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Split Ratings and Asymmetric Cost Behavior: Empirical Evidence from Korea

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Abstract

The purpose of this study is to examine the effects of split ratings on earnings management through cost adjustments based on asymmetric cost behaviors. Using a sample of 2,027 Korean firm-year observations over the 2002–2019 period, we analyze whether a firm deliberately reduces discretionary costs, such as selling, general, and administrative (SG&A) expenses, to improve profits when it receives multiple ratings from credit rating agencies (CRAs). While examining earnings management incentives in the presence of split ratings, we also investigate the moderating effects of Chaebols, Korea's unique corporate governance structure. We find that split-rating firms show less stickiness in SG&A costs compared to non-split-rating firms when sales decrease. This result implies the deliberate reduction of discretionary costs to improve earnings in the presence of split ratings, which are more likely to change in future credit assessments. We also find that the incentives for earnings management of split-rating firms are limited in Chaebol firms, which have high levels of socio-economic surveillance and support affiliated firms through the internal market of corporate groups. This study contributes to existing research by identifying new determinants of cost behavior by using the framework of asymmetric cost behavior in relation to earnings management incentives.

Keywords: Split Ratings, Asymmetric Cost Behavior, Earnings Management, Chaebol

JEL Classification Code: D24, G24, M41

1. Introduction

This study analyzes the effect of credit information on earnings management achieved by adjusting cost behavior. We focus on split ratings, namely situations in which multiple credit rating agencies (CRAs) offer different credit ratings for a particular bond. As a measure of earnings management, we use a framework of asymmetric cost behavior related to real activity manipulation (RAM) (Dierynck et al., 2013; Koo et al., 2015). Based on this framework, we empirically analyze whether a firm deliberately reduces discretionary costs, such as selling, general, and administrative

(SG&A) expenses, to improve profits when it receives multiple ratings from CRAs. While examining earnings management incentives in the presence of split ratings, we also examine the moderating effects of Chaebols, Korea's unique corporate governance structure.

Situations in which a particular bond (or issuer) receives different credit ratings from multiple CRAs are common (Jewell & Livingston, 1998; Livingston et al., 2007). In Korea, when a firm raises money by issuing bonds, it normally receives a credit rating from two or more CRAs. In some cases, CRAs provide inconsistent ratings for the same bond. Previous studies have investigated the main causes of split ratings (Ederington, 1986; Morgan, 2002; Livingston et al., 2007), how split ratings affect bond yields (Billingsley et al., 1985; Jewell & Livingston, 1998; Santos, 2006; Livingston & Zhou, 2010; Livingston et al., 2010), and changes in credit ratings after split ratings (Livingston et al., 2007). Most of these are financial studies that consider the phenomenon of split ratings from the perspective of investors in the capital market. However, few studies have examined the effects of split ratings on management decisions from the perspective of a firm's manager. This study focuses on split ratings as an incentive for management decision-making from an

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accounting perspective. Specifically, we examine whether split ratings act as an incentive for managers to engage in earnings management.

According to previous studies, split ratings are a sign of information opacity. Hence, in the capital market, split-rating bonds are required by investors to guarantee higher rewards (i.e., yield premiums) than non-split-rating bonds of similar risk levels, resulting in relatively high capital costs (Livingston & Zhou, 2010). In addition, split-rating bonds are more likely to be adjusted in the next credit assessments than non-split-rating bonds, resulting in greater credit rating instability (Livingston et al., 2007). Managers try to avoid split ratings not to incur additional capital costs (such as risk premiums). In addition, CRAs that assign higher ratings in relation to split-rating bonds are reported to be more likely to downgrade ratings (Livingston & Zhou 2010). Therefore, a split-rating firm has a greater incentive to prevent credit rating adjustment (or convergence) downward than a non-split-rating firm.

We test Korean listed firms from 2002 to 2019, based on credit and financial information, with the following results. Split-rating firms show less stickiness in SG&A costs compared to non-split-rating firms when sales decrease. This phenomenon is related to the deliberate reduction of discretionary costs to improve profits in the presence of split ratings, which are more likely to change in future credit assessments. Such attempts to engage in cost adjustment by split-rating firms are more pronounced in companies for which the next ($t + 1$) credit rating is downgraded. The incentives for split-rating firms to practice earnings management are partially controlled by Chaebol firms. We find only in the non-Chaebol sample that the split-rating show less stickiness in SG&A costs. This result suggests that Chaebol firms, having high levels of socio-economic surveillance and supporting affiliated firms through the internal market of corporate groups, respond passively to split ratings.

This study makes several contributions. First, it shows that by determining interest rates, credit information may act as an incentive to practice earnings management. In addition to the credit information (i.e., grade level and borderline grade) discussed in previous studies, we analyze the effect of split ratings, implying the possibility of changes in the next credit assessments. In particular, by using the framework of asymmetric cost behavior in relation to earnings management incentives, we contribute to the field of research by identifying various factors affecting cost behavior.

The remainder of this paper is organized as follows. Chapter II overviews previous studies and presents the proposed research hypotheses. Section III introduces the research model and process. Chapter IV reports the results of the empirical analysis, and Chapter V presents the study's summary and conclusions.

