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Earnings Management Behavior of Firms with Financial Constraints: Focusing on Firms that Issue Redeemable Convertible Preferred Stocks

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ABSTRACT

Purpose: This study aims to explore the effect of financial constraints on earnings management by focusing on firms that issue redeemable convertible preferred stocks (RCPS). RCPS are considered a financing option primarily used by firms that have investment opportunities but face difficulties in raising funds with a low cost of capital. Therefore, the issuance of RCPS can be an effective indicator to identify firms with financial constraints.

Design/methodology/approach: This study employs a sample of 12,406 firm-year observations of listed companies in the Korean stock market from 2011 to 2018. The study conducts multiple regression analyses to investigate the level of earnings management of RCPS-issuing firms with respect to that of non-issuing firms. In this analysis, the earnings management is proxied by discretionary accruals and real operational activities.

Findings: This study shows that RCPS-issuing firms have a higher level of discretionary accruals than non-issuing firms. Meanwhile, there is no significant difference in the level of real activities management between RCPS-issuing and non-issuing firms. These findings imply that firms with financial constraints engage in aggressive earnings management through discretionary accruals rather than real operational activities.

Research limitations/implications: This study provides compelling evidence that financially constrained firms strategically use discretionary accruals to signal positive prospects for external capital suppliers, allowing them to raise the capital necessary for investment. It is also confirmed that financially constrained firms do not depend on real activities management, which sacrifices cash flows and firm value in the long run.

Originality/value: This is the first study to test the link between financial constraints and earnings management by analyzing RCPS-issuing firms that conform to the definition of financial constraints. This approach can alleviate the risk of errors in the classification of firms and the endogeneity problems accompanied by estimating financially constrained firms with firm characteristics, such as dividend payout ratio, cash flows, size, age, or a combined index of these variables.

Keywords: Financial constraints, Financing capacity, Earnings management, Accruals, Redeemable convertible preferred stock

I. Introduction

This study explores financial reporting decisions

on earnings management of firms with financial constraints. Firms that have insufficient cash to undertake investment opportunities and face the high costs of external funds are defined as financially constrained firms (Korajczyk and Levy 2003; Hennessy and Whited 2007). Two recent studies document that financially constrained firms with investment

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opportunities have incentives to manage earnings to signal positive prospects in the market, enabling them to facilitate external financing (Linck et al. 2013; Kurt 2018). However, their findings involve the risk of errors in the classification of firms because, unfortunately, the accuracy and reliability of the measures used to capture firms with financial constraints are debatable (Farre-Mensa and Ljungqvist 2016). Previous studies have commonly adopted the approaches that identify financially constrained firms based on firm characteristics such as dividend payout ratio, cash flows, size, age, or a combined index of these variables, which can also lead to endogeneity problems. Our approach differs from these previous studies in that we consider firms that conform to the definition of financial constraints instead of classifying them as presumed by obscure proxies. More specifically, this study investigates the link between financial constraints and earnings management by focusing on the firms that issue redeemable convertible preferred stock (hereinafter referred to as RCPS).

RCPS are a type of hybrid security that provides investors with both redemption and conversion options. Investors can secure downside protection against the risk of investment loss by exercising a redemption option or simultaneously pursue the upside potential of equity investments by exercising a conversion option. Therefore, firms with low financing capacity are likely to increase their external funding opportunities by issuing RCPS that are attractive to potential investors. In fact, RCPS are used as a typical option for raising capital for startups or small- and medium-sized firms with high-growth opportunities but have difficulties with debt financing. Thus, the issuance of RCPS can be a rational indicator for identifying financially constrained firms that have investment opportunities but face high costs of external funding. Moreover, the number of RCPS issuances of listed companies in the Korean stock market has increased notably, as the issuance of various types of hybrid securities is permitted according to the Commercial Act amended in 2011. This legal environment in Korea provides a good opportunity to understand the financial reporting decisions of financially constrained firms

by empirically testing the earnings management behavior of RCPS-issuing firms.

Using a sample of 12,406 firm-year observations of listed companies in the Korean stock market during the period 2011-2018, we test whether RCPS-issuing firms engage in more aggressive earnings management than non-issuing firms. Specifically, we analyze two types of earnings management: discretionary accruals and real operational activities. The findings reveal that the level of discretionary accruals is higher for RCPS-issuing firms than for non-issuing ones. Meanwhile, we find no difference in the level of real activities management between RCPS-issuing and non-issuing firms. Our findings indicate that financially constrained firms engage in more aggressive earnings management than unconstrained firms, and that constrained firms attempt to raise capital for investments by informing outsiders about positive prospects through discretionary accruals rather than real operational activities.

