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The Impact of COVID-19 on Earnings Management in the Distribution and Service Industries

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Abstract

Purpose: This study aimed to investigate whether distribution and service companies maintained their accounting information quality and provided reliable information despite the economic changes occurring after the outbreak of the COVID-19 pandemic in Korea. The distribution industry has enjoyed increased demand as many companies expanded their untact distribution channels, including to online sales. However, as the pandemic drags on, their future prospects remain uncertain. **Research design, data, and methodology**: In this study, we define 2018-2019 as the "pre COVID-19 period" and 2020 as the "post COVID-19 period." An empirical analysis was performed using a regression model that includes POST, the independent variable, indicating the post COVID-19 period, and discretionary accruals (DA), a proxy for earnings management, as a dependent variable. **Results**: The analysis shows that the coefficient of POST is significantly positive (+) for the dependent variable DA. This finding suggests that distribution and service companies engaged in more earnings management during the post COVID-19 period than during the pre COVID-19 period, indicating their awareness of the uncertainty of future business performance as the pandemic persists. An additional analysis confirmed that smaller companies with fewer stakeholders and higher information asymmetry tend to engage more in earnings management than larger companies.

Keywords: Distribution and Service Industries, COVID 19 Pandemic, Earnings Management, Information Asymmetry

JEL Classification Code: D52, G30, M41

1. Introduction[1]

Nearly every business across all industries, including travel, transport, energy, and manufacturing, has suffered the effects of the COVID-19 pandemic: rapidly deteriorating business performance and heightening economic uncertainty, soaring exchange rates and oil prices and plummeting stock markets (Carracedo, Puertas, & Marti, 2021). These economic conditions are making accounting information measurements more unreliable and opportunistic accounting choices more tempting for those who seek immediate gains. The overheated capital market, with its abundant liquidity and recent volatility, no longer seems to pay much attention to accounting information. It is likely that such an economic environment during the pandemic will lead to lower accounting information quality.

Although the distribution industry has enjoyed increased demand due to many companies expanding their untact distribution channels, such as online sales, as the pandemic drags on, their future prospects, like those of many other industries, remain uncertain.

This study aims to verify how managers of distribution and service companies maintained the quality of financial reporting and provide reliable information in response to the

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economic changes they have faced since the outbreak of COVID-19. No study has investigated the extent of earnings management in the distribution and service industries during the pandemic. The Asian financial crisis in 1997 and the COVID-19 crisis in 2019 have substantial differences in their causes, impact on capital markets, and the processes through which they spread. This study is significant because it examines the financial reporting tendencies of companies after the onset of the pandemic, unlike studies that analyze the aftereffects of the financial crisis.

This paper is organized as follows. In Section 2, we conduct a literature review and establish a research hypothesis. In Section 3, a model and measurement variables are defined to test the hypothesis. In Section 4, we present and interpret the empirical analysis results, and in Section 5, we summarize our conclusions and discuss the study's implications.

2. Theoretical Background and Research Hypothesis

The Korean economy, with its heavy dependence on exports and an open capital market, is susceptible to a rapid outflow of foreign capital as exchange rates soar and oil prices drop due to the increasing uncertainties in the global economy. After the outbreak of COVID-19, foreign investors net sold Korean stocks while individual investors made net purchases. Previous research shows that a reduced proportion of foreign ownership weakens the effect of management supervision by foreign investors while relatively increasing the stake and, consequently, the influence of the majority shareholders, increasing the possibility of earnings management (An, 2019). Choe, Kho, and Stulz (2005) analyzed the impact of the changes in the stakes of majority shareholders and foreigners on companies' accrual earnings management before and after the global financial crisis. The analysis results showed that discretionary accruals (DA) increased after the financial crisis, suggesting a decline in accounting transparency. At the same time, while the portion of foreign ownership of Korean stocks decreased after the financial crisis, the influence of majority shareholders increased. The higher the proportion of foreign ownership, the lower the DA; the higher the proportion of majority shareholders, the greater the earnings management practices. This finding implies that foreign investors serve as watchdogs to protect against earnings management practices.

However, management may feel more tempted to reduce or hide their business's deteriorating performance and financial soundness during a pandemic. This occurs because the economic benefits of upward earnings management increases while potential losses decrease, as the possibility of being detected is lower due to increased information asymmetry and relaxed monitoring. Under these circumstances, companies are more strongly motivated to manage earnings and more tempted to underreport bad business performance or delay the timing of their reports. Lassoued and Khanchel (2021) examined the impact of the COVID-19 pandemic on earnings management practices, focusing on a sample of 2,031 firms listed on stock exchanges in 15 European countries. They found that the sample firms tended to manage earnings more during the pandemic period (1Q–4Q, 2020), resulting in reduced reliability of their financial reports. Funke and Ho (2021) confirmed earnings management activities during the pandemic in 87 firms listed in Iraq, which they argue negatively influenced the value relevance of earnings data. Xiao and Xi (2021) investigated 2,029 firms listed in China and found a positive correlation between the level of risk (death rate) in the region where a company is located and the degree of earnings management. To summarize, previous studies have pointed out that the pandemic may have a long-term negative effect on the reliability of financial statements.