2. Literature Review and Hypothesis Development

2.1. Split Ratings under the Credit Rating System

A credit rating is an index that represents the credit-worthiness (default risk) of a firm (the debtor) or a specific debt (corporate bond). It is a criterion for determining the cost (interest rate) incurred when borrowing capital in the market. The purpose of a credit rating is to communicate information about possible debt redemption risks to investors. Credit ratings, assessed and disclosed through a public authority, reduce information asymmetry in the bond market by providing investors with objective and reliable information about the firms, inducing an efficient allocation of resources within the capital market (Tang, 2009).

Firms that issue corporate bonds to directly raise long-term funds in the capital market are obliged to provide credit ratings released by CRAs. They often receive ratings from multiple CRAs, which evaluate the credit risk of a firm (or corporate bond) according to individual evaluation standard systems. Split ratings are a very common phenomenon, which emerges when CRAs assign different ratings to a firm's credit risk (Jewell & Livingston, 1998; Livingston et al., 2007).

Previous literature on split ratings reviewed their determinants and effects on bond yields (bond prices). For instance, Ederington (1986), Morgan (2002), and Livingston et al. (2007) discussed the causes of split ratings. Further, Billingsley et al. (1985), Jewell and Livingston (1998), Santos (2006), Livingston and Zhou (2010), and Livingston et al. (2010) analyzed the effect of split ratings on the bond interest rate (spread).

Ederington (1986) identified the following causes of split ratings for bonds assessed by Moody's and Standard & Poor's (S&P): 1) different standards of CRAs' creditworthiness, 2) a systematic difference in CRA'S rating procedures, and 3) subjective tasks, such as non-systematic difference in CRAs' judgments. Morgan (2002) reported that rating splits occur more frequently with financial intermediaries (i.e., banks and insurance firms that are inherently more opaque than others). He explained that a bank's uncertainty comes from assets, and the bank's high leverage, which causes agency problems, adds to the uncertainty about assets. Livingston et al. (2007) reported that the higher the asset opaqueness, the more likely it is to receive split bond ratings from Moody's and S&P. Park and Yoo (2019) insisted that opinion conflict among credit rating agencies is reduced for companies with more analyst following.

Regarding the effects of split ratings on bond interest rates, Billingsley et al. (1985) insisted that investors perceive bond ratings as the lower of the two split ratings when they value bonds with split ratings. In other words, they suggest

that investors assign more weight to the downside of a split bond rating. Jewell and Livingston (1998) found the yields on split rating bonds are the average of the yields of the two ratings. Thus, split ratings may reflect random differences among CRAs. Santos (2006) showed that split ratings, the proxy for the quality of the CRAs' output, increase the cost of capital for mid-credit rating issuers in recessions. Livingston and Zhou (2010) showed that investors impose a higher cost on issuers with information opacity as they charge an information opacity premium on split rating bonds. In addition, evidence of an information opacity premium further supports the theory that a split rating indicates information opacity. Livingston et al. (2010) found that yields on split rating bonds with upper Moody's ratings are approximately eight basis points (bps) lower than yields on split rating bonds with upper S&P ratings. This result suggests that investors place more weight on the ratings from Moody's, the more conservative rating agency.

2.2. Asymmetric Cost Behavior used as Earnings Management Verification

Earnings management is the intentional intervention of managers in the process of making external financial reporting to the extent that generally accepted accounting principles (GAAP) allow, them to gain private benefits (Schipper, 1989). Alternatively, it is defined as a manager's intervention in the financial reporting or accounting process, changing the disclosed financial information to influence the contractual relationship determined by the accounting values (Healy & Wahlen, 1999). Earnings can be adjusted upward or downward according to motives such as an interesting segment of managers (avoidance of loss, income smoothing, or big bath), managerial compensation, and political costs (Graham et al., 2005; Roychowdhury, 2006; Cohen et al., 2010; Keung et al., 2010).

A firm's cost behavior is linked to earnings management because its cost is a determinant of earnings (Banker & Byzalov, 2014). According to Graham et al. (2005), the results of surveys conducted on top management indicated that more than 80% of respondents reported reducing discretionary expenditures, such as R&D and advertising expenses, to realize target earnings. Roychowdhury (2006), Cohen et al. (2010), and Keung et al. (2010) presented the results of an analysis in which a firm adjusted (reduced) costs to raise profits for avoiding loss or achieving financial analysts' earnings forecasts.

Managers' incentives to adjust their profits, to achieve target earnings, can be examined using the framework of asymmetrical cost behavior (Dierynck et al., 2012; Kama & Weiss, 2013; Banker & Byzalov, 2014; Koo et al., 2015). Asymmetric cost behavior (cost stickiness) means that the rate of cost decrease when sales decrease is smaller than the rate of cost increase when sales increase. Asymmetric cost

behavior has been demonstrated in Anderson et al. (2003), and its factors have been discussed in numerous studies. According to Anderson et al. (2003), the reasons for asymmetric cost behavior include management's optimistic expectations, the opportunity cost of adjustment costs, and management's empire-building incentive. Studies on various factors affecting asymmetric cost behavior have been actively conducted. As a result, resource utilization rate, employee and asset concentration, continuous decrease in sales, corporate governance and ownership structure, industrial characteristics, and macroeconomic factors, among others, have been pointed out as determinants of asymmetric cost behavior (Anderson et al., 2007; Balakrishnan & Gruca, 2008; Homburg & Nasev, 2008; Chen et al., 2012; Banker et al., 2013, 2014; Chae & Ryu, 2016; Oh, 2022).

