805). The 2013 revision reflects the fact that for firms that have grown from small-sized firms to medium-sized firms, provisions were included that guarantee the management conditions of the defense industry. These provisions include ensuring that the same general management rate ceiling as that of existing SMEs is applied for five years after the conversion in order to alleviate the management burden. Therefore, the prediction is that defense firms will try to improve their negotiating power with the government.

This study attempts to analyze the sustainability of earnings management methods adopted in the defense industry of South Korea, with a view to propose ways for the government’s control. We applied the Kothari’s model to get discretionary accruals as a proxy of earnings management, thereby analyzing the relationship between them with the OLS method.

The structure of this paper is as follows: Section 2 describes previous research and hypotheses based on it. Section 3 discusses the research model to verify the hypotheses and the selection of sample firms to be used in the analysis. Section 4 presents the empirical analysis results, and Section 5 summarizes the results of this study and presents limitations.

2. Preliminary Research and Hypothesis

2.1. Earnings Management Based on Portion of Defense

In firms producing defense materials, it is common to produce not only defense materials but also general materials. If a defense company manufactures defense and general materials at the same time, there is incentive to transfer the costs incurred in the production of general goods to the costs incurred in the production of defense materials.

First, Thomas and Tung [2] argued that the pension provision for employees who produce general goods is being turned into a pension provision for employees who produce defense materials. Specifically, by classifying employees in general production as employees in defense materials production, or by setting up pension provisions by expensing the general portion of pension liabilities

in the defense portion, the cost of the general portion is reduced and the cost of the defense portion is increased. They used standardized funding level (SFL) as a proxy for earnings management, which is a ratio of pension assets to accumulated pension obligations.

In particular, the level of earnings management, caused by the transfer of pension provisions to employees who produce defense materials, increases in proportion to sales of defense materials among all materials produced. This increase was found to become larger until the share of sales of defense materials and the sales portion of general goods became equal, and afterward, the sales increase of defense products decreased the level of pension provision.

On the other hand, the defense industry may transfer the costs from non-defense sectors to obtain the government's cost based compensations as evidenced by Pownall [3] who revealed the profits of government-oriented group to be almost three times as profitable as non-contractors.

Ahn and Heo [4] also suggested that cost-based profit compensation may be the incentive for transferring labor costs from general production to defense production, and that the degree of allocation depends on the relative difference between the sales of defense materials and the sales of general goods.

Yong [6] demonstrated that cost-centered profit compensation will serve as an incentive for earnings management, and that the larger the proportion of defense sales to total sales, the greater the transfer of costs. He estimated the normal cost of the defense and general divisions, and calculated the cost as the difference from the actual cost. He argued that an inverted U curve relationship exists between the proportion of defense sales and the transferred costs, and as the portion of defense sales increases, the transferred cost increases and then decreases at a certain level.

Yoon et al. [7] also found that discretionary accruals increased as the portion of sales of defense materials covered by cost-compensating contracts increased. However, unlike previous studies, Yoon used discretionary accruals as a measure of earnings management. As a result, the previous studies mainly used the cost-based profit compensation and information asymmetry of the defense industry as an earnings management measure, based on the cost transferred to the general section. As the proportion of defense sales increased, the total cost increased.

In this study, discretionary accruals were used as a measure of earnings management as in the study by Yoon et al. [7], unlike the preceding studies. However, unlike Yoon et al. [7], the relationship between discretionary accruals and the cost-compensated contract sales was defined using dummy variables as explanatory variables. This study analyzed the relationship between the size of discretionary accruals that do not take directionality and the ratio of defense sales to total sales.

This analysis focused on the relationship between the amount of earnings management and the ratio of defense sales to total sales, and not the direction of earnings management, for the following reasons. Since the profit structure of defense sales is cost-compensated, there is an incentive to reduce reported profits in order to mask defense firms' increasing profits caused by the transfer of costs from the general division to the defense division. On the other hand, an incentive exists to raise profits when the management performance of the entire company, including the defense division, is low from the management's point of view. With this in mind, we assumed that the increase in defense sales will affect the magnitude of earnings management, rather than the direction of earnings management, and the following hypothesis has been set.