This study contributes to the literature in several ways. First, this is the first study to test the relationship between firms' financing capacity and financial reporting by investigating the earnings management behavior of RCPS-issuing firms. The findings of this study provide compelling evidence that financial constraints are a motivation for firms to manage their earnings in financial reporting. Second, this study provides insights into the signaling effects of discretionary accruals that enhance the information value of earnings. Our results are consistent with the view that firms strategically use discretionary accruals to signal positive prospects for external capital suppliers, which allows them to ease their financial constraints and raise the capital necessary for investment. This study has important implications for market participants such as investors, auditors, analysts, and regulators interested in firms with financial constraints or firms that issue RCPS.

The remainder of this study is organized as follows. Section 2 reviews the related literature and proposes the hypotheses. Section 3 describes the data selection and the research methods used to test the hypotheses. Section 4 discusses the empirical results and robustness

tests. Finally, conclusions are presented in Section 5.

II. Literature Review and Hypothesis Development

A. Literature Review

1. *Earnings management*

Earnings management is defined as a purposeful intervention in the financial reporting process to obtain some private gain (Schipper 1984). Since earnings management is a crucial corporate behavior that affects figures in financial statements and financial report users' decision-making, several studies have attempted to understand the motivations for earnings management, such as explicit contractual arrangements or capital market pressure. Regarding explicit contract arrangements, Watts and Zimmerman (1986) asserted that firms tend to select income-increasing accounting procedures to avoid violating their debt covenants. Healy (1985) argued that earnings-based bonus contracts provide incentives for managers to choose accounting procedures that optimize their bonuses.

Stein (1989) argued that capital market pressure motivates managers to inflate earnings to mislead the market regarding their firm value. Several studies have provided evidence of earnings management driven by capital market pressure. Teoh et al. (1989) analyzed 1,649 initial public offerings firms during 1980-1992 and found that IPO firms manage earnings upward using discretionary accruals to raise more capital. This is because higher reported earnings lead to higher offering prices in the capital markets. Richardson et al. (2002) investigated 255 firms that restated earnings during 1971-2000 and found that restatement firms are high-growth, have more frequent financing needs and raise larger amounts of cash. They mentioned that the primary motivation for earnings management is related to the desire to attract external financing at a lower cost.

In a related study, Linck et al. (2013) investigated

whether firms with financial constraints managed earnings to facilitate external financing based on a large panel of firms from 1987-2009. They found that financially constrained firms have higher discretionary accruals than unconstrained firms, suggesting that high accruals ease financial constraints and, thus, facilitate their access to external capital by signaling positive prospects to the market. Similarly, Kurt (2018) examined the link between financing capacity and earnings management using a sample of firms with seasoned equity offerings from 1983-2014. He found that financially constrained firms with limited access to the capital market report higher income-increasing accruals than unconstrained firms when selling equity. They explained that constrained firms manage earnings to ease their access to the capital market by conveying better prospects to investors.

There is also a stream of literature on earnings management methods, which is mainly classified into two categories: earnings management through discretionary accruals and real operational activities. McNichols and Wilson (1988) and Jones (1991) pointed out that discretionary accruals are used as a measure of earnings management and developed a model to capture it. Dechow et al. (1995) extended prior studies by proposing a modified version of the Jones model that exhibits the most power in detecting accrual-based earnings management. In contrast, Graham et al. (2005) found that managers take real actions such as cutting expenditures on advertising or maintenance to meet earnings benchmarks based on a survey of more than 400 executives. Roychowdhury (2006) also provided evidence of earnings management through real operational activities, such as sales manipulation, reduction of discretionary expenditures, and overproduction. Furthermore, he developed models to detect real activity manipulation.

Based on the previous literature, this study investigates whether firms depend on discretionary accruals and/or real operational activities in earnings management to ease their financial constraints.

2. Redeemable convertible preferred stock

Myers and Majluf (1984) proposed pecking order theory, in which firms have a specific preference order for their sources of financing. They argued that firms prefer internal financing to external financing and debt to equity when external financing is required. Lemmon and Zender (2010) tested firms' financial behavior based on the pecking order theory and found that debt is preferred to equity for firms that are not constrained by debt capacity. Their findings show that small and high-growth firms tend to frequently issue equity for their financing.

As the issuance of preferred stocks increased relatively in the 1970s, Moyer et al. (1987) paid attention to preferred stocks among equity financing and compared the financial ratios of preferred stock-issuing firms and non-issuing firms. They found that the market-to-book value ratio, interest coverage ratio, retained earnings, and equity ratio are lower for preferred stock-issuing firms than for non-issuing firms. Their finding implies that preferred stocks are issued primarily by financially distressed firms because these firms cannot benefit from the tax deduction on interest payments from debt financing and can reduce the bankruptcy risk of the failure to pay interest through preferred stock financing. Frischmann et al. (1999) analyzed the trends in preferred stocks issued from 1993 to 1996 and found that new types of preferred stocks with attributes such as redeemability or callability significantly increased. They also discussed the importance of developing accounting standard rules that properly report these new types of preferred stocks with both debt and equity features.