Dierynck et al. (2012) used the number of employees and working hours to assess earnings management in private Belgian firms that suffered disadvantages (limits) related to dividends and audit opinions if they did not meet zero earnings benchmarks. They posited that managers meeting or beating the zero earnings benchmark increase labor costs to a more extent when sales decrease. Hence, more symmetric labor cost behavior should be observed in firms that report a small profit. Kama and Weiss (2013) focused on the effect of incentives to meet earnings targets on cost structure. They found that when managers face incentives to avoid losses or earnings decreases or to meet financial analysts' earnings forecasts, they downgrade slack resources when sales decrease, therefore mitigating the degree of cost stickiness. Koo et al. (2015) investigated the effects of managerial incentives for earnings management on asymmetric cost behavior, especially SG&A expenses, finding that earnings-management-suspect firms reduce the stickiness of the SG&A expenses when sales decline.

2.3. Credit Rating Evaluation for Korea Chaebol

Chaebol, a unique form of corporate governance in Korea, indicates a group of firms in which the same person (head of family members) controls two or more firms, non-profit corporations, and affiliates alone or through relatives. It is a large group of monopoly capitalists or family members with great power in the business world. Chaebols are organic aggregates where firms, independent entities by law, are united in equity investment, sharing the same block holders, internal market, common management method, and corporate culture. In Korea, Chaebol firms that may significantly impact the national economy belong to conglomerates designated each year by the Fair Trade Commission in accordance with the Monopoly Regulation and Fair Trade Act. Korean Chaebol firms emerged after the government's random distribution of Japanese property was destroyed immediately after World War II. In the 1970s and the 1980s, to promote economic growth during the military

regime, Chaebols grew and received preferential treatment, such as preferential interest rates, tax benefits, and exclusive protection for management.

As the socio-economic influence of Chaebols has expanded over time, interest in their role has gradually increased. Thus, government agencies' regulations of (the Fair Trade Commission and Financial Supervisory Commission) and the monitoring of Chaebol firms by civic groups have become stricter. At the end of each business year, the Fair Trade Commission collects and discloses the conglomerate's equity and financial statement data. In particular, according to the criteria for the asset size of conglomerates, disclosure obligations (business group status, major matters of non-listed firms, stock ownership status, and large-scale internal transactions) and prohibition of providing unfair profits to the affiliates (driving away one's worth) are applied. In other words, the strength of checks and surveillance by the government and civic groups is higher for the management of firms belonging to conglomerates legally and socially. Therefore, opportunistic decision-making, which may adversely impact long-term performance, may be particularly challenging for Chaebols. This is because firms with high social interests are likely to faithfully implement the disclosure of information required by society to avoid legal and political conflicts (Belkaoui & Karpik, 1989; Deegan & Hallam, 1991; Deegan & Carroll, 1993).

Chaebol firms have relatively high economic flexibility as they can support each other in the group. These firms are competitive, sharing resources through a large-scale internal market and enjoying a coinsurance effect through business diversification (Lincoln et al., 1996; La Porta et al., 1999; Khanna & Yafeh, 2005). Therefore, when evaluating Chaebol firms' credit ratings, factors such as support among affiliates need to be considered. In practice, the final credit rating of a Chaebol firm is computed by taking into account the likelihood of support from affiliates and the characteristics of individual financial investment instruments after evaluating the stand-alone rating of the firm issuing the bonds at stake. As a result, these firms often acquire higher ratings than their stand-alone rating (Han et al., 2016).

2.4. Hypothesis Development

As mentioned above, previous literature on split ratings has mainly addressed the causes of split ratings (Ederington, 1986; Morgan, 2002; Livingston et al., 2007), how split ratings affect bond yields (Billingsley et al., 1985; Jewell & Livingston, 1998; Santos, 2006; Livingston & Zhou, 2010; Livingston et al., 2010), and changes in credit ratings after split ratings (Livingston et al., 2007).

In particular, Billingsley et al. (1985) and Livingston and Zhou (2010) insisted that split ratings are a sign of the information opacity of the bond, and in the capital

market, split-rating bonds are required by investors to receive higher yield premiums than non-split-rating bonds of similar risk levels. According to Livingston and Zhou (2010), the yield premium increases by five bps when the split rating is one notch and 15 bps (20 bps) for two notches (three notches). In addition, Livingston et al. (2007) have reported that credit rating agencies that give higher (lower) evaluations to split-rating bonds are more likely to downgrade (upgrade) ratings and converge to the same grade with a time difference. The higher the initial rating of Moody's and S&P, the more likely it is to be downgraded within 1 year of the initial issuance, 3.56% and 4.55%, respectively. The lower the initial rating of Moody's and S&P, the more likely it is to be upgraded, 4.34% (5.64%), respectively; hence, approximately 30% of split-rating bonds converge to the same level with a time difference. Therefore, split-rating bonds are more likely to be adjusted in the next credit rating than non-split bonds, inducing instability (variability) in credit ratings (Livingston et al., 2007). According to Livingston et al. (2007), one-notch (more than one notch) split ratings increase the probability of a rating shift by about 3% (6%) within 1 year of issuing the bond, and 30% converge to the same grade.

Split-rating bonds have a relatively high capital cost due to high-risk premiums and future credit rating fluctuations. Thus, an incentive to attempt to change the rating may occur to avoid additional capital costs. As mentioned above, the ratings of CRAs that assign higher ratings to split-rating bonds are reported to be more likely to downgrade (Livingston & Zhou, 2010). Hence, firms' managers will try to avoid their credit rating being adjusted (converged) downward at all costs. As a factor of split ratings, the opacity of information and the difference between credit rating standards and evaluation procedures of CRAs are being discussed (Ederington, 1986; Morgan, 2002; Livingston et al., 2007; Livingston & Zhou, 2010). Substantial lag may be observed in rating adjustment between CRAs.

