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## Article

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## Labor Union and Real Earnings Management

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### ABSTRACT

This study examines the effect of labor union on the extent of real earnings management using 3,375 firm-year observations of listed Korean firms over 2002–2008. The empirical results suggest that labor unionization rate is positively associated with real earnings management and the absolute value of each real earnings management proxy. Further, these empirical results are more pronounced in non-chaebol firms. The additional robustness tests using union existence as a supplementary proxy of labor union strength and 2SLS regression supports above findings. Thus, we conclude that labor unions push managers to increase real earnings management to create a favorable negotiation environment for wage maximization and hired managers collude with labor union to receive cash-based bonus incentive.

*Keywords: Labor union strength, Negotiation, Real earnings management, Wage maximization*

## 1. Introduction

This study examines whether labor unions affect the extent of real earnings management (EM) on the Korean market. More specifically this paper uses labor unionization rate and existence as labor union strength and abnormal operating cash flow, abnormal production costs, and abnormal discretionary expenses as real EM proxies. In addition, this study examines the potential difference in the effect when a labor union belongs to chaebol or non-chaebol groups.

Real EM is “management actions that deviate from

normal business practices, undertaken with the primary objective of meeting certain earnings thresholds” (Roychowdhury 2006). Prior research on real EM suggests that managers actually use real EM methods to manipulate earnings (e.g., Roychowdhury 2006) and that real EM has negative effects on firms’ long-term profitability or cost of equity capital (e.g., Cohen and Zarowin 2010; Graham, Harvey, and Rajgopal 2005; Kim and Sohn 2013). In particular, Cohen, Dey, and Lys (2008) suggest that managers have begun to substitute EM based on discretionary accrual EM with real EM since the enforcement of these accounting regulations. Thus, after the passage of the Sarbanes-Oxley act (SOX), managers began to substitute accrual EM with real EM due to the increasing litigation costs of accrual EM.

Labor unions in Korea are regulated and can change via labor laws and regulations. Medoff (1979) suggests

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that labor unions encourage shirking, increase bargaining for wages above the equilibrium level, and lead to lower employee productivity due to strike action. A number of U.S. based labor union studies advocate that unions are counterproductive to firms because these rent-seeking agents constrain managers to making sub-optimal choices (Chen, Kacperczyk, and Ortiz-Molina 2011; Chyz *et al.* 2013; He, Tian, and Yang 2014). Chen, Kacperczyk, and Ortiz-Molina (2011) especially suggest that labor unions can lower operating flexibility, which can increase firms' cost of equity capital. Thus, firms with labor unions suffer higher bid-ask spreads and lower analyst followings (Hilary 2006), produce less valuable R&D investments, and hinder innovation (Bradley, Kim, and Tian 2016). On the contrary, some labor union studies argue that labor unions could monitor the manager as the internal monitoring mechanism in Korea (Park, Ha, and Choi 2016). In this paper, we focus on the negative role of labor unions which would be closely related to rent-seeking behavior and misaligned incentive behavior. We expect that in line with labor unions' rent seeking behavior and the aim to create a favorable wage negotiation atmosphere, labor unions might encourage managers to increase opportunistic real EM. Further, we divided our sample into two groups: chaebol and non-chaebol firms. Chaebol firms have pyramidal ownership structures and the owner-managers of chaebol-affiliated groups hold the ultimate power in their firms (Kim 2015). Thus, a labor union could have an effect on non-chaebol group firms especially because we expect that labor unions will have limited influence on the owner manager. We therefore posit that labor unions have effective and significant strength to influence real EM only on non-chaebol groups.

This paper has several advantages over the voluminous labor union studies in the U.S. Korea has firm-year labor union data available, and thus we can use more accurate and valuable labor union data using comprehensive Korean firm-year hand-collected data. Hence, we use firm-year labor unionization rates and labor union existence as a proxy for labor union strength in a firm. Furthermore, and more importantly, labor unions play a significant role as a non-financial

stakeholder in Korea (Cho *et al.* 2016; Chung *et al.* 2016). In addition, chaebol and non-chaebol groups have several differences in terms of labor union strength or influence in the group. This examination is possible only in Korea.

This study uses 3,375 firm-year observations for firms listed on the KOSPI<sup>1)</sup> for the period 2002–2008. The empirical result suggests that labor unionization rate is positively associated with real EM. Thus, labor unions' rent-seeking behavior could directly affect managers' opportunistic behavior, which would remain consistent in the absolute value of each real EM proxy as well as the income increasing and decreasing real EM proxy. We can thus conjecture that labor unions entice managers to commit opportunistic real EM due to their wage maximization negotiations via higher reported earnings. Further, in terms of the chaebol and non-chaebol groups, our positive empirical result is only consistent for the non-chaebol group. We also conduct several robustness tests using labor union existence as a supplementary proxy for our labor union strength. Labor union existence is positively associated with real EM and the absolute value of real EM, indicating that labor unions can affect real EM and even increase it. Endogeneity is one potential concern in our study. Finally, we conduct a 2SLS regression, and our empirical result is consistent for both the full and non-chaebol only samples. The results from the 2SLS regression suggest that our ordinary least squares (OLS) regression result is valid.

This paper offers several contributions to the accounting and finance literature. First, as far as we know, this is the first attempt to show the relationship between labor union strength and managers' real EM empirically. Thus, Korean labor unions push managers to use real EM because upward real EM would increase future wages. Also mostly hired managers collude with labor union to boost reported earnings for the cash-based incentive system for their own sake. This paper differs from and complements prior studies on the impact of labor unions on investment

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1) The analysis focuses on the KOSPI market because this market is more concentrated on manufacturing firms, and our topic is more focused on labor unions and their consequences for real EM.

efficiency (Cho *et al.* 2016) by focusing on real EM. Second, this paper suggests that labor union strength relative to the firm and its managers differs for chaebol and non-chaebol firms. In Korea, a chaebol is a unique characteristic of the business environment, in which the owner-manager can use their ultimate power to protect minority shareholders. Thus, labor unions have effective strength only in non-chaebol firms, which could suggest supplementary findings for existing studies. Third, this paper has the advantage of using a firm-year labor union strength proxy. U.S. labor union data contains only industry-level data, in contrast to this study, which can provide a more valid empirical result. The remainder of the paper proceeds as follows. Section 2 summarizes the prior research and develops hypotheses. Section 3 describes the sample and data and presents the research design. Section 4 reports the results of the main analysis of the impact of labor union on the extent of real EM and the cross-sectional analyses. Section 5 concludes.

## II. Literature Review and Hypothesis Development

### A. Real EM

Graham, Harvey, and Rajgopal (2005) show that about 80% of the managers reduce R&D expenses or postpone important investment or capital expenditures to meet or beat market benchmarks, such as analyst earnings forecasts, or to avoid losses. In addition, after the SOX implementation, the number of discretionary accruals has decreased (Boylan 2015), but managers use real EM as a supplementary tool to manage earnings, thus accrual EM. Similarly, Zang (2012) shows that managers use real EM when they perceive a high possibility of litigation cost. Cohen, Dey, and Lys (2008) find that the extent of real EM is higher in the post-SOX period than in the pre-SOX period. Francis, Hansan, and Li. (2016) show that real EM increases with country-level

legal strength using cross-country data and suggest that the legal environment plays a crucial role in firms' preference to use real EM.

Roychowdhury (2006) documents the existence of real EM in firms that meet or just beat earnings benchmarks using an empirical model to capture managers' opportunistic real EM. Further studies show the economic consequences of real EM through its negative association with the implied cost of equity capital than accrual EM (Kim and Sohn 2013) and the negative effect of real EM on future operating performance than accrual EM because real EM can distort optimal resource allocation (Gunny 2005). Cohen and Zarowin (2010) find that firms engaging in real EM prior to seasoned equity offerings have poorer future operating performance.