Research on specific types of preferred stocks was also conducted because of the increase in the issuance of various types of preferred stocks. Carter and Manzon (1995) focused on mandatorily redeemable preferred stocks that have similarities with debt in cash flows and contractual rights. By examining tax-based incentives for financing with mandatorily redeemable preferred stocks, they found that firms with low marginal tax rates tend to issue mandatorily redeemable preferred stock as a debt substitute

because they cannot make efficient use of tax shields through debt financing. Lee and Figlewicz (1999) investigated the financial characteristics of firms that issue convertible preferred stocks from 1977 to 1988. They reported that convertible preferred stock-issuing firms have higher bankruptcy risk and larger non-debt tax shields than convertible debt-issuing firms. They also found that the former has lower levels of free cash flow and growth potential than the latter.

Kimmel and Warfield (1995) analyzed the systematic risk of 239 firms that issue redeemable preferred stocks from 1979 to 1989. They revealed that the market perception of redeemable preferred stocks differs depending on their attributes such as voting rights or conversion features. Specifically, they found that convertible redeemable preferred stocks or redeemable preferred stocks with voting rights have an equity-like impact on systematic risk, whereas redeemable preferred stocks without these attributes do not have a similar effect on the systematic risk as debt or equity. They argued that the disclosure of information on these attributes is required to adequately convey the economic substance of hybrid securities. Similarly, McCarthy and Schneider (2001) investigated the market perception of RCPS issued by firms from 1991 to 1995 and found that it is perceived primarily as debt. Based on their findings, they raised a question about the current accounting rules for not classifying convertible redeemable preferred stocks as debt and suggested the development of new rules to adequately account for it.

This study extends the literature by exploring the earnings management of firms that issue RCPS to understand the financial reporting decisions of financially constrained firms.

B. Hypothesis Development

According to the pecking order theory, firms have a preference order for capital financing (Myers 198; Myers and Majluf 1984). They mostly prefer internal financing, and when external financing is required, they prefer debt, hybrid securities such as preferred

stocks, and common stocks, in that order. Thus, firms that have difficulty covering their external financing needs with debt are likely to issue hybrid securities.

Specifically, this study focuses on RCPS, which are a type of hybrid security that provide investors with both redemption and conversion options. RCPS have the characteristic of being favorable to investors because they can choose whether to convert or redeem depending on the market conditions. When the value of a stock increases, investors can maintain the upside potential inherent in equity investments by converting their preferred stock to common shares. In contrast, they can secure downside protection against the risk of investment loss by redeeming it for cash when the value of the stock decreases. Therefore, RCPS are considered a financing option primarily used by firms that are unable to raise funds with a low cost of capital such as debt and attempt to cover their financing needs by aggressively attracting investors.¹⁾ In this respect, the issuance of RCPS can be an effective indicator for identifying firms with financial constraints.

By definition, financially constrained firms have limited access to capital markets and face high costs from external funds (Korajczyk and Levy 2003; Hennessy and Whited 2007). They have greater incentives to manage earnings than unconstrained firms to lower their financing costs. This is because, for financially constrained firms, the benefits of earnings management (raising capital at more favorable terms by signaling positive prospects to investors) outweigh its costs (audit risk, litigation risk, and reputational damage) (Linck et al. 2013; Kurt 2015). However, since no agreement has been reached on the best proxy for financial constraints, previous studies arbitrarily measured financial constraints using variables such as firm size, age, cash flows, dividend payout ratio, and combined index. This leads to the potential problem that the results could be distorted by misclassifying firms with and without financial constraints. To alleviate this problem, this

study explored the earnings management behavior of financially constrained firms by analyzing RCPS-issuing firms. Based on the assumption that the issuance of RCPS is an effective indicator for determining firms with financial constraints, we expect that RCPS-issuing firms are more likely to engage in aggressive earnings management than non-issuing firms to enhance their financing capacity. Therefore, the first hypothesis is formulated as follows.

Hypothesis 1. RCPS-issuing firms are more likely to engage in aggressive earnings management than non-issuing firms.

Firms' earnings management is typically divided into accrual-based and real activities management. First, since accruals are recognized under the discretion of management, they are used as a means of opportunistically managing earnings without changing cash flows, but also as a signal that reveals managers' private information about the future profitability of firms under the information asymmetry between managers and outside investors (Watts and Zimmerman 1986; Healy and Palepu 1993; Dechow 1994). Linck et al. (2013) provide evidence that financially constrained firms with good investment opportunities report high discretionary accruals to signal positive prospects, enabling them to raise capital for investments. However, accrual-based management tends to draw more scrutiny from regulators and auditors than real activities management (Chan et al. 2015).