As detailed in the previous section, by adjusting the cost when sales decrease, managers carry out earnings management (Dierynck et al., 2012; Kama & Weiss, 2013; Banker & Byzalov, 2014; Koo et al., 2015). To this end, they may reduce discretionary expenditures to avoid a loss or meet analysts' forecasts (Graham et al., 2005; Roychowdhury, 2006; Cohen et al., 2010; Keung et al., 2010). These managerial incentives for earnings management induce changes in asymmetric cost behavior (Dierynck et al., 2012; Kama & Weiss, 2013; Banker & Byzalov, 2014; Koo et al., 2015).

If firms with split ratings that are more likely to be revised in the future try to manage earnings by reducing SG&A expenses, such a change in cost behavior may induce an earnings increase, ultimately improving profitability or firms' cash flow indicators considered by CRAs when assessing credit worthiness. This phenomenon alleviates

the stickiness of SG&A expenses. Hence, we propose the following hypothesis:

H1: *Split-rating firms show less stickiness in SG&A expenses when sales decrease compared to non-split-rating firms.*

Chaebol firms may have different incentives for earnings management related to credit ratings. As mentioned above, they are subject to stricter monitoring and regulation by government agencies and civic groups. Therefore, opportunistic decisions (such as earnings management) are less likely for firms belonging to conglomerates (Belkaoui & Karpik, 1989; Deegan & Hallam, 1991; Deegan & Carroll, 1993). Further, Chaebol firms enjoy a relatively large economic flexibility (Lincoln et al., 1996; La Porta et al., 1999; Khanna & Yafeh, 2005). Therefore, they are less likely to face high capital costs.

Earning management's substantial political costs and Chaebols' economic flexibility likely limit their attempts to adjust their profits to overcome split ratings. Therefore, split-rating firms are expected to show less stickiness in SG&A expenses when sales decrease in non-Chaebol firms. Hence, we propose the following hypothesis:

H2: *The lower stickiness of SG&A expenses in split-rating firms is pronounced in non-Chaebol firms.*

3. Research Methodology

3.1. Measure of Split Ratings

Korea has three CRAs equivalent to Moody's and S&P: NICE Investors Service (NICE), Korea Investors Service (KIS), and Korea Ratings (KR). In this study, split ratings are measured in two ways. First, we use SplitDum, a dummy variable equal to 1 if any of the three CRAs reports different ratings, and 0 otherwise. Second, we use the magnitude of split ratings (SplitScore), which transforms the rating scales of the three rating agencies into a numeric format. SplitScore is the absolute value of the difference in credit rating scores (i.e., AAA ratings equal to "20," and D ratings equal to "1") when a firm receives multiple ratings, with greater values indicating greater rating agency disagreement.

3.2. Model Specification

We measure cost asymmetry following Anderson et al. (2003), as follows:

$$\Delta\text{SGA}_{it} = \beta_0 + \beta_1 \Delta\text{Sales}_{it} + \beta_2 (\text{DD}_{it} * \Delta\text{Sales}_{it}) + \varepsilon_{it} \quad (1)$$

where ΔSGA is the log-change SG&A for firm i in year t , and ΔSales indicates the log-change in sales revenue. DD is a dummy variable that takes the value

of 1 when sales in year t are less than sales in year $t-1$, and 0 otherwise. In this model, β_1 captures the increase in cost for sales increases, and $\beta_1 + \beta_2$ measures the decrease in cost for sales decreases. If cost is sticky, the slope of sales decreases should be smaller than the slope of sales increases (i.e., $\beta_1 > \beta_1 + \beta_2$). In other words, $\beta_1 > 0$ and $\beta_2 < 0$ are expected in the cost model.

Hypothesis1 examines the effect of split ratings on asymmetric cost behavior. To test this hypothesis, we modify Model (1) to vary as a function of split ratings. We also control for the economic determinants of cost behavior addressed by previous studies (Anderson et al., 2003; Banker et al., 2014, etc.), such as successive decreases in sales, employee intensity, asset intensity, and previous year's net loss. As split ratings may play a significant role in asymmetric cost behavior, we add the interaction term Split * DD * Sales:

$$\begin{aligned} \Delta\text{SGA}_{it} = & \beta_0 + \beta_1 \Delta\text{Sales}_{it} + \beta_2 (\text{DD}_{it} * \Delta\text{Sales}_{it}) \\ & + \beta_3 (\text{Split}_{it} * \text{DD}_{it} * \Delta\text{Sales}_{it}) \\ & + \beta_4 (\text{SuccessiveDecrease}_{it} * \text{DD}_{it} * \Delta\text{Sales}_{it}) \\ & + \beta_5 (\text{EmployeeIntensity}_{it} * \text{DD}_{it} * \Delta\text{Sales}_{it}) \\ & + \beta_6 (\text{AssetIntensity}_{it} * \text{DD}_{it} * \Delta\text{Sales}_{it}) \\ & + \beta_7 (\text{LossPY}_{it} * \text{DD}_{it} * \Delta\text{Sales}_{it}) \\ & + \beta_8 (\text{PMDA}_{it} * \text{DD}_{it} * \Delta\text{Sales}_{it}) \\ & + \text{Industry dummy} + \text{Year dummy} + \varepsilon_{it} \end{aligned} \quad (2)$$

