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The Effects of Corporate Financial Disclosure on Stock Prices: A Case Study of Korea's Compulsory Preliminary Earnings Announcements

Sun-Keun Yoo and Se-Hak Chun *

Department of Business Administration, Seoul National University of Science and Technology, 232 Gongneung-ro, Nowon-gu, Seoul 01811, Republic of Korea; sk8436@seoultech.ac.kr
* Correspondence: shchun@seoultech.ac.kr; Tel.: +82-2-970-6487; Fax: +82-2-973-1349

Abstract: This paper examines the effects of Korea's compulsory preliminary earnings announcements on stock prices using individual corporate financial disclosure data. Korea's compulsory preliminary earnings announcements are similar to the US's fair disclosures in that they are preliminary settlement disclosures. Disclosure regulation aims to prevent insider trading and resolve information asymmetry among investors by promptly disclosing unconfirmed internal settlement information prior to an external audit. The disclosure of such changes in profit or loss is generally expected to affect stock prices. Many studies have analyzed the relationship between accounting profit disclosure and stock prices, but most have focused on the relationship between net profit disclosure and stock price without considering other disclosure information such as sales and operating profit. In addition, previous studies analyzed the information effect of accounting profits based on annual reports, which are based on analysts' predicted values and limited datasets. This study investigates the impact of Korea's compulsory disclosure on stock prices through a multiple regression analysis, considering three types of accounting information, including sales, operating profit, and net profit, based on actual announcement data and daily trading volumes. The effect of corporate financial disclosure might vary with stock market type and industry sector. For this reason, we analyze the relationship between financial disclosure and stock prices for different stock market types and industry sectors. Results show that sales information affected KOSPI-listed companies' stock prices, and operating profit information affected KOSDAQ-listed companies' stock prices. In terms of financial market efficiency, the results show weak-form efficiency for both the KOSPI and KOSDAQ markets in general. However, this implies that there is still information asymmetry in sales information for the KOSPI, which consists of large and valued stocks and is not completely efficient, whereas information asymmetry might occur in operating profit information for the KOSDAQ, which consists of relatively small-to-medium innovative growing companies. In addition, results show that operating profits affect manufacturing industries' stock prices, and that trading volumes significantly impact stock prices for all markets and industries.

Keywords: compulsory disclosure; fair disclosure; preliminary earnings announcement; profit and loss structure change disclosure

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1. Introduction

Many studies have investigated the information effect of annual report accounting profits on stock prices since Beaver (1968). They focused on the impact of compulsory earnings announcements on stock prices to find the relationship between unexpected earnings (net profit minus analyst-predicted net profit) and stock prices. They depended on a small sample size for unexpected earnings because analysts do not report all stocks. In addition, there is debate regarding whether an annual report is informative, because accounting profits can be predicted in the market through provisional settlement disclosure, which is a voluntary fair disclosure.

We investigate the impact of Korea's compulsory preliminary earnings announcements on stock prices using actual disclosure announcement data. Unlike those in the United States, listed corporations in Korea are obliged to immediately disclose changes in profit and loss structure before making their annual reports when major changes in their financial structure occur. Korean firms should immediately disclose changes in their profit and loss structure if any indicators of sales, operating profit, or net profit increase or decrease by 30% or more compared to the same period in the previous year. This regulation was adopted on 24 March 2000 to prevent insider trading and to resolve information asymmetry between investors by promptly disclosing unconfirmed internal settlement information prior to an external audit. After this regulation was adopted, many studies were conducted in Korea regarding the effect of such disclosures of profit and loss changes on stock prices (Jang and Cheon 2003; Sohn and Lee 2005; Lee and Jung 2008; Jeong and Jeong 2014). Some studies showed that accounting information affected stock prices (Jang and Cheon 2003; Sohn and Lee 2005; Jeong and Jeong 2014), but others showed that accounting information did not affect stock prices (Lee and Jung 2008). However, these studies relied only on analysts' forecasts instead of actual data. In addition, they used only net profit information, but not other important accounting information, such as sales and operating profit. This study analyzes the impact of Korean compulsory disclosure on stock prices by considering three types of accounting information (sales, operating profit, and net profit) based on actual announcement data. Moreover, this study analyzes the relationship between disclosure and stock prices using daily trading volumes for different market types and sectors.

This study contributes to the existing literature as follows: First, we overcame the limitations of existing research by analyzing the effect of Korean compulsory disclosure announcements that are provisional, such as fair disclosures, and compulsory, such as annual reports. Second, we comprehensively analyzed and reflected on disclosure effects using actual sales, operating profit, and net profit information instead of unexpected earnings based on analysts' net profit forecasts. Third, we measured the disclosure effect using the change in stock price on the day of disclosure.

