Print ISSN: 1738-3110 / Online ISSN 2093-7717
http://dx.doi.org/10.15722/jds.17.04.201904.5

Earnings Management in Price Cartel Firms and the Case of Distribution Industry*

Philip You**, Jaekyung Yi***

Received: February 22, 2019. Revised: March 03, 2019. Accepted: April 05, 2019.

Abstract

Purpose - This study examines whether price cartel firms perform downward earnings management to avoid or minimize penalty surcharges levied by the Korea Fair Trade Commission and analyzes such earnings management in distribution industry.

Research design, data, and methodology - We use 247 firms from 64 price cartel cases in the period of 2011-2016, and collect data from 3 years before to 3 years after the start of price cartel. Earnings management is measured by discretionary accruals. Three discretionary accrual estimation models are employed; modified Jones model, ROA adjusted modified Jones model and CFO-adjusted modified Jones model. For pre- and post-cartel periods, one year, two year, and three year windows are used. Additional empirical analyses are performed for distribution industry sub-sample of 25 cartel firms.

Result - The regression results show that cartel firms' discretionary accruals are significantly lower in the period after the start of price cartel than before. And discretionary accruals are lower in cartel firms than in non-cartel firms during the cartel period. Cartel firms in distribution industry also show the earnings management similar to those in other industries.

Conclusions - These two findings lead to the conjecture that managers of cartel firms manage their earnings downward. This behavior is indistinguishable between firms in distribution industry and other industries.

Keywords: Price Cartel, Distribution Industry, Earnings Management, Discretionary Accruals.

JEL Classifications: C21, D43, G38, K21, M41.

1. Introduction

A price cartel is one type of unfair trade activity which is" an agreement made by and between business entities to jointly control competition unfairly by fixing or raising prices" (Monopoly Regulation and Fair Trade Act, Article 19(1), hereafter MRFTA). Since its establishment in 1981, Korea Fair Trade Commission (KFTC) has regulated price cartels through various paths, however, the number of cases and volume of surcharges have been steadily increasing. Price cartels deteriorate fair trade order in the market, which results in inefficient economic resource allocations, monopolistic profits to the participating parties, and losses to the consumers. To reduce or block the negative effect of price cartels, KFTC identifies and issues to price cartel firms warnings, corrective orders, surcharges, and references to prosecutor's office.

Article 22 of MRFTA regulates surcharges on price cartel within 10% of related sales. As the surcharges are large in magnitude compared to the profits from the price cartel, cartel firms would put their priority in efforts not to be identified by KFTC. They would also prepare for being identified by reducing profits from the price cartel. Reporting low accounting earnings will help reducing both the possibility of identification and the amount of surcharge. Thus firms participating in price cartels have incentives to voluntarily reduce earnings.

This study examines whether cartel firms reduce their earnings by decreasing discretionary accruals during the period of price cartel specified in KFTC decisions by comparing discretionary accruals before and after the start of cartel. In addition, a cross sectional comparison of discretionary accruals between cartel firms and non-cartel

* This paper was modified and developed from the master's thesis of the first author.

** First Author, Master, College of Business Administration, Kookmin University, Seoul, Korea.

*** Corresponding Author, Professor, College of Business Administration, Kookmin University, Seoul, Korea,
Tel: +82-2-910-4554, E-mail: jkyi@kookmin.ac.kr

firms during the cartel period has been performed. We also perform the same empirical analysis for distribution industry sub-sample to find if there is any difference of earnings management in distribution industry compared to other industries. Empirical analyses are based on financial data of 247 firms in 64 price cartel cases in KFTC decisions during 2011-2016. Earnings managements are measured by discretionary accruals using modified Jones model (Dechaw, Sloan, & Sweeney, 1995), ROA adjusted modified Jones model (Kothari, Leone, & Wasley, 2005), and CFO adjusted modified Jones model (Rees, Gill, & Gore, 1996).

2. Literature Review

2.1. Research background - price cartels

MRFTA, enacted in 1980, restricts the price cartel as an unfair collaborative acts. Under Article 19(1) of MRFTA, firms shall not agree with other firms, organizations or individuals to unfairly restricts competition. There are several ways of placing responsibilities on enterprises violating the regulation; warnings, corrective orders, surcharges, and references to prosecutor's office. Surcharges may be levied within 10 percent of the related sales amount, and, in the extreme case, the court may sentence a maximum of three years of imprisonment, up to KRW 200 million fine or both imprisonment and fine.

Panel A of Table 1 provides statistics of cases reported and processed by KFTC and surcharges for price cartels from 1981 through 2014. Panel B shows the numbers of cases by types of corrective measures. There was a total of 2,038 cases reported during the period, and the most frequent year was 2014 with 207 cases. Among these, 1,961 cases were processed, and corrective measures were ordered to 1,021 cases. Surcharges were levied on 425 cases (41.6%), and the average amount per case was KRW 9,696 million with cumulative surcharges during the period amounting KRW 4,121 billion.

Table 1: Case Report and Processing Statistics

Panel A: Number of cases and amount of surcharges

Year	Cases reported	Cases processed	Cases with surcharges	Total surcharges (in million KRW)
1981~95	168	162	11	4,446
1996	54	51	13	14,513
1997	58	52	6	1,092
1998	118	77	19	31,991
1999	93	124	15	36,158
2000	74	78	12	198,812
2001	81	87	7	27,704
2002	79	78	14	53,109
2003	89	72	9	109,838
2004	89	81	12	29,184
2005	79	72	21	249,329
2006	88	80	27	110,544
2007	118	117	24	307,042
2008	125	145	45	197,479
2009	120	108	21	52,932
2010	105	104	26	585,822
2011	127	135	35	577,902
2012	76	76	24	398,866
2013	90	89	28	364,731
2014	207	173	56	769,428
Sum	2,038	1,961	425	4,120,922
Per case				9,696

Panel B: Performance in correction by corrective measures

Types	Filing complaints with prosecution	Surcharges	Corrective order	Request for correction	Corrective recommendation	Warning	Voluntary correction	Sum*
Number of cases	102	425	571	0	48	263	37	1,021

Note: Surcharges are not included in the calculation of sum since they are combined with other corrective measures.
Source: Statistical yearbook 2015, Korea Fair Trade Commission

2.2. Prior research in earnings management

Managers prefer to report higher earnings, but in some cases they intentionally report lower earnings. Watts and Zimmerman (1986) shows that managers tend to report lower earnings when high political costs are expected. In industries where the price is determined by government regulations, managers tend to decrease earnings when the investigation of unusually high profits is undergone. For examples, Key (1997) reports that companies manipulate their earnings downward in the period pertaining to the abolition of regulation on the cable TV's.