where Split is a proxy for split ratings, either SplitDum or SplitScore. In Model (2), we control for various determinants of cost behavior. First, managers' prospects for future sales are measured by a dummy variable that equals 1 if sales have decreased in 2 consecutive years, and 0 otherwise (i.e., $\text{Sales}_{it-2} > \text{Sales}_{it-1} > \text{Sales}_{it}$), demoted as SuccessiveDecrease. Second, higher adjustment costs lead managers to retain unutilized resources when sales decline, resulting in greater cost stickiness. Thus, we control for adjustment costs measured by asset intensity (AssetIntensity), namely, the ratio of total assets to sales revenue and employee intensity (EmployeeIntensity), or the ratio of the number of employees to sales revenue. The previous year's net loss (LossPY), equal to 1 if a firm reports a previous year's net loss, and 0 otherwise, is included in the model to control for the firm's profit effect. In addition, we consider the effect of discretionary accruals on cost behavior, as we use the asymmetric cost behavior framework to examine the incentives for managers' earnings management (Dierynck et al., 2012). Finally, industry and year-fixed effects are included in the model, and the standard errors are clustered at the firm level. The coefficient of interest is β_3 , which captures the association between split ratings and the degree of cost stickiness. We expect β_3 to be significant and positive in support of our first hypothesis, which states a lower degree of cost stickiness in relation to split ratings.

Hypothesis 2 investigates the effect of Chaebols on the association between split ratings and cost stickiness. We obtain relevant data from the Korean Fair Trade Commission (KFTC). Firms are considered Chaebols based on whether they belong to top business groups in Korea. We divide the sample into Chaebol firms and non-Chaebol firms and run Model (2) for each subsample. We expect β_3 to be significant and positive in non-Chaebol firms, indicating that the low stickiness of SG&A expenses in the split rating firms is pronounced in non-Chaebol firms.

3.3. Data and Sample Selection

This study's sample consists of firms listed on the Korea Stock Exchange (KSE) and Korean Securities Dealers Automated Quotations (KOSDAQ) for the fiscal years 2002–2019. We obtain credit rating and financial data from Data Guide Pro provided by Fn-Guide (equivalent to Compustat and CRSP in the U.S.). We impose the following data requirements on the initial sample. First, following

the literature on cost stickiness, we exclude financial and insurance companies and firms belonging to the utility sector because cost stickiness may manifest differently in these industries, given their distinct structures (Koo et al., 2015). Second, firms with non-December fiscal year-ends are deleted to ensure comparability within the sample. We then identify all firms for which credit rating data is available to measure split ratings and for which information for building the relevant control variables is also available. Finally, we winsorize all continuous variables at the 1st and 99th percentiles to reduce the effect of outliers. The final sample consists of 2,027 firm-year observations.

4. Results

4.1. Descriptive statistics and correlation

Table 1 presents the descriptive statistics of the variables used in the analyses. The mean of Δ SGA is 0.05, suggesting that SG&A expenses increased by 5%–6% annually. The average

Table 1: Descriptive Statistics

Variables	Mean	Std.	Min	Median	Max
Asset (billion won)	6.42	17.59	16	901	180.66
Sales (billion won)	5.26	12.72	3	819	96.81
Credit Rating Score	12.90	4.06	1.00	14.00	20.00
Δ SGA	0.05	0.27	-2.24	0.06	1.66
Δ Sales	0.05	0.26	-1.92	0.05	3.53
DD	0.32	0.47	0.00	0.00	1.00
SplitDum	0.11	0.31	0.00	0.00	1.00
SplitScore	0.15	0.69	0.00	0.00	14.00
Splitup	0.04	0.18	0.00	0.00	1.00
Splitdown	0.02	0.13	0.00	0.00	1.00
Chaebol	0.42	0.49	0.00	0.00	1.00
SuccessiveDecrease	0.15	0.36	0.00	0.00	1.00
EmployeeIntensity	1.65	1.52	0.01	1.27	27.02
AssetIntensity	1.32	0.76	0.21	1.15	10.18
LossPY	0.26	0.44	0.00	0.00	1.00
PMDA	0.02	0.05	-0.46	0.03	0.70

Note: Credit Rating Score = AAA 20 ~ D1; Δ SGA = $\ln(\text{SG\&A}_{i,t+1}/\text{SG\&A}_{i,t})$; Δ Sales = $\ln(\text{sales}_{i,t+1}/\text{sales}_{i,t})$; DD = a dummy variable that equals one if the firm's sales decrease during t , and zero otherwise; SplitDum = a dummy variable that equals one if the firm is split rating, and zero otherwise; SplitScore = difference in credit rating score of split rating firm; Splitup = a dummy variable that equals one if the next rating is upgraded among firms with split rating, and zero otherwise; Splitdown = a dummy variable that equals one if the next rating is downgraded among firms with split rating, and zero otherwise; Chaebol = a dummy variable that equals one if the firm belongs to a large enterprise group, and zero otherwise; SuccessiveDecrease = a dummy variable that equals one if the firm's sales decrease for 2 years ($t-1$ ~ t) successively, and zero otherwise; EmployeeIntensity = total number of employees(person)/sales(100 mill won); AssetIntensity = total asset/sales; LossPY = a dummy variable that equals one if the firm's net income is less than 0, and zero otherwise; PMDA = performance matched discretionary accruals by Kothari et al. (2005).