The structure of this paper is as follows: Section 2 reviews previous studies; Section 3 describes data used in this study; analysis and results are presented in Section 4; Section 5 provides conclusions and directions for further studies.

2. Literature Review

2.1. Earnings Reports and Stock Prices

Earnings surprises impact stock prices. In the efficient market hypothesis (EMH), as described by Fama (1970), all publicly available information is instantaneously reflected in the stock price; as a result, no investors expect abnormal excess returns in the long run. To verify the well-established EMH, many studies have investigated the information effect of annual report net profit information on stock prices. However, these studies have shown conflicting results. Since Beaver (1968), many studies related to the information effect of accounting profits have been conducted; most analyzed the relationship between unexpected earnings (actual income minus expected income) and stock prices using annual reports (Wilson 1987; Cready and Mynatt 1991; Lobo and Song 1989).

Some studies found that an annual report's unexpected earnings could have an information effect, because investors predict net profit based on analysts' net profit forecasts, showing that unexpected earnings affect stock prices (Wilson 1987; Lobo and Song 1989; Ball and Brown 1968; Busse and Green 2002; Chordia et al. 2005; Chordia et al. 2005). Chordia et al. (2005) analyzed the short-term effect of announcements using intraday returns for 150 NYSE stocks during the calendar years 1996, 1999, and 2002; they found that weak-form efficiency appeared to prevail over intervals from five minutes to one day. Lee and Choi (2009) analyzed a sample of fair disclosures announced from January 2003 to September 2004 using intraday data to verify the effectiveness of real-time information. They showed that stock prices reacted immediately to fair disclosures announced in real time in the Korean stock market, and argued that when there was an intraday disclosure,

the information was fully reflected in the stock price at the end of the day, with no information delay until the next business day. Olibe et al. (2022) found that significant price and trading volume responses accompanied earnings information in the days immediately surrounding earnings announcements.

However, some studies failed to detect such a price response. Cready and Mynatt (1991) examined price and trading responses to the release of annual reports of US companies that had already made preliminary earnings announcements. They found that the price response was insignificantly different from zero for each of the event days examined. Bänziger et al. (2023) found a semi-strong efficient market between earnings announcements of Swiss companies and stock prices, and suggested that pre- and post-announcement abnormal returns were modest and generally not statistically significant. Fink (2021) also found that an earnings surprise did not lead to a full, instantaneous stock price adjustment, but rather to a low, predictable drift.

2.2. Voluntary Fair Disclosure in the U.S. and Compulsory Disclosure in Korea

In the United States, the fair disclosure system was first introduced in October 2000 to establish fair provisional settlement disclosure. A little earlier, in March 2000, Korea introduced the profit and loss structure change, which required companies to immediately disclose any indicators of sales, operating profit, or net profit that increased or decreased by 30% or more compared to the same period in the previous year. The intent in doing so was to prevent insider trading and resolve information asymmetry between investors by promptly disclosing unconfirmed internal settlement information prior to an external audit. Such disclosure of changes in profit and loss was generally expected to affect stock prices.

Heflin et al. (2003) argued that fair disclosure played a role in narrowing the information gap between investors; they found smaller deviations between pre- and post-announcement stock prices. However, Bailey et al. (2003) found no significant change in return volatility after fair disclosure regulation. Ahmed and Schneible (2007) reported limitations, including selective disclosures regarding disclosure details, and companies that chose whether or not to disclose; however, the information gap between investors had been largely resolved by the introduction of fair disclosure. Sidhu et al. (2008) reported a negative aspect, that inaccurate information might be provided to the market as companies became more arbitrary in their disclosure process.

Since the adoption of compulsory disclosure in Korea, many studies have shown that fair disclosure has information effects (Jang and Cheon 2003; Lee and Choi 2009; Jeong and Jeong 2014; Kim 2018). Some studies have found that accounting information affected stock prices (Jang and Cheon 2003; Sohn and Lee 2005; Jeong and Jeong 2014; Sohn et al. 2015; Lee 2020). Sohn and Lee (2005) showed a relationship between unexpected net profit and stock price using analysts' forecasts. Lee and Choi (2009) analyzed a sample of fair disclosures announced from January 2003 to September 2004 using intraday data to verify the effectiveness of real-time information. They showed that stock prices immediately reacted to fair disclosures announced in real time in the Korean stock market, and argued that when there was an intraday disclosure, the information was fully reflected in the stock price at the end of the day, and that there was no information delay until the next business day. However, Lee and Jung (2008) found no relationship between unexpected net profit and stock price when they used analysts' forecasts; this implies that researchers need to analyze the relationship between net profit and stock price based on actual data instead of analysts' forecasts.