Hypothesis 1 (H1). *The proportion of sales of defense products positively affects the absolute value of discretionary accruals.*

2.2. Information Symmetry and Earnings Management

Jang [8] argued that the larger the information asymmetry between managers and stakeholders, the greater the magnitude of earnings management. To investigate, he studied the relationship between discretionary accruals and the buy-sell quotation spread as a proxy for information asymmetry among 396 firms that were not involved in the financial industry from 1999 to 2005. The results of the study proved that a positive relationship exists between the two.

Kim and Kang [5] selected corporate governance as a proxy variable for information asymmetry and analyzed its relationship with earnings management. They argued that the degree of actual earnings management would decrease if corporate governance is healthy. To support this, manufacturing companies listed on the South Korea Stock Exchange from 2005 to 2012 were analyzed, and the results were significant. As a measure of overall corporate governance, they demonstrated a negative relationship between corporate governance and earnings management by using the governance structure recommended by the South Korea Corporate Governance Service.

On the other hand, studies have also investigated the effect of earnings management on information asymmetry. Bae et al. [9] argued that a difference in the degree of asymmetry of information exists according to earnings management behavior, by separating the latter into deficit avoidance and big bath. He defined firms with different reporting and nondiscretionary profit between 2005 and 2010 as earnings management firms.

The degree of information asymmetry is based on the standard deviation of daily returns. Based on the difference between reported and nondiscretionary earnings, firms that avoided loss and big-bath firms were selected. The results showed that both types of earnings management firms had more information asymmetry than other firm types.

The purpose of this study was to investigate whether any difference exists in the earnings management among firms that received the Defense Cost-Management System Certification, conducted by the Defense Acquisition Program Administration in 2012, and those who did not. In order to receive the certification, the cost information managed by the ERP system should be directly linked to the Defense Acquisition Program Administration system, and the data should be automatically shared without manual operation. So, we predicted that the firms that received the certification would have less asymmetry in cost-related information than those that did not. Therefore, the following hypotheses are set.

Hypothesis 2a (H2a). *The Defense Cost-Management System Certification will have a negative (–) impact on the absolute value of discretionary accruals.*

Hypothesis 2b (H2b). *For a company certified by the Defense Cost-Management System, discretionary accruals increase, caused by an increase in defense sales, will be less than for those that are not.*

2.3. Earnings Management Based on Political Cost Hypothesis

As an international study, Gill-de-Abornoz [10] first studied the effect of price regulation on the accounting policies of Spanish electric firms from 1991 to 2001. He argued that when the government tried to raise electricity rates, the electric firms adjusted their earnings to report less profit. Specifically, when the government raised electricity rates, electric firms used conservative accounting policies to prevent social antipathy for electricity rate hikes and reduce demand for electricity. Hence, discretionary accruals and changes in electricity rates were inversely related.

Navissi [11] studied the earnings management of New Zealand manufacturing firms during those firms' request for price increases given the government's price-freeze regulations between 1971 and 1972. He argued that manufacturing firms lowered profits to justify the price increases. For this purpose, the discretionary accruals in 1971 and 1972 by the nonmanufacturing group were compared, and the results showed that more discretionary accruals were generated in manufacturing firms than in nonmanufacturing firms, which were the control group.

Cahan [12] studied the earnings management of monopoly corporations in the USA. He argued that corporate executives, who could be investigated for monopoly violations, would intentionally lower profits by means of unusual accruals, since the government perceives the monopoly of a corporation by abnormal profit margins in accounting. He argued that there would be a difference between accruals before and after the investigation, especially for firms surveyed for monopoly violations. For this purpose, he analyzed the discretionary accruals for the year, and periods other

than that of the investigation period, over 15 years for 48 firms surveyed for monopoly violations, and found that the discretionary accruals were lower than in the other period.