Defense contractors under the cost compensation price system tend to increase their costs and lower the reported income in order to enhance price negotiation power (Thomas & Tung, 1992). Jones (1991) provides the empirical evidence that twenty three companies reduce their reported earnings during the period when the U.S. Trade Association studies the increase of tariffs or the decrease of import quarter. A regulatory relief from price controls provides incentives for income decreasing earnings management (Navissi, 1999). Similar behaviors are observed in the private sector. It is plausible that firms violating fair trade regulations prepare for the case of being investigated and manage their reported earnings to be lower than it should be. Cohan (1992) shows that 48 firms under investigation of the U.S. Antitrust Acts violation manipulate their reported earnings downward during the investigation period.

3. Research Hypotheses

Watts and Zimmerman (1978) postulates that when political costs are expected, managers will try to avoid these costs by reducing the reported earnings. Earnings downward management can be achieved by manipulating discretionary accruals. According to Table 1, cases added up 72 to 173 annually since 2001, and 24% of those were levied with surcharges. Price cartel firms may learn from previous cases that they may be identified and levied with surcharges. With that expectation, cartel firms would prepare during the cartel period for being identified and surcharged. One of the key factors leading to a surcharge decision is whether there is unfair profit from the price cartel.

Price cartels increasing sales prices naturally lead to higher earnings, and the larger the profits, the bigger the penalty surcharges will be. It would therefore be better for managers to report lower earnings to prepare for plausible surcharges. Lower earnings can be used as a defensive justification. Based on the above discussions, we hypothesize and empirically test that cartel firms report lower earnings than 'as is' by managing the discretionary accruals.

Hypothesis 1: Discretionary accruals of price cartel firms are lower during the cartel period than before the cartel.

Hypothesis 2: During the cartel period, discretionary accruals of cartel firms are lower than non-cartel firms.

4. Research Design

4.1. Research models

Earnings management researches using discretionary accruals most often employ modified Jones' model (Dechow et al., 1995; MJ model) or performance-adjusted modified Jones' model (Kothari et al., 2005; ROA model) to estimate discretionary accruals. In addition we add cash flow-adjusted modified Jones' model (CFO model) introduced in Rees et al. (1996).

$$TA_t/A_{t-1} = \beta_1(1/A_{t-1}) + \beta_2([\triangle REV_t - \triangle REC_t]/A_{t-1}) + \beta_3(PPE_t/A_{t-1}) + \epsilon_t \quad (1)$$

$$TA_t/A_{t-1} = \beta_1(1/A_{t-1}) + \beta_2([\triangle REV_t - \triangle REC_t]/A_{t-1}) + \beta_3(PPE_t/A_{t-1}) + \beta_4 ROA_t + \epsilon_t \quad (2)$$

$$TA_t/A_{t-1} = \beta_1(1/A_{t-1}) + \beta_2([\triangle REV_t - \triangle REC_t]/A_{t-1}) + \beta_3(PPE_t/A_{t-1}) + \beta_4 CFO_t + \epsilon_t \quad (3)$$

We define the discretionary accruals, ϵ_t, from MJ model specified in equation (1) as DAMJ, from ROA model in equation (2) as DAROA, and from CFO model in equation (3) as DACFO, and these DA's are dependent variable in empirical hypothesis tests.

$$DA_t(DAMJ, DAROA \text{ or } DACFO) = \alpha_0 + \beta_1 CARTELP_t + \beta_2 LOSS_t + \beta_3 TA_{t-1} + \beta_4 SIZE_t + \beta_5 LEV_t + \beta_6 GROWTH_t + \beta_7 BIG4_t + \sum IND_t + \sum YEAR_t + \epsilon_t \quad (4)$$

$$DA_t(DAMJ, DAROA \text{ or } DACFO) = \alpha_0 + \beta_1 CARTELF_t + \beta_2 LOSS_t + \beta_3 TA_{t-1} + \beta_4 SIZE_t + \beta_5 LEV_t + \beta_6 GROWTH_t + \beta_7 BIG4_t + \sum IND_t + \sum YEAR_t + \epsilon_t \quad (5)$$

Table 2: Definition of Variables

TA_t	(net income – cash flows from operation) in period t
A_{t-1}	total assets at the end of period (t-1)
$\triangle REV_t$	change in sales in period t (= sales in t – sales in (t-1)
$\triangle REC_t$	change in accounts receivable in period t
PPE_t	property, plant and equipment at the end of t (excluding land and assets under construction)
ROA_t	net income of t / total assets at the beginning of t
CFO_t	cash from operation in t / total asset at the beginning of t
DA_t	discretionary accruals estimated using equation (1)-(3), $DAMJ$, $DAROA$ or $DACFO$ each
$CARTELP_t$	1 for the period after the start of cartel and 0 otherwise for cartel firms
$CARTELF_t$	1 for cartel firms and 0 for non-cartel firms
$LOSS_t$	1 if net income is negative and 0 otherwise
TA_{t-1}	total accruals of period t-1
$SIZE_t$	natural log of total asset of t
LEV_t	total liabilities / total assets at the end of t
$GROWTH_t$	growth rate of total asset for period t
$BIG4_t$	1 if outside auditor is BIG4 and 0 otherwise for period t
IND_t	industry dummy variables for 13 industries
$YEAR_t$	year dummy variables for 6 years
ϵ_t	residual

Equation (4) is an empirical model for testing whether discretionary accruals are different between the periods before and after the price cartel, and the variable of interest is *CARTELP*. *CARTELP* is zero (0) if the period is before the start of the cartel specified in KFTC decision and is one (1) if the period is after the date. Per hypothesis 1, if cartel firms have incentives to reduce reported earnings, the coefficient estimate of *CARTELP*, β_1, would be negative (-) with statistical significance.

The cartel period varies from one year to 14 years so that it is difficult to consistently define pre- and post-cartel periods. In this study we make three windows one year, two years, and three years before and after the starting date, and empirical tests are performed for each window sample to mitigate the bias from differences in cartel duration and to secure the robustness. For example, the three year window sample includes firm-year observations of three years(-3), two years(-2) and one year(-1) before the start year of price cartel and start year(+1), one year after the start year(+2) and two years after the start year(+3). For a price cartel firm, a total of six firm-year observations are included in the three year window sample, and four and two firm-year observations for two year and one year window samples.

