UNBILLED RECEIVABLES, LOSS ALLOWANCES AND EARNINGS MANAGEMENT

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ABSTRACT

This paper analyzes results on the effect of unbilled receivables on earnings management. Although unbilled receivables are accounts that essentially arise in order-based industries such as construction or shipbuilding, they are considered to be centerpieces requiring attention because they can be interpreted as a sign of accounting fraud. This study analyzes two relationships: unbilled receivables and earnings management and unbilled receivables with loss management and earnings management during the period from 2010 through 2016. The results reveal that while companies conduct earnings management using unbilled receivables, different patterns are demonstrated in cases where loss allowances are established even when there are unbilled receivables.

Key words: Unbilled Receivables, Loss Allowances, Earnings Management.

JEL Classification*:* M41

INTRODUCTION

Unbilled receivables are amounts of money that have not been charged to the ordering entity even after construction is completed. They are marked as assets in statements of financial position. Construction and shipbuilding industries, which require long periods of time to complete orders, use a percentage-of-completion method for revenue recognition. This accounting method creates unbilled receivables. In this method, the total contract price is distributed to each year based on the percentage of completion and, generally, the percentage is calculated as the ratio of costs incurred to date divided by total estimated costs. The total estimated costs tend to increase with the passage of time owing to increases in labor cost, changes in design or increases in cost caused by upsurges in the costs of raw materials. If not reflected on time, the percentage of completion tends to be higher than in reality, which causes revenue to be recognized early, and, as the period is delayed, the possibility of additional losses tends to increase. In the case of overseas construction, additional costs or losses may be incurred because of unpredicted local circumstances, for example, due to abrupt policy changes made by a foreign government.

Recently in Korea, concerns about unbilled receivables have raised the issue of accounting management. Especially, in construction and shipbuilding industries, unbilled receivables have increased significantly before large-scale operating losses actually took place, and hence, unbilled receivables have been considered a sign of possible future insolvency. Investors must trust the publicized accounting information of a company's financial statements. A Barron’s article called Watch Their Language (Racanelli, 2009) pointed to unbilled receivables as one of the accounts to which special attention should be paid in order to prevent unexpected investment losses. In addition, companies that have actively utilized unbilled receivables were proven via an empirical analysis to be accused of accounting fraud later on (Loughran & McDonald, 2011).

Accounting fraud cases in Korea's construction and shipbuilding industries have revealed that the amount of unbilled receivables alone for the top 20 construction and shipbuilding companies in Korea was estimated to be over 30 trillion won. At the end of October 2015, the Financial Services Commission and the Financial Supervisory Service announced a plan to enhance the transparency of accounting practices in order-made production industries. According to the plan, contractors in construction and shipbuilding industries will be required to re-evaluate unbilled receivables on a quarterly basis and to turn unbilled receivables with a low possibility of recovery into loss allowances. A core auditor system will also be introduced to verify the validity of estimated project progress and costs. Financial authorities are planning to secure effective means of preventing accounting fraud by establishing a "*standing supervision system*" to inspect accounting irregularities in order-made production industries and by expanding the imposition of fines on accounting firms that commit accounting fraud. It is highly probable that the companies have adjusted their profits by avoiding the proper accumulation of loss allowances for unbilled receivables. Considering such large stakes, this study examines the relationship between unbilled receivables and earnings management and investigates whether loss allowances for unbilled receivables demonstrate different patterns.

The remainder of this paper is organized as follows. Section 2 provides a literature review and hypothesis development. Section 3 discusses research samples and methodology. Section 4 presents descriptive statistics, correlations and regression results. The final section provides a summary and conclusions.

THEORETICAL BACKGROUND, LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Unbilled Receivables

The timing of revenue recognition, billings, and cash collections results in billed accounts receivable and unbilled receivables. Overproduced unbilled receivables may be due to premature revenue recognition. Premature revenue recognition is an earnings type (Levitt, 1998). Myers et al. (2017) find that premature revenue recognition gives managers the discretion to accelerate revenue recognition and increase the value relevance of earnings and accruals quality.

