

Consequences of Real Activity based Earnings Management: Evidence of Seasoned Equity Offering Firms in Korea*

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This paper aims to the examine consequences of earnings management in Korea. We focus on the real activity based earnings management using a sample of suspect firms which are likely to be engaged in earnings management upward, seasoned equity offering(SEO) firms.

We find that managers attempt to inflate their reported earnings around the SEO, specifically in the fiscal year prior to the SEO and they use real activities in addition to accruals enhancing stock prices. Operating performances after earnings management significantly declines but these underperformance are recovered in the third year after earnings management. This could be caused by accruals reversion but firms classified as being engaged in real activity based earnings management show underperformance for a long time subsequent to the earnings management. In particular, firms having lower largest shareholder's ownership report abnormal accruals and real activities for inflating earnings before the SEO and show underperformance after that because those firms are expected to have weaker internal control system. Thus we infer the largest shareholder's ownership is one of factors to manage earnings and negatively influence on subsequent performance.

The results of earnings managements and those consequences around the SEO are consistent with Yoon and Lee(2001), but much pronounced when we examine abnormal real activity as another proxy of earnings management. Consequences of real activity based earnings management using SEO firms are the first empirical evidence reported in Korea to the best of our knowledge. These empirical evidences provide an insight into future real activity based studies even though it is based on the estimated proxies of earnings management.

Key words: Earnings Management, Seasoned Equity Offering, Abnormal Accruals, Real activity based Earnings Management, Consequences, Ownership

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1. Introduction

This paper aims to examine earnings management and the subsequent operating performance, focusing on the real activity based earnings management. The accounting literature is extensive on the issue of earnings management and there are substantial evidences that earnings are controlled at such corporate events as merger and acquisitions (M&A), initial public offerings(IPO), and seasoned equity offering(SEO). Earnings management to achieve a certain level of earnings is primarily performed by managers who make decisions about accounting choices from among GAAP and/or operating choices from among diverse alternatives. We examine earnings management and those consequences using a sample of SEO firms whose managers are known to have incentives to manage earnings upward for this event.

A Seasoned Equity Offering(SEO) is one of the means to increase capital as the firm issues a new stock after its initial public offering(IPO). In the Korean market, the new issue price at the SEO is determined mainly based on the market price and generally priced with consideration of the portion which is diluted after the SEO. A right offering is a common way to the SEO in

Korea, different from the case of IPO,¹⁾ in an attempt to protect existing shareholders' rights. It is usually the case where a firm gives pre-emptive rights to existing shareholders and to members in an employee stock ownership association and assigns a portion of new shares for them to buy. If they do not buy new shares assigned, these become forfeited shares and accordingly managers may have to change their financing plan, as a result of which the firm's image is injured. Thus managers have strong incentives to artificially inflate earnings in order to enhance stock price to avoid forfeited shares, improving their capital structure and raising their assets.

Prior studies provide the evidence that managers are indeed engaged in earnings management and raise their stock prices around the SEO (Kwon and Shim 1997; Teoh et al. 1998; Ragan 1998, Choi and Back 1999; Shivakumar 2000; Yoon and Lee 2001; Cohen et al. 2008). They also report significant declines of operating performance subsequent to the SEO. However, they report inconsistent results on the timing when managers manipulate earnings, from -2 years up to the quarter of the SEO. They all use abnormal accruals as a proxy of earnings management. Multiple proxies of earnings management are being studied recently.

1) In the case of IPO, new issues are all open to the public without pre-emptive right to existing shareholders in Korea.

They examine earnings management behavior using book-tax differences and abnormal real activities as well as abnormal accruals. A few studies on real activity based earnings management are followed since Graham et al.(2005), which provide empirical evidence that CEO's prefer to use real activities in order to manipulate earnings. Estimation models for abnormal real activities are developed by Roychowdhury(2006) and studies are still going on regarding the trade off relationships between accounting accrual based earnings manipulation and real activities based earning manipulation (Gunny 2005; Zang 2005; Cohen and Zarowin 2008). But there is no study on earnings management through real activities around the SEO in Korea so far.

This paper examines whether firms are engaged in earnings management for the SEO using real activities in addition to accruals. It also examines the consequence after earnings management for the SEO. As Graham et al.(2005) documents that managers prefer taking economic actions which could have negative long-term consequences to making within-GAAP accounting choices for earnings management, it is hypothesized that the subsequent performance gets worse for those firms that inflate earnings through real activities. We analyze whether the performance of those firms engaged in real activity based earnings management significantly

declines after the SEO. We use both univariate analysis and multivariate regressions to find earnings management through accruals or real activities around the SEO and to examine the subsequent performance. In particular, we examine this using lower ownership group which may have weaker internal control system so that more likely to be engaged in real activity based earnings management. The empirical results show that managers inflate their reported earnings upward in the fiscal year prior to the SEO using real activities in addition to accruals, and operating performances decline subsequently. Operating performances after earnings management significantly declines but these underperformance are recovered in the third year after earnings management, which is probably caused by accruals reversion. However, firms that heavily use real activities to inflate their earnings show lower operating performance for a longer time subsequent to the SEO. Also, we find the consistent results from lower ownership group. These results are the first finding of real activity based earnings management, and distinguishes this paper from prior studies. The second contribution of this paper is that the empirical result confirms the timing of earnings management of the SEO firms which use real activity based earnings management. The evidence that reported earnings are managed in the fiscal year prior to the

SEO is consistent with Yoon and Lee(2001), but much pronounced with firms that are engaged in earnings management through real activities in addition to accruals. This paper shows the first empirical evidence that earnings are manipulated through real activities in addition to accruals in the year prior to the SEO in Korea. This study also considers abnormal real activities more extensively by including disposal of asset sales that was neglected in prior studies. Our finding that the largest shareholder's ownership is one of factors that firms are engaged in real activity based earnings management and negatively associated with subsequent performance is other contribution. However, this study is subject to possible biases embedded in the models that try to capture proxies of earnings management.

This paper is composed as follows. Section 2 reviews relevant prior research and develops hypotheses. Section 3 describes the sample and the empirical models. Section 4 presents empirical results. Finally, the Section 5 provides concluding remarks.

II. Literature and Hypothesis Development

2.1 Earnings Management around the SEO and the Subsequent Performance

Most prior studies examining earnings management around the SEO are motivated by the observation that performances decline after the SEO. Many researchers maintain that this phenomenon is explained by the management of reported earnings upward around the SEO and subsequent reversal. Teoh et al.(1998) and Ragan(1998) as well as Shivakumar(2000) all provide evidence that earnings have been managed upward before the SEO and subsequently reversed. But the result on the timing of earnings management by SEO firms is inconsistent. Teoh et al.(1998) report that earnings are manipulated by income increasing accruals from the second year prior to the SEO to at the time of the SEO and subsequently reversed after the SEO. Ragan(1998) finds earnings management upward during the year of the SEO, both at the time of announcement and the subsequent quarter of the SEO. On the other hand, Shivarkumar (2000) reports that earnings management is observed from the fourth quarter to the second quarter prior to the SEO. Although the timing of positive abnormal accruals

varies with studies,²⁾ it can be concluded that earnings are managed upward in anticipation of the SEO. There are evidences on earnings management in anticipation of the SEO in Korea as well (Kwon and Shim 1997; Choi and Back 1999; Yoon and Lee 2001). They all report increasing abnormal accruals up to the year of the offering and significant decrease in subsequent years. In particular, abnormal accruals are the highest in the year of the SEO in Kwon and Shim(1997), and Choi and Back(1999), whose study periods are 1984~1993 and 1991~1995 respectively. Yoon and Lee(2001) report that both abnormal accruals and earnings are the highest in the fiscal year prior to the SEO for the study period of 1995 to 1997. They all use abnormal accruals as a proxy of earnings management around the SEO. Recently, Cohen et al.(2008) report consistent evidence on earnings management around the SEO using both accruals based and real activity based earnings manipulations. They find managers inflate their earnings using real activities, as well as accruals around the SEO, and argue that a manager's strategy with regard to choosing earnings management tools has been changed before and after the SOX Act. They suggest a shift from accruals based earnings management to real activity based one after

the SOX has been implemented because such a regulation has made accruals based manipulation be more costly. They also provide evidence on underperformance after the SEO, because inflated abnormal accruals are predicted to be reversed in subsequent years and earnings and stock returns are also expected to decline (Kwon and Shim 1997; Teoh et al. 1998; Rangan 1998; Choi and Back 1999; Shivakumar 2000; Yoon and Lee 2001). They report that firms manage earnings upward around the SEO and the stock market is misled by these inflated earnings, temporarily overvaluing those firms. However disappointed by their earnings declines, their stock prices fall down subsequently. Suvarkumar(2000) reports consistent finding on earnings management behaviors around the SEO. But he arguments on the market response after the SEO, in that seasoned equity issuers' earnings management may not be designed to mislead investors, rather it may merely reflect the issuers' rational response to anticipated market behavior at the offering announcements. That is, managers overstate reported earnings before the SEO because they believe that investors expect that all firms announcing the SEO report inflated earnings prior to the SEO, and investors discount their stock prices accordingly.

2) This timing gap might be caused from different study periods, 1970~1989 for Teoh et al(1998), 1987~1990 for Rangan(1998), and 1983~1992 for Shivakumar(2000), respectively.