Equation (5) is an empirical model for the test of hypothesis 2, which examine whether there are differences in discretionary accruals between cartel and non-cartel firms. The variable of interest is *CARTELF* with 1 assigned for cartel firms and 0 for non-cartel firms. If cartel firms manage earnings downward using discretionary accruals, the coefficient of *CARTELF*, β_1, would be negative and statistically significant.

Equation (4) and (5) include various control variables reflecting the findings of prior research. *LOSS* is a control for unusual earnings management behavior of net loss firms, and TA_{t-1} is a control for the effect of reverse of accruals. Natural log of total assets (*SIZE*) is a control for miscellaneous firm characteristics not specified, and debt ratio (*LEV*) controls for the unusual earnings management of firms with high loans. Total asset growth ratio (*GROWTH*) and *BIG4* are known to affect the level of discretionary accruals. Industry dummies (*IND*) as well as year dummies (*YEAR*) are included to control for the differences of discretionary accruals by industry and year.

4.2. Sample selection

Cartel firms were selected from KFTC decisions provided in the website of KFTC (www.ftc.go.kr). There are 263 decisions published during 2011-2016, and, after deleting decisions on appeals for initial decision, decisions on one-time cartels of bid-fixing and decisions to individuals, 64

decisions are used in this study.

Panel A of Table 3 shows the distribution of the number of firms for 64 decisions. The total number of firms is 464, and the average participating firms per cartel is 6.8 firms. Fourteen cartels have two participating firms while 13 cartels have more than 10 participating firms. Panel B explains the sampling process for 247 final sample firms. Thirty eight firms involved in more than two cartels, and 43 firms in banking and finance industry are eliminated. Data is not available for 106 firms in DART or DataGuide. The sample firms are distributed in 12 sections and 41 divisions of Korean Standard Industrial Classification; more than 51% of firms (149 firms) are in manufacturing industries and 25 firms are from distribution industry (retail and whole sale industry and logistics industry).

Table 3: Sample Firms

Panel A: Number of firms per price cartel case

Firms per case	2	3	4	5	6	7	8	9	10	11	12	13	16	17~25	Total
Cases	14	6	9	5	5	5	4	2	1	2	3	2	2	4	64
Number of firms	28	18	36	25	30	35	32	18	10	22	36	26	32	86	434

Panel B: Sampling process

Total firms in 64 cases with surcharges	434
Firms involved in more than two cases	(38)
Firms in banking and finance industry	(43)
Firms with no data in DART or DataGuide	(106)
Firms in the final sample	247

Table 4: Descriptive Statistics for Three Year Window Sample

Panel A: Full sample

Variable	N	Mean	Std Dev	Min	p25	Median	p75	Max
$DAMJ_t$	1,004	-0.002	0.112	-1.107	-0.051	0.003	0.052	0.392
$DAROA_t$	1,004	-0.007	0.106	-0.657	-0.053	0.001	0.054	0.423
$DACFO_t$	1,004	0.008	0.096	-0.981	-0.035	0.010	0.052	0.363
$CARTELP_t$	1,004	0.526	0.500	0	0	1	1	1
$LOSS_t$	1,004	0.221	0.415	0	0	0	0	1
TA_{t-1}	1,004	-0.047	0.102	-0.504	-0.087	-0.039	0.008	0.345
SIZEt	1,004	18.83	1.984	15.72	17.30	18.44	20.06	24.96
LEV_t	1,004	0.545	0.235	0.067	0.380	0.563	0.700	1.342
$GROWTH_t$	1,004	0.136	0.838	-0.435	-0.020	0.063	0.180	25.12
$BIG4_t$	1,004	0.256	0.437	0	0	0	1	1

Panel B: Firms in distribution industry and difference of mean test against other industries

Variable	N	Mean	Std Dev	Min	p25	Median	p75	Max	ΔMean[1]	t-value
$DAMJ_t$	126	-0.007	0.107	-0.342	-0.052	0.001	0.048	0.287	0.006	0.59
$DAROA_t$	126	-0.020	0.101	-0.324	-0.073	-0.014	0.033	0.251	0.022**	2.20
$DACFO_t$	126	-0.029	0.082	-0.311	-0.057	-0.025	0.019	0.218	0.042***	4.59
$CARTELP_t$	126	0.524	0.501	0	0	1	1	1	0.002	0.05
$LOSS_t$	126	0.238	0.428	0	0	0	0	1	-0.019	-0.49
TA_{t-1}	126	-0.049	0.118	-0.504	-0.093	-0.036	0.011	0.345	0.003	0.27
SIZEt	126	18.07	1.923	15.72	16.56	17.67	18.41	22.95	0.881***	4.71
LEV_t	126	0.660	0.242	0.169	0.484	0.653	0.820	1.342	-0.131***	-5.95
$GROWTH_t$	126	0.073	0.262	-0.435	-0.063	0.040	0.151	1.242	0.072	0.90
$BIG4_t$	126	0.127	0.334	0	0	0	0	1	0.148***	3.53

Note: 1. ΔMean = (Mean of other industries sub-sample) – (Mean of distribution industry sub-sample)

Table 4 reports descriptive statistics of 1,004 firm-year data of 247 cartel firms from three years before the cartel year (year -3) to two years after the cartel year (year +3). In Panel A, the averages of discretionary accruals are 0.002 for *DAMJ*, -0.007 for *DAROA*, and 0.008 for *DACFO*. The average of *CARTELP* is 0.528 meaning more firm-years in the post-cartel period. More than 22% experience net loss (LOSS). The mean of the natural log of total assets (*SIZE*) is 18.83 which is equivalent to KRW 150 million. The mean of total liabilities to total assets ratio (*LEV*) is 0.545. These indicate that sample firms are relatively small and financially safe. The firms are growing with an average asset growth rate of 13.6%, and only 25.6% of them are audited by Big4 accounting firms.

Panel B provides the same statistics of cartel firms in distribution industry sub-sample and mean differences between distribution industry and other industries. Among three discretionary accruals *DAROA* and *DACFO* are significantly bigger (by 0.022 and 0.042) in other industries than in distribution industry. Cartel firms in other industries are larger in firm size (by 0.881) and less leveraged (by –0.131) than those in distribution industry, and more cartel firms in other industries are audited by Big4 auditors. The differences of variables *SIZE, LEV*, and *BIG4* are significant at 1% level. Considering the differences in the firm characteristic variables, there may exist a fundamental difference in earnings management behavior which needs to be empirically tested.