Unbilled receivables are the estimated revenue exceeding billings, and representing revenue that has not yet been billed. Unbilled receivables differ from receivables in that they are amounts of money that have been charged but not yet recovered. They are a constructed receivable, and they appear as outstanding receivables already reflected in sales figures.
However, if firms are unable to recover these amounts, they are counted as losses. Unbilled receivables often signal the potential for accounting fraud. Loughran & McDonald (2011) prove that when firms use unbilled receivables for aggressive accounting practices, there is a high probability that they will be accused of accounting fraud later. Jung et al. (2018) find that average operating profit is strongly negatively associated with unbilled receivables. This imply that unbilled receivables may possibly occur losses. This is due to construction companies' profit is likely to contain estimation errors that can cause significant profit variances at the end of the construction projects. Kwon & Lee (2018) analyze the relationship between unbilled receivables and the type of earnings management based on the signs of both nondiscretionary earnings and discretionary accruals. They find that firms use unbilled receivables for upward earnings management and/or downward earnings management (big bath accounting).

One warning sign of possible financial statement issues (in Financial Shenanigans

How to Detect Accounting Gimmicks & Fraud in Financial Reports, Schilit) is that "*unbilled receivables grow faster than sales or billed receivables*". This situation raises the potential issue that the greater portion of revenue may be coming from sales under the percentage-of-completion method. Percentage-of-completion accounting has been proposed for investors should be aware of (Racanelli, 2009).

As mentioned, unbilled receivables inevitably arise in the construction or shipbuilding industries due to the following reasons. First, a difference between the percentage of completion calculated by the constructor and the percentage of completion recognized by the ordering entity. Second, a difference in opinion between the constructor and the ordering entity when the contract amount changes. Third, a difference in the payment terms.

According to custom, the construction industry uses a milestone method that charges construction costs for each process, whereas the shipbuilding industry uses a heavy-tail method in which the shipbuilder receives a larger amount of money at the time of delivery than in the early stages of shipbuilding. In the milestone method, unbilled receivables come from the difference between the time when construction costs are incurred and the time when the ordering entity recognizes the percentage of completion. On the other hand, in the heavy-tail method, unbilled receivables increase as the construction of the ship progresses. The problem is that it is not possible to decide on the amount of unbilled receivables that might go insolvent.

When construction is delayed, cost rates tend to increase radically due to increases in raw material, labor, etc., and while the unbilled receivables rapidly increase, payment rates from the ordering entity decline. Thus, the uncollected rate of construction costs increases and operating losses result. Because unbilled receivables significantly affect management performance, they can be used as an irregular accounting means to hide poor management performance and possible future insolvency caused by low-priced orders.
Based on the aforementioned literature, this study sets *Hypothesis 1*.

H1: The amount of unbilled receivables is positively associated with a firm's earnings management.

We additionally use two alternative measures for unbilled receivables: the changes in unbilled receivables relative to the previous year and the discretionary (abnormal) unbilled receivables.

In terms of the usefulness of accounting information, the use of the percentage completion method is preferred over the completed contract method, and unbilled receivables may be inevitably recorded in a timely manner. Therefore, we separate the abnormal unbilled receivables from total unbilled receivables.

Loss Allowances for Uncollectible Accounts

Several studies have analyzed discretionary behavior using allowance-related accrual accounts. Jackson & Liu (2010) found a relationship between allowances and earnings management. According to their findings, firms were likely to manage bad debt expenses to meet or beat analysts' earnings forecasts.

McNichols & Wilson (1988) suggested that firms with extreme earnings tended to decrease income using discretionary bad debt expenses for earnings management, and Caylor (2009) discovered that firms managed receivables to avoid missing analysts' earnings forecasts. Teoh et al. (1998) compared allowances for uncollectible accounts between IPO firms and public firms. Ma (1988) confirmed using panel data for 100 US banks from 1980 through 1984 that US banks were smoothing their income through loss allowances for

uncollectible accounts.

Meanwhile, other studies verified market responses to loss allowances for uncollectible accounts. Beaver & Engel (1996) studied market responses by dividing loss allowances for uncollectible accounts into discretionary and non-discretionary segments. The discretionary segment, a favorable indicator for future financial conditions, showed a positive response to market valuation. In addition, banks' loss allowances for uncollectible accounts also showed positive responses to bank stock prices (Beaver et al., 1989). In contrast, Docking et al. (1997) and Ahmed et al. (1999) demonstrated that there was a negative relationship between loss allowances for uncollectible accounts and stock prices. Liu et al. (1997) classified banks into two groups according to their capital adequacy and investigated market responses to loss allowances for the uncollectible accounts of the two groups. In their results, banks with good capital adequacy showed positive responses.