2.2 Real Activity based Earnings Management

Earnings could be managed by both accruals and real activities: However, real activities based earnings management has not been as widely studied as accruals based one. 'Real activity based earnings management' is defined as management actions that deviate from normal business practices to meet certain earnings thresholds (Roychowdhury 2006), whereas accruals based earnings management is a managerial intervention in financial reporting process which is usually a matter of accounting choice. Most early studies related to earnings management are exclusively focused on accruals based earnings management. There has been sparse empirical study assessing real activity based earnings management practice but it has been suggested that it does take place. Bartov(1993) reports evidence that managers can use the timing of asset sales, both fixed assets and investments in order to avoid negative earnings growth and violation of debt covenant. Herrmann, Inoue and Thomas (2003) report that managers increase earnings through the sale of fixed assets and marketable securities when current operating income falls below manager's forecast in Japan. It means that they have an oppor-

tunity to manage selling point of assets because a gain is recognized on the income statement at the time of sale as the difference between the net book value and the current market value. Graham et al. (2005) survey on top executives and provide evidence that managers prefer real activity based earnings management to accruals based one, because it can be hardly detected until they get to know manager's true intention. Managers like to manage their earnings by reducing discretionary expenditures or capital investment in order to achieve a target income. They report the reason why managers prefer real activity based manipulation is that accruals based earnings management is more likely to be detected by regulatory scrutiny or class action litigations and they can diversify risks³⁾ by using accruals and real activities. Recently, empirical studies on earnings management through real activities as well as accruals are followed. Roychowdhury (2006) presents evidence that firms use multiple tools based on real activities in an effort to avoid reporting annual losses, where firms give price discounts to temporarily boost sales, overproduce to report lower cost of goods sold, and reduce discretionary expenditures to improve margins. Gunny(2005) analyses the consequences of real activity

3) Using accruals based earnings management alone is risky because real activities can be occurred during the year and these cannot be adjusted at the end of the fiscal year. If reported earnings fall below the target and all accruals based earnings management to meet it is exhausted, then managers are left with few options.

based earnings management. Real activity based earnings management has direct effects on cash flows whereas accruals based one does not. Accruals based earnings management is just a way of representing those underlying activities through a choice of accounting methods, and it is not accompanied by changing the underlying economic activities of the firm. But real activity based earnings management directly changes a firm's underlying operations such as operating and investment decisions. Gunny identifies high abnormal real activity group using portfolios and examine whether high abnormal real activities have a significantly negative impact on future performance, earnings and cash flows. She finds a negative subsequent performance in high abnormal real activity group. There are evidences on real activity based earnings management in Korea. Choi (2004) investigates whether managers sell assets in order to manage their earnings and he documents that managers perform earnings management realizing gains from asset sales, and accomplish effective tax planning considering both taxable costs and nontaxable costs. Kim et al.(2008) examine whether managers conduct real earnings manipulations. They show the evidence that real activities such as price discounts, overproducing, and reducing discretionary expenditures are found in firms suspected to avoid loss where earnings are just above zero

(called suspect firm-years). Also Lee et al.(2009) document that differential type of earnings management based on ownership structure and report a positive association between lower ownership and real activity based earnings management. Regarding the relationships between accruals management and real activity based earnings management, Zang(2005) examines the tradeoffs between accruals and real activity based manipulations. It is found that managers determine real activity based manipulation before accruals based one and real activity and accruals based manipulations are negatively associated. She concludes that managers use those methods as a substitute depending on their strategies. Especially, firms facing or after lawsuit filings tend to switch their earnings management strategies, from accruals based manipulation to real activity based manipulation. With regard to the litigation risks, similar results are documented by Cohen et al.(2008) and they suggest that firms switch from accruals based earnings management to real earnings management after the passage of Sarbanes-Oxley Act (SOX). They compare the levels of accruals based and real activity based earnings managements in the pre- and post-SOX periods. They report an increasing trend in accruals based one in the period up to the passage of SOX and a reversal after the passage of SOX. They observed an

increasing trend in real activity based earnings management after the passage of SOX.

2.3 Hypothesis Development

2.3.1 The existence of earnings management through real activities

Earlier studies suggest that reported earnings and abnormal accruals increase around the SEO, and decline significantly after earnings management for the SEO. However, it remains unclear as to exactly when firms are engaged in earnings management. Meanwhile managers prefer real activity based manipulation to accruals based one in Graham et al.(2005)'s survey. Thus we need to examine whether managers inflate earnings through real activities as well as accruals around the SEO. Especially, we predict managers implement reported earnings upward before the SEO because financial reports in fiscal year prior to the SEO are the most recent one audited and investors may regard them as the most credible one. So, reported earnings are likely to be manipulated before they issue new shares. There is another reason to manage earnings prior to the SEO, which is to reduce negotiation risks between underwriters and the firm. Firms provide their financial statements to underwriters before the SEO and managers try to negotiate from a favorable position with better

performance.

We examine whether managers boost earnings around the SEO using both abnormal accruals and abnormal real activities. This test is a prerequisite for examining the subsequent performance of the SEO firms, i.e., to test H2-a, H2-b, and H2-c. It is also an expansion of prior works on real activity based earnings management in that we consider abnormal real activities more extensively by including abnormal disposal of assets. Finally the results reconfirm the time when firms are engaged in earnings management for the SEO using real activity based earnings management in addition to accruals based one. We consider abnormal cash flows from operations, abnormal production costs, abnormal discretionary expenses, and abnormal gains from asset sales as abnormal real activities. Managers are likely to boost current earnings by providing incentives to customers to buy more products such as big price discounts or more lenient credit terms, which would accelerate the timing of sales. It does increase sales and boost net income if the margin is positive, but it may result in lower cash flows from operations relative to sales increases in the current period. They also increase production more than necessary in order to reduce the cost of goods sold as fixed overhead costs are spread over larger outputs. It could happen as long as the reduction in fixed

costs per unit is not offset by any increase in marginal cost per unit so that total cost per unit declines. They may cut discretionary expenses such as advertising expense, research and development, and selling, general, and administrative expenses to manage earnings. Also they can manage the point of sales of assets and recognize abnormal gains in current period to boost income. All these lead to the following hypotheses.

- H 1-a: Abnormal accruals are positive in the year prior to the SEO
- H 1-b: Abnormal cash flows from operations are negative in the year prior to the SEO
- H 1-c: Abnormal production costs are positive in the year prior to the SEO
- H 1-d: Abnormal discretionary expenses are negative in the year prior to the SEO
- H 1-e: Abnormal gains from disposals of assets are positive in the year prior to the SEO
- H 1-f: Abnormal real activity based earnings management as a whole is positive in the year prior to the SEO.

We set an additional hypothesis to examine whether real activity based earnings ma-

agement is influenced by firm's ownership structure for the SEO because it may impact on internal control system inside. If firms operate weaker internal control system and face to manage earnings upward, then they are likely to be engaged in real activity based earnings management. Followed by prior results that lower ownership structure makes firms to be engaged in real activity based earnings management(Lee et al. 2009), we examine the earnings management and subsequent performance using sample divided by ownership structure, the largest shareholder's ownership.⁴⁾ So we define higher ownership group(*H-Owner*) as firms having higher the largest shareholder's ownership while, lower ownership group(*L-Owner*) as firms having lower the largest shareholder's ownership, respectively. Then we analyze earnings management and subsequent performance of those groups, especially for lower ownership group.

- H 1-g: Abnormal real activity based earnings management of SEO firms in lower ownership group is positive in the year prior to the SEO.

4) We use the largest shareholder's ownership as a proxy of owner-manager's share and it includes holdings of a majority shareholder, his or her family and affiliated firms which have special relations with the firm according to the Article 2 of Securities and Exchange Act.

2.3.2 Consequences of earnings management

Prior studies document performances subsequent to the SEO decline for those firms with abnormal accruals before the SEO. We examine whether the subsequent operating performance declines after earnings management for the SEO. According to Gunny(2005), a real activity based earnings management has a negative impact on future performance. So, we investigate whether operating performances subsequent to earnings management for the SEO decline significantly, especially for those firms engaged in real activity based earnings management. For this, we identify a group of firms which are likely to be engaged in real activity based earnings management. For this, we divide the sample into two groups based on the level of abnormal real activities when they inflate their earnings. We use an aggregate value of abnormal real activities, *RM_Proxy*, because they are likely to use multiple activities such as aggressive price discount, over-production, cutting off discretionary expenses, and sales of assets in order to inflate earnings comprehensively. Firms are classified into 'high real activity manipulation group(H-RM group)' if firms have abnormal real activities(*RM_Proxy*) above the median. Likewise, firms are classified into 'low real activity manipulation group(L-RM group)' if firms have abnormal real activities (*RM_Proxy*) below

the median. These lead to the following hypotheses as to performance measured by ROA(return on assets).

- H 2-a: ROAs decline subsequent to earnings management for the SEO.
- H 2-b: ROAs subsequent to earnings management for the SEO are negatively associated with real activity based earnings management.

We also set the following hypothesis to examine whether subsequent performance declines especially when firms run weaker internal control system with lower ownership structure. We expect firms having lower largest shareholder's ownership show under-performance after earnings management through real activity.

- H 2-c: ROAs subsequent to earnings management for the SEO are negatively associated with lower group of the largest shareholder's ownership.

III. Research Design

3.1 Models

We examine whether earnings are managed with accruals and/or real activities before

the SEO using both univariate and multivariate analysis. We set the window from year -2 to year +2 surrounding the SEO year. We predict the means of abnormal accruals, abnormal production costs, abnormal gains from asset sales, and an aggregate value of abnormal real activities are significantly higher in the fiscal year prior to the SEO. We anticipate mean values of cash flows from operations and discretionary expense are significantly lower in the fiscal year prior to the SEO. Thus each sign of *SEOTIME2*, a_3 , will be significant if any kind of method is used for earnings management for the SEO. In particular, we examine this using higher/lower ownership group. If firms in lower group of the largest shareholder's ownership are engaged in real activity based earnings management much more, then each sign of *L_OWNERTIME2*, a_4 , shows a significance.

For multivariate analysis, we regress [Model 1]⁵⁾ to examine earnings management around the SEO. [Model 1-1] is employed especially when we examine those associations using higher/lower ownership group.