These controversial results motivated us to examine the following questions: Why were the results different? Why did researchers rely on only net profit information to find the relationship between disclosure information and stock price? Why did they use analysts' forecast information instead of using actual data? Thus, we tried to fill the gaps left by the limitations of previous studies and investigated how the disclosure of profit and loss structure changes affected stock prices for different market types and sectors.

3. Materials and Methods

3.1. Data Description

We used web crawling to collect disclosure information from the Korea Exchange's electronic disclosure system (KIND) for January to March 2021 for listed corporations on the KOSPI and the KOSDAQ that disclosed changes in their profit and loss structure. There are approximately 800 companies listed on the KOSPI and approximately 1400 companies listed on the KOSDAQ; approximately 80% of these companies disclose changes in profit and loss structure at the beginning of each year. We obtained 932 records from 2139 disclosures after removing 556 corrective disclosures and 652 records of non-numerical information regarding surplus and deficit conversion. Sohn et al. (2015) analyzed corrective announcements and reported that they have no information effect, so we excluded them from the sample.

3.2. Methodology

We used the following regression model to investigate how disclosure information regarding profit and loss structure changes affected stock prices for different market types and market sectors.

$$\mathrm{AR} = b_0 + b_1\mathrm{SR} + b_2\mathrm{OPR} + b_3\mathrm{NPR} + b_4\mathrm{VR} + \mathrm{e}$$

Table 1 describes the regression model's independent and dependent variables.

Table 1. Variables description.

No	Category	Variable Symbols	Description	References
1	Dependent variable	Abnormal returns (AR)	$R_{it} - R_{mt} = \frac{P_{it}-P_{it-1}}{P_{it-1}} - \sum_{i=1}^{n}(\frac{p_{it}-p_{it-1}}{p_{it-1}})/n$	Sohn and Lee (2005), Chordia et al. (2005), Kim (2018), Gregoire and Martineau (2022), Bänziger et al. (2023)
2	Independent variable	Change rate of sales (SR)	$\frac{SR_{it}-SR_{it-1}}{SR_{it-1}}$ where t is the year, and binned from −5 to 5	Lee and Yoo (2012), Kim (2021)
3	Independent variable	Change rate of operating profit (OPR)	$\frac{OPR_{it}-OPR_{it-1}}{OPR_{it-1}}$ where t is the year, and binned from −5 to 5	Hue and Yoo (2009), Kang and Choi (2014), Kim (2021)
4	Independent variable	Change rate of net profit (NPR)	$\frac{NPR_{it}-NPR_{it-1}}{NPR_{it-1}}$ where t is the year, and binned from −5 to 5	Beaver et al. (1979), Kothari (2001), Bradshaw et al. (2012), Kim (2018), Gregoire and Martineau (2022)
5	Independent variable	Change rate of volume (VR)	$\frac{\ln(VR_{it})-\ln(VR_{it-1})}{\ln(VR_{it-1})}$ where t is the day	Westerfield (1977), Epps (1977), Gallant et al. (1992), An et al. (2006), Jeong and Jeong (2014), Choi (2019), Park (2021)

We used a dependent variable as the abnormal returns by subtracting the average stock price change rate of the sector to which each company belonged from the individual company's stock price change rate (Sohn and Lee 2005; Chordia et al. 2005; Kim 2018; Gregoire and Martineau 2022; Bänziger et al. 2023). Thus, abnormal returns were denoted by

$$AR_{it} = R_{it} - R_{mt}$$

Here, $R_{it} = \frac{P_{it}-P_{it-1}}{P_{it-1}}$, where P_{it} is the individual stock price and P_{it-1} is the stock price of the previous day, and $R_{mt} = \sum_{i=1}^{n}(\frac{p_{it}-p_{it-1}}{p_{it-1}})/n$, where m is the market sector to which each company belongs, and n is the total number of firms in the market sector. We used three disclosures as independent variables: percentage change in sales, percentage change in profit, and percentage change in net profit. We divided each of these three independent variables into 10 bins because the linear relationship between excess returns and unexpected