Meanwhile, firms can manage their earnings by changing or altering their real business transactions, including sales manipulation, the reduction of discretionary expenditures, and overproduction, which is defined as real activities management. The extent of real activities management varies with flexibility, and firms must undertake such activities. Furthermore, it is less subject to external scrutiny than accrual-based management, but it may reduce firm value in the long term because the actions taken in the current period to manipulate earnings sacrifice cash flows in future periods (Roychowdhury 2006).

1) It is well known that startups or small- and medium-sized firms with high growth opportunities but have limited access to the bond market typically use RCPS to raise their capital.

Given these two types of earnings management attributes, we expect that RCPS-issuing firms rely more on accruals than on operational activities when they manage earnings to raise capital. As they are financially constrained, they are more likely to adopt the strategic use of accruals that convey their private information about positive prospects to the capital market and thus ease their financial constraints rather than real activities management that would deteriorate cash flows and firm value. Based on the above arguments, we formulated the second hypothesis.

Hypothesis 2. RCPS-issuing firms are likely to rely more on accruals than on real operational activities for earnings management.

III. Research Design

A. Data Selection

The initial sample consists of non-financial firms listed on the Korea Stock Exchange (KSE) from 2011 to 2018. Financial firms were excluded from the initial sample because their financial statements and accounting rules are significantly different from those in other industries. We also eliminated 1,535 firm-years for which financial data are not available in TS2000 and 455 firm-years with impaired capital. We hand-collected data related to the issuance of the RCPS from the firms' annual reports disclosed in DART site (Repository of Korea's Corporate Filings, <https://dart.fss.or.kr>). This sample selection process resulted in a final sample of 12,406 firm-years. The summary statistics are presented in Table 1. Table 2 reports the number of observations for RCPS-issuing and non-issuing firms included in the final sample.

B. Model Specification

We developed regression models 1 and 2 to investigate the level of earnings management of firms

issuing RCPS. The main variable of interest, *RCPS*, stands for the dummy variable that equals 1 if the firm issued RCPS and 0 otherwise. The dependent variables are the two types of earnings management: accruals and operational activities. Discretionary accruals (*DA*) and performance-matched discretionary accruals (*ROADA*) serve as proxies for accrual-based management (Dechow et al., 1995; Kothari et al., 2005).²⁾ *RAM*, a proxy for real activities management, is a combined measure of abnormal operational activities (Cohen et al., 2008). We also added control factors that can affect a firm's earnings management to the models. These factors include firm size (*SIZE*), leverage (*LEV*), return on equity (*ROE*), operating cash flow (*OCF*), market-to-book value ratio (*MTB*), binary indicator of loss (*LOSS*), year indicators (*YR*),

Table 1. Sample Selection Procedure

Procedures	No. of Firm-Years
2011-2018 Observations with reporting data in TS2000 excluding firms in the financial industry	14,396
Less:	
Observations without financial data	1,535
Observations with impaired capital	455
Final sample firm-years	12,406

Table 2. Number of RCPS-issuing and Non-issuing Firms by Year

Year	Number of RCPS-issuing firms	Number of non-issuing firms
2011	11	1,363
2012	9	1,397
2013	13	1,421
2014	21	1,449
2015	18	1,548
2016	21	1,604
2017	23	1,693
2018	31	1,784
Total	147	12,259

- 2) Since discretion allowed in determining accruals enables managers to manipulate earnings, the magnitude of discretionary accruals has been widely used as a representative measure of earnings management (Kim et al., 2010)

and industry indicators (*IND*).

$$\begin{aligned} DA(ROADA) = & \beta_0 + \beta_1 RCPS + \beta_2 SIZE + \beta_3 LEV \\ & + \beta_4 ROE + \beta_5 OCF + \beta_6 MTB \\ & + \beta_7 LOSS + \beta_8 OWN + \beta_9 FOR \\ & + \beta_{10} \sum YR + \beta_{11} \sum IND + \varepsilon \end{aligned} \quad (\text{Model 1})$$

$$\begin{aligned} RAM = & \beta_0 + \beta_1 RCPS + \beta_2 SIZE + \beta_3 LEV \\ & + \beta_4 ROE + \beta_5 OCF + \beta_6 MTB + \beta_7 LOSS \\ & + \beta_8 OWN + \beta_9 FOR + \beta_{10} \sum YR + \beta_{11} \sum IND \\ & + \varepsilon \end{aligned} \quad (\text{Model 2})$$

DA: discretionary accruals estimated using the modified Jones model (Dechow et al., 1995);

ROADA: performance-matched discretionary accruals (Kothari et al., 2005);

RAM: a proxy for real activities management (Cohen et al., 2008);

RCPS: 1 if the firm issued RCPS, and 0 otherwise;

SIZE: log of total assets;

LEV: total liabilities divided by total assets;

ROE: return on equity;

OCF: operating cash flows scaled by total assets;

MTB: market-to-book value ratio;

LOSS: 1 if the operating income is negative, and 0 otherwise;

OWN: stock ownership ratio of the largest shareholder;

FOR: stock ownership ratio of foreign investors;

YR: year indicators; and

IND: industry indicators.