In contrast, some companies in industries that are benefiting from the COVID-19 crisis may resort to discretionary accounting practices to smooth earnings by underreporting business performance and deferring earnings. Pharmaceutical companies and the manufacturers of test kits are enjoying explosive demand from the outbreak of the pandemic, and distribution and service industries are benefiting through the expansion of untact distribution channels. Thus, the incentives for management to make opportunistic accounting choices after the COVID-19 outbreak may differ among industries. This is likely to undermine the neutrality and consistency of financial statements, lowering the usefulness and reliability of accounting information (Moscariello, Fera, & Cinque, 2020). Aljawaheri, Ojah, Machi, and Almagtome (2021) mentioned that worsening business performance and increasing uncertainties due to the pandemic encourage opportunistic accounting practices and reduce the quality of accounting reports.

As companies perform poorly and uncertainties rise in the overall economy, information asymmetry between company insiders and outsiders increases as well (Oskouei & Sureshjani, 2020). Thus, it is expected that distribution and service companies will also make more opportunistic earnings management choices. This study aims to examine how the extent of earnings management in distribution and service industries changes before and after the outbreak of COVID-19. The research hypothesis is as follows:

[H] The extent of earnings management is higher in the post COVID-19 period than in the pre COVID-19 period.

3. Research Methodology

3.1. Estimating the COVID-19 Period

After the first outbreak in China in November 2019, COVID-19 crossed China's boundaries in January 2020 to spread around the world beginning in mid-February. In this study, we set 2018-2019 as the "pre COVID-19 period," and 2020 as the "post COVID-19 period." The pandemic period may vary slightly depending on the research context and focus. Most studies that use company-year data have set the entire year of 2020 as the pandemic period (Shawn, Choi, Kang, & Choi, 2021).

3.2. Research Model

This study aims to analyze if earnings management increased among companies in the distribution and service industries after the outbreak of COVID-19. To this end, a regression analysis model was established with POST, the independent variable, which indicates the post COVID-19 period, and discretionary accruals (DA), a proxy for earnings management, as a dependent variable, as shown in Eq. (1):

$$DA_{i,t} = \gamma_0 + \alpha_1 POST_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 CFO_{i,t} + \alpha_4 LEV_{i,t} + \alpha_5 BIG4_{i,t} + \alpha_6 ROA_{i,t} + \alpha_7 LOSS_{i,t} + \alpha_8 KOSPI_{i,t} + \epsilon_{i,t} \quad (1)$$

In this study, we used performance-matched discretionary accrual measures (Kothari, Leone, & Wasley, 2005), improved from the modified Jones model (Dechow, Sloan, & Sweeney, 1995), to measure the extent of accrual earrings management. The total amount of DA was measured by deducting operating cash flow from net income. Out of total accruals, the residual, excluding non-SA, is estimated as the amount of DA using Eq. (2) as follows:

$$TA_{i,t}/A_{i,t-1} = \beta_0 + \beta_1 (1 / A_{i,t-1}) + \beta_2 [(\Delta S_{i,t} - \Delta AR_{i,t}) / A_{i,t-1}] + \beta_3 PPE_{i,t} / A_{i,t-1} + \beta_4 ROA_{i,t} + \varepsilon_{i,t} \quad (2)$$

TAi,t = Net income - cash flow from operating activities;
Ai,t-1 = Total assets;
ΔSi,t = Change in sales;
ΔARi,t = Change in accounts receivable;
PPEi,t = Tangible assets – land - construction in progress;
ROAi,t = Net income/total assets;
ε = Residuals; and
i,t = firm, year

Control variables include company size (SIZE), operating cash flow (CFO), the debt ratio (LEV), professional auditor (BIG4), profitability (ROA), whether a company incurred a loss (LOSS), and whether a company is listed in KOSPI (KOSPI). The measurement of the control variables is described in <Table 1>.

BIG4 is a measure of audit quality. Previous studies have defined audit quality as high or low depending on the presence of the use of one of the Big 4 accounting firms (Deloitte, Ernst, & Young (EY), KPMG, and PricewaterhouseCoopers (PwC)) as the firm's auditor. Use of a Big 4 accounting firm was defined as a proxy for superior audit quality because previous studies have reported that they provide high-quality audits through a variety of internal training programs and peer reviews and are more likely to maintain their professional brand name than other accounting firms (Becker, DeFond, Jiambalvo, & Subramanyam, 1998; Krishnan, 2003).