### B. Labor unions

Labor unions aim to protect unionized workers' benefits, rights and job security, they should also perform a monitoring role to increase firms' long-term sustainability. Recent studies have started to pay attention to this aspect. Jensen and Meckling (1976) suggest that labor unions could be an important non-stakeholder group that directly affects managers' decisions. Farber *et al.* (2010) and Leung *et al.* (2010) discuss that unionized firms are associated with higher accounting conservatism. Accounting conservatism has stricter standards to verify good economic gains and requires recognizing all possible losses in time, which can be used to monitor management behaviors and reduce agency costs (Watts, 2003). Positive role of labor union is limited because labor union is stakeholder to maximize their economic benefit. However, most studies of labor unions find that they are rent-seeking and bargaining agents that siphon firms' resources in exchange for union benefits. Grout (1984) and Malcomson (1997) implicitly assume that unionized firms underinvest due to the holdup problem. Connolly, Hirsch, and Hirschey (1986) suggest that intangible R&D investment in unionized firms adds less to market value than that in non-

unionized firms. Bronars and Deere (1991) show that unionized firms are more likely to use financial leverage because it allows them to shield their cash flows from labor union demands. Chen, Kacperczyk, and Ortiz-Molina (2011) find that the cost of equity capital is significantly higher for firms in more unionized industries, even after controlling for several industry and firm characteristics. These findings therefore suggest that labor unions increase firms' cost of equity capital by decreasing their operating flexibility. The labor union literature suggests that labor unions make wages more sticky and layoffs more costly, which makes firms more likely to decrease operating flexibility (Chen, Kacperczyk, and Ortiz-Molina 2011; Chung *et al.* 2016).

He, Tian, and Yang (2014) find that unionized firms pay less dividends and buy back fewer shares due to the increased operating risk. Lee and Mas (2012) suggest that unionization destroys shareholder wealth, leading to negative abnormal returns over the long term. Chyz *et al.* (2013) find that more unionized firms are less likely to engage in aggressive tax strategies due to unions' rent seeking behavior, and propose that the market expects these reductions around union elections and discounts firms, which likely adds shareholder value via aggressive tax strategies. Bradley, Kim, and Tian (2016) show that union elections result in an 8.7% (12.5%) decline in patent quantity (quality) three years post-election. An important point is that unionized firms reduce R&D expenditures and have lower productivity. Bradley, Kim, and Tian (2016) refer to this potential consequence as the misaligned incentives hypothesis. Unionization may create misaligned incentives among employees and impede firm innovation. This line of labor union research suggests that labor unions can influence managers to make sub-optimal decisions, and labor union strength could destroy firm value, increase the cost of equity capital (Chen, Kacperczyk, and Ortiz-Molina 2011), or even reduce innovation (Bradley, Kim, and Tian 2016). In the U.S., there is relatively scarce empirical evidence concerning labor unions because no comprehensive firm-level measure of the unionization rate is yet available

(Chung *et al.* 2016). In contrast, Korean listed firms are required to report the number of labor union workers in their annual reports, from which we can retrieve a comprehensive firm-level unionization rate for each firm in a given year.

## C. Hypothesis Development

The labor union literature suggests that labor unions engage in rent-seeking behavior and support the misaligned incentive hypothesis (Bradley, Kim, and Tian 2016; Chen, Kacperczyk, and Ortiz-Molina 2011; Chyz *et al.* 2013; He, Tian, and Yang 2014). There is some positive role of labor union paper exits, however there might be limited evidence especially in Korea. In line with labor unions' rent-seeking behavior, we expect that labor unions boost managers' opportunistic use of real EM to report higher earnings. We posit that unionized firms are more likely to pursue wage maximization than they push managers to use real EM to increase reported earnings for a favorable atmosphere to negotiate wage increases or improvements to work conditions. Typical labor negotiations in Korea take the form of collective bargaining covering all topics, including wages, improvements to work conditions, and compensation packages (Chung *et al.* 2016).<sup>2)</sup> The most important thing for labor unions is that they wish to maximize their wages beyond their equilibrium level and higher reported earnings would be one important determinant in their aggressive wage negotiation. Once the management and union sign the labor contract, it is not generally subject to renegotiation. Thus, creating an environment that favors labor unions in negotiations require that they increase managers' use of real EM. Labor unions push managers to conduct real EM rather than accrual EM to increase reported earnings is that real EM is hard to distinguish from ordinary

2) Recent labor unions try to analyze firm' earnings and they make their own strategy when is the most good time to raise their wage maximization. Also in the process of negotiation, manager and labor union negotiate next year wage by current or following firm' earnings. So labor union membership collects financial data for the better negotiation condition.

firm strategic behavior (Cohen, Dey, and Lys 2008) and real EM does not violate current regulations or laws (Cohen and Zarowin 2010; Francis, Hansan, and Li. 2016).

Thus, if labor unions perceive that real EM is safer tool to increase reported earnings, then they push managers to use real EM. Additionally, most hired managers' incentive systems also linked to high reported earnings, so they will cooperate and aim to fulfill this labor union requirement. For example, incentive method is classified into two categories; cash-based bonus, stock-based bonus (Holmstrom 1979), then most of incentive method toward hired managers is cash-based bonus because in Korea stock-based bonus brings serious social problem. Hired managers in Korea receive cash-based bonus when managers meet or beat target reported earnings. As a result, most of cash-based bonus would be closely linked in financial performance within hired manager's tenure. So manager and labor union might collude to boost reported earnings by using real EM to satisfy their own self-interest. However it might be the open empirical question whether labor union effectively affect on manager's financial decision and also manager collude with labor union. If manager is colluded with labor union to upward real EM, then labor union strength is positively associated with real EM. To the contrary, if manager is not collude with labor union or labor union strength is not enough to powerfully influence to manager then labor union might be not associated with real EM. Also there is some possibility that owner manager do not need to boost real EM to higher reported earnings because owner manager do not want to share their economic benefit with labor union. Additionally, to the best of our knowledge, there is no existing empirical study using firm-year data for labor unions and real EM due to data unavailability in the U.S. Study. Therefore, first hypotheses are as follows:

**HI)** Labor union is associated with real EM.

Further, we divide our sample into two group; chaebol firms and non-chaebol firms. We posit that owner manager of the firm hardly use real EM to

boost reported earnings according to labor union strength. Because prior papers related to real EM shows that real EM has bad economic consequences to the firm in the long run (Cohen and Zarowin 2010; Sohn and Kim 2013). So chaebol firms, they are mostly owner manager of the firm, scarcely use real EM even though labor union strongly require it. We thus posit that labor unions' strength to influence real EM is only effective in non-chaebol firms. On average, owner-managers of a chaebol group use their excessive rights to control entire group, which then weakens labor unions' strength or negotiating power compared to that in non-chaebol firms (which we call independent firms). On the contrary, non-chaebol firms, might use real EM to boost reported earnings by labor union strength. We therefore expect that the positive association between labor union strength and real EM would be more pronounced in non-chaebol firms. Thus our second hypothesis as follows:

**H2)** *Ceteris paribus*, the positive association between labor union and real EM is more pronounced in non-chaebol firms.

### III. RESEARCH METHODOLOGY

#### A. Real EM Estimation Model

In this study, following the prior studies such as Roychowdhury (2006), Cohen and Zarowin (2010), the magnitude of the real EM that managers want to adjust the reported earnings through abnormal business decisions is divided into three categories: sales, production, and expenses. The abnormal operating cash flow can be estimated as the residual after subtracting the normal operating cash flow from sales and sales changes in the following equation (1) and subtracting it from the actual operating cash flow. The abnormal operating cash flow of negative (-) means upward real EM, and positive (+) abnormal operating cash flow means downward real EM. We use equations (2) and (3) to estimate the magnitude

of real EM through production adjustments, the normal cost of goods, and an increase in inventory assets that constitute the manufacturing cost. We then estimate the normal manufacturing cost by adding the normal cost of goods sold and the increase in inventories estimated in equations (2) and (3), and substituting equation (4) for the normal production cost. The residual of equation (4), which is the difference between the actual production cost and the normal production cost estimated from equation (4), can be used as a proxy for the scale of real EM through production adjustment. To estimate these abnormal discretionary expenses, we estimate the normal cost of discretionary expenses using equation (5), assuming that the cost items that the manager can arbitrarily adjust are linear with the previous year's sales. We then estimate the extent of real earnings management through abnormal discretionary expenses by subtracting the normal discretionary expenses from the actual discretionary expenses. In this paper, we analyze the abnormal operating cash flow and the abnormal discretionary expense by multiplying (-1) for the convenience of interpretation.

$$\frac{CFO_{it}}{Assets_{i,t-1}} = k_{1t} \frac{1}{Assets_{i,t-1}} + k_{2t} \frac{Sales_{it}}{Assets_{i,t-1}} + k_{3t} \frac{\Delta Sales_{it}}{Assets_{i,t-1}} + \varepsilon_{it} \quad (1)$$

where, *CFO* is operating cash flow, *Sales* is sales, and *Assets* means total assets.