Specifically, *DA* and *ROADA* are calculated as residuals from Models 3-1 and 3-2, respectively (Dechow et al., 1995; Kothari et al., 2005).

$$\begin{aligned} \frac{TAC_t}{A_{t-1}} = & \alpha_0 + \alpha_1 \frac{\Delta ADJREV_t}{A_{t-1}} + \alpha_2 \frac{PPE_t}{A_{t-1}} \\ & + \epsilon_t \end{aligned} \quad (\text{Model 3-1})$$

TAC: total accruals;

ADJREV: change in sales minus change in accounts receivable;

PPE: property, plant, and equipment; and

A: total assets.

$$\begin{aligned} \frac{TAC_t}{A_{t-1}} = & \alpha_0 + \alpha_1 \frac{\Delta ADJREV_t}{A_{t-1}} + \alpha_2 \frac{PPE_t}{A_{t-1}} \\ & + ROA_{t-1} + \epsilon_t \end{aligned} \quad (\text{Model 3-2})$$

ROA: return on asset.

For *RAM*, three activities are considered: (1) sales manipulation, (2) overproduction, and (3) reduction in discretionary expenses (Roychowdhury, 2006). These activities can be measured using abnormal cash flows from operations (*ACFO*), abnormal production costs (*APROD*), and abnormal discretionary expenses (*ADISEXP*). A lower level of abnormal cash flows from operations (*ACFO*) or abnormal discretionary expenses (*ADISEXP*) indicates that a firm is more likely to manage earnings through sales manipulation or a reduction in discretionary expenditures. A higher value of *APROD* indicates that a firm is more likely to manage earnings through overproduction. *ACFO*, *APROD*, and *ADISEXP* can be estimated as residuals from Models 3-1, 3-2, and 3-3, respectively. Cohen et al. (2008) provide a measure of *RAM* generated by combining these three variables, as in Model 3-4. As suggested by Cohen et al. (2008), we used the *RAM* variable to measure the level of real activities management.

$$\begin{aligned} \frac{CFO_t}{A_{t-1}} = & \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{SALES_t}{A_{t-1}} \\ & + \alpha_3 \frac{\Delta SALES_t}{A_{t-1}} + \epsilon_{it} \end{aligned} \quad (\text{Model 4-1})$$

$$\begin{aligned} \frac{PROD_{it}}{A_{t-1}} = & \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{SALES_t}{A_{t-1}} \\ & + \alpha_3 \frac{\Delta SALES_t}{A_{t-1}} + \alpha_4 \frac{\Delta SALES_{t-1}}{A_{t-1}} + \epsilon_{it} \end{aligned} \quad (\text{Model 4-2})$$

$$\begin{aligned} \frac{DISEXP_t}{A_{t-1}} = & \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{SALES_t}{A_{t-1}} + \epsilon_{it} \end{aligned} \quad (\text{Model 4-3})$$

CFO: cash flows from operations;

SALES: sales;

PROD: production costs, defined as the sum of the cost of goods sold and the change in inventories

DISEXP: discretionary expenses, defined as selling, general, and administrative expenses;

A: total assets.

$$RAM = NEG_ACFO + APROD + NEG_ADISEXP$$

(Model 4-4)

RAM: a proxy for real activities management (Cohen et al., 2008);

NEG_ACFO: negative value of abnormal cash flows from operations;

APROD: abnormal production costs; and

NEG_DISEXP: negative value of abnormal discretionary expenses.

IV. Empirical Results

A. Descriptive Statistics and Correlation

Table 3 presents descriptive statistics of the variables used to test the hypotheses. To rule out the effects of outliers, we winsorized the top and bottom 1% of the observations for all the continuous variables. As measures of accrual-based management, the mean (median) values of *DA* and *ROADA* are -0.002 (0.000) and -0.004 (-0.002), respectively. The mean (median) value of *RAM* is -0.027 (0.017). The mean (median) value of the dummy variable for RCPS-issuing firms (*RCPS*) is 0.012, indicating that RCPS-issuing firms constitute approximately 1.2% of the sample. For the control variables, the mean (median) values of firm size (*SIZE*) and debt ratio (*LEV*) are 19.022 (18.758) and 0.372 (0.368), respectively. The mean (median) values of return on equity (*ROE*) and operating cash flows (*CFO*) are 0.009 (0.044) and 0.043 (0.043), respectively. The mean (median) values