Among domestic research, Yoon [7] argued that defense firms would require earnings management that intentionally reduces profit in order to revise the system in their favor before changing major accounting-related systems. For this, the discretionary accruals, at the revision of the cost system, had a great effect on the costing in 1982, 1997, and 2003. The subsequent discretionary accruals were compared and the results showed that defense firms used earnings management to intentionally reduce profits before the amendment.

Kim et al. [13] studied the earnings management of defense firms before the system change. He separated the earnings management actions to reduce the reporting profit from the actions taken to reduce earnings management, and all results were significant. According to his research results, when the system is changed, the defense firms reduce their profits by using earnings management; however, less earnings management activities occurred than in the period when the system was unchanged.

By extending the research of Kim et al. [13], this study investigated whether a change in both the amount and the direction of earnings management occurred before the institution change. When choosing a period to investigate the downward adjustment in earnings in order to influence the revision of the system, most of the studies were conducted with the year of revision as the target period. However, in this study, we chose the year before the system revision as the period that affects the revision of the system by the downward adjustment of earnings, because the government should use the published financial statements as a reference of the performance of the company when the government improves the system. Since the defense firms' accounts are due in December, the government will refer to the business performance of the previous year's earnings management, and the company will report less profit in the previous year. Therefore, we set the study period as the period to reduce profits in the previous year. For the current year, the earnings management actions would be reduced, since that is when the investigation activities, such as local inspection by the government, are carried out. For these reasons, the following hypotheses are set.

Hypothesis 3a (H3a). *The discretionary accruals (DA_{it-1}), for the year prior to the revision of the defense cost system, are negative (-).*

Hypothesis 3b (H3b). *The absolute value ($|DA_{it}|$) of the discretionary accruals for the revised year of the defense cost system is negative (-).*

3. Research Design and Sample Selection

3.1. Estimation of Discretionary Accruals

This study employs Kothari's performance-based model to estimate the discretionary accruals as a substitute for earnings management as shown in Equation (1) below: The model includes the total asset as a deflator, controlling heteroscedasticity.

$$\frac{TA_{it}}{Asset_{it-1}} = \alpha_0 \left(\frac{1}{Asset_{it-1}} \right) + \beta_1 \left(\frac{\Delta REV_{it} - \Delta AR_{it}}{Asset_{it-1}} \right) + \beta_2 \left(\frac{PPE_{it}}{Asset_{it-1}} \right) + \beta_3 \left(\frac{Netincome_{it}}{Asset_{it-1}} \right) + \varepsilon_t \dots \quad (1)$$

$$DA = \frac{TA_{it}}{Asset_{it-1}} - \left[\alpha_0 \left(\frac{1}{Asset_{it-1}} \right) + \beta_1 \left(\frac{\Delta REV_{it} - \Delta AR_{it}}{Asset_{it-1}} \right) + \beta_2 \left(\frac{PPE_{it}}{Asset_{it-1}} \right) + \beta_3 \left(\frac{Netincome_{it}}{Asset_{it-1}} \right) \right] \dots \quad (2)$$

where TA_{it} is the total accruals of company i in year t (net profit during the term minus cash from operations), ΔREV_{it} is the change in sales of company i in year t (sales during the term minus sales in the previous term), ΔAR_{it} is the changes in accounts receivable of company i in year t (accounts receivable during the term minus accounts receivable of previous term), PPE_{it} is the assets of company i in year t , and $Asset_{it-1}$ is the total assets of company i in year $t - 1$.

3.2. Research Model

3.2.1. Research Model to Study the Defense Sales and Asymmetry of Information

First, to test Hypothesis 1, the research model was constructed by using the absolute value of discretionary accruals as the dependent variable and $Dportion$ as an explanatory variable. In this case, $Dportion$ refers to the portion of defense sales of the total sales of both the defense and general divisions of the firm.