$$\frac{COGS_{it}}{Assets_{i,t-1}} = k_{1t} \frac{1}{Assets_{i,t-1}} + k_{2t} \frac{Sales_{it}}{Assets_{i,t-1}} + \varepsilon_{it} \quad (2)$$

$$\frac{COGS_{it}}{Assets_{i,t-1}} = k_{1t} \frac{1}{Assets_{i,t-1}} + k_{2t} \frac{Sales_{it}}{Assets_{i,t-1}} + \varepsilon_{it} \quad (3)$$

where, *COGS* is the cost of goods sold and *INV* is the inventory.

$$\frac{Prod_{it}}{Assets_{i,t-1}} = k_{1t} \frac{1}{Assets_{i,t-1}} + k_{2t} \frac{Sales_{it}}{Assets_{i,t-1}} + k_{3t} \frac{\Delta Sales_{it}}{Assets_{i,t-1}} + k_{4t} \frac{\Delta Sales_{it-1}}{Assets_{i,t-1}} + \varepsilon_{it} \quad (4)$$

where, *Prod* is the cost of production, and it means the sum of the normal COGS estimate of Equation (2) and the normalized inventory change estimate of Equation (3).

$$\frac{DiscExp_{it}}{Assets_{i,t-1}} = k_{1t} \frac{1}{Assets_{i,t-1}} + k_{2t} \frac{Sales_{it-1}}{Assets_{i,t-1}} + \varepsilon_{it} \quad (5)$$

where, *DiscExp* means discretionary expense, which is calculated as compound welfare cost + (general administrative expenses - tax and dues - depreciation - rent cost premium) + sales expenses + (research + ordinary research + development expenses).

Also following Cohen and Zarowin (2010), we use aggregate measure of real EM which is *RM1* and *RM2*. *RM1* is the aggregate measure of real EM which is calculated by sum of *APC* and *ADE*. *RM2* is the aggregate measure of real EM which is calculated by sum of *ACFO* and *ADE* (Cohen and Zarowin, 2010).

## B. Empirical Model

We test the hypothesis using equation (6) below. The dependent variable of equation (6) is the proxy of the magnitude of real EM and the independent variable is the labor unionization rate, which is a proxy for labor union strength. We performed multiple regression analysis on equation (6).

$$\begin{aligned} ACFO_t \text{ (} APC_t \text{ or } ADE_t \text{ or } RMI_t \text{ or } RM2_t) \\ = \beta_0 + \beta_1 RATE1(RATE2)_t + \beta_2 LNSIZE_t \\ + \beta_3 LEV_t + \beta_4 MB_t + \beta_5 ROA_t + \beta_6 LOSS_t \\ + \beta_7 NUMEST_t + \beta_8 CHAEBOL_t + \beta_9 PMDA_t \\ + \text{Firm \& Year Fixed Effects} + \varepsilon \end{aligned} \quad (6)$$

where *ACFO* is the level of abnormal cash flow from operations, which is the residual from equation (1) multiplied by (-1). *APC* is the level of abnormal production cost, which is the residual from equation (4). *ADE* is the level of abnormal discretionary expense, which is the residual from equation (5) multiplied by (-1). *RMI* is the aggregate measure of real EM calculated as the sum of *APC* and *ADE*. *RM2* is the

aggregate measure of real EM calculated as the sum of *ACFO* and *ADE* (Cohen and Zarowin 2010). *PMDA* is the level of performance matched discretionary accruals.<sup>3)</sup> *RATE1* is the unionization rate calculated as the union membership number divided by the total number of employees. *RATE2* is an indicator variable equal to 1 if the firm has a labor union and 0 otherwise. *LNSIZE* is the natural log of total assets. *LEV* is calculated as total debts divided by total assets. *MB* is the market to book ratio, a ratio of market value of equity to book value of equity. *ROA* is calculated as net income divided by total assets. *LOSS* is an indicator variable equal to 1 if the firm provides net losses and 0 otherwise. *NUMEST* represents the number of analysts covering the firm. *CHAEVOL* is indicator variable equal to 1 if the firm belongs to a top thirty business group in Korea and 0 otherwise.

If the real EM magnitude increases as labor unionization rate increases, the coefficient of *RATE1* will have a positive (+) value. To mitigate the influence of extreme values, all continuous variables are winsorized at the 1% and 99% levels. Because we use a panel data sample, in addition to the variables for individual companies, we used a fixed effect analysis to control the inherent attributes of the firm effectively.

This model includes several control variables related to real EM. *LNSIZE* has an effect on real EM according to the political cost hypothesis: as the firm size increases, the political costs increase and the incentive for managers to adjust their earnings decreases (Watts and Zimmerman 1978). We include *LEV* because the incentive to adjust earnings can change according to the firm's capital structure (Marquardt and Wiedman 2005). We use *MB* as a control variable to control for the effect of firm growth

on real EM (Cohen and Zarowin 2010). Since managers' incentive to adjust earnings can fluctuate depending on the firm's recent business performance, we control for *ROA* (Guay, Kothari, and Watts 1996). In addition, *Loss* is closely related to financial risk, which is associated with earnings management. We expect a positive association between *LOSS* and *Real EM*. We include *NUMEST* as a control variable to control for the effect of corporate governance according to previous studies of analyst coverage and real EM (Irani and Oesch 2016). Analysts play an important role in mitigating information asymmetry (Chun and Shim 2017; Shim and Ki 2017). Based on previous studies, we expect a negative association between *NUMEST* and *Real EM*. We included *CHAEVOL* as a control variable to control for the effect of corporate governance. In Korea, Chaebol firms have pyramidal ownership structures and the owner-managers of chaebol-affiliated groups retain ultimate power in the firm (Kim 2015), which would reduce the strength of the influence of a labor union on the owner-manager's economic decision making. We thus expect a negative association between *CHAEVOL* and *Real EM*. To control for the potential impact of the scale of accounting earnings adjustments on the extent of real EM, we included *PMDA* as a control variable (Cohen, Dey, and Lys 2008; Kothari, Leone, and Wasley. 2005). Finally, we included firm and year dummy variables as control variables.

### C. Sample

Our empirical analysis is based on a sample of Korean firms listed on the KOSPI from 2002 to 2008. In our sample period, all listed firms were required to report the number of union members and the number of total employees in the electronic corporate filing services of the Financial Supervisory Services (FSS, equivalent to the SEC in the U.S.). We hand-collect data to construct the firm-year level unionization rate measures (the ratio of union to total employees). In Korea, the existence of a labor union and labor unionization rate were only disclosed until 2008, after

3) We use regression analysis for each industry and year to estimate the magnitude of accruals EM and to calculate the non-discretionary accruals. We then calculate discretionary accruals by subtracting the expected non-discretionary accruals from actual accruals (Kothari et al. 2005).

TAT: total accruals during period  $t$  (net income - operating cash flow). Asset $t-1$ : Total assets at the end of  $t-1$ . DREV $t$ : Change in sales from  $t-1$  to  $t$ . DART: Changes in accounts receivable from  $t-1$  to  $t$ . PPET: tangible assets at end of year  $t$ . ROAt-1: Return on total assets during  $t-1$



which Korean firms did not mandatorily or voluntarily disclose these figures in the electronic corporate filings. The change in the labor union disclosure policy in Korea explains the sample period of 2002–2008, as in other studies related to labor unions (Chung *et al.* 2016). However, labor union data in Korea has a unique firm-year labor unionization rate, on the contrary to just industry labor unionization data in U.S.

We extract accounting data and chaebol data from the Korea Information Services Value (Kis-Value) database and Fair Trade Commission (FTC). We select companies that satisfy the following criteria (1) firms with financial statement data available from Kis-Value and labor union strength information available from the FSS, (2) fiscal year ended December 31, and (3) firms in non-financial industries. This process yields final sample of 3,375 annual firm-year observations for companies listed on the KOSPI between 2002 and 2008.