Correlation coefficients of the variables in Table 4 are presented in Table 5. Correlations among three dependent variables, *DAMJ, DAROA* and *DACFO*, are very high to be significant at 1% level. *CARTELP* shows negative correlation with these dependent variables, but they are not statistically significant. The control variables, *LOSS, SIZE* and *LEV* are positively correlated with *DAROA* at 1% significance level while their correlations with *DAMJ* and *DACFO* are significantly negative except the correlation between DAMJ and *SIZE*. These results provide an explanation why previous researches show inconsistent correlations between discretionary accruals and *LOSS, SIZE*, or *LEV*. The correlations are dependent on the estimation model of discretionary accruals. Prior period total accruals (TA_{t-1}), total assets growth rate (*GROWTH*), and types of auditor (*BIG4*) have consistent correlations with discretionary accruals not with regard to the estimation model. Growing firms show bigger discretionary accruals in general, however, it is not the case in this study; discretionary accruals are negatively correlated with *GROWTH* at 1% significance level meaning that the faster growing cartel firms would manage their earnings lower.

5. Empirical results

5.1. Comparisons of discretionary accruals before and after price cartels

We report in Table 6 the multi-variate regression results testing whether discretionary accruals are reduced after the

Table 5: Correlation among variables

(n=1,004)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$DAMJ_t$ (1)	1									
$DAROA_t$ (2)	0.888*** (<0.01)	1								
$DACFO_t$ (3)	0.770*** (<0.01)	0.497*** (<0.01)	1							
$CARTELP_t$ (4)	-0.043 (0.18)	-0.027 (0.40)	-0.046 (0.14)	1						
$LOSS_t$ (5)	-0.155*** (<0.01)	0.085*** (<0.01)	-0.338*** (<0.01)	-0.018 (0.57)	1					
TA_{t-1} (6)	0.199*** (<0.01)	0.280*** (<0.01)	0.010 (0.76)	0.032 (0.31)	-0.040 (0.21)	1				
$SIZE_t$ (7)	-0.009 (0.78)	0.067** (0.03)	-0.101*** (<0.01)	0.057* (0.07)	-0.051 (0.11)	0.110*** (<0.01)	1			
LEV_t (8)	-0.093*** (<0.01)	0.081** (0.01)	-0.294*** (<0.01)	0.001 (0.98)	0.322*** (<0.01)	-0.033 (0.30)	0.004 (0.91)	1		
$GROWTH_t$ (9)	-0.154*** (<0.01)	-0.093*** (<0.01)	-0.179*** (<0.01)	-0.030 (0.34)	0.016 (0.63)	0.036 (0.25)	0.050 (0.12)	-0.03 (0.34)	1	
$BIG4_t$ (10)	0.029 (0.36)	0.092*** (<0.01)	-0.019 (0.56)	0.072** (0.02)	0.0175 (0.58)	0.082*** (<0.01)	0.566*** (<0.01)	-0.041 (0.20)	-0.031 (0.34)	1

price cartel with effects of other variables affecting discretionary accruals controlled. Panel A shows the results for all firms, and Panel B for cartel firms in distribution industry only. Both panels present empirical results for the six year (-3 to +3) sample, four year (-2 to +2) sample, and two year (-1 to +1) sample separately. In Panel A, the six year sample with 1,004 firm-year observations shows that all the coefficient estimates of *CARTELP* are statistically significant and consistent for different dependent variables; 0.026 for *DAMJ* and 0.029 for *DAROA* at 1% significance level, and 0.015 for *DACFO* at 5% significance level. From these results consistent across the discretionary accruals estimation model, we can postulate that after the start of price cartels participating firms manage their discretionary accruals to reduce reported earnings.

The empirical findings are similar in the four year sample of 673 firm-year observations; the sign is all negative and magnitudes of coefficient estimates of *CARTELP* are almost the same with the six year sample and statistically significant. The only exception is that the significance of *DACFO* reduces to 10% level. The two year sample has 336 firm-year observations, and because of the small sample size the significance level decreases for *DAMJ* and *DACFO* to 10% level and no significance for *DAROA*. Empirical results using three different samples altogether support the conjecture that price cartel firms take the accounting choices towards lowering their reported earnings as soon as they participate in the cartel.

Panel B of Table 6 presents regression results of cartel firms in distribution industry sub-sample. Twenty five firms in retail and logistics business participated in price cartels during 2011-2016. The results are very close to Panel A that all of coefficient estimates of *CARTELP* are negative and significant at least 10% level except two year sample *DAROA* case. There are differences in the magnitude of coefficient and the level of statistical significance. To test whether there exist significant difference of the earnings management between distribution industry and other industries, additional regression analysis is performed by including distribution industry dummy variable, DIST, and the interaction term, *CARTELP x DIST*, in model (4). If there is a significant difference of earnings management in distribution industry, the coefficient estimate of interaction term, *CARTELP x DIST*, will be significantly different from zero.

Panel C of Table 6 provides regression results of comparing discretionary accruals between distribution industry and other industries. The coefficient estimate of *CARTELP x DIST* is negative but insignificant across samples and dependent variables, meaning that there is no significant difference of earnings management in cartel firms between distribution industry and other industries.

From panels of Table 6, we induce that managers of cartel firms exercise their discretion to report earnings lower than as is after the start of cartel. This downward management of earnings shows similarly in distribution industries as well as in other industries.

Table 6: Regression results of cartel firms before and after the start of cartel

Panel A: Full sample

$$DA_t(DAMJ, DAROA \text{ or } DACFO) = \alpha_0 + \beta_1 CARTELP_t + \beta_2 LOSS_t + \beta_3 TA_{t-1} + \beta_4 SIZE_t + \beta_5 LEV_t + \beta_6 GROWTH_t + \beta_7 BIG4_t + \sum IND_t + \sum YEAR_t + \epsilon_t$$