Table 1: Variable Measurement

Variable	Measurement
DA	= discretionary accruals estimated using equation (2)
POST	= 1 if the fiscal year of the firm is 2020, and 0 otherwise.
SIZE	= the logarithm of market value
CFO	= the ratio of operating cash flow to total assets
LEV	= the ratio of total debt to total assets
BIG4	= 1 if the firm is audited by a BIG4 auditor, and 0 otherwise.
ROA	= the ratio of net income to total assets
LOSS	= 1 if the firm incurred a net loss, and 0 otherwise.
KOSPI	= 1 if the firm is listed on the KOSPI market, and 0 otherwise.
i,t	= firm, year

3.3. Sample Selection

This study targets distribution and service companies listed on the stock exchange from 2018 to 2020. To secure temporally homogeneous data, the firms selected were limited to corporations that settle accounts at the end of December; the financial data were extracted from the KIS-VALUE database. To control for outliers, the variables used in the empirical analysis were winsorized at the top and bottom 1%. According to these criteria, a final sample of 869 company-year observations was obtained.

4. Empirical Analysis

4.1. Descriptive Statistics

<Table 2> reports the descriptive statistics of the sample before and after the COVID-19 outbreak. The average value (median) of DA, a proxy for earnings management, was 0.001 (0.003) in the pre COVID-19 period and 0.003 (0.005)

in the post COVID-19 period. These figures reveal that distribution and service companies have been involved in earnings management practices on a larger scale in the post COVID-19 period than before the pandemic.

Table 2: Descriptive Statistics

Panel. A: Pre COVID-19 period (n=580)					
Variable	**Mean**	**Standard Deviation**	**Minimum**	**Median**	**Maximum**
DA	0.001	0.082	-0.339	0.003	0.322
SIZE	26.011	1.397	23.367	25.718	30.432
CFO	0.039	0.087	-0.250	0.034	0.295
LEV	0.352	0.192	0.031	0.352	0.926
BIG4	0.517	0.500	0.000	1.000	1.000
ROA	-0.007	0.118	-0.545	0.017	0.256
LOSS	0.350	0.477	0.000	0.000	1.000
KOSPI	0.359	0.480	0.000	0.000	1.000
Panel. B: Post COVID-19 period (n=289)					
Variable	**Mean**	**Standard Deviation**	**Minimum**	**Median**	**Maximum**
DA	0.003	0.091	-0.339	0.005	0.322
SIZE	26.098	1.389	23.229	25.775	30.432
CFO	0.047	0.096	-0.250	0.044	0.295
LEV	0.357	0.194	0.031	0.340	0.926
BIG4	0.398	0.490	0.000	0.000	1.000
ROA	-0.003	0.121	-0.545	0.023	0.256
LOSS	0.356	0.480	0.000	0.000	1.000
KOSPI	0.356	0.480	0.000	0.000	1.000

Variable definitions: refer to <Table 1>.

4.2. Correlation Analysis

<Table 3> shows the correlations between the primary variables used in this study. The dependent variable, DA, was found to have a significantly negative relationship with the variable CFO, which indicates the level of operating cash holdings, and the profitability variable ROA at the 1% and 5% significance levels, respectively. It was confirmed that companies with a higher amount of liquid funds and higher profitability are less likely to engage in earnings management through DA. In addition, using a Big 4 accounting firm to perform the company's audit also had a significantly negative relationship with DA at the 5% significance level, suggesting that the auditor's expertise effectively controls corporate earnings management. In contrast, LOSS, indicating that the company incurred a loss, was found to have a significantly positive (+) relationship with DA at the 1% significance level, implying that loss-making companies are more incentivized than profitable companies to make opportunistic earnings management choices.

However, <Table 3> reports the results of a bivariate correlation analysis, which does not control for the effects of other factors. It is necessary to perform multivariate analysis, which includes other variables that affect the dependent variable as control variables, to ensure the robustness of the hypothesis test.

4.3. Regression Analysis

This study aims to examine the change in the extent of earnings management before and after the outbreak of COVID-19. The research hypothesis proposes that the extent of earnings management is higher after the pandemic's outbreak than before.

<Table 4> shows the results of the regression analysis based on Eq. (2). The coefficient of POST, indicating after the COVID-19 pandemic, was 0.008 and significantly positive (+) at the 1% level for the dependent variable DA. This finding suggests that although the distribution industry has enjoyed increased demand because many companies have been expanding untact distribution channels, including online sales, companies in the industry have engaged in more earnings management since the pandemic began because their future prospects remain uncertain as it drags on.