## IV. EMPIRICAL RESULTS

### A. Descriptive Statistics

Table 1 shows the sample distribution by year and distribution of main variables for the hypotheses tests. We present the observations by year in Panel

A of Table 1. Panel A of Table 1 shows that the number of observations is fairly distributed from 2002 to 2008. Panel B provides descriptive statistics for the main variables using this study. The mean (std.dev) value of the abnormal operating cash flow (*ACFO*), abnormal manufacturing cost (*APC*) and abnormal discretionary expense (*ADE*) was -0.002 (0.877), -0.007 (0.131) and -0.011 (0.117), respectively. All of these values are residual values, so the mean value of each real EM proxy is almost zero. In addition, the mean (std.dev) of *RMI* and *RM2*, which are integrated measures of real EM, are -0.017 (0.227) and -0.012 (0.156), respectively. Mean value (median) of labor unionization ratio (*RATE1*) is 0.318(0.306). Average (median) value of labor union existence (*RATE2*) is 0.682(1). So labor unionization ratio and labor union existence are similar statistics as prior paper (Chung *et al.* 2016). All other control variables such as *LNSIZE*, *LEV*, *MB*, *ROA*, *LOSS*, *NUMEST* are similar result as prior papers (Yoo, Kim, and Chun 2014). Also mean value of chaebol firm is 17.8%. In contrast, mean value of non-chaebol firm is 82.2% in our sample.

### B. Univariate Analysis

Table 2 reported Pearson's correlation coefficients among the main variables used in the empirical analysis of this study. The labor unionization rate

**Table 1.** Descriptive Statistics

This table presents the descriptive statistics for the main variables. All variables are defined in Appendix A.

Panel A: Distribution of Number of Sample across Years

Year	Number of Observations
2002	432
2003	449
2004	471
2005	486
2006	500
2007	511
2008	526
Total	3,375

Panel B: Distribution of Main Variables

Variables	N. of Obs.	Mean	Std. Dev.	1%	10%	25%	Median	75%	90%	99%
<i>ACFO</i>	3,375	-0.002	0.877	-0.258	-0.102	-0.051	-0.004	0.044	0.100	0.284
<i>APC</i>	3,375	-0.007	0.131	-0.492	-0.151	-0.066	-0.005	0.055	0.138	0.389
<i>ADE</i>	3,375	-0.011	0.117	-0.521	-0.142	-0.048	0.001	0.041	0.108	0.296
<i>RM1</i>	3,375	-0.017	0.227	-0.878	-0.272	-0.110	-0.006	0.090	0.233	0.641
<i>RM2</i>	3,375	-0.012	0.156	-0.587	-0.189	-0.086	-0.008	0.069	0.159	0.450
<i>PMDA</i>	3,375	0.001	0.105	-0.372	-0.102	-0.046	0.001	0.049	0.110	0.375
<i>RATE1</i>	3,375	0.318	0.287	0	0	0	0.306	0.584	0.717	0.855
<i>RATE2</i>	3,375	0.682	0.465	0	0	0	1	1	1	1
<i>LNSIZE</i>	3,375	26.32	1.457	23.70	24.69	25.30	26.05	27.10	28.51	30.55
<i>LEV</i>	3,375	0.451	0.195	0.082	0.184	0.303	0.456	0.593	0.699	0.929
<i>MB</i>	3,375	1.002	0.939	0.119	0.271	0.423	0.703	1.220	2.031	6.004
<i>ROA</i>	3,375	0.029	0.087	-0.416	-0.045	0.009	0.039	0.072	0.110	0.213
<i>LOSS</i>	3,375	0.178	0.383	0	0	0	0	0	1	1
<i>NUMEST</i>	3,375	1.986	4.638	0	0	0	0	1	8	21
<i>CHAEVOL</i>	3,375	0.178	0.382	0	0	0	0	0	1	1

**Table 2.** Univariate Correlations among the Key Variables

This table presents Pearson correlations among the key variables for the pooled sample. Bold text indicates the significance at 5% level or better based on two tailed test. All variables are defined in Appendix A.

Variables	<i>ACFO</i>	<i>APC</i>	<i>ADE</i>	<i>PMDA</i>	<i>RATE1</i>	<i>RATE2</i>	<i>LNSIZE</i>	<i>LEV</i>	<i>MB</i>	<i>ROA</i>	<i>LOSS</i>	<i>NUMEST</i>
<i>APC</i>	<b>0.414</b>											
<i>ADE</i>	<b>0.108</b>	<b>0.713</b>										
<i>PMDA</i>	<b>0.510</b>	<b>0.098</b>	<b>0.066</b>									
<i>RATE1</i>	<b>-0.058</b>	0.027	<b>0.040</b>	-0.023								
<i>RATE2</i>	<b>-0.037</b>	-0.021	<b>-0.055</b>	-0.021	<b>0.757</b>							
<i>LNSIZE</i>	<b>-0.234</b>	<b>-0.151</b>	<b>-0.111</b>	<b>-0.061</b>	<b>0.209</b>	<b>0.247</b>						
<i>LEV</i>	<b>0.212</b>	<b>0.149</b>	0.017	<b>-0.053</b>	<b>0.130</b>	<b>0.110</b>	<b>0.139</b>					
<i>MB</i>	-0.026	<b>-0.114</b>	<b>-0.166</b>	<b>-0.054</b>	<b>-0.152</b>	<b>-0.091</b>	<b>0.073</b>	<b>0.196</b>				
<i>ROA</i>	<b>-0.212</b>	<b>-0.251</b>	<b>-0.07</b>	<b>0.313</b>	0.023	<b>0.059</b>	<b>0.213</b>	<b>-0.310</b>	-0.033			
<i>LOSS</i>	<b>0.236</b>	<b>0.190</b>	<b>0.056</b>	<b>-0.192</b>	-0.014	<b>-0.066</b>	<b>-0.183</b>	<b>0.235</b>	<b>0.066</b>	<b>-0.699</b>		
<i>NUMEST</i>	<b>-0.208</b>	<b>-0.202</b>	<b>-0.160</b>	<b>-0.067</b>	<b>0.056</b>	<b>0.081</b>	<b>0.587</b>	-0.002	<b>0.257</b>	<b>0.186</b>	<b>-0.139</b>	
<i>CHAEVOL</i>	<b>-0.182</b>	<b>-0.147</b>	<b>-0.105</b>	<b>-0.066</b>	<b>0.055</b>	<b>0.097</b>	<b>0.650</b>	<b>0.129</b>	<b>0.154</b>	<b>0.135</b>	<b>-0.134</b>	<b>0.056</b>

(*RATE1*), which is the main interest variable of this study, showed a significant negative correlation with abnormal operating cash flow (*ACFO*) and positive correlation with abnormal discretionary expense (*ADE*) at 5% level. On the other hand, when we look at the correlation between the real EM proxies,

there is a significant positive correlation between the abnormal operating cash flow (*ACFO*), abnormal manufacturing cost (*APC*) and abnormal discretionary expense (*ADE*). *PMDA* is also positively correlated with abnormal operating cash flow (*ACFO*), abnormal manufacturing cost (*APC*) and abnormal discretionary

expense (*ADE*) at 5% level.

The firm size (*LNSIZE*) between the control variables used in this study and real EM showed a significant negative correlation with abnormal operating cash flow (*ACFO*), abnormal manufacturing cost (*APC*), abnormal discretionary expense (*ADE*), respectively. On the other hand, leverage (*LEV*) has a significant positive correlation with abnormal operating cash flow (*ACFO*) and abnormal manufacturing cost (*APC*) at 5% level. However, the implication of the univariate result is limited. Therefore, we perform multivariate regression analyses to examine the overall association between labor union strength and real EM with control variables.

### C. Multivariate Analysis

We first analyze the impact of labor unionization rate on the extent of real EM. The sample used in this study is a form of panel data. In addition to the variables of the individual firms already included, we conducted a firm and year fixed effect analysis to control the inherent attributes of the firm effectively. Fixed effect analysis can obtain more efficient and consistent estimation results than pooled-OLS by eliminating potential bias by controlling fixed attributes of individual firms.

Table 3 shows the association between labor unionization rate and real EM. In this test, labor unionization rate (*RATE1*) is a statistically and significantly positive association with *ACFO* (t-value =2.581), *APC*(t-value=1.994) and *RM2*(t-value=2.210).