As stipulated in "*Measures to Improve Transparency of Accounting for Order-made Production Industries*" in 2015, companies in order-made production industries are required to make periodic calculations for unbilled receivables and accumulate loss allowances for the unbilled receivables with a low possibility of recovery in the future to prepare for losses from unbilled receivables on a regular basis. An increase in the loss allowance ratio is a positive measure in terms of financial soundness, although a construction company's operating profits may temporarily decline. It also helps prevent negative reactions in the stock market in advance in the event that astronomical losses are suddenly disclosed after some period of no unusual changes in the financial statements. Thus, companies that accumulate appropriate loss allowances for unbilled receivables of uncollectible accounts can demonstrate that they do not have ill intentions for earnings management via unbilled receivables.
Based on the aforementioned literature and cases, this study sets *Hypothesis 2*.

H2: Unbilled receivables with loss allowances are not associated with a firm's earnings management.

RESEARCH METHODOLOGY

Sample Selection

This study uses financial data made available by KIS-DATA, a database developed by Korea Investors Service, Inc., for the years 2010 to 2016[1]. The sample only includes publicly traded non-financial firms on the Korean Stock Exchange (KSE) having unbilled receivables, the key variable, and having a fiscal year-end of December 31. The top and bottom 1% of all continuous variables are winsorized to moderate the influence of outliers. Thus, the final sample includes 955 firm-year observations. Table 1 shows the distribution of sample firms across various industries based on the one-digit Korea Standard Industry Code.

Table 1
INDUSTRY DISTRIBUTION OF THE SAMPLE

Industry	Number of Firm-Year Observations	%
Manufacturing	483	50.6%
Construction	316	33.1%
Wholesale/Retail	32	3.4%
Publication/Broadcasting/Communication	61	6.4%
Medical/Computer/Information	63	6.5%
Total	955	100%

Regression Model and Measurement of Variables

For an empirical analysis of *Hypothesis 1*, the OLS model is employed with discretionary accruals as the dependent variable, and the regression model is as follows.

$$\text{Disacc}_{i,t} = \alpha + \beta_1 \text{Unbilled}_{i.t} + \sum \alpha_j X_j + \sum \alpha_k \text{IND}_k + \sum \alpha_l \text{YEAR}_l + \varepsilon_{i,t} \quad (1)$$

Where, $\text{Disacc}_{i,t}$ is the discretionary accruals, $\text{Unbilled}_{i.t}$ is the amount of unbilled receivables, X_j is the other factors affecting earnings management using accruals (explained below), IND is the industry indicator variables, and YEAR is the year indicator variables.
Following the modified Jones model developed by Dechow et al. (1995), the OLS regression model below is performed, and the residual is determined. The estimated residual is the proxy for the discretionary accruals.

$$\frac{Tacc_{i,t}}{\text{Assets}_{i,t-1}} = \alpha_1 \frac{1}{\text{Assets}_{i,t-1}} + \alpha_2 \frac{\Delta\text{Sales}_{i,t}}{\text{Assets}_{i,t-1}} + \alpha_3 \frac{\text{PPE}_{i,t}}{\text{Assets}_{i,t-1}} + \alpha_4 \text{ROA}_{i,t} + \varepsilon_{i,t} \quad (2)$$

Where, Tacc is the total accruals calculated by subtracting operating cash flows from net income using the measure of total accruals developed by (Hribar & Collins, 2002), thereafter divided by the beginning of year assets. PPE is property, plant, and equipment. ΔSales is the change in sales relative to the previous year, and ROA is return on assets. We estimate Eq. (2) for each industry and in each year.

The model includes four control variables that can affect earnings management: leverage, size, return on assets and sales growth. Finally, industry dummy variables, defined by the one-digit Korea Standard Industry Code, and year dummy variables are included as control variables.