Table 3. Descriptive Statistics of Variables

Variables	N	Mean	Median	SD	MIN	MAX
DA	12406	-0.002	0.000	0.089	-0.295	0.318
ROADA	12406	-0.004	-0.002	0.089	-0.290	0.317
RAM	12406	-0.027	0.017	0.335	-1.444	0.749
RCPS	12406	0.012	0.000	0.108	0.000	1.000
SIZE	12406	19.022	18.758	1.342	16.739	23.745
LEV	12406	0.372	0.368	0.196	0.026	0.822
ROE	12406	0.009	0.044	0.185	-0.975	0.329
CFO	12406	0.043	0.043	0.080	-0.207	0.263
MTB	12406	1.616	1.130	1.502	0.242	9.037
LOSS	12406	0.259	0.000	0.438	0.000	1.000
OWN	12406	0.278	0.252	0.144	0.000	0.700
FOR	12406	0.067	0.021	0.106	0.000	0.529

Definition of variables

DA: discretionary accruals estimated by the Modified Jones Model (Dechow et al., 1995)

ROADA: performance-matched discretionary accruals (Kothari et al., 2005)

RAM: real activities management (Cohen et al., 2008)

RCPS: 1 if the firm issued RCPS, and 0 otherwise

SIZE: log of total assets

LEV: total liabilities divided by total assets

ROE: return on equity

CFO: operating cash flows scaled by total assets

MTB: market-to-book value ratio

LOSS: 1 if the operating income is negative, and 0 otherwise

OWN: stock ownership ratio of the largest shareholder

FOR: stock ownership ratio of foreign investors

of the market-to-book ratio (*MTB*) and a dummy variable for firms with negative operating income (*LOSS*) are 1.616 (1.130) and 0.259 (0.000), respectively. Finally, the mean (median) values of the stock ownership ratio of the largest shareholder (*OWN*) and foreign investors (*FOR*) are 0.278 (0.252) and 0.067 (0.021), respectively.

Table 4 presents the results of Pearson's correlations between all variables included in this study. The dummy variable for RCPS-issuing firms (*RCPS*) is positively correlated with *DA*, *ROADA*, and *RAM* but not significantly. *DA* and *ROADA* are positively correlated with firm size (*SIZE*), return on equity (*ROE*), and the ownership ratio of the largest shareholder (*OWN*), whereas they are negatively correlated with debt ratio (*LEV*), operating cash flows

(*CFO*), (*MTB*), and the dummy variable for loss firms (*LOSS*). *RAM* is positively correlated with debt ratio (*LEV*) and the dummy variable for loss-making firms (*LOSS*), whereas it is negatively correlated with firm size (*SIZE*), return on equity (*ROE*), operating cash flows (*CFO*), market-to-book ratio (*MTB*), and ownership ratio of foreign investors (*FOR*).

The results of Pearson's correlation analysis show that some variables are highly and significantly correlated. To alleviate the concern of multicollinearity, variance inflation factors (VIF) are calculated after the regression. The VIF tests show that the VIF for each variable is all less than 3, which indicates that there is no serious multicollinearity problem in the model.

Table 4. Correlations of Variables

	DA	ROADA	RAM	RCPS	SIZE	LEV	ROE	CFO	MTB	LOSS	OWN	FOR
DA	1.0000	0.9919	0.1650	0.0026	0.0222	-0.1104	0.4847	-0.4244	-0.0333	-0.3287	0.0438	-0.0096
		<.0001	<.0001	0.7698	0.0136	<.0001	<.0001	<.0001	0.0002	<.0001	<.0001	0.2843
ROADA		1.0000	0.1868	0.0021	0.0224	-0.0767	0.4523	-0.4520	-0.0338	-0.3007	0.0312	-0.0200
			<.0001	0.8139	0.0127	<.0001	<.0001	<.0001	0.0002	<.0001	0.0005	0.0258
RAM			1.0000	0.0081	-0.0751	0.2259	-0.2045	-0.4205	-0.1851	0.1701	-0.0142	-0.1994
				0.3699	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.1137	<.0001
RCPS				1.0000	0.0125	0.0494	-0.0288	-0.0211	0.0052	0.0339	0.0004	-0.0193
					0.1637	<.0001	0.0013	0.0190	0.5601	0.0002	0.9610	0.0315
SIZE					1.0000	0.2003	0.1849	0.1334	-0.1647	-0.1723	0.0979	0.4837
						<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
LEV						1.0000	-0.2525	-0.1367	0.0030	0.2093	-0.0441	-0.1059
							<.0001	<.0001	0.7429	<.0001	<.0001	<.0001
ROE							1.0000	0.4413	-0.0958	-0.6791	0.1417	0.1663
								<.0001	<.0001	<.0001	<.0001	<.0001
CFO								1.0000	-0.0303	-0.3910	0.1058	0.2001
									0.0007	<.0001	<.0001	<.0001
MTB									1.0000	0.0963	-0.0799	0.0811
										<.0001	<.0001	<.0001
LOSS										1.0000	-0.1295	-0.1496
											<.0001	<.0001
OWN											1.0000	0.0445
												<.0001
FOR												1.0000

Note: The variables are defined in Table 3.