**Table 3.** Real Earnings Management and Labor Unionization Rate

<i>VARIABLES</i>	<i>ACFO</i>	<i>APC</i>	<i>ADE</i>	<i>RM1</i>	<i>RM2</i>
<i>RATE1</i>	0.032*** [2.581]	0.033** [1.994]	-0.001 [-0.041]	0.036 [1.492]	0.042** [2.210]
<i>LNSIZE</i>	0.007* [1.654]	0.017*** [3.014]	-0.026*** [-5.197]	-0.012 [-1.446]	-0.017*** [-2.634]
<i>LEV</i>	0.036*** [3.018]	0.048*** [3.030]	-0.008 [-0.543]	0.042* [1.791]	0.004 [0.244]
<i>MB</i>	0.001 [0.834]	-0.006*** [-2.995]	-0.012*** [-6.601]	-0.019*** [-5.904]	-0.009*** [-3.810]
<i>ROA</i>	-0.479*** [-24.527]	-0.244*** [-9.410]	0.018 [0.780]	-0.235*** [-6.119]	-0.508*** [-16.926]
<i>LOSS</i>	0.001 [0.241]	0.004 [0.790]	0.004 [0.978]	0.009 [1.180]	0.006 [0.979]
<i>NUMEST</i>	-0.000 [-0.161]	-0.001*** [-3.093]	-0.001*** [-2.681]	-0.002*** [-3.569]	-0.001* [-1.904]
<i>CHAEVOL</i>	0.003 [0.536]	-0.006 [-0.761]	-0.005 [-0.706]	-0.011 [-0.891]	-0.001 [-0.095]
<i>PMDA</i>	0.521*** [50.878]	0.146*** [10.765]	0.025** [2.098]	0.177*** [8.773]	0.575*** [36.569]
<i>Constant</i>	-0.217* [-1.958]	-0.493*** [-3.347]	0.669*** [5.205]	0.269 [1.233]	0.425** [2.490]
<i>Firm Dummy</i>	yes	yes	Yes	yes	yes
<i>Year Dummy</i>	yes	yes	Yes	yes	yes
<i>Observations</i>	3,375	3,375	3,375	3,375	3,375
<i>R-squared</i>	0.496	0.095	0.048	0.497	0.096

This table presents the firm and year fixed effects regressions estimation results by regressing the real earnings management proxies on firm's labor union strength with control variables. Regressions include intercept, control variables, year and firm fixed effects. \*\*\*, \*\*, \* indicate, respectively, the significance level at the 1%, 5% and 10% level or better. All variables are defined in Appendix A.

The positive *RATE1* coefficient implies that company manipulates earnings by upward real EM when labor unionization rate is high. The results on control variables are generally consistent with prior studies (Cohen, Dey, and Lys 2008; Yoo, Kim, and Chun 2014). We find some evidence that the manager of firms that have higher labor unionization rate are more likely to engage in real EM (*ACFO*, *APC*, *RM2*). So this main empirical result shows that labor unionization can affect on upward real EM to boost reported earnings. So labor union push the “managers” and managers collude with labor union to higher reported earnings following prior papers (Chen, Kacperczyk, and Ortiz-Molina 2011; Bradley, Kim, and Tian 2016). So labor union strength is positively associated with

real EM, specially abnormal cash flows and abnormal production costs. This paper’s main result supports the negative role of labor union.

Francis, Hansan, and Li. (2016) using absolute value of real EM because manipulation through real activities may also reverse from an economic perspective. So firms can cut discretionary expense for one period, however, to remain competitive in the same industry, they might have to make it up in another period. So we also use absolute value of real EM as our supplementary measure for real EM. Table 4 of Panel A shows the relationship between absolute level of real EM and labor unionization rate. In this test, labor unionization rate (*RATE1*) is a statistically and significantly positive association with *ABSCFO* (t-value

**Table 4.** Absolute Level of Real Earnings Management and Income Increasing and Income Decreasing Real Earnings Management and Labor Unionization Rate

Panel A: Regressions of the Absolute Magnitude of Real Earnings Management on the Labor Unionization Rate

VARIABLES	ABSCFO	ABSPC	ABSDE
<i>RATE1</i>	0.026** [2.366]	0.029** [2.065]	0.017 [1.470]
<i>LNSIZE</i>	0.003 [0.763]	-0.005 [-0.964]	-0.013*** [-3.157]
<i>LEV</i>	-0.015 [-1.362]	-0.001 [-0.076]	-0.017 [-1.499]
<i>MB</i>	0.004*** [2.753]	0.004** [2.027]	0.007*** [4.707]
<i>ROA</i>	0.084*** [5.136]	0.090*** [4.417]	0.058*** [3.339]
<i>LOSS</i>	0.010*** [3.075]	0.015*** [3.490]	0.001 [0.367]
<i>NUMEST</i>	-0.001** [-1.967]	0.000 [0.243]	-0.000 [-0.702]
<i>CHAEVOL</i>	0.008 [1.430]	-0.007 [-0.974]	0.005 [0.866]
<i>ABSDA</i>	0.262*** [20.839]	0.063*** [4.020]	0.047*** [3.553]
<i>Constant</i>	-0.050 [-0.494]	0.182 [1.465]	0.391*** [3.679]
<i>Firm dummy</i>	yes	yes	yes
<i>Year Dummy</i>	yes	yes	yes
<i>Observations</i>	3,375	3,375	3,375
<i>R-squared</i>	0.153	0.024	0.057

In this table, *ABSCFO*, *ABSPC* and *ABSDE*, the real earnings management proxies are absolute value of *ACFO*, *APC* and *ADE*. Regressions include intercept, control variables, year and firm fixed effects. \*\*\*, \*\*, \* indicate, respectively, the significance level at the 1%, 5% and 10% level or better. All variables are defined in Appendix A.

Panel B: Regressions of the Magnitude of Income-Increasing or Income-Decreasing Real Earnings Management on the Labor Unionization Rate

VARIABLES	ACFO > 0	ACFO < 0	APC>0	APC<0	ADE>0	ADE<0
<i>RATE1</i>	0.052*** [3.238]	-0.001 [-0.056]	0.007 [0.315]	-0.034* [-1.764]	0.013 [1.032]	-0.003 [-0.161]
<i>LNSIZE</i>	0.012** [2.251]	-0.009* [-1.782]	0.003 [0.417]	0.004 [0.560]	-0.038*** [-8.136]	-0.012* [-1.858]
<i>LEV</i>	0.018 [1.150]	0.009 [0.634]	0.024 [1.157]	0.049*** [2.648]	-0.011 [-0.921]	0.031* [1.714]
<i>MB</i>	0.003 [1.407]	-0.001 [-0.371]	-0.002 [-0.787]	-0.014*** [-5.436]	-0.003 [-1.550]	-0.016*** [-6.555]
<i>ROA</i>	-0.263*** [-10.397]	-0.424*** [-16.660]	-0.084** [-2.387]	-0.265*** [-8.943]	0.054** [2.556]	-0.052* [-1.838]
<i>LOSS</i>	0.007 [1.522]	-0.018*** [-3.720]	0.012* [1.779]	-0.013** [-2.259]	0.001 [0.207]	-0.004 [-0.631]
<i>NUMEST</i>	-0.000 [-0.208]	0.001** [2.184]	-0.001 [-1.379]	-0.000 [-0.763]	-0.000 [-0.662]	0.001 [1.590]
<i>CHAEVOL</i>	0.001 [0.144]	-0.004 [-0.581]	-0.007 [-0.643]	0.008 [0.916]	0.000 [0.013]	-0.011 [-1.278]
<i>PMDA</i>	0.052*** [3.238]	-0.001 [-0.056]	0.007 [0.315]	-0.034* [-1.764]	0.013 [1.032]	-0.003 [-0.161]
<i>Constant</i>	-0.294** [-2.167]	0.211 [1.523]	-0.035 [-0.170]	-0.181 [-1.034]	1.028*** [8.608]	0.244 [1.408]
<i>Firm dummy</i>	yes	yes	Yes	yes	Yes	yes
<i>Year Dummy</i>	yes	yes	Yes	yes	Yes	yes
<i>Observations</i>	1,600	1,775	1,605	1,770	1,719	1,656
<i>R-squared</i>	0.303	0.362	0.051	0.117	0.136	0.053

This table presents the results of separated regressions of the positive or negative values of proxies for the magnitude of real earnings management (ACFO, APC and ADE) on the labor unionization rate with a set of control variables. We conduct separated firm fixed regression tests for each group which is classified by the sign of each proxy for the magnitude of real earnings management (ACFO, APC and ADE). \*\*\*, \*\*, \* indicate, respectively, the significance level at the 1%, 5% and 10% level or better. All variables are defined in Appendix A.