		(-3~+3)period (n=1,004)			(-2~+2)period (n=673)			(-1~+1)period (n=336)		
Variables	**EXP.**	**DAMJ**	**DAROA**	**DACFO**	**DAMJ**	**DAROA**	**DACFO**	**DAMJ**	**DAROA**	**DACFO**
CARTELP$_t$	(-)	-0.026***	-0.029***	-0.015**	-0.027***	-0.027***	-0.014*	-0.021*	-0.017	-0.016*
		(-3.21)	(-3.88)	(-2.24)	(-2.80)	(-3.01)	(-1.94)	(-1.94)	(-1.54)	(-1.85)
LOSS$_t$	(-)	-0.038***	0.015*	-0.067***	-0.038***	0.014	-0.068***	-0.004	0.047***	-0.047***
		(-4.28)	(1.79)	(-9.45)	(-3.47)	(1.32)	(-7.93)	(-0.27)	(3.39)	(-4.33)
TA$_{t-1}$	(-)	0.120***	0.170***	-0.009	0.129***	0.164***	0.012	0.073	0.108**	0
		(3.30)	(5.12)	(-0.32)	(2.96)	(4.00)	(0.33)	(1.42)	(2.09)	0
SIZE$_t$	(-)	-0.009***	-0.006***	-0.011***	-0.009***	-0.007**	-0.012***	-0.006	-0.004	-0.008**
		(-3.64)	(-2.59)	(-5.27)	(-2.93)	(-2.18)	(-4.76)	(-1.45)	(-1.02)	(-2.41)
LEV$_t$	(-)/(+)	-0.039**	0.017	-0.077***	-0.032	0.022	-0.062***	-0.076***	-0.020	-0.094***
		(-2.30)	(1.11)	(-5.67)	(1.51)	(1.10)	(-3.76)	(-2.92)	(-0.78)	(-4.59)
GROWTH$_t$	(+)	-0.021***	-0.0140***	-0.021***	0.005	0.009	0.0017	0.063***	0.063***	0.024
		(-5.35)	(-3.79)	(-6.47)	(0.32)	(0.67)	(0.14)	(2.65)	(2.64)	(1.28)
BIG4$_t$	(-)	0.017	0.019**	0.024***	0.019	0.023*	0.030***	0.007	0.013	0.018
		(1.64)	(1.97)	(2.94)	(1.54)	(1.96)	(3.01)	(0.42)	(0.81)	(1.46)
IND$_t$		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR$_t$		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj, R^2		0.144	0.200	0.278	0.069	0.151	0.213	0.118	0.164	0.257

Panel B: Cartel firms in distribution industry

$$DA_t(DAMJ, DAROA \text{ or } DACFO) = \alpha_0 + \beta_1 CARTELP_t + \beta_2 LOSS_t + \beta_3 TA_{t-1} + \beta_4 SIZE_t + \beta_5 LEV_t + \beta_6 GROWTH_t + \beta_7 BIG4_t + \sum IND_t + \sum YEAR_t + \epsilon_t$$

		(-3~+3)period (n=126)			(-2~+2)period (n=88)			(-1~+1)period (n=44)		
Variables	**EXP.**	**DAMJ**	**DAROA**	**DACFO**	**DAMJ**	**DAROA**	**DACFO**	**DAMJ**	**DAROA**	**DACFO**
$CARTELP_t$	(-)	-0.053*	-0.057**	-0.035**	-0.068**	-0.063*	-0.048**	-0.073*	-0.060	-0.047*
		(-1.76)	(-2.03)	(-1.99)	(-2.02)	(-1.94)	(-2.35)	(-1.72)	(-1.36)	(-1.87)
$LOSS_t$	(-)	-0.044	-0.010	-0.100***	-0.027	-0.005	-0.084***	-0.018	-0.004	-0.045
		(-1.56)	(-0.39)	(-6.01)	(-0.79)	(-0.15)	(-3.97)	(-0.37)	(-0.07)	(-1.57)
TA_{t-1}	(-)	0.186**	0.199**	0.059	0.031	0.032	-0.007	0.170	0.178	0.109
		(2.09)	(2.37)	(1.11)	(0.27)	(0.29)	(-0.10)	(1.12)	(1.12)	(1.23)
$SIZE_t$	(-)	-0.014	-0.015*	-0.019***	0.007	0.002	-0.008	0.036**	0.022	0.015
		(-1.51)	(-1.67)	(-3.43)	(0.63)	(0.21)	(-1.16)	(2.22)	(1.31)	(1.53)
LEV_t	(-)/(+)	-0.058	-0.056	-0.037	-0.059	-0.047	-0.040	-0.093	-0.095	-0.054
		(-1.16)	(-1.20)	(-1.25)	(-0.96)	(-0.79)	(-1.07)	(-1.17)	(-1.13)	(-1.16)
$GROWTH_t$	(+)	-0.012	-0.004	0.032	0.024	0.024	0.063*	-0.063	-0.047	0.005
		(-0.26)	(-0.10)	(1.22)	(0.43)	(0.45)	(1.86)	(-0.97)	(-0.69)	(0.13)
$BIG4_t$	(-)	0.048	0.095**	0.095***	-0.044	0.019	0.052	-0.166**	-0.079	-0.038
		(0.99)	(2.09)	(3.30)	(-0.74)	(0.32)	(1.44)	(-2.07)	(-0.93)	(-0.81)
IND_t		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$YEAR_t$		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj, R^2		0.097	0.108	0.467	0.066	0.057	0.409	0.133	-0.008	0.444

Panel C: Comparison between cartel firms in distribution industry and in other industries

$$DA_t(DAMJ, DAROA \text{ or } DACFO) = \alpha_0 + \beta_1 CARTELP_t + \beta_2 DIST_t + \beta_3 CARTELP_t \times DIST_t + \beta_4 LOSS_t + \beta_5 TA_{t-1} + \beta_6 SIZE_t + \beta_7 LEV_t + \beta_8 GROWTH_t + \beta_9 BIG4_t + \sum IND_t + \sum YEAR_t + \epsilon_t$$