In Hypothesis 2, '1' was assigned to certified companies in the defense cost-management system, and '0' was assigned to the firms that were not. In addition, to verify whether the defense cost-control system had a controlling effect on the degree of earnings management of defense sales, the effect from adding the interaction term ($Inter_Dportion_{it}$), which combines the two variables, was analyzed.

The total gross accruals (TA_{it-1}), debt ratio (LEV_{it}), total assets ($SIZE_{it}$), and cash from operations (OCF_{it}) were used as control variables. The total accruals in the previous term were selected according to the results of Becker et al. [14], which affects the current discretionary accruals and have a negative correlation. In addition, the debt ratio is included in the model, based on the results of Becker et al. [14], where the debt ratio is likely to violate the debt contract. The size of the firm was included in the model based on the results of DeFond and Jiambalvo [15], who found that it can be used as a substitute variable for several omitted variables. Lastly, the business activity was included in the model according to Dechow et al. [16], Dechow et al. [17]. It has a negative correlation with discretionary accruals. The research model is

$$|DA_{it}| = \alpha_0 + \beta_1 Dportion_{it} + \beta_2 System_{it} + \beta_3 Inter_Dportion_{it} + \beta_4 TA_{it-1} + \beta_5 LEV_{it} + \beta_6 SIZE_{it} + \beta_7 OCF_{it} + \beta_i \sum Firm_i + \beta_j \sum Year_j + \varepsilon_{it} \quad (3)$$

where $Dportion_{it}$ is the proportion of defense sales; $System_{it}$ is a certified company of the defense cost-management system and is 1, otherwise, 0; $Inter_Dportion_{it}$ is $Dportion \times System$; TA_{it-1} is the total gross accrued amount of previous term divided by the total assets of previous term (basic total assets); LEV_{it} is the end of term total liabilities divided by the basic total assets; $SIZE_{it}$ is the natural log of the basic total assets; OCF_{it} is the cash from operating divided by sales; $\sum Firm_i$ is the company dummy; and $\sum Year_j$ is the year dummy. The coefficient is estimated by OLS.

3.2.2. Study of the Political Cost Hypothesis

To verify Hypothesis 3a, a research model, with discretionary accruals as a dependent variable, was set by assigning '1' to the dummy (T_1) and otherwise assigning '0'. The control variable is the same as in model 1.

$$DA_{it} = \alpha_0 + \beta_1 T_1 + \beta_2 TA_{it-1} + \beta_3 LEV_{it} + \beta_4 SIZE_{it} + \beta_5 OCF_{it} + \beta_i \sum Firm_i + \beta_j \sum Year_j + \varepsilon_{it} \quad (4)$$

where T_1 is 1 if the year prior to the revision of the cost of defense system and is otherwise 0; TA_{it-1} is the total gross accrued amount of the previous year divided by the total assets of the previous year (basic total assets); LEV_{it} is the end of term total liabilities divided by the basic total assets; $SIZE_{it}$ is the natural log of the basic total assets; OCF_{it} is the cash from operating divided by the sales; $\sum Firm_i$ is the company dummy; and $\sum Year_j$ is the year dummy. The coefficient is estimated with the OLS method.

In order to verify Hypothesis 3b, the dummy (T) was set to '1' for the year prior to the revision of the defense cost system, and was otherwise set to '0'. The discretionary accruals are the dependent variables. The control variable is the same as in Model 1.

$$|DA_{it}| = \alpha_0 + \beta_1 T + \beta_2 TA_{it-1} + \beta_3 LEV_{it} + \beta_4 SIZE_{it} + \beta_5 OCF_{it} + \beta_i \sum Firm_i + \beta_j \sum Year_j + \varepsilon_{it} \quad (5)$$

where T is 1 if the revised year of the defense cost system, otherwise 0; TA_{it-1} is the total gross accrued amount of previous term divided by the total assets of previous term (basic total assets); ROA_{it} is

the net profit of company i in year t divided by the basic total assets; LEV_{it} is the end of term total liabilities divided by the basic total assets; $SIZE_{it}$ is the natural log of the basic total assets; OCF_{it} is the cash from operating divided by sales; $\sum Firm_i$ is the company dummy; and $\sum Year_j$ is the year dummy. The coefficient is estimated by OLS.