[Model 1]

$$EM_{ijt} = a_0 + a_1 SEO_{it} + a_2 SEOTIME1_{it} + a_3 SEOTIME2_{it} + a_4 SEOTIME3_{it} + a_5 SEOTIME4_{it} + a_6 SEOTIME5_{it} + a_7 ROA_{it} + a_8 SIZE_{it} + a_9 LEVERAGE_{it}$$

$$+ a_{10} Ind_Dummy + a_{11} YEAR_Dummy + e_{it}$$

where,

SEO_{it}: SEO dummy equals 1 if there is a SEO of firm *i* in year *t* and 0 otherwise

SEOTIME1_{it}: Time dummy equals 1 if it is the year *t-2* relative to the SEO and 0 otherwise

SEOTIME2_{it}: Time dummy equals 1 if it is the year *t-1* relative to the SEO and 0 otherwise

SEOTIME3_{it}: Time dummy equals 1 if it is the year *t* of the SEO and 0 otherwise

SEOTIME4_{it}: Time dummy equals 1 if it is the year *t+1* relative to the SEO and 0 otherwise

SEOTIME5_{it}: Time dummy equals 1 if it is the year *t+2* relative to the SEO and 0 otherwise

SIZE_{it}: Natural log of total assets of firm *i* in year *t*

LEVERAGE_{it}: Debt ratio of firm *i* in year *t* (Total Debt_{it}/Total Assets_{it-1})

Ind_Dummy: Industry dummy

Year_Dummy: Year dummy

EM_{ijt}: Proxies of earnings management of firm *i* in year *t*, where *j* = *Ab.ACC₁*, *Ab.ACC₂*, *Ab.OCF*, *Ab.PROD_cost*, *Ab.EXP*, *Ab.GSA*, *RM_Proxy*

Ab.ACC_{1it}: Abnormal accruals estimated by the Modified Jones model

Ab.ACC_{2it}: Abnormal accruals estimated by the Performance matched model

Ab.OCF_{it}: Abnormal cash flows from operations of firm *i* in year *t*

Ab.PROD_cost_{it}: Abnormal production costs of firm *i* in year *t*

Ab.EXP_{it}: Abnormal discretionary expenses (Selling&administrative expense-salaries) of firm *i* in year *t*

5) We appreciate for anonymous referee's suggestion of [Model 1].

$Ab.GSA_{it}$: Abnormal gains or losses from sales of assets of firm i in year t

RM_Proxy_{it} : Sum of standardized abnormal cash flow from operations, abnormal production costs, abnormal discretionary expense, and abnormal gains from asset sales of firm i in year t (We multiply $Ab.OCF$ and $Ab.EXP$ by negative one so that the sum of the four variables will be indicative of overall real earnings management)

[Model 1-1]

$$EM_{ijt} = a_0 + a_1 SEO_{it} + a_2 L_OWNER_{it} + a_3 L_OWNERTIME1_{it} + a_4 L_OWNERTIME2_{it} + a_5 L_OWNERTIME3_{it} + a_6 L_OWNERTIME4_{it} + a_7 L_OWNERTIME5_{it} + a_8 ROA_{it} + a_9 SIZE_{it} + a_{10} LEVERAGE_{it} + a_{11} Ind_Dummy + a_{12} YEAR_Dummy + e_{it}$$

where,

SEO_{it} : SEO dummy equals 1 if there is a SEO of firm i in year t and 0 otherwise

L_OWNER_{it} : Ownership dummy equals 1 if the the largest shareholder's ownership of firm i in year t is below the median, and 0 otherwise

$L_OWNERTIME1_{it}$: Interaction variable between L_OWNER and $SEOTIME1$ of firm i in year t

$L_OWNERTIME2_{it}$: Interaction variable between L_OWNER and $SEOTIME2$ of firm i in year t

$L_OWNERTIME3_{it}$: Interaction variable between L_OWNER and $SEOTIME3$ of firm i in year t

$L_OWNERTIME4_{it}$: Interaction variable between

L_OWNER and $SEOTIME4$ of firm i in year t

$L_OWNERTIME5_{it}$: Interaction variable between L_OWNER and $SEOTIME5$ of firm i in year t

EM_{ijt} : Proxies of earnings management of firm i in year t , where $j = Ab.ACC_1, Ab.ACC_2, Ab.OCF, Ab.PROD_cost, Ab.EXP, Ab.GSA, RM_Proxy$

We test the operating performance subsequent to the earnings management for the SEO using univariate analysis and multivariate regressions. SEO firms' performances in years from $t+1$ to $t+3$ after earnings management are measured by ROAs, matched ROAs, and those changes. We make a matched sample which consists of firms have the same year and industry, and similar ROA in the year of earnings management in order to control the effects of firm characteristics on performance. So matched ROAs is calculated as median difference⁶⁾ between each ROA and ROA of matched samples. ROA is scaled by total assets at the beginning of the fiscal year. For multivariate analysis, subsequent performances in year $t+1$ to $t+3$ are regressed using [Model 2]. We use Heckman(1979)'s two stage approach to control the association between abnormal accruals and abnormal real activity. That is because strong correlations between abnormal accruals and abnormal real activities shown by <Table 3> and prior study results(Cohen

6) We use median differences in order to reduce the effect of extreme values. We get similar results when we use mean difference, which are untabulated here.

et al. 2008) make us to consider those associations in our model. Firstly we run the following logistic regression[Model 2-1] and get inverse Mills ratios. Then we regress the [Model 2-2] including these inverse Mills ratios as an additional independent variable.⁷⁾

[Model 2-1]

$$RM_{it} = a_0 + a_1 Ab.ACC_{1it} + e_{it}$$

where,

RM_{it} : 1 if RM_Proxy of firm i in year t is above the median, and 0 otherwise

$Ab.ACC_{1it}$: Abnormal accruals estimated by the Modified Jones model of firm i in year t

[Model 2-2]

$$ROA_{it+j} = a_0 + a_1 SEO_{it} + a_2 RM_Proxy_{it} + a_3 SEORM_Proxy_{it} + a_4 SIZE_{it} + a_5 LEV_{it} + a_6 BTM_{it} + a_7 ROA_{it} + a_8 Mills_{it} + a_9 Ind_Dummy + a_{10} YEAR_Dummy + e_{it}$$

where,

ROA_{it+j} : Return on Assets of firm i in year t ($j=1,2,3$)($EBT_{it+j} / Total Assets_{it+j-1}$)

EBT_{it} : Earnings before corporate tax of firm i in year t

SEO_{it} : SEO dummy equals 1 if there is a SEO of firm i in year t and 0 otherwise

RM_Proxy_{it} : Sum of standardized abnormal cash flow from operations, abnormal production costs, abnormal discretionary expense, and

abnormal gains from asset sales of firm i in year t (We multiply $Ab.OCF$ and $Ab.EXP$ by negative one so that the sum of the four variables will be indicative of overall real earnings management)

$SEORM_Proxy_{it}$: Interaction variable between SEO and RM_Proxy of firm i in year t

$Ab.OCF_{it}$: Abnormal cash flows from operations of firm i in year t

$Ab.PROD_cost_{it}$: Abnormal production costs of firm i in year t

$Ab.EXP_{it}$: Abnormal discretionary expenses (Selling&administrative expense-salaries) of firm i in year t

$Ab.GSA_{it}$: Abnormal gains or losses from sales of assets of firm i in year t

AM_{it} : Abnormal accruals of firm i in year t estimated by the Modified Jones model (Ab_ACC_1)

$SIZE_{it}$: Natural log of total assets of firm i in year t

LEV_{it} : Debt ratio of firm i in year t (Total Debt_{it}/Total Assets_{it-1})

BTM_{it} : Book to market value of firm i in year t (Book value of equity_{it}/Market value of equity_{it})

$Mills_{it}$: Inverse Mills Ratio of firm i in year t from the 1st stage regression

Ind_Dummy : Industry dummy

$Year_Dummy$: Year dummy

RM_Proxy represents an aggregate variable of abnormal real activities and is obtained by adding standardized variables: abnormal cash flows from operations, abnormal pro-

7) We thank you the referee for suggestion of [model 2-2]. We try to control the endogenous problem between abnormal accruals and abnormal real activity using this approach.

duction costs, abnormal discretionary expenses, and abnormal gains from asset sales. Specifically, we multiply abnormal cash flows from operations and abnormal discretionary expense by negative one so that the sum of the four variables will be indicative of overall real activity based earnings management. On the other hand, abnormal production costs and abnormal gains from disposal of assets are not multiplied because higher production costs are indicative of overproduction to reduce the cost of goods sold and higher gains from asset sales are signs of abnormal sales of investment to boost current earnings. We employ this single variable of aggregation in order to capture the overall effect of real activity based earnings management following prior studies (Roychowdhury 2006; Gunny 2005; Zang 2005; Cohen et al. 2008). The higher *RM_Proxy* is, the more it is likely that the firm is engaged in real activity based earnings management. We expect the coefficient of *RM_Proxy*, a_2 , is negative if there are underperformance of firms engaged in real activity based earnings management in subsequent years in general. As we examine these associations using SEO sample, the variable of interest in [Model 2-2] is *SEORM_Proxy*, which represents abnormal real activities of SEO firms. We expect the sign of *SEORM_Proxy* is negative, meaning that firm's subsequent performances are negative after engaged in real activity

based earnings management when offering new shares. We include factors which may influence future operating performance such as size effects (*SIZE*) and capital structure (*LEV*). We include book to market ratio (*BTM*) to control for growth opportunities and the life cycle of the firm. *ROA* is included to control for the time-series properties. We also include *Ind_Dummy* and *Year_Dummy* to control for each industrial and yearly effect, respectively.

For examining H2-c, we run the following regression [Model 2-3]. We expect the sign of *SEOWNER* is negative so that firms having relatively lower ownership among SEO firms report underperformance after earnings management. And we predict the sign of *SEORMOWNER*, the variable of interest, is also negative because abnormal real activity of firms having lower largest shareholder's ownership among SEO firms have negatively associated with subsequent performance after that.