		(-3~+3)period (n=1004)			(-2~+2)period (n=673)			(-1~+1)period (n=336)		
Variables	**EXP.**	**DAMJ**	**DAROA**	**DACFO**	**DAMJ**	**DAROA**	**DACFO**	**DAMJ**	**DAROA**	**DACFO**
$CARTELP_t$	(-)	-0.025***	-0.026***	-0.013*	-0.025**	-0.024**	-0.013*	-0.017	0.011	-0.016*
		(-2.86)	(-3.29)	(-1.86)	(-2.48)	(-2.57)	(-1.65)	(-1.47)	(-0.95)	(-1.74)
$DIST_t$	(-)	-0.080**	-0.085**	-0.058**	-0.089*	-0.096**	-0.067*	-0.095	-0.107	-0.102
		(-2.24)	(-2.57)	(-2.02)	(-1.81)	(-2.07)	(-1.73)	(-1.15)	(-1.30)	(-1.56)
$CARTELP_t$ X $DIST_t$	(-)	-0.011	-0.023	-0.013	-0.011	-0.018	-0.01	-0.033	-0.046	0.001
		(-0.52)	(-1.16)	(-0.78)	(-0.41)	(-0.70)	(-0.48)	(-1.03)	(-1.45)	(0.03)
$LOSS_t$	(-)	-0.038***	0.015*	-0.067***	-0.038***	0.014	-0.068***	-0.004	0.047***	-0.047***
		(-4.25)	(1.84)	(-9.41)	(-3.45)	(1.35)	(-7.90)	(-0.26)	(3.42)	(-4.32)
TA_{t-1}	(-)	0.119***	0.169***	-0.009	0.129***	0.164***	0.011	0.072	0.107**	0.001
		(3.30)	(5.11)	(-0.33)	(2.95)	(4.00)	(0.33)	(1.41)	(2.07)	(0.00)
$SIZE_t$	(-)	-0.009***	-0.006***	-0.011***	-0.009***	-0.007**	-0.012***	-0.006	-0.004	-0.008**
		(-3.64)	(-2.59)	(-5.27)	(-2.93)	(-2.19)	(-4.76)	(-1.49)	(-1.08)	(-2.40)
LEV_t	(-)/(+)	-0.039**	0.018	-0.076***	-0.031	0.022	-0.062***	-0.075***	-0.019	-0.094***
		(-2.28)	(1.15)	(-5.64)	(-1.49)	(1.12)	(-3.74)	(-2.87)	(-0.71)	(-4.58)
$GROWTH_t$	(+)	-0.021***	-0.014***	-0.020***	0.005	0.01	0.002	0.065***	0.066***	0.024
		(-5.34)	(-3.76)	(-6.45)	(0.36)	(0.74)	(0.19)	(2.73)	(2.76)	(1.27)
$BIG4_t$	(-)	0.017	0.019**	0.024***	0.019	0.023**	0.03***	0.007	0.013	0.018
		1.64	(1.98)	(2.94)	(1.55)	(1.97)	(3.01)	(0.43)	(0.81)	(1.45)
IND_t		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$YEAR_t$		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj, R^2		0.143	0.200	0.278	0.068	0.150	0.212	0.118	0.167	0.255

5.2. Comparisons of discretionary accruals between cartel and non-cartel firms

The fact that cartel firms show lower discretionary accruals during the cartel period than before may be caused

by other factors than downward earnings management. The price cartels mostly occur when the prices of major cost factors such as raw materials, exchange rate, labor, or energy increase. Changes in cost structure, market situation, or macro-economic environment may result in decreases of discretionary accruals not caused by managers' earnings management. One of the way of controlling this possibility is to compare discretionary accruals between cartel and non-cartel firms during the cartel period and to find whether discretionary accruals are lower in cartel firms than in non-cartel firms.

Table 7 presents the results of multi-variate regressions testing whether discretionary accruals are lower in cartel firms during the cartel period. The coefficient estimate of *CARTELF* captures average difference of discretionary accruals in cartel firms compared to non-cartel firms. *CARTELF* is a dummy variable with 1 if a firm is in a price cartel during the cartel period and 0 if it is not participating in the cartel. Panel A is the results of regressions for all cartel firms. The coefficient estimate of the interest variable, *CARTELF*, for three year (+1 to +3) sample is -0.025 for the dependent variable *DAMJ*, -0.030 for *DAROA*, and -0.017 for *DACOF*, all negative and statistically significant at 5%, 1%, and 5% level each. The same estimates for the two year (+1 to +2) sample have similar values (-0.025, -0.029, -0.015) but levels of statistical significance are lower (10%, 5%, insignificant). The coefficient estimates of the one year (+1) sample are all negative (-0.018, -0.020, -0.016), but none of them are statistically significant.

Panel B is the regression results for distribution industry sub-sample, that is, cartel firms and non-cartel firms in distribution industry. All coefficient estimates of *CARTELF* are negative for three year (-0.053, -0.059, -0.032), two year (-0.056, -0.060, -0.030), and one year samples (-0.072, -0.075, -0.038). The coefficient estimates show significance at 5% and below level for dependent variables *DAMJ* and *DAROA* and at 10% and below level for *DACFO*. The magnitude of coefficient is bigger and significance level is higher in distribution sub-sample than in full sample. To test whether these differences are statistically significant, we perform additional regression analysis by including distribution industry dummy variable *DIST* and the interaction term, *CARTELF x DIST*, in model (5).

Table 7: Regression results of comparison between cartel and non-cartel firms

Panel A: Full sample

$$DA_t(DAMJ, DAROA \text{ or } DACFO) = \alpha_0 + \beta_1 CARTELF_t + \beta_2 LOSS_t + \beta_3 TA_{t-1} + \beta_4 SIZE_t + \beta_5 LEV_t + \beta_6 GROWTH_t + \beta_7 BIG4_t + \sum IND_t + \sum YEAR_t + \epsilon_t$$

		(+1~+3)period (n=26,531)			(+1~+2)period (n=17,472)			(+1)period (n=8,492)		
Variables	**EXP.**	***DAMJ***	***DAROA***	***DACFO***	***DAMJ***	***DAROA***	***DACFO***	***DAMJ***	***DAROA***	***DACFO***
$CARTELF_t$	(-)	-0.025**	-0.030***	-0.017**	-0.025*	-0.029**	-0.015	-0.018	-0.020	-0.016
		(-2.31)	(-3.09)	(-2.23)	(-1.90)	(-2.48)	(-1.58)	(-0.98)	(-1.19)	(-1.23)
$LOSS_t$	(-)	-0.050***	0.001***	-0.101***	-0.0506***	0.0100***	-0.101***	-0.0472***	0.0150***	-0.0992***
		(-18.45)	(4.01)	(-52.79)	(-15.33)	(3.34)	(-42.46)	(-10.10)	(3.53)	(-29.36)
TA_{t-1}	(-)	0.017***	0.010	-0.006	0.004	-0.001	-0.009	0.001	0.004	-0.015*
		(2.68)	(1.64)	(-1.38)	(0.48)	(-0.03)	(-1.52)	(0.01)	(0.38)	(-1.74)
$SIZE_t$	(-)	-0.008***	0.001	-0.004***	-0.008***	0.001	-0.004***	-0.010***	0.001	-0.005***
		(-7.56)	(0.84)	(-4.85)	(-6.81)	(1.21)	(-4.05)	(-5.54)	(0.77)	(-3.60)
LEV_t	(-)/(+)	-0.069***	-0.035***	-0.093***	-0.070***	-0.034***	-0.094***	-0.070***	-0.034***	-0.093***
		(-22.01)	(-12.19)	(-41.82)	(-18.22)	(-9.81)	(-34.07)	(-12.88)	(-6.86)	(-23.70)
$GROWTH_t$	(+)	0.099***	0.072***	0.050***	0.105***	0.076***	0.055***	0.119***	0.087***	0.067***
		(33.57)	(26.95)	(23.63)	(28.52)	(22.70)	(21.05)	(22.35)	(18.00)	(17.45)
$BIG4_t$	(-)	0.022***	0.013***	0.030***	0.023***	0.011**	0.034***	0.040***	0.022***	0.050***
		(5.02)	(3.29)	(9.42)	(4.31)	(2.32)	(8.65)	(4.85)	(2.91)	(8.48)
IND_t		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$YEAR_t$		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj, R^2		0.115	0.055	0.274	0.118	0.059	0.273	0.132	0.07	0.283