earnings diminishes when the numerical volatility of unexpected earnings is high (Beaver et al. 1979; Kothari 2001; Kimbrough 2005; Khan and Watts 2009; Kim 2018). Thus, if the percentage change in sales, profit, and net profit increased by 30% or less year-over-year, we categorized it as 1; a 30–60% change in sales, profit, and net profit was categorized as 2; a 60–90% change was categorized as 3; 90–120% as 4; and 120% or more as 5. We categorized decreases the same way, as −1, −2, −3, −4, and −5, respectively; altogether we formed 10 bins, from −5 to 5. In addition, we considered the volume change rate as an independent variable because it played a role in investors' decisions and has been positively related to price changes (Park 2021; Choi 2019; Jeong and Jeong 2014; An et al. 2006; Westerfield 1977; Epps 1977; Gallant et al. 1992). Park (2021) found that an abnormal increase in the trading volume of an individual stock had a significant positive (+) relationship with the stock's excess return. Gallant et al. (1992) suggested that it is effective to simultaneously consider various data, including trading volume, for a more accurate stock price prediction. Therefore, we obtained the volume change rate using the logarithm of the volume on the disclosure day minus the logarithm of the volume on the day before disclosure day, which is $\frac{\ln(VR_{it}) - \ln(VR_{it-1})}{\ln(VR_{it-1})}$.

Next, we examined the effect of disclosure information for two markets (the KOSPI and the KOSDAQ) because different markets might react differently to disclosures (Grant 1980). The KOSPI market is composed of large-cap stocks that have been listed for a long time. There is much information available for large companies in the market, and there might be less unexpected information at the time when earnings are actually disclosed (Atiase 1985). However, the KOSDAQ market is composed of small- and mid-cap stocks that have been listed for a relatively short period of time. We also examined whether the effect of disclosure information differed between manufacturing and non-manufacturing firms, because existing studies mainly analyzed manufacturing firms.

4. Results

4.1. Descriptive Statistics

Prior to empirical analysis, the descriptive statistics of variables used in this study were confirmed. The values of independent and dependent variables are shown in Table 2. Table 2 indicates that the overall accounting profit, trading volume, and stock price increased above the market average because averages of sales, operating profit, net profit, and volume change were all positive on the date of changes in profit and loss disclosure.

Table 2. Descriptive statistics.

	Sales	Profit	Net Profit	Volume	AR
Count	932	932	932	932	932
Mean	0.21	0.42	0.39	0.22	0.09
Std	1.47	2.69	3.06	0.80	3.05
Min	−4.00	−5.00	−5.00	−3.02	−9.84
25%	−1.00	−2.00	−2.00	−0.25	−1.59
50%	1.00	1.00	1.00	0.15	−0.06
75%	1.00	2.00	3.00	0.63	1.56
Max	5.00	5.00	5.00	3.52	16.80

4.2. Correlation Analysis

Table 3 shows correlation analysis results; there was a significant positive correlation among variables. In particular, trading volume was closely related to returns and stock prices. Among the financial disclosure information, operating profit was the most highly correlated with abnormal returns, followed by net profit and sales.

Table 3. Correlation analysis.

	Sales	Profit	Net Profit	Volume	AR
Sales	1	0.447 *	0.321 *	0.100 *	0.096 *
Profit	0.447 *	1	0.640 *	0.149 *	0.141 *
Net Profit	0.321 *	0.640 *	1	0.117 *	0.118 *
Volume	0.100 *	0.149 *	0.117 *	1	0.368 *
AR	0.096 *	0.141 *	0.118 *	0.368 *	1

* denotes 1% significance with *p*-value less than 0.01.

4.3. Results of the Market Model

A regression analysis for each of the KOSPI and KOSDAQ markets was conducted to investigate the influence of three types of financial disclosure information and trading volume on the stock price. We used the following regression model to investigate how compulsory disclosure information affected stock prices for different market types as follows:

$$AR_i = b_0 + b_1 SR_i + b_2 OPR_i + b_3 NPR_i + b_4 VR_i + e$$

where i represents KOSPI and KOSDAQ market types.

Table 4 shows regression analysis results with four factors as independent variables and the stock price change as the dependent variable.

Table 4. Regression analysis results for market models.

Variables		Market		
		KOSPI	KOSDAQ	Total
Intercept	Coefficient	−0.232	−0.628	−0.533
	t-Value (Sig.)	−0.106 (0.916)	−0.348 (0.728)	−0.380 (0.704)
Change rate of sales (SR)	Coefficient	0.359	−0.146	0.051
	t-Value (Sig.)	3.171 * (0.002)	−1.614 (0.107)	0.722 (0.470)
Change rate of operating profit (OPR)	Coefficient	−0.012	0.123	0.065
	t-Value (Sig.)	−0.161 (0.872)	2.009 ** (0.045)	1.356 (0.175)
Change rate of net profit (NPR)	Coefficient	0.066	0.008	0.033
	t-Value (Sig.)	0.984 (0.326)	0.172 (0.863)	0.823 (0.411)
Change rate of volume (VR)	Coefficient	1.357	1.285	1.340
	t-Value (Sig.)	8.711 * (0.000)	7.227 * (0.000)	11.463 * (0.000)
Adj. R^2		0.208	0.096	0.140
Obs.		367	565	932

* and ** denote 1% and 5% significance, respectively.