[Model 2-3]

$$\begin{aligned}
 ROA_{it+j} = & a_0 + a_1 SEO_{it} + a_2 RM_Proxy_{it} \\
 & + a_3 L_OWNER_{it} + a_4 SEORM_Proxy_{it} \\
 & + a_5 SEOWNER_{it} + a_6 SEORMOWNER_{it} \\
 & + a_7 SIZE_{it} + a_8 LEV_{it} + a_9 BTM_{it} + a_{10} ROA_{it} \\
 & + a_{11} Mills + a_{12} Ind_Dummy \\
 & + a_{13} YEAR_Dummy + e_{it}
 \end{aligned}$$

where,

L_OWNER_{it} : Ownership dummy equals 1 if the the largest shareholder's ownership of firm i in year t is below the median, and 0 otherwise

RM_Proxy_{it} : Sum of standardized abnormal cash flow from operations, abnormal production costs, abnormal discretionary expense, and abnormal gains from asset sales of firm i in year t (We multiply $Ab.OCF$ and $Ab.EXP$ by negative one so that the sum of the four variables will be indicative of overall real earnings management)

$SEORM_Proxy_{it}$: Interaction variable between SEO and RM_Proxy of firm i in year t

$SEOOWNER_{it}$: Interaction variable between SEO and L_OWNER of firm i in year t

$SEORMOWNER_{it}$: Interaction variable among SEO , RM_Proxy , and L_OWNER of firm i in year t

3.2 Measurement of Variables

We employ both accruals and real activity based earnings managements to examine whether there is earnings management in the fiscal year prior to the SEO. It is difficult to distinguish the part of earnings from normal operations from the part due to earnings manipulations. We rely on previous estimation models for normal levels of accruals and real activities.

First, we use abnormal accruals(Ab_ACC) as a proxy of accruals based earnings management. And we estimate normal accruals (N_ACC) using the modified Jones model

(Dechow et al. 1995) and the performance matched model(Kothari et al. 2005). Total accruals(TA) are defined as the difference between net income(NI) and cash flows from operations(OCF) following prior studies(Collins and Hribar 1999; Choi and Back 1999; Park 2003). Abnormal accruals (Ab_ACC) are calculated by subtracting normal accruals (N_ACC) from total accruals(TA). We estimate normal accruals(N_ACC) using the modified Jones model by industry and year⁸⁾ In the case of the modified Jones model, normal accruals(N_ACC) are calculated by (2). The coefficients used in equation (2) are estimated cross-sectionally by year and industry for equation (1) and abnormal accruals(Ab_ACC) is calculated by (3).

$$TA/A_{it-1} = a_0(1/A_{it-1}) + a_1(\Delta S_{it}/A_{it-1}) + a_2(PPE_{it}/A_{it-1}) + e_{it} \quad (1)$$

$$N_ACC_{it} = \hat{a}_0(1/A_{it-1}) + \hat{a}_1[(\Delta S_{it} - \Delta AR_{it})/A_{it-1}] + \hat{a}_2(PPE_{it}/A_{it-1}) \quad (2)$$

$$Ab_ACC_{it} = (TA_{it}/A_{it-1}) - N_ACC_{it} \quad (3)$$

where,

TA_{it} : Total accruals of firm i in year t (Net Income - Cash flows from operations), ΔS_{it} : Changes in sales of firm i in year t ($S_{it} - S_{it-1}$), ΔAR_{it} : Changes in accounts receivables of firm i in year t , PPE_{it} : Gross property plant and equipment of firm i in year

8) This partially controls for industry changes in economic conditions that affect total accruals while allowing the coefficients to vary across time (Kaszniak, 1999).

t (Fixed assets except land&construction in process), A_{it-1} : Total assets of firm i at the beginning year t , Ab_ACC_{1it} : Abnormal accruals estimated by industry and year using the modified Jones model of firm i in year t , N_ACC_{it} : Normal accruals of firm i in year t

Since there is a positive correlation between performance and accruals, it is problematic to test earnings management if performance is not properly controlled for. Kothari et al.(2005) control for the impact of performance on estimated abnormal accruals(Ab_ACC) using a performance-matched firm's abnormal accruals(Ab_ACC).

$$Ab_ACC_{2it} = Ab_ACC_{1it} - Ab_ACC_{it}^{median} \quad (4)$$

where,

Ab_ACC_{2it} : Abnormal accruals estimated by industry and year using the performance-matched model of firm i in year t

Second, we use each abnormal cash flows from operations, abnormal production costs, abnormal discretionary expenses, and abnormal gains from asset sales as well as a combined variable(RM_Proxy) for proxies of

real activity based earnings management. These variables have been used and validated to capture the effect of real operations in prior research (Roychowdhury 2006; Zang 2005; Gunny 2005; Cohen et al. 2008; Cohen and Zarowin 2008). Abnormal cash flows from operations, abnormal production costs, abnormal discretionary expenses, and abnormal gains from asset sales are calculated by the difference between the actual values and the normal values estimated by equations (5), (8), (9), and (10). We estimate normal levels of cash flows from operations, production costs, discretionary expenses, and gains from asset sales from the models developed by Bartov(1993)⁹⁾ and Dechow et al.(1998) and implemented by Zang(2005) and Roychowdhury(2006).

We run the following cross-sectional regressions for each industry and year¹⁰⁾ to estimate these models. We express normal cash flows from operations as a linear function of sales and changes in sales in the current period. Production costs are defined as the sum of cost of goods sold($COGS$) and change in inventory(ΔINV) during the year. We consider selling and administrative expenses except salaries as discretionary items¹¹⁾

9) He investigates a manager's opportunistic behavior using a disposal of fixed assets and investment. We modify this and examine the existence of abnormal gains from asset sales, short term investment, and long term investment.

10) Market and industry wide factors are controlled for when we regress the data cross sectionally for each year and industry. It excludes exogenous demand shift and reflects endogenous pricing decision in the case of sales price.

11) We classify all selling and administration expense items except salaries as discretionary expense because most items are controllable and we do not know which item they use to manage earning. Relatively, salaries are semi fixed costs and uncontrollable.

in operating expenses. The normal level of discretionary expenses is also expressed to be a linear function of lagged sales because modeling discretionary expense as a function of current sales creates a technical problem in that unusually low residuals can be resulted if firms manage sales upward to increase earnings in a certain year. The model for normal gains from asset sales is based on Zang(2005). Normal level of gains or losses from asset sales(GSA) is modeled as a linear function of sale of investment and PPE, which is expected to have positive coefficient. As growing firms tend to be young and are less likely to recognize gains from selling assets, change in sales is included to control for a firm's growth.

$$OCF_{it}/A_{it-1} = a_0(1/A_{it-1}) + a_1(S_{it}/A_{it-1}) + a_2(\Delta S_{it}/A_{it-1}) + e_{it} \quad (5)$$

$$COGS_{it}/A_{it-1} = a_0(1/A_{it-1}) + a_1(S_{it}/A_{it-1}) + e_{it} \quad (6)$$

$$\Delta INV_{it}/A_{it-1} = a_0(1/A_{it-1}) + a_1(\Delta S_{it}/A_{it-1}) + a_2(\Delta S_{it-1}/A_{it-1}) + e_{it} \quad (7)$$

$$PROD_{it}/A_{it-1} = a_0(1/A_{it-1}) + a_1(S_{it}/A_{it-1}) + a_2(\Delta S_{it}/A_{it-1}) + a_3(\Delta S_{it-1}/A_{it-1}) + e_{it} \quad (8)$$

$$DISCEXP_{it}/A_{it-1} = a_0(1/A_{it-1}) + a_1(S_{it-1}/A_{it-1}) + e_{it} \quad (9)$$

$$GSA_{it}/A_{it-1} = a_0(1/A_{it-1}) + a_1(INV_S_{it}/A_{it-1}) + a_2(PPE_S_{it}/A_{it-1}) + a_3(\Delta S_{it}/A_{it-1}) + e_{it} \quad (10)$$

where,

OCF_{it} : Cash flows from operations of firm i in year t , $PROD_{it}$: COGS plus ΔINV of firm i in year t , $COGS_{it}$: Cost of goods sold of firm i in year t , ΔINV_{it} : Change in inventory of firm i in year t , $DISCEXP_{it}$: Discretionary expenses of firm i in year t (selling and administrative expense-salaries), GSA_{it} : Gains or losses from sale of assets, PPE and investment, of firm i in year t , INV_S_{it} : Sales on investment of firm i in year t , PPE_S_{it} : Sales on Property, plant, and equipment of firm i in year t , A_{it-1} : Total assets of firm i at the beginning of year t , S_{it} : Sales of firm i in year t , ΔS_{it} : Change in sales of firm i in year $t(S_{it} - S_{it-1})$, ΔS_{it-1} : Change in sales of firm i in year $t-1(S_{it-1} - S_{it-2})$

Firms that manage earnings upward using real activities are likely to use one or more of these tools: unusually low cash flows from operations, unusually high production costs, unusually low discretionary expenses, and unusual gains from asset sales. Thus, we use a single measure combining these variables to capture overall effects of abnormal real activities. We multiply abnormal cash flows from operations and abnormal discretionary expense by negative one for easier interpretation.