DD and Successive decreases are 0.32 and 0.15, respectively. This result implies that the sales of approximately 32% of the total sample have decreased compared to the previous year, and the sales of approximately 15% of the sample have decreased in the last 2 consecutive years ($t-1$ to t). The average of LossPY, indicating whether a deficit is observed, is 0.26, meaning that approximately 26% of the total sample was in deficit in the previous year.

The average credit rating score is approximately 12.9 points, and the average credit ratings are between BBB+ and BBB in the sample. Where credit ratings scores may be AAA 20, AA+ 19, AA 18, AA- 17, A+ 16, A 15, A- 14, BBB+ 13, BBB 12, BBB- 11, BB+ 10, BB 9, BB- 8, B+ 7, B 6, B- 5, CCC 4, CC 3, C 2, or D1. On average, SplitDum and SplitScore are 0.10 and 0.15, respectively, suggesting that approximately 10% of the sample receives different credit assessments from CRAs, and the grade difference is approximately 0.15 notch. Approximately 90% of firms that receive credit ratings from two or more CRAs have

no difference in credit ratings, and such differences, when present, are less than 0.2 notches.

The Pearson correlations among the main variables are reported in Table 2. Δ Sales and Δ SGA are significantly and positively correlated. This result indicates that sales recognized as cost drivers and SG&A expenses are highly correlated. SplitDum and SplitScore show a significant positive association. Split (SplitDum and SplitScore) is positively correlated with Δ SGA and Chaebol, while it is negatively associated with DD, SuccessiveDecrease, EmployeeIntensity, and LossPY.

4.2.1. Split Ratings and Cost Stickiness

Table 3 reports the regression results for split ratings and cost behavior. We examine the effects of SplitDum and SplitScore on cost stickiness. In the extended model of Anderson et al. (2003), we find significantly positive coefficients for the three-way interaction term including

Table 2: Correlation Analysis

Correlation	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Δ SGA	1											
(2) Δ Sales	0.62 (0.00)	1										
(3) DD	-0.33 (0.00)	-0.58 (0.00)	1									
(4) SplitDum	-0.04 (0.11)	-0.07 (0.81)	0.02 (0.38)	1								
(4) SplitScore	-0.06 (0.01)	-0.03 (0.25)	0.06 (0.01)	0.65 (0.00)	1							
(5) Splitup	0.03 (0.15)	0.04 (0.07)	-0.01 (0.74)	0.56 (0.00)	0.35 (0.00)	1						
(6) Splitdown	-0.04 (0.07)	-0.06 (0.01)	0.06 (0.02)	0.39 (0.00)	0.22 (0.00)	-0.03 (0.28)	1					
(7) Chaebol	0.03 (0.17)	0.05 (0.06)	-0.02 (0.32)	-0.05 (0.04)	-0.04 (0.12)	0.05 (0.06)	-0.01 (0.68)	1				
(8) Successive Decrease	-0.25 (0.00)	-0.38 (0.00)	0.61 (0.00)	0.05 (0.03)	0.05 (0.03)	0.01 (0.60)	0.06 (0.01)	-0.02 (0.31)	1			
(9) Employee Intensity	-0.04 (0.09)	-0.15 (0.00)	0.04 (0.07)	0.06 (0.01)	0.06 (0.01)	-0.02 (0.30)	0.11 (0.00)	-0.27 (0.00)	0.02 (0.46)	1		
(11) Asset Intensity	-0.14 (0.00)	-0.17 (0.00)	0.17 (0.00)	0.01 (0.56)	0.01 (0.56)	-0.04 (0.11)	0.06 (0.01)	-0.02 (0.31)	0.14 (0.00)	0.24 (0.00)	1	
(12) LossPY	-0.24 (0.00)	-0.19 (0.00)	0.19 (0.00)	0.10 (0.00)	0.10 (0.00)	-0.02 (0.45)	0.10 (0.00)	-0.12 (0.00)	0.26 (0.00)	0.19 (0.00)	0.24 (0.00)	1
(13) PMDA	-0.00 (0.87)	-0.04 (0.09)	0.09 (0.00)	0.03 (0.22)	0.03 (0.22)	-0.03 (0.22)	0.08 (0.00)	-0.06 (0.01)	0.11 (0.00)	0.15 (0.00)	0.16 (0.00)	0.28 (0.00)

Note: This table presents the Pearson correlations. The second row in each cell represents the p -value. The definitions of variables are in Table 1.

Table 3: Split Ratings and Asymmetric Cost Behavior

Dependent Variables	Δ SGA	
	SplitDum	SplitScore
Δ Sales	0.626 (22.443)***	0.623 (22.405)***
Δ Sales*DD	-0.460 (-4.621)***	-0.438 (-4.611)***
Δ Sales*DD*Split	0.374 (3.814)***	0.303 (4.795)***
Δ Sales*DD*Successive	0.095 (1.529)	0.095 (1.538)
Δ Sales*DD*EmployeeIntensity	-0.046 (-7.280)***	-0.045 (-7.192)***
Δ Sales*DD*AssetIntensity	0.154 (0.479)	0.156 (0.575)
Δ Sales*DD*LossPY	0.197 (2.486)***	0.166 (2.175)***
Δ Sales*DD*PMDA	0.362 (0.627)	0.366 (0.636)
Constant	0.017 (2.707)***	0.018 (2.927)***
# of Obs.	2.027	2.027
Adjusted R^2	0.498	0.413
Industry Effects	Yes	Yes
Year Effects	Yes	Yes

Note: This table presents the regression results for the effect of split ratings on asymmetric cost behavior. Definitions of variables used in the model specification are in Table 1. All specifications are estimated with robust standard errors clustered by the firm and include industry-year fixed effects. The robust t-statistics are in parentheses. *, **, *** indicates significance at the 10%, 5%, and 1% level, respectively (two-tailed test).