3.3. Sample Selection

The status of the defense firms in this study was based on the status of the member firms provided on the homepage of the South Korea Defense Industry Promotion Association and KISVALUE of Nice Information Service, South Korea. In Hypotheses 1 and 2, financial data from 2006 to 2014 were used. Of the total 698 observations, 671 were used, excluding cases where the assets were missing or less than zero, and if the cash flow from operating activities was missing. In Hypothesis 3, financial data from 2011 to 2014 were used. A total of 363 observations were selected from the 382 observations, excluding the cases where the assets were noncovalent or less than zero, and the cash flow was missing from the sample.

4. Empirical Analysis Results

4.1. Technical Statistics and Correlation Analysis

Table 1 shows the descriptive statistics of the variables used in Hypotheses 1 and 2. The mean value of the dependent variable $|DA_{it}|$ was 0.0709. The average of TA_{it-1} was -0.0291 and its median was -0.0231 , which indicates that defense firms in the target period mainly generated negative total accruals. The average value of each ROA_{it} , LEV_{it} , $SIZE_{it}$, and OCF_{it} represent positive values.

Table 1. Descriptive statistics.

Variable	Average	Median	Standard Deviation	Minimum Value	Maximum Value
DA_{it}	-0.0177	-0.0179	0.0966	-0.3678	0.4427
$ DA_{it} $	0.0709	0.0494	0.0679	0.0001	0.4427
$Dportion_{it}$	0.3545	0.2000	0.3729	0	1.0000
$System_{it}$	0.1723	0	0.3780	0	1.0000
$Inter_Dportion_{it}$	0.0838	0	0.2260	0	1.0000
TA_{it-1}	-0.0291	-0.0231	0.1037	-0.6628	0.3864
LEV_{it}	0.6475	0.6339	0.2959	0.0928	3.1818
$SIZE_{it}$	25.8530	25.0008	2.2821	22.5172	30.9218
OCF_{it}	0.0498	0.0545	0.1218	-0.4766	0.4895

Table 2 shows the correlation of variables used in Hypotheses 1 and 2. $|DA_{it}|$ has a significant positive correlation of 0.0999 with $Dportion_{it}$, and a significant negative correlation of -0.0269 with $System_{it}$. There is a significant negative correlation of -0.1596 with the control variable TA_{it-1} . It has significant negative correlations with $SIZE_{it}$, and has a significant positive correlation with LEV_{it} . However, there is no significant correlation with OCF_{it} .

4.2. Empirical Analysis Results

Table 3 shows the analysis results of Hypothesis 1, which was the absolute value of discretionary accruals will increase as the share of defense sales increase. Hypothesis 2 was the defense system cost-management system would have a negative impact on the absolute value of discretionary accruals.

For Hypothesis 1, the coefficient of $Dportion$ ($Dportion_{it}$) is 0.0490, which is significant at the 1% level, implies that the greater the share of defense sales in the company's overall sales, the greater the amount of earnings management. The estimated coefficient was not statistically significant when the dependent variable was DA_{it} is supported that the increase of defense sales may be marked in both

directions (+, −) in earnings management. A regression analysis was performed with the analysis of the dependent variables with DA_{it} . As a result the parameter was 0.0122 and the t-value was 0.80.

Table 2. Pearson correlation coefficient.