Panel B: Sub-sample of distribution industry

$$DA_t(DAMJ, DAROA \text{ or } DACFO) = \alpha_0 + \beta_1 CARTELF_t + \beta_2 LOSS_t + \beta_3 TA_{t-1} + \beta_4 SIZE_t + \beta_5 LEV_t + \beta_6 GROWTH_t + \beta_7 BIG4_t + \sum IND_t + \sum YEAR_t + \epsilon_t$$

		(+1~+3)period (n=2,654)			(+1~+2)period (n=2,194)			(+1)period (n=1,071)		
Variables	**EXP.**	***DAMJ***	***DAROA***	***DACFO***	***DAMJ***	***DAROA***	***DACFO***	***DAMJ***	***DAROA***	***DACFO***
$CARTELF_t$	(-)	-0.053**	-0.059***	-0.032**	-0.056**	-0.060**	-0.030*	-0.072**	-0.075**	-0.038*
		(-2.41)	(-2.85)	(-2.38)	(-2.22)	(-2.55)	(-1.90)	(-2.05)	(-2.30)	(-1.71)
$LOSS_t$	(-)	-0.052***	-0.013**	-0.106***	-0.052***	-0.010	-0.107***	-0.064***	-0.017*	-0.119***
		(-7.53)	(-1.96)	(-25.05)	(-6.87)	(-1.46)	(-23.04)	(-6.01)	(-1.73)	(-17.92)
TA_{t-1}	(-)	0.095***	0.087***	0.029**	0.079***	0.075***	0.029**	0.116***	0.114***	0.046**
		(4.60)	(4.48)	(2.30)	(3.34)	(3.41)	(1.99)	(3.37)	(3.58)	(2.15)
$SIZE_t$	(-)	-0.006***	-0.010***	0.001	-0.003	-0.006**	0.003*	0.002	-0.001	0.007***
		(-2.63)	(-4.46)	(0.44)	(-1.22)	(-2.27)	(1.95)	(0.57)	(-0.26)	(-3.11)
LEV_t	(-)/(+)	-0.059***	-0.029***	-0.077***	-0.060***	-0.027***	-0.075***	-0.034***	-0.007	-0.056***
		(-7.37)	(-3.86)	(-15.75)	(-6.90)	(-3.37)	(-14.04)	(-2.88)	(-0.63)	(-7.46)
$GROWTH_t$	(+)	0.027***	0.027***	0.010**	0.021**	0.019**	0.003	0.048***	0.045***	0.008
		(3.45)	(3.58)	(2.11)	(2.43)	(2.37)	(0.49)	(3.98)	(4.04)	(1.00)
$BIG4_t$	(-)	-0.035***	-0.025**	-0.001	-0.036***	-0.029***	-0.002	-0.086***	-0.057**	-0.041**
		(-3.17)	(-2.34)	(-0.18)	(-3.06)	(-2.61)	(-0.24)	(-2.88)	(-2.09)	(-2.17)
IND_t		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$YEAR_t$		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj, R^2		0.092	0.041	0.383	0.088	0.030	0.386	0.098	0.041	0.373

Panel C: Comparison between distribution industry and other industries

$$DA_t(DAMJ, DAROA \text{ or } DACFO) = \alpha_0 + \beta_1 CARTELF_t + \beta_2 DIST_t + \beta_3 CARTELF_t \times DIST_t + \beta_4 LOSS_t + \beta_5 TA_{t-1} + \beta_6 SIZE_t + \beta_7 LEV_t + \beta_8 GROWTH_t + \beta_9 BIG4_t + \sum IND_t + \sum YEAR_t + \epsilon_t$$

		(-3~+3)period (n=26,531)			(-2~+2)period (n=17,472)			(-1~+1)period (n=8,492)		
Variables	**EXP.**	***DAMJ***	***DAROA***	***DACFO***	***DAMJ***	***DAROA***	***DACFO***	***DAMJ***	***DAROA***	***DACFO***
$CARTELF_t$	(-)	-0.019	-0.023**	-0.015*	-0.018	-0.022*	-0.012	-0.006	-0.007	-0.012
		(-1.63)	(-2.17)	(-1.72)	(-1.23)	(-1.66)	(-1.13)	(-0.29)	(-0.37)	-0.81
$DIST_t$	(-)	0.068***	0.076***	0.027**	0.026	0.029	0.013	0.046***	0.046***	0.021
		(3.49)	(4.32)	(1.98)	(1.01)	(1.23)	(0.70)	(3.03)	(3.29)	1.89
$CARTELF_t$ X $DIST_t$	(-)	-0.035	-0.044	-0.017	-0.039	-0.042	-0.017	-0.066	-0.071	-0.024
		(-1.20)	(-1.64)	(-0.80)	(-1.16)	(-1.39)	(-0.69)	(-1.39)	(-1.64)	-0.71
$LOSS_t$	(-)	-0.050***	0.010***	-0.101***	-0.051***	0.010***	-0.101***	-0.047***	0.015***	-0.01
		(-18.44)	(4.02)	(-52.79)	(-15.33)	(3.34)	(-42.46)	(-10.09)	(3.54)	-29.36
TA_{t-1}	(-)	0.017***	0.010*	-0.006	0.004	-0.0003	-0.009	0.001	0.004	-0.015
		(2.68)	(1.65)	(-1.38)	(0.47)	(-0.04)	(-1.53)	(0.01)	(0.38)	-1.74
$SIZE_t$	(-)	-0.008***	0.001	-0.003***	-0.008***	0.001	-0.004***	-0.01***	0.001	-0.005
		(-7.58)	(0.80)	(-4.87)	(-6.84)	(1.17)	(-4.07)	(-5.58)	0.71	-3.62
LEV_t	(-)/(+)	-0.069***	-0.035***	-0.093***	-0.070***	-0.034***	-0.094***	-0.070***	-0.034	-0.093
		(-22.01)	(-12.20)	(-41.82)	(-18.22)	(-9.82)	(-34.08)	(-12.88)	-6.86	-23.70
$GROWTH_t$	(+)	0.100***	0.072***	0.050***	0.105***	0.076***	0.055***	0.119***	0.088	0.067
		(33.58)	(26.96)	(23.64)	(28.53)	(22.72)	(21.06)	(22.37)	18.02	17.46
$BIG4_t$	(-)	0.022***	0.013***	0.030***	0.023***	0.011**	0.033***	0.039***	0.021	0.05
		(5.00)	(3.25)	(9.40)	(4.29)	(2.28)	(8.63)	(4.82)	2.88	8.47
IND_t		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$YEAR_t$		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj, R^2		0.115	0.055	0.274	0.118	0.059	0.273	0.132	0.070	0.283