=2.366), *ABSPC* (t-value=2.065). So labor union strength is positively associated with magnitude of real EM in our sample. Panel B presents the results of separated regressions of the income increasing or income decreasing value of proxies for the magnitude of real EM (*ACFO*, *APC* and *ADE*) on the labor unionization rate with a set of control variables. We conducted separated tests for each group which is classified by the sign of each proxy for the magnitude of real EM (*ACFO*, *APC* and *ADE*). The labor unionization rate (*RATE1*) has a positive coefficient at the 1% level for the upward adjusted earnings group with abnormal operating cash flow (*ACFO*) greater than zero, while unionization rate (*RATE1*) is not statistically significant in relation to the abnormal operating cash flow (*ACFO*) in the downward earnings-adjusted group. These

results show that as the labor unionization rate of individual firms' increases, the increase in the scale of real EM can be observed for the firms that have performed the upward real EM, as reported in Table 4 of Panel B. In sum, the empirical result suggests that labor unionization rate is positively associated with real EM. So labor union could directly effect on manager's opportunistic behavior due to rent-seeking behavior. Also this positive association is consistent in absolute value for each real EM proxy as well as income increasing and income decreasing real EM proxy. Thus, we can interpret this to mean that labor unions encourage managers' opportunistic real EM due to improve their wage maximization negotiations via higher reported earnings and managers consent labor unions' requirement because hired managers'

**Table 5.** Real Earnings Management and Labor Unionization Rate, Chaebol vs. Non-Chaebol

VARIABLES	CHAEBOL					NON-CHAEBOL				
	ACFO	APC	ADE	RMI	RM2	ACFO	APC	ADE	RMI	RM2
<i>RATE1</i>	-0.003 [-0.092]	-0.005 [-0.142]	-0.056 [-1.445]	-0.054 [-0.917]	-0.067 [-1.375]	0.045*** [3.181]	0.064*** [3.386]	0.016 [1.010]	0.083*** [2.998]	0.078*** [3.664]
<i>LNSIZE</i>	-0.003 [-0.271]	0.024 [1.561]	-0.004 [-0.243]	0.020 [0.790]	-0.006 [-0.288]	0.007 [1.419]	0.018*** [2.926]	-0.025*** [-4.697]	-0.011 [-1.207]	-0.016** [-2.253]
<i>LEV</i>	0.048 [1.331]	0.015 [0.341]	-0.093* [-1.944]	-0.061 [-0.843]	-0.057 [-0.941]	0.037*** [2.834]	0.049*** [2.802]	0.001 [0.097]	0.050* [1.951]	0.014 [0.714]
<i>MB</i>	0.002 [0.530]	-0.014*** [-2.981]	-0.012** [-2.337]	-0.025*** [-3.353]	-0.013** [-2.048]	0.002 [1.309]	-0.002 [-0.850]	-0.011*** [-5.016]	-0.013*** [-3.535]	-0.006** [-2.131]
<i>ROA</i>	-0.642*** [-9.690]	-0.441*** [-5.360]	-0.211** [-2.416]	-0.653*** [-4.909]	-0.904*** [-8.209]	-0.470*** [-22.181]	-0.215*** [-7.587]	0.045* [1.901]	-0.177*** [-4.294]	-0.468*** [-14.629]
<i>LOSS</i>	-0.013 [-1.325]	-0.025* [-1.955]	-0.031** [-2.327]	-0.056*** [-2.719]	-0.047*** [-2.751]	0.002 [0.416]	0.008 [1.374]	0.008* [1.813]	0.017** [2.108]	0.011* [1.748]
<i>NUMEST</i>	0.000 [0.324]	-0.002** [-2.479]	-0.001 [-0.955]	-0.003** [-2.317]	-0.000 [-0.421]	0.001 [0.918]	-0.003*** [-2.876]	-0.003*** [-4.228]	-0.005*** [-4.245]	-0.002** [-2.402]
<i>PMDA</i>	0.499*** [21.794]	0.095*** [3.332]	-0.017 [-0.557]	0.096** [2.094]	0.511*** [13.427]	0.526*** [45.674]	0.148*** [9.606]	0.025** [1.974]	0.177*** [7.921]	0.581*** [33.407]
<i>Constant</i>	0.070 [0.203]	-0.719* [-1.674]	0.161 [0.354]	-0.554 [-0.797]	0.206 [0.357]	-0.207* [-1.721]	-0.527*** [-3.271]	0.625*** [4.626]	0.220 [0.941]	0.370** [2.032]
<i>Firm dummy</i>	yes	yes	yes	yes	Yes	yes	Yes	yes	yes	yes
<i>Year Dummy</i>	yes	yes	yes	yes	Yes	yes	Yes	yes	yes	yes
<i>Observations</i>	602	602	602	602	602	2,773	2,773	2,773	2,773	2,773
<i>R-squared</i>	0.555	0.175	0.115	0.161	0.370	0.496	0.092	0.046	0.071	0.354

This table presents the relationship of level of real earnings management and labor unionization rate in chaebol or non-chaebol groups. In this table, we divided our sample into two groups, chaebol or non-chaebol groups. Regressions include intercept, control variables, year and firm fixed effects. \*\*\*, \*\*, \* indicate, respectively, the significance level at the 1%, 5% and 10% level or better. All variables are defined in Appendix A

incentive system is also aligned to high reported earnings. Overall, the results reported above are consistent with Hypotheses 1 that labor union is associated with real EM and show that labor union strength is positively associated with real EM.

To test Hypotheses 2, we divided our sample into two groups, chaebol or non-chaebol groups. As discussed in prior section, influence of labor union toward the firm might be difference between chaebol and non-chaebol groups. Table 5 shows the relationship of level of real EM and labor unionization rate in chaebol or non-chaebol groups. In this test, our positive empirical result is only consistent with in non-chaebol groups. The labor unionization rate (*RATE1*) is a statistically and significantly positive association at the 1% level with proxies for the magnitude of real EM (*ACFO*, *APC*, *RMI* and *RM2*) in non-chaebol groups only. As we expected, owner-managers of chaebol groups have ultimate power in Korea as discussed

in prior literatures (Hwang et al. 2013; Kim 2015), then owner-manager of the firm do not use real EM to boost upward earnings even though labor union require it. Also this empirical analyses show that labor union's strength is only effective in non-chaebol firms. Hired manager are generally pursue short-term reported earnings for their cash-based incentive system then they collude with labor union. Overall, the results reported above are consistent with Hypotheses 2 that ceteris paribus, the positive association between labor union strength and real EM is more pronounced in non-chaebol firms.<sup>4)</sup>

4) We conducted additional analyses about labor union strength and accrual earnings management. The empirical result suggests that labor union strength is positively but statistically insignificant with accrual earnings management.

## D. Robustness Analysis

We conducted several robustness tests in this section. First, we use labor union existence as the supplementary proxy as our labor union strength following Chung *et al.* (2016). Table 6 presents the association between the extent of real EM and the labor union existence. In this table, we use labor union existence (*RATE2*) as a supplementary proxy for our labor union strength instead of labor unionization rate (*RATE1*). Panel A of Table 6 presents the relationship between level of real EM and labor union existence (*RATE2*). Panel B uses the absolute

value of *ACFO*, *APC* and *ADE* (*ABSCFO*, *ABSPC*, *ABSDE*), the real EM proxies. Labor union existence (*RATE2*) is a statistically and significantly positive association with *ACFO* (t-value=2.200), but is a statistically and significantly negative association with *ADE* (t-value=-2.135). And Labor union existence (*RATE2*) is a statistically and significantly positive association with *ABSCFO* (t-value=3.039), *ABSPC* (t-value=3.205) and *ABSDE* (t-value=3.395). This results show that the firms that exists labor union are more likely to engage in real EM as reported in Table 3 and Table 4. So our empirical analyses are consistent in using labor existence as the labor

**Table 6.** Robustness test- Real Earnings Management and Labor Union Existence

This table presents the relationship of the magnitude of real earnings management and the labor union existence. In this table, we use labor union existence (*RATE2*) as the supplementary proxy of labor union strength instead of labor unionization rate (*RATE1*). Panel A presents the relationship of level of real earnings management and labor union existence (*RATE2*). Panel B uses the absolute value of *ACFO*, *APC* and *ADE*, the real earnings management proxies. Regressions include intercept, control variables, year and firm fixed effects. \*\*\*, \*\*, \* indicate, respectively, the significance level at the 1%, 5% and 10% level or better. All variables are defined in Appendix A.

Panel A: Regressions of the Magnitude of Real Earnings Management on the Labor Union Existence.