For the additional analysis of *Hypothesis 1*, we use the change of unbilled receivables and the discretionary (abnormal) unbilled receivables. Therefore, the following two regression models are also employed[2].

$$\text{Disacc}_{i,t} = \alpha + \beta_1 \Delta\text{Unbilled}_{i.t} + \sum \alpha_j X_j + \sum \alpha_k \text{IND}_k + \sum \alpha_l \text{YEAR}_l + \varepsilon_{i,t} \quad (3)$$

where $\Delta\text{Unbilled}_{i.t}$ is the change of unbilled receivables relative to the previous year.

$$\text{Disacc}_{i,t} = \alpha + \beta_1 \text{DISCunbilled}_{i.t} + \sum \alpha_j X_j + \sum \alpha_k \text{IND}_k + \sum \alpha_l \text{YEAR}_l + \varepsilon_{i,t} \quad (4)$$

Where, $\text{DISCunbilled}_{i.t}$ is the discretionary (abnormal) unbilled receivables relative to the previous year. We separate the abnormal unbilled receivables from the total unbilled receivables. We run the following regression model by year and industry and take the residual for the analysis.

$$\text{Unbilled}_{i,t} = \alpha + \sum \alpha_j X_j + \varepsilon_{i,t} \quad (5)$$

Where, $\text{Unbilled}_{i,t}$ is the amount of unbilled receivables, and X_j is the other factors affecting unbilled receivables, including leverage, size, ROA, sales growth and the natural log of sales. We include leverage which is computed by dividing total liabilities by total assets. The higher the debt ratio of the company, the more incentive to manage earnings to reduce debt costs (Smith & Stulz, 1985; Graham & Rodgers, 2000). Size, the natural log of total assets controls for size effects. Firm profitability and form growth are controlled by Return on assets, which is measured as net income divided by total assets, and sales growth, which is measured as the change in sales relative to the previous year, respectively. Finally, we include the industry dummy variable (*IND*) and the year dummy variable (*YEAR*) to control for differences across

industries and years.

For the analysis of *Hypothesis 2*, the unbilled interaction term with the allowance dummy is included. For unbilled variables, both the total unbilled receivables and the abnormal unbilled receivables are used. The allowance dummy is coded 1 if the firm establishes loss allowances. Otherwise, it is coded as 0. The regression model is as follows.

$$\text{Disacc}_{i,t} = \alpha + \beta_1 \text{Unbilled}_{i.t} + \beta_2 \text{Unbilled*Allest}_{i.t} + \sum \alpha_j X_j + \sum \alpha_k \text{IND}_k + \sum \alpha_l \text{YEAR}_l + \varepsilon_{i,t} \quad (6)$$

EMPIRICAL RESULTS

Descriptive Statistics and Correlations

Table 2 shows the descriptive statistics for the main variables. The mean (median) for Discacc is 0.1382 (0.0538). The means (medians) for Unbilled, ∆Unbilled and DISCunbilled are 0.1821 (0.0805), 0.0119 (0.002) and -0.0977 (-0.0725), respectively. The mean (median) for ALLest is 0.1130 (0), meaning that 11% of the sample firms having unbilled receivables account with loss allowances. The mean (median) values for the control variables LEV, SIZE, ROA and GROW 0.8435 (0.5281), 19.5870 (19.2118), 0.0394 (0.0176) and 0.4429 (0.0131), respectively.

TABLE 2
DESCRIPTIVE STATISTICS

Variables	Mean	StdDev	Median	Q1	Q3
Discacc	0.1382	0.5949	0.0538	0.0269	0.1010
Unbilled	0.1821	0.6089	0.0805	0.0200	0.1677
∆Unbilled	0.0119	0.1525	0.0002	0.0001	0.0006
DISCunbilled	-0.0977	0.3346	-0.0725	-0.2349	0.0840
ALLest	0.1130	0.3167	0	0	0
LEV	0.8435	1.7908	0.5281	0.3004	0.7088
SIZE	19.5870	1.6407	19.2118	18.3633	20.6501
ROA	0.0394	0.6475	0.0176	-0.0173	0.0570
GROW	0.4429	2.2629	0.0131	-0.1402	0.1893

Note:
Disacc : discretionary accruals calculated using modified Jones model developed by Dechow et al. (1995)
Unbilled : the amount of unbilled receivables divided by assets.
∆Unbilled : the change in unbilled receivables relative to the previous year.
DISCunbilled : discretionary (abnormal) unbilled receivables.
ALLest : coded 1 for firms that establish loss allowances, and 0 otherwise.
LEV : total liabilities divided by total assets.
SIZE : the natural logarithm of total assets.
ROA : net income divided by total assets.
GROW : sales growth.