Table 3: Pearson's correlations (n=869)

	DA	**SIZE**	**CFO**	**LEV**	**BIG4**	**ROA**	**LOSS**	**KOSPI**
DA	1	-0.041	-0.837	-0.038	-0.110	-0.101	0.159	-0.012
		(0.2257)	(<.0001)	(0.2613)	(0.0012)	(0.003)	(<.0001)	(0.7297)
SIZE		1	0.147	0.216	0.515	0.240	-0.224	0.505
			(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
CFO			1	0.006	0.176	0.452	-0.402	0.000
				(0.8675)	(<.0001)	(<.0001)	(<.0001)	(0.9969)
LEV				1	0.032	-0.115	0.121	0.068
					(0.3413)	(0.0007)	(0.0003)	(0.0439)
BIG4					1	0.190	-0.179	0.267
						(<.0001)	(<.0001)	(<.0001)
ROA						1	-0.696	0.005
							(<.0001)	(0.894)
LOSS							1	-0.033
								(0.3352)
KOSPI								1

Variable definitions: refer to <Table 1>. Values in parentheses are p-values.

Table 4: Effect of COVID-19 on Earnings Management

Dependent Variable: DA		
Variables	**coefficient**	**z-value**
Intercept	-0.038	(-1.28)
POST	0.008	(3.1)***
SIZE	0.003	(2.79)***
CFO	-0.956	(-61.81)***
LEV	0.007	(1.13)
BIG4	-0.005	(-1.98)**
ROA	0.235	(15.72)***
LOSS	0.000	(0.18)
KOSPI	0.000	(-0.19)
F-value	446.83***	
Adjusted R^2	0.82	
Sample Size	869	

***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively. Variable definitions: refer to <Table 1>.

4.4. Additional Analysis

<Table 5> shows whether companies with high information asymmetry show more evidence of earnings management after the COVID-19 outbreak. The amount of company information asymmetry was determined based on the median of the SIZE variable, which measures company size, and the firm-years were divided into two groups: those with high information asymmetry and those with low information asymmetry. The larger a company is, the more stakeholders it has, making it difficult for management to make decisions that go against the interests of its stakeholders. Accordingly, the group with SIZE above the median value was set as having low information asymmetry (Low IA Group) because there is a large number of stakeholders who can monitor accounting practices. The group with SIZE less than the median was set as having high information asymmetry (High IA Group). <Table 5> shows that the coefficient value for POST, indicating after the COVID-19 outbreak, for the High IA Group, was 0.011, significant at the 1% level. This means that distribution and service industries with high information asymmetry also increased earnings management significantly in the post COVID-19 period. On the contrary, the group with low information asymmetry (Low IA Group) did not show a significant result for the POST variable. These findings support the robustness of the main analysis result and suggest that the level of information asymmetry inside and outside the company is one of the main factors that influences earnings management.

Table 5: Effect of COVID-19 on Earnings Management (Additional Test: Using Information Asymmetry Groups)

Variables	**(1) High IA Group**		**(2) Low IA Group**	
	Coef.	**t−value**	**Coef.**	**t−value**
Intercept	-0.103	(-1.1)	0.031	(0.72)
POST	0.011	(3.01)***	0.004	(1.17)
SIZE	0.006	(1.6)	0.000	(0.37)
CFO	-0.937	(-43.16)***	-0.983	(-43.66)***
LEV	-0.003	(-0.35)	0.017	(1.99)**
BIG4	-0.006	(-1.53)	-0.006	(-1.71)*
ROA	0.212	(11.25)***	0.279	(9.12)***
LOSS	0.000	(-0.08)	0.004	(0.95)
KOSPI	-0.003	(-0.69)	0.002	(0.61)
F-value	222.66 ***		228.57 ***	
Adjusted R^2	0.82		0.82	
Sample Size	423		562	

***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively. Variable definitions: refer to <Table 1>.

5. Conclusion

Companies are facing growing uncertainties in the management environment and worsening business performance since the outbreak of COVID-19. Aggravated by the difficulty measuring accounting information, these companies more susceptible to the temptation to use opportunistic accounting practices to avoid the crisis at hand (Chen, Liu, Liu, & Wang, 2021). Under these circumstances, managers may have incentives to increase information asymmetry between corporate insiders and outsiders. Some companies have attempted to report higher quarterly earnings than actually achieved by, for example, deferring recognized impairment (Kustono, Agustini, & Dermawan, 2021). Clearly, COVID-19 is an accounting crisis as well as a public health and economic crisis.

This study's purpose was to verify whether companies in the distribution and service industries have become more involved in the opportunistic practice of earnings management after the pandemic than before. The results show that companies increased DA significantly in the post COVID-19 period compared to the pre COVID-19 period, suggesting the that financial reporting quality has declined during the pandemic. In addition, the practice of earnings management was more evident in companies with higher information asymmetry and with a smaller number of stakeholders and a lower level of monitoring activities. This study contributes to the literature by examining how health crises such as the COVID-19 pandemic can affect the accounting practices of distribution and service companies.

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