Table 4 shows that there are no significant variables for total sum of KOSDAQ and KOSPI data, except trading volume, which had a 1% significance level. However, sales and trading volume variables were found to have 1% statistical significance for the KOSPI market data, and operating profit variable had 5% significance and trading volume had 1% statistical significance for the KOSDAQ market data. These results are interesting because previous studies considered only net profit as a significant variable. Our results show that sales and operating profit affect stock prices more than net profit does. Kim (2021) showed that changes in the performance of a company's main operating activities had a more significant impact on stock price fluctuations than non-operating activities did.

Furthermore, Kim (2021) said that change rate of operating profit affected stock prices of startup companies which was established 10 years or less ago, whereas change rate of sales affected stock prices of somewhat established companies which are 11 to 30 years old, which supported our results that sales affected KOSPI stock prices and operating profits affected KOSDAQ stock prices. Our results are consistent with those of Grant (1980) and Atiase (1985), who found that stock price reactions to accounting earnings varied across markets. The results also show that trading volume had a significant impact on stock prices regardless of KOSPI or KOSDAQ market type. This implies that market participants consider trading volume as well as sales and operating profit, because stock prices tends to rise when trading volume increased on announcement day compared to the day before the announcement.

4.4. Results of the Sector Model

Regression analysis was conducted for the two sectors to investigate the influence of three types of financial information and volume on the stock price. We also used the following regression model for different sectors:

$$AR_i = b_0 + b_1 SR_i + b_2 OPR_i + b_3 NPR_i + b_4 VR_i + e$$

where i represents manufacturing and non-manufacturing market sectors.

Table 5 shows the results of regression analysis for the sector model that operating profit affects manufacturing firms' stock prices at a 10% significance, whereas no accounting profit affects non-manufacturing firms' stock prices. Additionally, trading volume affects stock prices of both manufacturing and non-manufacturing industries at 1% significance.

Table 5. Regression results for sector models.

Variables		Sector	
		Manufacturing	**Non-Manufacturing**
Intercept	Coefficient	−0.352	−0.980
	t-Value (Sig.)	−0.194 (0.846)	−0.408 (0.683)
Change rate of sales (SR)	Coefficient	0.059	0.054
	t-Value (Sig.)	0.623 (0.533)	0.468 (0.641)
Change rate of operating profit (OPR)	Coefficient	0.111	−0.014
	t-Value (Sig.)	1.740 *** (0.082)	−0.183 (0.855)
Change rate of net profit (NPR)	Coefficient	−0.004	0.093
	t-Value (Sig.)	−0.072 (0.942)	1.398 (0.163)
Change rate of volume (VR)	Coefficient	1.372	1.285
	t-Value (Sig.)	9.362 * (0.000)	1.319 * (0.000)
Adj. R^2		0.153	0.120
Obs.		577	287

* and *** denote 1% and 10% significance, respectively.

5. Conclusions

This paper examined the effects of Korea's compulsory preliminary profit and loss disclosure on stock prices using individual corporate financial profit and loss disclosure data. The effect of corporate financial disclosure might vary by stock market type and

industry sector; therefore, we analyzed the relationship between financial disclosure and stock prices for different types of stock markets and industry sectors.

The results of this study are as follows: First, the results indicate that the stock markets generally had weak-form efficiency. However, the results also show that sales information affected KOSPI-listed companies' stock prices and that operating profit information affected KOSDAQ-listed companies' stock prices. Second, operating profit information affected manufacturing industries' stock prices, whereas any accounting information did not affect non-manufacturing industries' stock prices. Third, trading volumes significantly impacted stock prices regardless of market type or industry, which implies that market participants were concerned about trading volumes. Thus, the results indicate that there was room for investors to profit from the possibility of market inefficiency.

However, this study was limited in that we did not analyze unquantified data such as operating profit turnover or net profit turnover information; therefore, these data types were excluded. For future studies, we need to find a way to quantify operating profit turnover and net profit turnover information to comprehensively analyze the disclosure announcement effect.

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