Classification	$ DA_{it} $	$Dportion_{it}$	$System_{it}$	TA_{it-1}	LEV_{it}	$SIZE_{it}$	OCF_{it}
$ DA_{it} $	1						
$Dportion_{it}$	0.0999 ** (0.0167)	1					
$System_{it}$	−0.0420 (0.3136)	0.1556 *** (0.0002)	1				
TA_{it-1}	−0.1596 *** (0.0001)	−0.0529 (0.2040)	−0.0171 (0.6796)	1			
LEV_{it}	0.2822 *** (<0.0001)	−0.0404 (0.3321)	0.0338 (0.4148)	−0.1042 ** (0.0116)	1		
$SIZE_{it}$	−0.1732 *** (0.0008)	−0.3805 *** (0.0001)	0.4083 *** (0.0001)	0.0571 (0.1673)	0.1025 ** (0.0131)	1	
OCF_{it}	0.1148 *** (0.0057)	0.1165 *** (0.0050)	−0.0479 (0.2472)	−0.0056 (0.8926)	−0.1393 *** (0.0007)	−0.0861 ** (0.0373)	1

Note: ***, ** indicate a significance level of 1% and 5% respectively.

In addition, LEV_{it} and $SIZE_{it}$ were 0.0558, and -0.0541 , respectively, which are significant at the 1% level. However, OCF_{it} showed statistically insignificant results.

For Hypothesis 2a, the coefficient of $System_{it}$, which indicates whether a company has a certified defense cost-management system, is -0.8071 , implying a significant value at the 1% level. So, firms with the certified defense cost-management system generate less discretionary accruals than those without the system. Next, the coefficient of the interaction term $Inter_Dportion_{it}$ is -0.0418 for Hypothesis 2b, which shows significance at the 5% level. This implies that the sales of defense products affect discretionary accruals in smaller scales than in non-defense firms. Furthermore, this study verifies that the defense cost-management system is effective in controlling a firm's earnings management.

Table 3. Regression for testing Hypotheses 1 and 2. Panel A: Hypotheses 1 and 2.

Variable	Dependent Variable: PRC		
	Predicted Sign	Estimate	t-Value
Intercept	?	1.5872 ***	4.57
$System_{it}$	−	−0.8071 ***	−3.4
$Dportion_{it}$	+	0.0490 ***	2.93
$Inter_Deortion_{it}$	−	−0.04179 ***	−2.49
TA_{it-1}	−	−0.0412 **	−1.56
LEV_{it}	+	0.0558 ***	3.75
$SIZE_{it}$	−	−0.0541 ***	−4.68
OCF_{it}	?	0.0324	1.32
Firm Fixed/Time Fixed		Included	
Adjusted- R^2		0.2536	
Sample		586	

Note: ***, ** indicate significance of at least 1% and 5% respectively.

On the other hand, Table 4 shows the results for Hypothesis 3a, which was that the discretionary accruals in the previous year of the revision of the defense cost system would have a negative value. Through verification, the coefficient of T_1 is -0.0224 , which is significant. So, it is verified that

companies reduce the reported profit for the purpose of inducing and supporting the revision of the system in the year prior to the revision, in order to revise their defense cost system.

Table 4. Regression for testing Hypothesis 3a. Panel A: Hypothesis 3a.

Variable	Dependent Variable: <i>PRC</i>		
	Predicted Sign	Estimate	<i>t</i> -Value
<i>Intercept</i>	?	−0.1643 **	−0.36
<i>T</i> _{−1}	−	−0.0224	−2.76
<i>TA</i> _{<i>it</i>−1}	−	−0.0058	−0.21
<i>LEV</i> _{<i>it</i>}	+	0.0356 **	1.94
<i>SIZE</i> _{<i>it</i>}	−	0.0053	0.32
<i>OCF</i> _{<i>it</i>}	?	−0.6953 ***	−26.44
Firm Fixed/Time Fixed	Included		
Adjusted- <i>R</i> ²		0.73	
Sample		384	

Note: ***, ** indicate significance of at least 1% and 5% respectively.