3.3 Sample Selection

SEO sample consists of 381 firm-year ob-

servations listed on the Korea Stock Exchange (KSE) from 1995 to 2007. Necessary data are obtained from the Fn-DataGuidePro database. The sample is restricted to post-1995 data in order to calculate accruals consistently using the statement of cash flows. Firm-year observations are used to secure sufficient SEO data. We restrict sample firms to non-financial firms because financial firms operating in highly regulated industries with accounting rules differ from those in other industries.¹²⁾ We exclude firms with negative capitals and firms that issue stocks sequentially.¹³⁾ Since the incentives of firms frequently raising equity financing may differ from those of other firms,¹⁴⁾ we require the firm not to issue stocks sequentially. Sample firms have SEO only once in a 3 year period in order to measure the following performance without compounding effects. The sample consists of SEO firms with cash only and we exclude firms making combined offerings of equity and other securities or self offerings. We require that each firm-year observation has the data necessary to calculate abnormal accruals and abnormal real activities used in this analysis. Further,

each firm-year observation has to have the fiscal year ending as of December to secure homogeneity. We delete the top and bottom 1% of the distribution so that the results are not affected by outliers.¹⁵⁾

Panel A of <Table 1> shows the distribution of the SEO over time. Many SEOs occur during the late 1990s and the year 2000 records the highest number of SEOs because of the stock market boom.¹⁶⁾ There have been a fewer SEOs beginning 2001 as the market experienced a significant downturn. *Panel B* of <Table 1> reports industry composition of SEO firms and sub-groups. Chemical products are the most highly represented industry making up 16% of the full sample. Machine and electronics are the next at 8% and 9%, respectively. This finding is not surprising considering that high technology industries led the 1990s stock market boom, consistent with previous findings. We find more frequently represented industries in high real activity based earnings management group are electronics, machine, and manufacturing (textile product and food product). It is possible that manufacturing firms are more likely to be en-

12) 7 firm-year observations belong to utility industry and results do not differ from analyzing without those firms.

13) The SEO firm-year observations are 695 in the total sample of 4,670 firms from 1995 to 2007. 314 sequentially offering firm-year observations are excluded during the window.

14) Dechow et al.(1996) suggest that managers of firms that require frequent external financing will report earnings conservatively to create a positive reputation in the market, from which they can benefit in subsequent offerings.

15) We find a consistent result even examining the analysis with a winsorized sample.

16) Even we exclude the sample in 2000, which forms 21% of SEO sample, we do not find any inconsistency with main results.

〈Table 1〉 Samples selection and distribution

Panel A: Time Distribution

Year	Frequency	%	Year	Frequency	%
1995	32	8%	2002	24	6%
1996	38	10%	2003	24	6%
1997	34	9%	2004	20	5%
1998	29	8%	2005	22	6%
1999	16	4%	2006	16	4%
2000	80	21%	2007	27	7%
2001	19	5%	Total	381	100%

*The sample is based on the year of the SEO (year *t*).

Panel B: Industry Distribution

Industry	Code	High RM Group		Low RM Group		Total	
Food products	I.005	10	7%	7	5%	17	6%
Textile products	I.006	8	6%	5	3%	13	5%
Paper and Paper products	I.007	6	4%	7	5%	13	5%
Chemical products	I.008	25	17%	22	15%	47	16%
Medicine	I.009	5	3%	10	7%	15	5%
Nonmetal Minerals	I.010	2	1%	17	12%	19	7%
Metal and Steels	I.011	6	4%	6	4%	12	4%
Machine	I.012	15	10%	8	6%	23	8%
Electronics	I.013	18	13%	9	6%	27	9%
Health	I.014	1	1%	1	1%	2	1%
Transportation	I.015	10	7%	10	7%	20	7%
Distributions	I.016	3	2%	17	12%	20	7%
Electricity and Gas	I.017	0	0%	7	5%	7	2%
Construction	I.018	13	9%	11	8%	24	8%
Transport and Storage	I.019	10	7%	1	1%	11	4%
Others		11	8%	6	4%	17	6%
Total		143	100%	144	100%	287	100%

* Industryclassification is by Fn-DataGuidePro database.

** The sample is based on data in one year prior to the SEO, the year of earnings management (*t-1*).

*** *High RM(Real Activity Manipulation) group* includes firms having aggregate abnormal real activities above the median. *Low RM group* includes firms having aggregate abnormal real activities below the median.

gaged in overproduction.

IV. Empirical Results

4.1 Descriptive Statistics

〈Table 2〉 reports the summary statistics on earnings management of the sample: SEO sample and samples by group. *Panel A* shows that means of abnormal accruals by the modified Jones model(Ab_ACC_1) and abnormal accruals by the performance matched model(Ab_ACC_2) are 0.014 and 0.013, respectively. The mean of Ab_ACC_2 is slightly lower than Ab_ACC_1 because Ab_ACC_2 is estimated as the difference between Ab_ACC of a firm and the median of the industry-year portfolio. It is noted that mean values of accruals based earnings management, Ab_ACC_1 and Ab_ACC_2 , are higher than those of real activity based earnings management such as Ab_OCF , $Ab_PROD\ costs$, Ab_EXP , Ab_GSA , and even an aggregate of RM_Proxy in *Panel A*, which is consistent with prior results(Graham et al. 2005; Cohen et al. 2008)

Panel B of 〈Table 2〉 shows descriptive statistics of each group sample in the year of earnings management for the SEO. Abnormal accruals, both Ab_ACC_1 and Ab_ACC_2 , of firms in H-RM group are higher than

those in L-RM group, which means that firms use both accruals and real activities like complimentary goods. The higher abnormal real activities firms have, the more abnormal accruals firms have. Firms in H-RM group are smaller(18.93) compared to those in L-RM group. These firms have more debts and are less profitable(low ROA and OCF) compared to those in the other group. The mean value of book-to-market ratio(BTM) in H-RM group is higher (1.935) than that of L-RM group, which implies more mature firms are included in the H-RM group.

〈Table 3〉 reports correlations among main variables. Spearman(Pearson) correlation coefficients are below(above) the diagonal and correlations are based on the year of earnings management, one fiscal year prior to the SEO.

Abnormal accruals(Ab_ACC_s) are negatively correlated with abnormal cash flows from operations(Ab_OCF) and abnormal discretionary expenses(Ab_EXP), while positively correlated with abnormal production costs($Ab_PROD\ cost$) and abnormal gains from asset sales(Ab_GSA). A negative correlation between abnormal accruals(Ab_ACC_s) and abnormal cash flows from operations(Ab_OCF) implies that firms are simultaneously engaged in both accruals and price discount, one of real activities based earnings management. A positive relationship between Ab_ACC_1 and $Ab_PROD\ cost$ (0.105 at 10% level, Spearman) can also be interpreted that managers use both

<Table 2> Descriptive Statistics

Panel A: Descriptive Statistics: SEO sample

Sample	Variables	Mean	Std.Dev	1 st Quantile	Median	3 rd Quartile
Full samples (N=287)	<i>Ab ACC₁</i>	0.014	0.071	-0.030	0.013	0.054
	<i>Ab ACC₂</i>	0.013	0.068	-0.024	0.006	0.051
	<i>Ab.OCF</i>	-0.011	0.078	-0.055	-0.007	0.040
	<i>Ab.PROD_cost</i>	-0.006	0.093	-0.058	-0.007	0.056
	<i>Ab.EXP</i>	0.003	0.049	-0.022	-0.004	0.028
	<i>Ab.GSA</i>	0.001	0.006	-0.001	0.000	0.002
	<i>RM Proxy</i>	0.003	0.016	-0.010	-0.002	0.057
	<i>SIZE</i>	19.17	1.200	18.24	19.01	19.92
	<i>LEV</i>	0.632	0.219	0.469	0.653	0.777
	<i>BTM</i>	1.926	3.091	0.848	1.341	2.101
	<i>ROA</i>	0.047	0.073	0.014	0.036	0.082
<i>OCF</i>	0.050	0.077	0.003	0.057	0.101	

Panel B: Descriptive Statistics: Sub Sample

Sample	Variables	Mean	Std.Dev	1st Quantile	Median	3rd Quartile
High RM group (N=143)	<i>Ab ACC₁</i>	0.035	0.071	-0.011	0.030	0.079
	<i>Ab ACC₂</i>	0.032	0.070	-0.009	0.034	0.078
	<i>Ab.OCF</i>	-0.049	0.075	-0.091	-0.045	-0.001
	<i>Ab.PROD_cost</i>	0.058	0.066	0.014	0.055	0.095
	<i>Ab.EXP</i>	-0.022	0.033	-0.038	-0.016	-0.003
	<i>Ab.GSA</i>	0.001	0.007	-0.001	0.000	0.001
	<i>RM Proxy</i>	0.130	0.018	0.048	0.098	0.190
	<i>SIZE</i>	18.93	1.105	18.08	18.79	19.60
	<i>LEV</i>	0.647	0.206	0.507	0.670	0.771
	<i>BTM</i>	1.935	3.044	0.883	1.370	2.109
	<i>ROA</i>	0.033	0.064	0.009	0.026	0.063
<i>OCF</i>	0.020	0.074	-0.028	0.016	0.077	
Low RM group (N=144)	<i>Ab ACC₁</i>	-0.006	0.064	-0.041	-0.004	0.028
	<i>Ab ACC₂</i>	-0.006	0.058	-0.037	-0.002	0.021
	<i>Ab.OCF</i>	0.027	0.061	-0.009	0.026	0.064
	<i>Ab.PROD_cost</i>	-0.069	0.070	-0.101	-0.057	-0.021
	<i>Ab.EXP</i>	0.028	0.049	-0.006	0.023	0.049
	<i>Ab.GSA</i>	0.000	0.006	-0.001	0.000	0.002
	<i>RM Proxy</i>	-0.123	0.011	-0.165	-0.101	-0.045
	<i>SIZE</i>	19.42	1.250	18.00	19.00	20.00
	<i>LEV</i>	0.616	0.231	0.458	0.613	0.778
	<i>BTM</i>	1.917	3.147	0.836	1.308	2.086
	<i>ROA</i>	0.061	0.077	0.019	0.054	0.097
<i>OCF</i>	0.080	0.068	0.035	0.075	0.118	

* The sample is based on data one year prior to the SEO, the year of earnings management (*t-1*).