6. Conclusion

6.1. Summary

This study performs empirical tests whether there exists opportunistic behavior of price cartel firms in preparation for possible penalty surcharges by KFTC resulting from investigations into the price cartel. Price cartel firms possess the incentive to report lower net income in preparation of being judged for a violation of MRFTC. We investigate whether cartel firms reveal downward earnings management and whether distribution industry shows any difference in the earnings management.

A sample of 274 firms participated in 64 cartels during 2011-2016 are selected, and among these 25 firms are from distribution industry. Multi-variate regression analyses are performed to verify whether discretionary accruals are decreased during cartel periods compared to pre-cartel periods and non-cartel firms. Discretionary accruals are estimated using three different models; modified Jones' model (Dechaw et al., 1995), performance adjusted modified Jones' model (Kothari et al., 2005), and cash flow adjusted modified Jones' model (Rees et al., 1996). Three windows of pre- and post-cartel periods are employed, three years, two years and one year, to reduce the effect of noise from various durations of cartels and to secure the robustness of empirical tests.

Empirical results support that cartel firms manage discretionary accruals downward during cartel periods in order to report lower net income. Discretionary accruals of cartel firms are lower during cartel periods than in pre-cartel periods. The coefficient estimates of the dummy variable representing cartel period are all negative and statistically significant in three different estimation models and three different sample windows except a one year window using *DAROA* model. The downward management of earnings by cartel firms during the cartel period is pervasive in both distribution industry and other industries, and cartel firms in distribution industry do not show differences compared to those in other industries.

Changes in cost structure, market situation, or macro-economic environment around the price cartel period may cause decrease in discretionary accruals instead of managers' earnings management. To control for these factors, we also compare discretionary accruals during the cartel period between cartel and non-cartel firms. The result is consistent with downward earnings management; that is, cartel firms report lower earnings than non-cartel firms by reducing discretionary accruals. No difference is identified between distribution industry and other industries in the downward management of earnings.

6.2. Implications

This research contributes to the related research by generalizing the downward management of earnings by price cartel firms; not confined to a specific industry and small number of firms but expanding to 274 firms in 41 industries. In research design we compare not only the pre- and post-cartel periods but also cartel and non-cartel firms during the cartel period to control for the effect on the estimation of discretionary accruals of plausible changes in the cost structure, market situation, and macro-economic environment. Three different models for discretionary accrual estimation and three different period windows are employed in the empirical tests to mitigate bias from the estimation model and to secure robustness in testing. In this way the current research provides a comprehensive framework for research on earnings management of price cartel firms. It also provides an evidence that cartel firms in distribution industry are not different from those in other industries in the earnings management.

The results of the study contribute to the practice of fair trading regulation in a couple of ways. When KFTC makes a decision on the amount of surcharge, it would have to consider that cartel firms' monopolistic profits are under-estimated and thus have to recalculate earnings before manipulation. The results of this study also reinforce the reasoning of KFTC's surcharge calculation, which is initially based on cartel-related sales instead of profits.

References

Cahan, S. (1992). The effect of antitrust investigation on discretionary accruals: A refined test of political-cost hypothesis. *The Accounting Review, 67*(1), 77-95.

Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1995). Detecting earnings management. *Accounting Review, 70*(2), 193-225.

Gill-de-Albornoz, B., & Illueca, M. (2005). Earnings management under price regulation: Empirical evidence from Spanish electricity industry. *Energy Economics, 27*(2), 279-304.

Jones, J. (1991). Earnings management during import relief investigation. *Journal of Accounting Research, 29*(2), 193-228.

Key, K. G. (1997). Political cost incentives for earnings management in the cables television industry. *Journal of Accounting and Economics, 23*(3), 309-337.

Korea Fair Trading Commission. (2011-2016). *Committee Resolutions.*

Korea Fair Trading Commission. (2017). *Enforcement Decree of Monopoly Regulation and Fair Trade Act.*

Korea Fair Trading Commission. (2016). *Statictical Yearbook_2015.*

Kothari, S. P., Leone, A. J., & Wasley, C. E. (2005). Performance-matched discretionary accrual measures. *Journal of Accounting and Economics, 39*(1), 163-197.

Navissi, F. (1999). Earnings management under price regulation. C*ontemporary Accounting Research, 16*(2), 281-304

Rees, L., Gill, S., & Gore, R. (1996). An investigation of asset write-downs and concurrent abnormal accruals. *Journal of Accounting Research, 34*(3), 157-169.

Thomas, J., & Tung, S. (1992). Cost manipulation incentives under cost reimbursement: Pension costs for defense contracts. *Accounting Review, 67*(4), 691-711.

Watts, R., & Zimmerman, J. (1978). Toward a positive theory of the determination of accounting standards. *The Accounting Review, 53*(1), 112-134.

Watts, R., & Zimmerman, J. (1986). *Positive Accounting Theory.* Englewood Cliffs, NJ: Prentice Hall.

Zang, A. (2012). Evidence on the trade-off between real activities manipulation and accrual-based earnings management. *The Accounting Review, 87*(2), 675-703.