B. Regression Results

Table 5 presents the results of the regression analysis of accrual-based earnings management of RCPS-issuing firms. Column A reports that the coefficient of *RCPS* is significant at $p < 0.01$, suggesting that RCPS-issuing firms have a higher level of *DA* than non-issuing firms. Similar results are obtained for the level of *ROADA*, as shown in column B. The results indicate that RCPS-issuing firms engage in more aggressive earnings management using discretionary accruals than non-issuing firms, which is consistent with our first hypothesis. It can be inferred that as RCPS-issuing firms are financially constrained, they attempt to raise capital on more favorable terms by conveying information about the future profitability of firms through accruals to investors.

Table 6 presents the results of the regression analysis of the real activities management of RCPS-issuing firms. The coefficient of *RCPS* is statistically insignificant, suggesting that there is no significant difference in the level of *RAM* between RCPS-issuing and non-issuing firms. This implies that RCPS-issuing firms do not engage in real activities management.

This is because RCPS-issuing firms have a low level of flexibility to change their real business transactions for earnings management because of financial constraints. In addition, it appears that real activities

Table 6. The Results of Regression Analysis for Real Activities Management of RCPS-issuing Firms

Variables	RAM		
	Coef.	t-stat	p-value
Intercept	0.141	3.18***	0.002
RCPS	-0.011	-0.47	0.639
SIZE	-0.014	-5.94***	<.0001
LEV	0.239	16.84***	<.0001
ROE	0.000	-0.01	0.993
CFO	-1.657	-47.07***	<.0001
MTB	-0.034	-19.19***	<.0001
LOSS	-0.012	-1.56	0.118
OWN	0.067	3.87***	0.000
FOR	-0.173	-6.13***	<.0001
YR		Included	
IND		Included	
adj-R2		0.334	
F		223.59	

Note: These variables are listed in Table 3. *** indicate significance levels at the 1% based on two-tailed tests.

Table 5. The results of Regression Analysis for Accrual-based Management of RCPS-issuing Firms

Variables	Column A. DA			Column B. ROADA		
	Coef.	t-stat	p-value	Coef.	t-stat	p-value
Intercept	0.084	11.82***	<.0001	0.077	10.76***	<.0001
RCPS	0.010	2.84***	0.005	0.008	2.24**	0.025
SIZE	-0.003	-8.27***	<.0001	-0.003	-7.92***	<.0001
LEV	0.004	1.67*	0.095	0.015	6.62***	<.0001
ROE	0.366	119.26***	<.0001	0.356	114.83***	<.0001
CFO	-0.914	-161.76***	<.0001	-0.922	-161.55***	<.0001
MTB	0.001	4.58***	<.0001	0.001	4.02***	<.0001
LOSS	-0.029	-22.89***	<.0001	-0.027	-21.30***	<.0001
OWN	0.006	2.13**	0.033	0.001	0.41	0.685
FOR	0.026	5.70***	<.0001	0.025	5.42***	<.0001
YR		Included			Included	
IND		Included			Included	
adj-R2		0.760			0.750	
F		1401.59			1332.82	

Note: These variables are listed in Table 3. *, **, and *** indicate significance levels at 10%, 5%, and 1%, respectively, based on two-tailed tests.

management leads to a decrease in future cash flows and firm value, making it an unsuitable option for RCPS-issuing firms that manage earnings to enhance their financing capacity. The results taken together from Tables 5 and 6 support our second hypothesis that RCPS-issuing firms rely more on accruals than on real operational activities for earnings management.

C. Additional Analysis

To control for the effects of covariate variables between RCPS issuers and non-issuers, this study conducted an additional analysis by creating a matching sample. We constructed a control group of 147 non-issuing firms matched by asset size and industry type with 147 RCPS-issuing firms, generating a matching sample of 354 firm-year observations (Beaver, 1966; Altman, 1968; Barnes, 1990). Tables 7 and 8 present the results of the additional analysis to estimate Models 1 and 2, respectively, based on the matching sample. As shown in Table 7, the coefficients of *RCPS* for both *DA* and *ROADA* are significantly positive. This indicates that RCPS-issuing

firms have a higher level of discretionary accruals than non-issuing firms. Table 8 shows that the

Table 8. The Results of Regression Analysis for Real Activities Management of RCPS-issuing Firms based on a Matching Sample

Variables	RAM		
	Coef.	t-stat	p-value
Intercept	0.617	2.04**	0.043
RCPS	0.007	0.23	0.820
SIZE	-0.033	-1.92*	0.056
LEV	0.328	3.30***	0.001
ROE	-0.263	-1.06	0.288
CFO	-1.580	-6.91***	<.0001
MTB	-0.040	-3.34***	0.001
LOSS	-0.076	-1.59	0.113
OWN	-0.179	-1.42	0.156
FOR	-0.234	-0.94	0.348
YR	Included		
IND	Included		
adj-R2	0.317		
F	6.90		

Note: These variables are listed in Table 3. *, **, and *** indicate significance levels at 10%, 5%, and 1%, respectively, based on two-tailed tests.