VARIABLES	ACFO	APC	ADE
<i>RATE2</i>	0.014** [2.200]	0.005 [0.628]	-0.016** [-2.135]
<i>LNSIZE</i>	0.007 [1.599]	0.017*** [3.031]	-0.025*** [-5.070]
<i>LEV</i>	0.036*** [2.966]	0.049*** [3.097]	-0.005 [-0.326]
<i>MB</i>	0.001 [0.713]	-0.007*** [-3.117]	-0.012*** [-6.662]
<i>ROA</i>	-0.480*** [-24.582]	-0.245*** [-9.441]	0.018 [0.804]
<i>LOSS</i>	0.001 [0.261]	0.004 [0.787]	0.004 [0.944]
<i>NUMEST</i>	-0.000 [-0.164]	-0.001*** [-3.022]	-0.001** [-2.546]
<i>CHAEVOL</i>	0.003 [0.452]	-0.006 [-0.809]	-0.005 [-0.674]
<i>PMDA</i>	0.521*** [50.813]	0.146*** [10.751]	0.025** [2.147]
<i>Constant</i>	-0.210* [-1.888]	-0.489*** [-3.318]	0.662*** [5.155]
<i>Firm dummy</i>	yes	Yes	yes
<i>Year dummy</i>	yes	Yes	yes
<i>Observations</i>	3,375	3,375	3,375
<i>R-squared</i>	0.496	0.095	0.048

Panel B: Regressions of the Absolute Magnitude of Real Earnings Management on the Labor Union Existence

VARIABLES	ABSCFO	ABSPC	ABSDE
<i>RATE2</i>	0.017*** [3.039]	0.023*** [3.205]	0.020*** [3.395]
<i>LNSIZE</i>	0.003 [0.647]	-0.005 [-1.098]	-0.014*** [-3.320]
<i>LEV</i>	-0.017 [-1.521]	-0.004 [-0.275]	-0.020* [-1.756]
<i>MB</i>	0.004*** [2.664]	0.004** [1.961]	0.007*** [4.697]
<i>ROA</i>	0.083*** [5.043]	0.088*** [4.327]	0.056*** [3.255]
<i>LOSS</i>	0.011*** [3.106]	0.015*** [3.527]	0.001 [0.409]
<i>NUMEST</i>	-0.001** [-2.028]	0 [0.155]	0 [-0.836]
<i>CHAEVOL</i>	0.007 [1.339]	-0.007 [-1.063]	0.005 [0.789]
<i>ABSDA</i>	0.265*** [21.067]	0.066*** [4.216]	0.049*** [3.726]
<i>Constant</i>	-0.04 [-0.398]	0.194 [1.564]	0.401*** [3.782]
<i>Firm dummy</i>	yes	Yes	yes
<i>Year dummy</i>	yes	Yes	yes
<i>Observations</i>	3,375	3,375	3,375
<i>R-squared</i>	0.154	0.026	0.06

union strength. In sum, these overall results support Hypotheses 1.

On the other hand, in TABEL 2, the *RATE1* has a significant positive correlation with the *LNSIZE*, *LEV*, *NUMEST*, and *CHAEVOL*, showing a significant negative correlation with the *MB*. This implies that *RATE1* is a variable indicating the influence of labor unions that comprehensively considers the financial status and business performance of a company, as well as the endogenous variable induced by the financial condition and business performance of the company. As the endogenous variables have the potential to be reverse causality, there is a possibility that the labor union influence on the real EM, on the contrary, the characteristics of the firm with high real EM may have influenced the union rate. We try to control for the possible endogeneity of union strength more formally using 2SLS regressions. The OLS regressions might have potential endogeneity

problem by reverse causality, which might affect to the interpretation of labor union strength and real EM. The Possible endogeneity problem is that labor unionization is already determined by firm' real EM. So we need to re-analyze 2SLS regression to reduce this reverse causality problem. So we reduce this endogeneity problem by conducting 2SLS regression in this section. It is not easy to find a good instrumental variable for this method. Fortunately, however, we do have it for Korean data, which is the ratio of the number of male employees to the number of total employees (*MAN*).<sup>5)</sup> When the number of male employees is larger in a firm, its union tends to be further strengthened. That is, the firm is more likely

5) Previous studies have used the percentage of female employees (Chung et al. 2016). However, the ratio of male employees was used in this study because the causal relationship between male workers and labor union strength was more clear and strongly positive.



to have a union and, if it does, its unionization rate is higher (e.g., Antos, Chandler, and Mellow 1980; Hirsch, 1980). In contrast, there is no theoretical or empirical evidence that can establish a relation between the male worker ratio and real earnings management. In short, the male worker ratio is strongly correlated with union strength but minimally correlated with real EM. We regress the unionization rate on male employee ratio (*MAN*) and other explanatory

variables such as firm size (*LNSIZE*), leverage (*LEV*), market to book ratio (*MB*), return on assets (*ROA*), loss dummy (*LOSS*), analyst coverage (*NUMEST*), chaebol dummy (*CHAEVOL*), and performance matched discretionary accruals (*PMDA*) in the first stage regression and report the results in Panel A of Table 7. We adopt male employee ratio (*MAN*) following Antos, Chandler, and Mellow (1980) and Hirsch (1980) with other common firm characteristics to potentially affect

**Table 7.** Robustness test –2SLS regression

This table presents the result of 2SLS regressions to control for the possible endogeneity of labor union strength. Panel A provides the result of the first-stage regression in which *RATE1* is the dependent variable and *MAN* is an instrumental variable, and also Panel A provides the result of the second-stage regression of the level of real earnings management on *PRERATE1*. Panel B provides the result of the second-stage regression of real earnings management in chaebol or non-chaebol groups on *PRERATE1*, where *PRERATE1* is the fitted value in the first stage regression in Panel A. Regressions include intercept, control variables. \*\*\*, \*\*, \* indicate, respectively, the significance level at the 1%, 5% and 10% level or better. All variables are defined in Appendix A.

Panel A: 2SLS Regression of the Full Sample

<i>VARIABLES</i>	<i>First stage</i>	<i>Second stage</i>				
	<i>RATE1</i>	<i>ACFO</i>	<i>APC</i>	<i>ADE</i>	<i>RMI</i>	<i>RM2</i>
<i>MAN</i>	0.243*** [9.956]					
<i>PRERATE1</i>		<b>0.001</b> [0.032]	<b>0.586***</b> [3.588]	<b>0.574***</b> [3.608]	<b>1.102***</b> [3.658]	<b>0.555***</b> [3.325]
<i>LNSIZE</i>	0.050*** [10.668]	-0.005** [-1.976]	-0.034*** [-3.739]	-0.034*** [-3.973]	-0.065*** [-3.960]	-0.039*** [-4.315]
<i>LEV</i>	0.205*** [7.722]	0.061*** [4.645]	-0.034 [-0.904]	-0.090** [-2.422]	-0.111 [-1.579]	-0.031 [-0.774]
<i>MB</i>	-0.048*** [-8.927]	-0.002 [-0.770]	0.016* [1.692]	0.010 [1.125]	0.024 [1.435]	0.010 [1.041]
<i>ROA</i>	0.161** [2.003]	-0.497*** [-15.159]	-0.440*** [-7.012]	-0.123** [-2.037]	-0.543*** [-4.898]	-0.647*** [-9.390]
<i>LOSS</i>	0.019 [1.143]	-0.005 [-0.987]	-0.006 [-0.729]	-0.004 [-0.467]	-0.009 [-0.566]	-0.009 [-0.906]
<i>NUMEST</i>	0.001 [0.532]	-0.001* [-1.869]	-0.003*** [-3.285]	-0.003*** [-2.679]	-0.006*** [-3.133]	-0.004*** [-3.119]
<i>CHAEVOL</i>	-0.097*** [-5.794]	-0.002 [-0.398]	0.043** [2.034]	0.051** [2.465]	0.088** [2.255]	0.046** [2.062]
<i>PMDA</i>	-0.065 [-1.385]	0.552*** [27.506]	0.246*** [6.885]	0.105*** [3.325]	0.344*** [5.668]	0.679*** [18.622]
<i>Constant</i>	-1.217*** [-10.198]	0.112* [1.808]	0.678*** [3.377]	0.717*** [3.749]	1.343*** [3.650]	0.818*** [4.083]
<i>Industry dummy</i>		yes	Yes	yes	yes	yes
<i>Year dummy</i>		yes	Yes	yes	yes	yes
<i>Observations</i>	3,375	3,375	3,375	3,375	3,375	3,375
<i>R-squared</i>	0.125	0.566	0.203	0.133	0.176	0.348