Lastly, Table 5 shows the results for Hypothesis 3b, which was that the absolute value of discretionary accruals for the revised year of the cost of defense system will be negative. That is, the coefficient of *T* is 0.0136, which is not significant; so it is difficult to argue that they reduce the earnings management act that generates discretionary accruals in the revision year of the defense cost system.

Table 5. Regression for testing Hypothesis 3b. Panel A: Hypothesis 3b.

Variable	Dependent Variable: <i>PRC</i>		
	Predicted Sign	Estimate	<i>t</i> -Value
<i>Intercept</i>	?	1.8706 ***	3.23
<i>T</i>	−	0.0136	1.31
<i>TA</i> _{<i>it</i>−1}	−	−0.0036	−0.11
<i>LEV</i> _{<i>it</i>}	+	0.0681 ***	2.97
<i>SIZE</i> _{<i>it</i>}	−	−0.0679 ***	−3.26
<i>OCF</i> _{<i>it</i>}	?	−0.0303 ***	−0.91
Firm Fixed/Time Fixed	Included		
Adjusted- <i>R</i> ²		0.18	
Sample		373	

Note: ***, ** indicate significance of at least 1% and 5% respectively.

5. Conclusions

This study aimed to examine the earnings management behavior of firms in the defense industry in South Korea and find a solution for the government to reduce the earnings management. The results of the study are as follows.

First, firms with higher defense product sales increased their degree of earnings management. This differs from the study by Kim et al. [13] that showed that the higher the reliance on the defense industry is, the lower the reported profit is recorded. That is, for defense firms, a profit-centered system does not produce only one result, but creates different earnings management systems that can increase and/or reduce reported profit.

Second, the defense industry cost-management system, which shares cost management information about defense firms, was examined in relation to earnings management. We found that the level of earnings management was lower for the companies with the certified system than those without the system. This can be interpreted in two ways. Firstly, for a company that has the certified

defense cost-management system, due to the information asymmetry between the government and the company about the decrease in costs after the implementation of the system, the level of earnings management decreased; secondly, the firms with the certified system have already received the cost-related certification from the government because they did not engage in earnings management activities. Of these two interpretations, the latter is valid because the system for cost control in defense firms has been in effect since 2012. However, because there is not enough data (4 firms in 2012, 9 in 2013, and 12 in 2014), the effectiveness of the test could not be measured.

Third, the effect of the improvement of the defense cost system on earnings management was examined. Based on the reported profits, the government anticipates that earnings management will be actively implemented during the period in which the government can refer to the reported profit, based on the characteristics of the defense firms who want to influence the improvement of the government's defense cost system. The discretionary accruals of the previous year and of other periods were also compared. The results were statistically significant and these results are consistent with the findings of [7]. The main purpose of the improvement in the 2013 was to protect small businesses' profits. In particular when small and midsize firms were to grow in size, they were allowed to maintain the advantages of small and medium business status over the next five years. Thus, the results of this study showed that small size firms have strengthened their negotiating power by deliberately decreasing their reported profits to preserve their interests. In addition, we expected that the discretionary accruals would be lower during the system improvement period than in other periods as the defense firms limited their profits through government monitoring activities, but this was not the case. This means that the government's monitoring activities for the system revamp did not decrease the earnings management activities of the actual defense firms.

Overall, our results arguably suggest that the government should continue its effort to improve transparency of cost information. From the previous and current studies, we learn that earnings management is conducted persistently. The defense industry which has an asymmetric nature of cost information cannot sustain if the firm's opportunistic behavior like earning management persists. This paper makes significant contributions by verifying the effectiveness of the cost management certification system as a method to normalize the operations of the market amid threats of anonymity in the defense industry market in South Korea. Thus, the government should plan and promote in consistent manners various systems that allow the government to control firms' earnings management in the defense industry.

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