Table 7. The Results of Regression Analysis for Accrual-based Management of RCPS-issuing Firms based on a Matching Sample

Variables	Column A. DA			Column B. ROADA		
	Coef.	t-stat	p-value	Coef.	t-stat	p-value
Intercept	0.151	2.67***	0.008	0.140	2.42**	0.016
RCPS	0.014	2.36**	0.019	0.011	1.77*	0.078
SIZE	-0.007	-2.26**	0.025	-0.007	-2.16**	0.032
LEV	0.000	0.02	0.980	0.022	1.16	0.246
ROE	0.342	16.63***	<.0001	0.332	15.71***	<.0001
CFO	-0.937	-22.91***	<.0001	-0.944	-22.50***	<.0001
MTB	0.003	1.52	0.130	0.004	1.62	0.106
LOSS	-0.028	-3.23***	0.001	-0.032	-3.53***	0.001
OWN	-0.039	-1.63	0.104	-0.047	-1.92*	0.056
FOR	0.045	0.96	0.339	0.037	0.77	0.444
YR	Included			Included		
IND	Included			Included		
adj-R2	0.727			0.711		
F	35.00			32.32		

Note: These variables are listed in Table 3. *, **, and *** indicate significance levels at 10%, 5%, and 1%, respectively, based on two-tailed tests.

coefficient of *RCPS* for *RAM* is statistically insignificant, suggesting that the real activities management level of the *RCPS*-issuing firm is not significantly different from that of non-issuing firms. Overall, these results are consistent with those of the main analysis. To summarize, *RCPS*-issuing firms tend to manage earnings using accruals rather than real operational activities to signal positive prospects to investors and thus raise capital on more favorable terms.

This study also conducted an additional analysis of earnings management of *RCPS*-issuing firms at the initial issuing year. Specifically, we estimated our regression models 1 and 2, where the main variable of interest, *RCPS*, is replaced by *RCY*. *RCY* represents a dummy variable that equals 1 if the year is the firm initially issued *RCPS* and 0 otherwise. The results of the additional analysis show that the coefficients of *RCY* for both *DA* and *ROADA* are positive but insignificant. The coefficient of *RCY* for *RAM* is statistically insignificant, consistent with the results of the main analysis. In addition, we conducted an additional analysis using *RCY* based on a matching sample, and found that the coefficients of *RCY* for *DA*, *ROADA*, and *RAM* are statistically insignificant. These results are due to the fact that the number of *RCPS*-issuing firms at the initial issuing year is counted as only 47, which is extremely small relative to the total sample size of 12,406 firms.

V. Conclusion

This study examines the relationship between financial constraints and earnings management by focusing on *RCPS*-issuing firms. As *RCPS* appeal to investors by offering both redemption and conversion options, it is one of the preferred financing options for firms with investment opportunities but have difficulties in raising capital at a low cost. Thus, we posit that the issuance of *RCPS* is a useful indicator of financially constrained firms.

Based on a sample of 12,406 firm-year observations

of Korean listed firms covering 2011 to 2018, we analyzed the earnings management level of *RCPS*-issuing firms compared to non-issuing firms. Specifically, we considered earnings management through discretionary accruals and real operational activities. We found that *RCPS*-issuing firms report a higher level of discretionary accruals than non-issuing firms. Meanwhile, there is no significant difference in the level of real operational activities between *RCPS*-issuing and non-issuing firms. The results show that *RCPS*-issuing firms manage earnings and that discretionary accruals are used as strategic earnings management tools to alleviate financial constraints. This is consistent with the argument of prior studies that constrained firms to use accruals to communicate positive information related to future performance, which enables them to raise capital to make investments (Linck et al. 2013). Our findings also confirm that financially constrained firms do not depend on real activities management that sacrifices cash flows and firm value in the long term.

A limitation of this study is that we focused on the limited case of the issuance of *RCPS* in determining whether firms are financially constrained. However, this study provides compelling evidence that financial constraints affect accrual-based earnings management by departing from the common approaches to measuring financial constraints used in prior research. We expect that this study will provide useful insights for market participants such as investors, auditors, analysts, and accounting standard setters to better understand not only the financial reporting decisions of firms to ease financial constraints but also the attributes of *RCPS*-issuing firms. Also, it would be interesting if we can further explore the effect of financial constraints on earnings management by foreign companies issuing *RCPS* and investigate whether there is any significant difference between Korean and foreign companies. Since we have to rely on hand-collected data to obtain information on *RCPS*-firms, we leave this agenda for future research when the information is available.

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