Panel B: 2SLS Regression divided by Chaebol and Non-Chaebol Sample

VARIABLES	CHAEBOL					NON-CHAEBOL				
	ACFO	APC	ADE	RMI	RM2	ACFO	APC	ADE	RMI	RM2
<b>PRERATEI</b>	<b>0.086</b> [0.779]	<b>0.700</b> [1.186]	<b>0.765</b> [1.457]	<b>1.382</b> [1.302]	<b>0.824</b> [1.504]	<b>-0.000</b> [-0.001]	<b>0.578***</b> [3.764]	<b>0.534***</b> [3.422]	<b>1.061***</b> [3.719]	<b>0.513***</b> [3.085]
<i>LNSIZE</i>	-0.011* [-1.897]	-0.045 [-1.499]	-0.047* [-1.720]	-0.089 [-1.624]	-0.057** [-1.985]	-0.004 [-1.317]	-0.030*** [-3.418]	-0.031*** [-3.690]	-0.059*** [-3.690]	-0.034*** [-3.782]
<i>LEV</i>	0.051 [1.310]	0.069 [0.472]	-0.033 [-0.266]	0.049 [0.190]	0.021 [0.147]	0.058*** [4.250]	-0.059* [-1.656]	-0.100*** [-2.734]	-0.146** [-2.192]	-0.046 [-1.139]
<i>MB</i>	0.002 [0.181]	0.013 [0.424]	0.014 [0.553]	0.027 [0.491]	0.013 [0.446]	-0.001 [-0.450]	0.018** [2.044]	0.010 [1.133]	0.027 [1.645]	0.012 [1.289]
<i>ROA</i>	-0.628*** [-6.228]	-0.560** [-2.377]	-0.211 [-0.998]	-0.782* [-1.896]	-0.885*** [-3.581]	-0.486*** [-13.815]	-0.397*** [-3.985]	-0.084 [-1.269]	-0.459*** [-3.901]	-0.590*** [-8.065]
<i>LOSS</i>	-0.020* [-1.771]	-0.032 [-1.430]	-0.014 [-0.617]	-0.048 [-1.162]	-0.035 [-1.445]	-0.002 [-0.331]	0.000 [0.040]	-0.001 [-0.063]	0.002 [0.095]	-0.002 [-0.211]
<i>NUMEST</i>	-0.001 [-1.490]	-0.003* [-1.920]	-0.001 [-0.775]	-0.004 [-1.501]	-0.002 [-1.043]	-0.000 [-0.643]	-0.005*** [-2.718]	-0.005** [-2.205]	-0.010** [-2.540]	-0.006** [-2.416]
<i>PMDA</i>	0.568*** [10.371]	0.176** [2.528]	0.059 [1.120]	0.248** [2.239]	0.660*** [7.921]	0.548*** [25.501]	0.239*** [5.975]	0.097*** [2.660]	0.326*** [4.762]	0.663*** [16.099]
<i>Constant</i>	0.257* [1.771]	0.929 [1.318]	1.049 [1.634]	1.904 [1.487]	1.283* [1.902]	0.074 [1.090]	0.597*** [3.078]	0.654*** [3.488]	1.207*** [3.399]	0.717*** [3.540]
<i>Industry dummy</i>	yes	yes	yes	Yes	Yes	yes	yes	yes	yes	yes
<i>Year dummy</i>	yes	yes	yes	Yes	Yes	yes	yes	yes	yes	yes
<i>Observations</i>	602	602	602	602	602	2,773	2,773	2,773	2,773	2,773
<i>R-squared</i>	0.650	0.405	0.300	0.379	0.483	0.540	0.176	0.128	0.157	0.315

the degree of unionization. As expected, the coefficient on male employee ratio (*MAN*) is 1 percent and significantly positive association with labor unionization ratio (*RATEI*). Specifically, it is 0.243(t-value=9.956) coefficient in the first stage for unionization rate, significant at the 1% level even controlling control variables. As for control variables, higher leveraged firms are more likely to be strongly unionized. Using the fitted value of the first stage regression of the labor unionization ratio, we repeat our main analyses in Tables 3 report the results in the second stage of Table 7. The coefficient on the fitted value of labor union is still positive and 1 percent significant for *APC*, *ADE*, *RMI* and *RM2* consistent with Hypotheses 1. Its magnitude is even larger than that of the corresponding coefficient in Table 3. This indicates that managers' general tendency of real EM when their unions are stronger is maintained after controlling for the endogeneity of union strength. The second

stage regression results using more refined classifications of chaebol versus non-chaebol are similar in Table 5. When we use value of *RATEI* as the dependent variable, the coefficients on the fitted value of labor union strength are significantly positive in non-chaebol group, consistent with Table 5 and Hypotheses 2. So Panel B of Table 7 suggests that our positive association between labor union strength and real EM is even pronounced in non-chaebol group even we use fitted value of labor union strength which is calculated from the first stage regression using male employee ratio as instrumental variable.

## V. Conclusion

This paper used firm-year level unionization rates

and real EM data for a sample of Korean KOSPI listed firms. The empirical result suggests that labor unionization rate is positively associated with real EM. This positive association is consistent in absolute value for each real EM proxy as well as the income increasing and income decreasing real EM proxy. Thus, we can interpret this to mean that labor unions encourage managers' opportunistic real EM due to improve their wage maximization negotiations via higher reported earnings. Further, we divided our sample into chaebol and non-chaebol firms, and found that our positive empirical result is only consistent in the non-chaebol group. We also conducted several robustness tests using labor union existence as a supplementary proxy of labor union strength. Labor union existence is positively associated with real EM and the absolute value of real EM. Finally, we conducted a 2SLS regression and found empirical results consistent with the full and non-chaebol only samples, supporting the validity of the OLS regression results.

Evidence of motivations for earnings management help the relevant policy institutions and information user better understand their accounting practices. This is important in raising the quality of accounting profits and increasing the relevance of making decision. This paper shows additional factors in the motivation of earnings adjustments, which may vary from country to country. International differences in earnings adjustments can affect the comparability of information. In this context, it is necessary to analyze the real EM as a subject of unions and chaebols that may be a special situation in Korea.

Like most empirical studies, our research has limitations. Though we attempt to address concerns about the possible weakness in causality between labor unions and real EM, and on the endogeneity in disclosure and union strength by adopting 2SLS, the main results are not completely free of these concerns. To the extent that the main variables of interest are determined endogenously and the true levels of labor union strength and real EM are measured with errors by the proxies, and to the extent that our manual news classifications are subjective,

the reported results can be spurious. In addition, there is an unpredictable limit to the same outcome at different times in addition to the analysis period of this study. Notwithstanding, we believe that the consistent results from various robustness analyses ameliorate these concerns and corroborate the positive relationship between labor union strength and real EM.

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## APPENDIX. Variables Definition

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<i>ACFO</i>	The level of abnormal cash flow from operations which is the residual from equation (1) multiplied by (-1)
<i>APC</i>	The level of abnormal production cost which is the residual from equation (4)
<i>ADE</i>	The of abnormal discretionary expense which is the residual from equation (5) multiplied by (-1)
<i>RM1</i>	The aggregate measure of real earnings management as the sum of <i>APC</i> and <i>ADE</i> .
<i>RM2</i>	The aggregate measure of real earnings management as the sum of <i>ACFO</i> and <i>ADE</i>
<i>PMDA</i>	The level of performance matched discretionary accruals following Kothari, Leone, and Wasley. (2005)
<i>RATE1</i>	The unionization rate calculated as the the union membership number divided by the total number of employees
<i>RATE2</i>	An indicator variable equal to 1 if the firm has a labor union and 0 otherwise.
<i>LNSIZE</i>	The natural log of total assets.
<i>LEV</i>	Leverage, calculated as total debts divided by total assets
<i>MB</i>	The market to book ratio, a ratio of market value of equity to book value of equity
<i>ROA</i>	Return on assets, calculated as net income divided by total assets
<i>LOSS</i>	An indicator variable equal to 1 if the firm provides net losses and 0 otherwise
<i>NUMEST</i>	The number of analysts covering the firm
<i>CHAEVOL</i>	An indicator variable equal to 1 if the firm belongs to top thirty business group in Korea and 0 otherwise
<i>MAN</i>	The ratio of the number of male employees to the number of total employees

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