SplitDum and SplitScore variables (coefficient = 0.374, t -stat = 3.81 and coefficient = 0.303, t -stat = 4.80, respectively). Thus, consistent with Hypothesis 1, split-rating firms show less stickiness of SG&A expenses when sales decrease. This result indicates that split-rating firms are more likely to cut SG&A costs when sales decrease, suggesting that split ratings affect incentive income-increasing earnings management through cost behavior.

Split-rating firms are expected to show different cost behaviors depending on the adjustment direction (upward or downward) of the next ($t + 1$) credit rating. As discussed above, the incentives of firms with multiple credit ratings to raise profits through cost reduction may be greater in a sample with a higher probability of being downgraded than upgraded. Thus, split ratings may motivate managers to reduce cost asymmetry in firms that are likely to experience a lowered next credit rating.

Focusing on SG&A expenses as a measure of discretionary costs, we find that the coefficient on (SplitUp * DD * Δ Sales) is positive and statistically insignificant for firms whose next credit rating is upgraded (coefficient = 0.303, t -stat = 0.75). However, the coefficient on (SplitDown * DD * Δ Sales) is significant and positive (coefficient = 0.319, t -stat = 2.71) in firms whose next credit rating is

downgraded. Therefore, in split-rating firms, the attempt to manipulate earnings management by using SG&A costs is observed only in firms in which the next credit rating has declined (Table 4).

To verify the robustness of the research result for Hypothesis 1, we also utilize abnormal reduction of discretionary expenses (the reduction of SG&A expenses) among RAM, following Roychowdhury (2006). Roychowdhury (2006) measures RAM in three ways: 1) sales manipulation through price discounts or lenient credit terms, 2) reduction of discretionary expenditures to improve reported margins, and 3) overproduction to report lower costs of the goods sold.

In particular, abnormal discretionary expenses are directly related to the cost behavior of SG&A expenses. If a manager with an incentive for earnings management significantly reduces SG&A expenses when sales decrease, SG&A cost stickiness is alleviated. Thus, we perform further analysis by designing a regression model with split ratings (split) as an independent variable and abnormal reduction of discretionary expenses (abDE) derived from Roychowdhury (2006) as the dependent variable. Abnormal discretionary expenses are the residual of a regression model (industry-year cross-sectional

Table 4: Split Ratings and Asymmetric Cost Behavior: Splitup vs. Splitdown

Dependent Variables	Δ SGA	
	Splitup	Splitdown
Δ Sales	0.617 (22.091)***	0.623 (22.301)***
Δ Sales*DD	-0.451 (-3.310)***	-0.412 (-4.108)***
Δ Sales*DD*Split	0.303 (0.752)	0.319 (2.712)***
Δ Sales*DD*Successive	0.092 (2.309)**	0.079 (1.269)
Δ Sales*DD*EmployeeIntensity	-0.043 (-6.960)***	-0.045 (-7.224)***
Δ Sales*DD*AssetIntensity 1.5	0.139 (0.930)	0.145 (0.154)
Δ Sales*DD*LossPY	0.168 (1.945)*	0.203 (2.444)**
Δ Sales*DD*PMDA	0.355 (0.614)	0.361 (0.616)
Constant	0.019 (3.058)***	0.016 (2.621)***
# of Obs.	2.027	2.027
Adjusted R^2	0.406	0.741
Industry Effects	Yes	Yes
Year Effects	Yes	Yes

Note: This table presents the regression results for the effect of split ratings on asymmetric cost behavior according to the next rating direction. Definitions of variables used in the model specification are in Table 1. All specifications are estimated with robust standard errors clustered by the firm and include industry-year fixed effects. The robust t -statistics are in parentheses. *, **, *** indicates significance at the 10%, 5%, and 1% level, respectively (two-tailed test).

analysis) with sales and discretionary expenses adjusted to total assets in the previous year ($t - 1$) as independent and dependent variables, respectively. In this study, for convenience of interpretation, the residual is multiplied by -1 and defined as an abnormal reduction of discretionary expenses. Therefore, the greater the abnormal reduction of discretionary expenses, the larger the earnings management to report earnings high.

Table 5 presents the results of the regression analysis. The coefficient on Split is significant and positive, indicating that split-rating firms attempt earnings management by manipulating discretionary expenses to report high earnings. This finding is consistent with the results of the main analysis reported in Tables 3 and 4; hence, Hypothesis 1 is strongly supported.

4.2.2. Split Ratings and Cost Stickiness: Effect of Chaebol

Hypothesis 2 contends that Chaebols drive the differential relation between split ratings and cost stickiness. As mentioned above, we expect Chaebol firms to respond more passively to split ratings because they have high levels of socio-economic monitoring and high economic flexibility.

Table 6 shows results consistent with the above prediction. We find that the negative relationship between split ratings and cost stickiness is only observed in non-Chaebol firms. Specifically, we find that the coefficient on SplitDum (or SplitScore) * DD * Δ Sales is significant and positive only in non-Chaebol firms (coefficient = 0.406, t -stat = 3.62 and coefficient = 0.341, t -stat = 4.67, respectively). The coefficient of SplitDum (or SplitScore) * DD * Δ Sales is insignificant for Chaebol firms.