** High RM group includes firms having aggregate abnormal real activities above the median. Low RM group includes firms having aggregate abnormal real activities below the median.

*** The variables are defined as follows: *Ab.ACC₁*: Abnormal accruals estimated by the Modified Jones model, *Ab.ACC₂*: Abnormal accruals estimated by the Performance matched model, *Ab.OCF*: Abnormal cash flows from operations, *Ab.PROD_cost*: Abnormal production costs, *Ab.EXP*: Abnormal discretionary expenses (Selling and administrative expense -salaries), *Ab.GSA*: Abnormal gains or losses from sales of assets, *RM proxy*: Sum of *Ab.OCF*, *Ab.PROD_cost*, *Ab.EXP*, and *Ab.GSA* (We multiply *Ab.OCF* and *Ab.EXP* by negative one so that the sum of the four variables will be indicative of overall real earnings management), *SIZE*: Natural log of total assets, *LEV*: Debt ratio (Total Debt/ Beginning Assets), *BTM*: Book to market value (Book value of equity /Market value of equity), *ROA*: Return on Assets (*EBT*/ Beginning Assets), *OCF*: Cash flows from operations (*OCF*/ Beginning Assets), *EBT*: Earnings before income tax

〈Table 3〉 Correlations

N=287	<i>Ab.ACC₁</i>	<i>Ab.ACC₂</i>	<i>Ab.OCF</i>	<i>Ab.PROD_{cost}</i>	<i>Ab.EXP</i>	<i>Ab.GSA</i>	<i>RM_Proxy</i>	SIZE	LEV	BTM	ROA	OCF
<i>Ab.ACC₁</i>		0.935***	-0.624***	0.054	-0.040	0.069	0.337***	-0.100*	-0.040	-0.201	0.325***	-0.611***
<i>Ab.ACC₂</i>	0.922***		-0.654***	0.051	-0.016	0.044	0.341***	-0.074	-0.067	-0.077	0.255***	-0.612***
<i>Ab.OCF</i>	-0.659***	-0.654***		-0.300***	0.054	0.008	-0.651***	0.219***	-0.104*	0.049	0.317***	0.842***
<i>Ab.PROD_{cost}</i>	0.105*	0.103*	-0.316***		-0.644***	0.090	0.888***	-0.165***	0.124**	0.010	-0.249***	-0.193***
<i>Ab.EXP</i>	-0.074	-0.039	0.035	-0.611***		-0.090	-0.678***	0.099*	-0.082	-0.082	0.028	0.010
<i>Ab.GSA</i>	0.126**	0.088	-0.055	0.045	-0.060		0.111*	-0.032	-0.027	0.086	0.123**	0.020
<i>RM_Proxy</i>	0.391***	0.379***	-0.629***	0.883***	-0.637***	0.096		-0.225***	0.140**	0.009	-0.290***	-0.504***
SIZE	-0.105*	-0.045	0.226***	-0.165***	0.085	-0.024	-0.216***		0.214***	0.112*	0.019	0.125**
LEV	-0.037	-0.059	-0.086	0.055	-0.033	-0.038	0.063	0.233***		-0.081	-0.250***	-0.160***
BTM	0.028	0.082	-0.029	0.098*	-0.056	-0.024	0.101*	0.158***	-0.102*		-0.380***	-0.234***
ROA	0.180***	0.117**	0.306***	-0.240***	0.021	0.116**	-0.269***	-0.002	-0.265***	-0.382***		0.470***
OCF	-0.642***	-0.634***	0.831***	-0.198***	-0.022	-0.013	-0.476***	0.128**	-0.138**	-0.280***	0.470***	

* Spearman (Pearson) correlations are below (above) the diagonal.

** Correlations are based on the year of earnings management, the fiscal year prior to the SEO.

*** **: significant at the 1% level, **: significant at the 5% level, *: significant at the 10%

accruals and overproduction. While the correlation between Ab_ACC_1 and $Ab.GSA$ is also positive and significant (0.126 at 10% level, Spearman), the associations between Ab_ACC_1 and $Ab.EXP$ are not found. We conclude that abnormal accruals and abnormal real activities are positively associated as a whole. These imply that managers are likely to inflate earnings using both accruals and real activities. Regarding the correlations among abnormal real activities, abnormal cash flows from operations ($Ab.OCF$) and abnormal production costs ($Ab.PROD\ cost$) are negatively associated (-0.300 and -0.316 both at 1% level, Pearson and Spearman). This also means managers use both price discount and overproduction. The correlation coefficient between abnormal production costs ($Ab.PROD\ cost$) and abnormal discretionary expense ($Ab.EXP$) is also negative (-0.644 and -0.611 both at 1% levels, Pearson and Spearman). It means managers are cutting discretionary expenses as well as overproducing in order to boost current earnings. Thus it can be concluded that managers tend to manipulate reported earnings using multiple real activities. The correlation coefficient between book-to-market ratio (BTM) and abnormal real activities (RM_Proxy) is positive (0.101 at 10% level, Spearman) and this implies that mature firms are more likely to be engaged in real activity based earnings management. The

result of correlations are consistent with prior findings (Roychowdhury 2006; Kim et al. 2008).

4.2 Earnings Management around the SEO

In this section, we investigate whether earnings management occurs through either accruals or real activities to boost reported earnings before the seasoned equity offering (SEO). The study period is for years -2 to +2 around the SEO. Panel A of <Table 4> presents the mean values of abnormal accruals, abnormal cash flows from operations, abnormal production costs, abnormal discretionary expenses, and abnormal gains from asset sales, testing from H1-a to H1-f. All these variables are scaled by beginning of the period assets.

Earnings and associated abnormal accruals are the highest in the year prior to the SEO. ROAs increase by 17% from two years (0.040) to one year (0.047) before the SEO, which means that earnings are overstated in the year prior to the SEO. Abnormal accruals estimated by the Modified Jones Model (Ab_ACC_1) and by the Performance Matched Model (Ab_ACC_2) are also significantly positive in the fiscal year prior to the SEO, as predicted. The result is supporting the hypothesis (H1-a) that firms are engaged in accruals based earnings management in order to inflate earnings in the fiscal year

prior to the SEO. These findings are consistent with prior studies (Shivakumar 2000; Yoon and Lee 2001). Abnormal cash flows from operations (*Ab.OCF*) is significantly negative in year $t-1$, implying that aggressive price discount or lenient credit terms are used to boost earnings for the SEO, supporting H1-b. Abnormal production cost (*Ab.PROD cost*) is not significantly different from zero in all years around the SEO. Abnormal discretionary expense (*Ab.EXP*) in year $t-1$ is neither significantly different from nor lower than other years in the window, reject-

ing H1-c and H1-d. Abnormal gains from asset sales (*Ab.GSA*) increase and are significantly positive in the fiscal year prior to the SEO, supporting H1-e. An aggregate measure of abnormal real activities, *RM_Proxy*, is also positive in year $t-1$ even though it is marginally significant, weakly supporting H1-f. We note that abnormal cash flows from operation takes up a considerable portion of an aggregate measure of real activities, *RM_Proxy*, in Panel A.

We examine those earnings management behaviors around the SEO after controlling

〈Table 4〉 Earnings Management around the SEO

Panel A: Univariate analysis (SEO sample)

Variables	t-2	t-1	t	t+1	t+2
<i>Ab.ACC₁</i>	-0.0008	0.0141***	0.0044	0.0005	0.0027
<i>Ab.ACC₂</i>	-0.0014	0.0134***	0.0011	0.0034	0.0017
<i>Ab.OCF</i>	-0.0037	-0.0108**	-0.0041	-0.0064	-0.0062
<i>Ab.PROD_{cost}</i>	-0.0063	-0.0057	-0.0044	-0.0085	0.0030
<i>Ab.EXP</i>	0.0022	0.0030	0.0025	0.0024	0.0018
<i>Ab.GSA</i>	0.0006	0.0009**	0.0005*	0.0007*	0.0008*
<i>RM_{proxy}</i>	-0.004	0.003*	-0.002	-0.004	0.008*
<i>ROA</i>	0.0402***	0.0471***	0.0420***	0.0386***	0.0404***
<i>N</i>	237	287	381	301	276

* This table reports abnormal accruals and abnormal real activities from year $t-2$ to year $t+2$ relative to the seasoned equity offering (year t).

** ***: significant at the 1% level, **: significant at the 5% level, *: significant at the 10%

*** The variables are defined as follows:

Ab.ACC₁: Abnormal accruals estimated by the Modified Jones model, *Ab.ACC₂*: Abnormal accruals estimated by the Performance matched model, *Ab.OCF*: Abnormal cash flows from operations, *Ab.PROD_{cost}*: Abnormal production costs, *Ab.EXP*: Abnormal discretionary expenses (Selling and administrative expense-salaries), *Ab.GSA*: Abnormal gains or losses from sales of assets, *RM_{proxy}*: Sum of *Ab.OCF*, *Ab.PROD_{cost}*, *Ab.EXP*, and *Ab.GSA* (We multiply *Ab.OCF* and *Ab.EXP* by negative one so that the sum of the four variables will be indicative of overall real earnings management), *ROA*: Return on Assets (*EBT*/Beginning Assets), *EBT*: Earnings before corporate tax

<Table 4> Earnings Management around the SEO (continue)

Panel B: Multivariate analysis(OLS results)

[Model 1] $EM_{ijt} = a_0 + a_1 SEO_{it} + a_2 SEOTIME1_{it} + a_3 SEOTIME2_{it} + a_4 SEOTIME3_{it} + a_5 SEOTIME4_{it} + a_6 SEOTIME5_{it} + a_7 ROA_{it} + a_8 SIZE_{it} + a_9 LEVERAGE_{it} + a_{10} Ind_Dummy + a_{11} YEAR_Dummy + e_{it}$