The Pearson correlation results are reported in Table 3. Significant correlations are observed between earnings management and unbilled receivables ($p<0.01$). Significant positive correlations are also seen between earnings management and four of the control variables (LEV, SIZE, ROA and GROW) ($p<0.01$). To test for multi-collinearity, the Variance Inflation Factors (VIFs) are computed. No multi-collinearity problems are evident.

Table 3
CORRELATIONS

Variables	discacc	Unbilled	∆Unbilled	DISCunbilled	ALLest	LEV	SIZE	ROA	GROW

Table 3
CORRELATIONS

discacc	1.0000								
Unbilled	0.7487	1.0000							
	0.0000	1.0000							
ΔUnbilled	0.7504	0.8574	1.0000						
	0.0000	0.0000	1.0000						
DISCunbilled	-0.0410	0.0438	0.0748	1.0000					
	0.2054	0.1765	0.0208	1.0000					
ALLest	-0.0335	0.0033	-0.0160	0.0252	1.0000				
	0.3017	0.9186	0.6216	0.4358	1.0000				
LEV	0.6383	0.7489	0.5293	-0.3507	-0.0119	1.0000			
	0.0000	0.0000	0.0000	0.0000	0.7130	1.0000			
SIZE	0.1438	0.1985	0.1312	-0.3697	0.0699	0.2863	1.0000		
	0.0000	0.0000	0.0000	0.0000	0.0306	0.0000	1.0000		
ROA	0.5631	0.6277	0.6562	0.1823	-0.0169	0.3056	0.0974	1.0000	
	0.0000	0.0000	0.0000	0.0000	0.6026	0.0000	0.0026	1.0000	
GROW	0.5377	0.6908	0.4463	-0.2911	-0.0256	0.9198	0.2214	0.2957	1.0000
	0.0000	0.0000	0.0000	0.0000	0.4302	0.0000	0.0000	0.0000	0.0022

Note: See Table 2 for variable definitions.

REGRESSION RESULTS AND DISCUSSION

Panel A in Table 4 shows the OLS regression results for the association between earnings management and the amount of unbilled receivables. The results, in all three models, show that the amount of unbilled receivables are significantly positively associated with earnings management ($p<0.01$), which provides support for *H1*. For Model 2, the change in unbilled receivables is used, and Model 3 includes the amount of discretionary (abnormal) unbilled receivables as the explanatory variable. The results imply that firms strategically use unbilled receivables accounts for earnings management through premature revenue recognition method as proved in (Levitt, 1998; Racanelli, 2009; Loughran & McDonald, 2011; Myers et al., 2017). The results also support the findings about the relationship between earnings management and the amount of unbilled receivables by Kwon & Lee (2018). Significant associations are also seen between earnings management and the control variables. Two of the control variables (LEV and ROA) are significantly positively associated with earnings management, and the other two (SIZE and GROW) are significantly negatively associated with earnings management. Panel B of <Table 3> represents the fixed effect regression results. For the main explanatory variables, these results remained consistent with the OLS results.

Table 4
REGRESSION RESULTS: UNBILLED RECEIVABLES-EARNINGS MANAGEMENT

Panel A. Regression Results

Variables	Expected sign	Dependent Variable: Discretionary Accruals		
		Model 1	Model 2	Model 3
Constant	?	0.3892^{**} (2.44)	0.3596^{***} (2.39)	0.0381(0.24)
Unbilled	+	0.4116^{***} (10.75)	-	-
ΔUnbilled	+	-	1.7340^{***} (15.56)	-
DISCunbilled	+	-	-	0.3579^{***} (11.43)
LEV	+	0.1992^{***} (10.34)	0.1926^{***} (10.99)	0.3025^{***} (17.22)
SIZE	+/ -	-0.0144^{*} (-1.85)	-0.0125^{*} (-1.70)	0.0026 (0.32)
ROA	+	0.1958^{***} (7.77)	0.1433^{***} (6.13)	0.1570^{***} (2.76)
GROW	-	-0.0943^{***} (-7.01)	-0.0611^{***} (-4.72)	-0.0883^{***} (-6.33)
Industry dummies		Included		