We resort to chi-square to compare the values of the regression coefficient derived from each sample and confirm the significant difference between the values of each regression coefficient β_3 derived from the sub-samples. Hypothesis 2, namely, that the lower stickiness of SG&A expenses in the split-rating firms is pronounced in non-Chaebol firms, is strongly supported.

5. Conclusion

This study examines the effects of split ratings on earnings management through cost adjustment. We employ an asymmetric cost behavior analysis framework for testing earnings management. We analyze whether split-rating firms adjust discretionary costs (i.e., selling and administrative costs) to increase reported earnings. While looking at the

Table 5: Split Ratings and Abnormal Discretionary Expense

Dependent Variables	abDE		
	Split	Splitup	Splitdown
Split	0.081 (2.013)**	0.089 (0.667)	0.072 (2.283)***
SIZE	-0.101 (-2.120)**	-0.110 (-2.194)**	-0.310 (-2.611)***
LEV	0.031 (2.281)***	0.028 (2.814)***	0.303 (3.095)***
ROA	-0.018 (-1.892)*	-0.023 (-1.529)	0.095 (-1.938)*
MTB	0.006 (1.810)*	0.004 (1.280)	0.045 (1.192)*
BIG4	-0.054 (-0.891)	-0.089 (-1.479)	-0.156 (-0.575)
PMDA	0.087 (2.000)**	-0.065 (-0.951)	0.712 (2.319)***
Constant	0.017 (0.529)	0.222 (0.707)	0.018 (1.227)
# of Obs.	2,027	1,990	1,953
Adjusted R ²	0.498	0.413	0.415
Industry Effects	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes

Note: This table presents the regression results for the effect of split ratings on abnormal discretionary expense. The variable definition is as follows; AbDE = abnormal reduction of discretionary expenses by Roychowdhury (2006); SIZE = firm size (natural logarithm of total assets); LEV = debt to asset ratio (debt/net assets); ROA = return on assets (net earnings/total assets); MTB = market to book value; BIG4 = indicator variable that takes the value 1 if a firm is audited by one of Big 4 audit firms, and 0 otherwise; Definitions of other variables used in the model specification are in Table 1. All specifications are estimated with robust standard errors clustered by the firm and include industry-year fixed effects. The robust t-statistics are in parentheses. *, **, *** indicates significance at the 10%, 5%, and 1% level, respectively (two-tailed test).

Table 6: Split Ratings and Asymmetric Cost Behavior: Effect of Chaebol

Dependent Variables	ΔSGA			
	(1)		(2)	
	Sample of Chaebol Firms		Sample of Non-Chaebol Firms	
	Splitup	Splitdown	Splitup	Splitdown
ΔSales	0.746*** (16.175)	0.748*** (16.198)	0.574*** (16.418)	0.570*** (16.388)
ΔSales*DD	-0.720*** (-4.545)	-0.726*** (-4.512)	-0.422*** (-3.340)	-0.396*** (-3.278)
ΔSales*DD*Split	0.394 (1.287)	0.117 (0.704)	0.406*** (3.621)	0.341*** (4.674)
ΔSales*DD*Successive	-0.004 (-0.032)	-0.010 (-0.089)	0.112 (1.448)	0.103 (1.327)
ΔSales*DD*EmployeeIntensity	-0.038 (0.418)	-0.033 (-0.575)	-0.034*** (-4.556)	-0.032*** (-4.413)
ΔSales*DD*AssetIntensity 1.5	0.369 (0.418)	0.365 (0.352)	0.102 (0.627)	0.103 (0.683)
ΔSales*DD*LossPY	-0.075 (-0.505)	-0.067 (-0.453)	0.254** (2.519)	0.207 (2.204)**
ΔSales*DD*PMDA	0.495 (0.972)	0.483 (0.497)	-0.307 (-0.379)	-0.384 (-0.477)
Constant	0.008 (0.854)	0.007 (0.807)	0.017** (2.065)	0.019** (2.321)
# of Obs.	857		1,170	
Adjusted R ²	0.495	0.494	0.376	0.376
Industry Effects	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes

Note: This table presents the regression results for the effect of split ratings on asymmetric cost behavior by chaebol or not. Definitions of variables used in the model specification are in Table 1. All specifications are estimated with robust standard errors clustered by the firm and include industry-year fixed effects. The robust t-statistics are in parentheses. *, **, *** indicates significance at the 10%, 5%, and 1% level, respectively (two-tailed test).

incentives of earnings management for credit information (especially split ratings), we also analyze the moderating effects of Chaebol, Korea's unique corporate governance structure.

We find that split-rating firms show less stickiness in SG&A costs compared to non-split-rating firms when sales decrease. This result reflects the deliberate reduction of discretionary costs to improve profits in the presence of split ratings, which are more likely to change in future credit assessments. The incentives for earnings management of split-rating firms are limited in Chaebol firms, which have high levels of socio-economic surveillance and support affiliated firms through the internal market of corporate groups.

This study contends that the credit information that determines interest rates can act as an incentive for earnings management. In addition to the credit ratings discussed in previous studies, we analyze the effect of split ratings, implying the possibility of changes in the next credit assessments. In particular, by using the framework of asymmetric cost behavior in relation to earnings management incentives, we contribute to the field of research by further defining and explaining the factors affecting cost behavior.

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