Coefficient (t-statistics)	a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	a_9	a_{10}	a_{11}	F-value	Adj.R ²	N
Exp. Sign	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-			
Ab.ACC _{1it}	0.031 (1.67*)	0.012 (3.23***)	-0.005 (-1.10)	0.006 (3.04***)	-0.003 (-2.27**)	0.0003 (0.31)	0.0003 (0.44)	0.271 (19.0***)	-0.003 (-4.33***)	0.042 (7.89***)	Inc.	Inc.	18.6***	0.09	4670
Ab.ACC _{2it}	0.036 (1.97**)	0.013 (3.67***)	-0.004 (-1.03)	0.007 (3.59***)	-0.003 (-2.36**)	0.001 (1.19)	0.0001 (0.20)	0.185 (13.3***)	-0.004 (-4.64***)	0.040 (7.70***)	Inc.	Inc.	10.6***	0.05	4670
Ab.OCF _{it}	-0.222 (-11.5***)	-0.012 (-3.2***)	0.006 (1.35)	-0.005 (-2.52**)	0.004 (2.37**)	0.00004 (0.04)	0.006 (0.70)	0.327 (22.5***)	0.012 (13.6***)	-0.066 (-11.9***)	Inc.	Inc.	42.6***	0.18	4670
Ab.PROD _{costit}	0.123 (4.77***)	-0.001 (-0.21)	-0.005 (-0.83)	-0.0007 (-0.26)	-0.001 (-0.05)	-0.001 (-1.30)	0.0005 (0.45)	-0.387 (-19.7***)	-0.004 (-4.03***)	0.029 (3.93***)	Inc.	Inc.	27.9***	0.13	4670
Ab.EXP _{it}	-0.045 (-3.10***)	0.002 (0.71)	0.004 (1.13)	0.002 (1.39)	0.0005 (0.43)	0.0009 (1.16)	0.0002 (0.41)	0.003 (0.31)	0.002 (3.28***)	-0.004 (-1.11)	Inc.	Inc.	10.0***	0.05	4670
Ab.GSA _{it}	0.004 (2.32**)	0.003 (1.65*)	0.00004 (0.08)	0.0002 (1.98**)	-0.0001 (-0.92)	-0.00002 (-0.02)	-0.00003 (-0.33)	0.004 (3.11***)	-0.0002 (-2.46**)	0.0002 (0.47)	Inc.	Inc.	2.11***	0.12	4670
RM _{proxyit}	0.396 (8.67***)	0.010 (1.93*)	-0.015 (-1.39)	0.005 (2.01**)	-0.004 (-1.20)	-0.003 (-1.14)	-0.0003 (-0.18)	-0.713 (-20.6***)	-0.019 (-9.16***)	0.100 (7.62***)	Inc.	Inc.	32.9***	0.15	4670

***: significant at the 1% level, **: significant at the 5% level, *: significant at the 10%

** The variables are defined as follows:

SEO_{it} : SEO dummy equals 1 if there is a SEO of firm i in year t and 0 otherwise

$SEOTIME1_{it}$: Time dummy equals 1 if it is year $t-2$ relative to the SEO and 0 otherwise

$SEOTIME2_{it}$: Time dummy equals 1 if it is year $t-1$ relative to the SEO and 0 otherwise

$SEOTIME3_{it}$: Time dummy equals 1 if it is year t of the SEO and 0 otherwise

$SEOTIME4_{it}$: Time dummy equals 1 if it is year $t+1$ relative to the SEO and 0 otherwise

$SEOTIME5_{it}$: Time dummy equals 1 if it is year $t+2$ relative to the SEO and 0 otherwise

$SIZE_{it}$: Natural log of total assets of firm i in year t , $LEVERAGE_{it}$: Debt ratio of firm i in year t (Total Debt_{it}/Total Assets_{it-1}).

Ind_Dummy : Industry dummy, $Year_Dummy$: Year dummy, EM_{ijt} : Proxies of earnings management of firm i in year t , where $j = Ab.ACC_1, Ab.ACC_2, Ab.OCF, Ab.PROD_cost, Ab.EXP, Ab.GSA, RM_Proxy$. Refer to the notes of Panel A for other variables

(Table 4) Earnings Management around the SEO (continue)

Panel C: Multivariate analysis(OLS results: High ownership group VS. Low ownership group)

$$\text{[Model 1-1]} EM_{ijt} = a_0 + a_1 SEO_{it} + a_2 L_OWNER_{it} + a_3 L_OWNERTIME1_{it} + a_4 L_OWNERTIME2_{it} + a_5 L_OWNERTIME3_{it} + a_6 L_OWNERTIME4_{it} + a_7 L_OWNERTIME5_{it} + a_8 ROA_{it} + a_9 SIZE_{it} + a_{10} LEVERAGE_{it} + a_{11} Ind_Dummy + a_{12} YEAR_Dummy + e_{it}$$

Coefficient (t-statistics)	a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	a_9	a_{10}	a_{11}	a_{12}	F-value	Adj.R ²	N
Exp. Sign	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-			
$Ab.ACC_{1it}$	0.032 (1.71*)	0.009 (2.91***)	0.001 (0.81)	-0.008 (-1.44)	0.008 (2.86***)	-0.003 (-1.76*)	0.001 (0.61)	-0.0004 (-0.40)	0.271 (19.0***)	-0.003 (-4.35***)	0.043 (8.06***)	Inc.	Inc.	17.9***	0.09	4670
$Ab.ACC_{2it}$	0.037 (2.03**)	0.009 (3.17***)	0.002 (0.96)	-0.007 (-1.32)	0.008 (2.94***)	-0.002 (-1.57)	0.001 (1.10)	-0.0006 (-0.52)	0.185 (13.3***)	-0.004 (-4.67***)	0.041 (7.89***)	Inc.	Inc.	9.9***	0.05	4670
$Ab.OCF_{it}$	-0.221 (-11.5***)	-0.008 (-2.7***)	-0.003 (-1.36)	0.009 (1.59)	-0.008 (-3.1***)	0.003 (1.72*)	-0.001 (-0.56)	0.001 (0.91)	0.325 (22.3***)	0.012 (13.6***)	-0.066 (-11.9***)	Inc.	Inc.	41.2***	0.18	4670
$Ab.PROD_cost_{it}$	0.122 (4.72***)	0.001 (0.02)	0.016 (0.53)	-0.003 (-0.43)	-0.001 (-0.37)	-0.001 (-0.58)	-0.001 (-0.91)	0.001 (0.31)	-0.387 (-19.6***)	-0.004 (-4.0***)	0.028 (3.87***)	Inc.	Inc.	27.9***	0.13	4670
$Ab.EXP_{it}$	-0.043 (-3.00***)	0.001 (0.67)	-0.003 (-1.92**)	0.003 (0.80)	0.001 (0.58)	0.001 (0.96)	0.001 (0.98)	-0.0001 (-0.16)	0.002 (0.22)	0.002 (3.25***)	-0.003 (-0.94)	Inc.	Inc.	9.7***	0.05	4670
$Ab.GSA_{it}$	0.004 (2.30**)	0.002 (1.64*)	0.001 (0.52)	-0.0000 (-0.01)	0.003 (2.01**)	-0.0001 (-0.57)	-0.0000 (-0.20)	-0.0000 (-0.05)	0.004 (3.07***)	-0.0002 (-2.42**)	0.0003 (0.51)	Inc.	Inc.	2.0***	0.11	4670
RM_proxy_{it}	0.392 (8.59***)	0.009 (1.83*)	0.008 (1.63*)	-0.016 (-1.17)	0.009 (1.97**)	-0.006 (-1.38)	-0.002 (-0.60)	-0.0004 (-0.16)	-0.709 (-20.5***)	-0.019 (-9.15***)	0.099 (7.54***)	Inc.	Inc.	31.7***	0.15	4670

* ***: significant at the 1% level, **: significant at the 5% level, *: significant at the 10%

** The variables are defined as follows:

 SEO_{it} : SEO dummy equals 1 if there is a SEO of firm i in year t and 0 otherwise L_OWNER_{it} : Ownership dummy equals 1 if the largest shareholder's ownership of firm i in year t is below the median, and 0 otherwise $L_OWNERTIME1_{it}$: Interaction variable between L_OWNER and $SEOTIME1$ of firm i in year t $L_OWNERTIME2_{it}$: Interaction variable between L_OWNER and $SEOTIME2$ of firm i in year t $L_OWNERTIME3_{it}$: Interaction variable between L_OWNER and $SEOTIME3$ of firm i in year t $L_OWNERTIME4_{it}$: Interaction variable between L_OWNER and $SEOTIME4$ of firm i in year t $L_OWNERTIME5_{it}$: Interaction variable between L_OWNER and $SEOTIME5$ of firm i in year t

Refer to the notes of Panel A for other variables

for firm's size, financial structure, and performance, which results are shown in *Panel B* and *C*. They report significant signs on both abnormal accruals, Ab_ACC_1 and Ab_ACC_2 , abnormal operating cash flows (Ab_OCF), abnormal gains from asset sales (Ab_GSA), and an aggregate value of abnormal real activity (RM_Proxy) in year $t-1$. It means that they use big price discounts or providing lenient credit terms or sales assets in addition to accruals in order to inflate reported earnings in a year prior to the SEO. Similar results are also reported when we examine firms in lower ownership group offer new shares. We find positive signs of $L_OWNERTIME2$ on Ab_ACC , Ab_GSA , and RM_Proxy while negative sign on Ab_OCF . All these results are consistent with ones from univariate analysis and support H1-a, b, e, f, and g. Regarding the timing of earnings management, we find earnings are inflated in the year prior to the SEO regardless of earnings management tools. This consistency is probably because we use post-1995 data which are subject to less measurement errors by getting a firm's cash flows directly from the statement of cash flows rather than using an estimation model. From the empirical results, we conclude that firms are engaged in real activity based earnings management in addition to accruals based one in order to inflate earnings in the fiscal year prior to the SEO. However the aggregate level of earnings ma-

agement through real activity is rather weak in this study, because the effect of abnormal cash flow from boosted sales is offset by other real activities like abnormal production cost which did not have expected, although insignificant, sign. Also, we find that lower ownership structure is associated with proxies of earnings management either abnormal accruals or abnormal real activities when they offer new shares.