Year dummies		Included		
F value		108.51***	128.92***	69.72***
Adjusted R^2		0.6283	0.6682	0.5196
N		955	954	954
Panel B. Fixed Effect Regression Results				
Variables	Expected sign	Dependent Variable: Discretionary Accruals		
		Model 1	Model 2	Model 3
Constant	?	0.4747 (0.53)	0.2161(0.25)	-1.3583(-1.51)
Unbilled	+	0.4043*** (9056)	-	-
ΔUnbilled	+	-	1.4111*** (12.43)	-
DISCunbilled	+	-	-	0.3596*** (10.21)
LEV	+	0.2024*** (9.67)	0.2059*** (10.54)	0.2993*** (15.61)
SIZE	+/-	-0.0347 (-0.77)	-0.0228 (-0.53)	0.0547 (1.21)
ROA	+	0.1583*** (5.58)	0.1480*** (5.84)	0.0856 (1.34)
GROW	-	-0.0850*** (-5.65)	-0.0555*** (-3.77)	-0.0776*** (-5.08)
Industry dummies		Included		
Year dummies		Included		
F value		114.82***	127.79***	77.42***
Adjusted R^2		0.5557	0.5183	0.3219
N		955	954	954

Note: See Table 2 for variable definitions; t-values are shown in parentheses; *p<0.10; **p<0.05; ***p<0.01.

Panel A in Table 5 represents the OLS regression results for the association between earnings management and unbilled receivables with loss allowances. The results in the two models show that the unbilled receivables of the sample firms that establish loss allowances for unbilled receivables are significantly negatively associated with earnings management (p<0.01), which provides support for *H2*. For Model 2, the amount of discretionary (abnormal) unbilled receivables are used as explanatory variables. Firms tend to engage in discretionary earnings management behavior using allowance accounts (Ma, 1988; McNichols & Wilson, 1988; Jackson & Liu, 2010). Hence, the establishment of loss allowances for uncollectible accounts has shown a positive effect, as proved in many previous studies (Beaver & Engel, 1996; Beaver et al., 1989; Liu et al. 1997). By extending the previous studies on allowance for uncollectible accounts, this study confirms that the firms that establish loss allowances for unbilled receivables may not discretionally use unbilled receivables for earnings management. Significant associations are also seen between earnings management and the control variables. For the analysis of Model 1, two control variables, LEV and ROA, are significantly positively associated with earnings management, and the others (SIZE and GROW) are significantly negatively associated with earnings management. For the analysis of Model 2, two control variables, LEV and ROA, are significantly positively associated with earnings management, and the GROW variable is significantly negatively associated with earnings management. Panel B in Table 5 shows the fixed effect regression results. For the main explanatory variables, these results remain consistent with the OLS results.

Table 5
REGRESSION RESULTS: UNBILLED RECEIVABLES WITH LOSS ALLOWANCES - EARNINGS MANAGEMENT

Panel A. OLS Regression Results			
Variables	Expected sign	Dependent Variable: Discretionary Accruals	
		Model 1	Model 2
Constant	?	0.3702** (2.43)	0.0619 (0.38)
Unbilled	+	0.4888*** (12.98)	-
Unbilled*ALLest	?	-0.6175*** (-7.07)	-
DISCunbilled	+	-	0.3662*** (11.57)

Table 5
REGRESSION RESULTS: UNBILLED RECEIVABLES WITH LOSS ALLOWANCES - EARNINGS MANAGEMENT

DISCunbilled*ALLest	?	-	-0.2200* (-1.75)
LEV	+	0.2112*** (11.39)	0.3014*** (17.16)
SIZE	+/-	-0.0129* (-1.73)	0.0012 (0.15)
ROA	+	0.4526*** (9.94)	0.1531*** (2.70)
GROW	-	-0.1114*** (-8.31)	-0.0867*** (-6.21)
Industry Dummies		Included	
Industry Dummies		Included	
F value		74.00***	65.7***
Adjusted R^2		0.5507	0.5207
N		954	954
Panel B. Fixed Effect Regression Results			
Variables	Expected sign	Dependent Variable: Discretionary Accruals	
		Model 1	Model 2
Constant	?	0.0388 (0.04)	-1.3539 (-1.51)
Unbilled	+	0.4713*** (11.17)	-
Unbilled*ALLest	?	-0.5224*** (-5.53)	-
DISCunbilled	+	-	0.3671*** (10.29)
DISCunbilled*ALLest	?	-	-0.1787 (-1.32)
LEV	+	0.2077*** (10.30)	0.2972*** (15.46)
SIZE	+/-	-0.0150 (-0.34)	0.0542 (0.20)
ROA	+	0.3899*** (7.80)	0.0820 (1.29)
GROW	-	-0.0988*** (-6.66)	-0.0752*** (-4.90)
Industry Dummies		Included	
Industry Dummies		Included	
F value		78.65***	71.66***
Adjusted R^2		0.4067	0.3150
N		954	954

Note:
Unbilled*ALLest : the Unbilled interaction term with establishment of loss allowances.
DISCunbilled*ALLest : the Discretionary Unbilled interaction term with establishment of loss allowances.
Other variables : See Table 2 for variable definitions.
t-values are shown in parentheses; *p<0.10; **p<0.05; ***p<0.01.

Unbilled receivables, the estimated revenue exceeding billings, can be seen as a signal of accounting fraud (Loughran & McDonald, 2011; Jung et al., 2018; Kwon & Lee, 2019). In some previous studies, discretionary behavior for earnings management using allowance-related accrual accounts has been analyzed (Ma, 1988; McNichols & Wilson, 1988; Caylor, 2009; Jackson & Liu, 2010). Jackson & Liu (2010) found a relationship between allowances and earnings management. Ma (1988) also found US banks were smoothing their income through loss allowances for uncollectible accounts.

CONCLUSIONS

As demonstrated in prior studies, top-tier construction and shipbuilding companies in Korea have recently conducted earnings management by using unbilled receivables. In addition, big baths were performed when the CEOs were replaced, which caused massive losses and ultimately led to accounting fraud. The percentage-of-completion method has been applied in recognizing revenue due to the nature of the two industries, and thus it is inevitable for unbilled receivables to occur. The problem, however, is that unbilled receivables are used as an irregular accounting tool to conceal poor management performance.

Preceding studies have shown that unbilled receivables may lead either to earnings management or accounting fraud and issued warnings for stakeholders to carefully observe unbilled receivables. While companies need to establish adequate loss allowances for

unbilled receivables, it is highly probable that they have adjusted their profits by not accumulating loss allowances for fear of their losses.

Therefore, this study investigated the relationship between unbilled receivables and earnings management to determine whether the correlation showed different patterns in cases where loss allowances were established for the unbilled receivables. The results of this study are as follows. First, there was a significant positive relationship between unbilled receivables and earnings management. To use more precise measures of unbilled receivables, this study conducted an additional analysis by using the changes in unbilled receivables relative to the previous year and discretionary (abnormal) unbilled receivables. All results using the three measurement types showed significant positive relationships, which implies that companies have strategically used unbilled receivables accounts for earnings management.

Second, there was a significant negative relationship between unbilled receivables with loss allowances and earnings management. That is, this study confirmed that the cases with established loss allowances show different patterns even when the companies retain unbilled receivables. This result implies an inevitability of carrying unbilled receivables due to the nature of the two industries and the fact that all unbilled receivables cannot be interpreted as a sign of future insolvency. In reality, it is difficult to determine the exact amount of unbilled receivables that can predict insolvency in the future.

With unbilled receivables as the major variable for analysis, this study has limitations in terms of data size, as the study uses data from 2010 forward, when unbilled receivables started to appear in financial statements. Nevertheless, this study contributes in that it presents results on the effects of unbilled receivables and loss allowances on earnings management, which provides useful information for academic circles and industry professionals alike, in the midst of a lack of research on unbilled receivables. Since there has been more public focus on unbilled receivables and also legislation addressing the issue, future research may consider to explore whether there will be a change in management practices since then. Future research also may consider correlation of earnings management through unbilled receivables with other indicators of management quality. The issue of limited data availability can be tackled by considering companies internationally; this likely provides a rich array of issues to explore with different practices across countries.

ENDNOTES

1. We use the data from 2010 forward, when unbilled receivables started to appear in financial statements with the adoption of IFRS.
2. To check reverse causality, we tried to re-estimate the model using a lagged independent variable so that the dependent variable (t) is a function of independent variable (t-1). We concluded that the regression model has not reverse causality.

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