4.3 Subsequent Performance

〈Table 5〉 summarizes consequences of earnings management for the SEO sample and Matched sample. We consider both ROA and $Matched\ ROA$ as operating performances, where $Matched\ ROA$ is defined as the median difference of each firm's ROA and matched sample's ROA . Matching is based on the same year and industry, and similar ROA in the year of earnings management. To test $H2-a$, we employ both changes of $ROA(\Delta ROA)$ and change of $Matched\ ROA(\Delta Matched\ ROA)$, respectively.

We find significant increases in abnormal performance in the year prior to the SEO and declines in the subsequent years for the whole sample in *Panel A*. The variable of interest is ΔROA that captures comparative performance in subsequent years relative to a base year. For the whole sample, ROA changes from year $t-2$ to year $t-1$, ΔROA_{t-1} ,

〈Table 5〉 Subsequent Performance(Univariate Analysis)

Panel A: Performance subsequent to earnings management: Return on Assets(ROA) and ΔROA

Base Year		ROA			Base Year		ΔROA		
EM(t)	SEO(t)	Full	High RM group	Low RM group	EM(t)	SEO(t)	Full	High RM group	Low RM group
$t-1$	$t-2$	0.0402***	0.0254***	0.0538***	$t-1$	$t-2$	0.0005	-0.0011	0.0019
t	$t-1$	0.0471***	0.0330***	0.0611***	t	$t-1$	0.0068*	0.0075*	0.0060
$t+1$	t	0.0420***	0.0240***	0.0612***	$t+1$	t	-0.0065*	-0.0194***	0.0067
$t+2$	$t+1$	0.0386***	0.0210***	0.0558***	$t+2$	$t+1$	-0.0085*	-0.0171**	0.0005
$t+3$	$t+2$	0.0404***	0.0242***	0.0609***	$t+3$	$t+2$	-0.0029	-0.0125*	0.0074

Panel B: Performance subsequent to earnings management: Matched ROAs and Δ Matched ROAs

Base Year		Matched ROAs			Base Year		Δ Matched ROAs		
EM(t)	SEO(t)	Full	High RM group	Low RM group	EM(t)	SEO(t)	Full	High RM group	Low RM group
$t-1$	$t-2$	-0.0005	0.0001	-0.0013	$t-1$	$t-2$	0.0006	0.0028	-0.0014
t	$t-1$	0.0016**	0.0031**	-0.0001	t	$t-1$	0.0038	0.0075	0.0002
$t+1$	t	-0.0031	-0.0050	-0.0012	$t+1$	t	-0.0017	-0.0020	0.0014
$t+2$	$t+1$	-0.0064	-0.0128**	0.0190**	$t+2$	$t+1$	-0.0080*	-0.016***	0.0007
$t+3$	$t+2$	-0.0069	-0.0142**	0.0005	$t+3$	$t+2$	-0.0067*	-0.002**	0.0068*

* This table reports subsequent performance from the year of earnings management up to three subsequent years. Note that the year of earnings management(t) is the prior year to the SEO. Thus the years related to earning management, from t to $t+3$, correspond to years related to the SEO, from $t-1$ to $t+2$.

** ***: significant at the 1% level, **: significant at the 5% level, *: significant at the 10%

*** The variables are defined as follows(SEO year base):

ROA: Earnings before corporate tax divided by total assets at the beginning of the fiscal year.

ΔROA_t is ROA growth rate of firm i in year t calculated by $(ROA_t - ROA_{t-1})/ROA_{t-1}$

Matched ROA: ROA differences between firm i in year t and matched firm, where matched firms have the same year and industry, and similar ROA with firm i in the year of earnings management

Δ Matched ROA: Changes in Matched ROA

High RM group includes firms having aggregate abnormal real activities above the median. Low RM group includes firms having aggregate abnormal real activities below the median.

is 0.0068 and significant at 10% level, implying managers' attempt to boost earnings before the SEO. However, ΔROA_t and ΔROA_{t+1} are significantly negative at 10% level (-0.0065 and -0.0085 respectively), meaning that there is underperformance

after earnings management for the SEO. ΔROA_{t+2} is also negative (-0.0029), but insignificant for the SEO sample. Thus we can conclude that underperformance continue for at least two years subsequent to the earnings management for the whole SEO

sample.¹⁷⁾ This phenomenon is much pronounced in the high real activity based earnings management group(H-RM). ΔROA_{t-1} of H-RM group is significantly positive (0.0075), which implies earnings are inflated a year prior to the SEO. On the other hand, ΔROA_t , ΔROA_{t+1} and ΔROA_{t+2} of H-RM group are all significantly negative (-0.0194, -0.0171, and -0.0125, respectively). These negative signs imply that firms in H-RM group show underperformance to the third year after earnings management. According to Choi and Back(1999), firms engaged in accrual based earning management show underperformance only up to one subsequent year after earnings management.¹⁸⁾ Thus we interpret our empirical result as that the effect of earnings management using real activities continue for a longer period compared to the case of accrual based earnings management. ΔROA of L-RM group is insignificant in all years during the window period. The change of ROA after the SEO is also insignificant and it implies that there is little earnings management for L-RM group compared to H-RM group.

We also examine the subsequent performance using *Matched ROAs* and those changes(Δ

Matched ROA) in order to show how firm's performance declines after earnings management compared to the matched firm's. The result is presented in *Panel B* of <Table 5> and shows similar even weaker pattern. For the full sample, $\Delta Matched ROA$ is negative in all three subsequent years (-0.0017, -0.0080, and -0.0067 respectively) after earnings management for the SEO, and significant until the 2nd year after earnings management. For the H-RM group, $\Delta Matched ROA$ is all negative in subsequent years after earnings management. Interestingly, the sign of *Matched ROAs* in H-RM group is negative in all years except the year t during the window period,¹⁹⁾ implying that firms engaged in earnings management through real activities show worse performance compared to their counterparts in the same year, industry and similar performance based on the year of earnings management. The evidence is consistent with the argument that firms with poor performance tend to be engaged in earnings management. In addition, negative impacts of manipulation using real activities continue for a long time, during the rest of years after earnings management. That implies that the consequence of real activity

17) We find that ROAs recover in three years after earnings management(EM year $t+3$).

18) They suggest that abnormal accruals increase and performance improves from year $t-2$ to the year t (SEO), followed by declining performance after the year of the SEO. The subsequent reversal of performance lasts up until the first year after the SEO. But our study shows that the negative effects of earnings management last for at least two years after the SEO.

19) It is probably because that the year t is the earnings management year.

based earnings management could be more serious than the one of accrual based earnings management. To reconfirm the consequence of real activity based earnings manipulation, we regress subsequent operating performances against abnormal real activities. <Table 6> provides those results.

We employ Heckman(1979)'s two stage approach in order to control the relationships between abnormal accruals and abnormal real activity. *Panel A* of <Table 6> reports the association between abnormal accruals and abnormal real activity, and we get an inverse Mills ratios that is an independent variable in [Model 2-2]. Strong positive relationships between them are consistent with the results from correlation analysis. In *Panel B*, an independent variable of interest, we use an interaction variable between an aggregate measure of abnormal real activities and SEO dummy, *SEORM_Proxy*. The higher *SEORM_Proxy* is, the more they

are likely to be engaged in sales manipulations through price discounts, overproduction, reducing discretionary expenses, or recognizing gains from asset sales when they offer new shares. The coefficient of *SEORM_Proxy*, a_3 , is significantly negative and is -0.016, -0.039, and -0.136 in the year $t+1$, $t+2$, and $t+3$, respectively. This suggests that real activity based earnings management has a negative effect on the future performance for a long time. We also find all negative signs of *RM_Proxy* and this implies real activity based earnings management negatively influences on firm's future performance in general, even it is insignificant. Firm size (*SIZE*) and performance (*ROA*) in the year of earnings management are positively associated with the subsequent performance, whereas both book to market ratio (*BTM*) and debt ratio (*LEV*) are negatively associated with the subsequent performance. Every result is controlled for industry and year.

<Table 6> Subsequent Performance (Regression approach)

Panel A: The 1st stage regression

[Model 2-1] $RM_{it} = a_0 + a_1 Ab.ACC_{it} + e_{it}$

Coefficient(t-statistics)	a_0	a_1	likelihood ratio χ^2	N
Exp. Sign	+/-	+		
RM_{it}	-0.018 (0.920)	5.682 (384.82***)	429.42***	4670

* ** : significant at the 1% level, ** : significant at the 5% level, * : significant at the 10%

** The variables are defined as follows:

RM_{it} : 1 if *RM_Proxy* of firm *i* in year *t* is above the median, and 0 otherwise

$Ab.ACC_{it}$: Abnormal accruals estimated by the Modified Jones model of firm *i* in year *t*

(Table 6) Subsequent Performance (Regression approach) (continue)

Panel B: The 2nd stage regression(Aggregate abnormal real activity)

$$\text{[Model 2-2]} \quad ROA_{it+j} = a_0 + a_1 SEO_{it} + a_2 RM_Proxy_{it} + a_3 SEORM_Proxy_{it} + a_4 SIZE_{it} + a_5 LEV_{it} + a_6 BTM_{it} + a_7 ROA_{it} + a_8 Mills_{it} + a_9 Ind_Dummy + a_{10} YEAR_Dummy + e_{it}$$

Coefficient (t-statistics)	a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	a_9	a_{10}	F-value	Adj.R ²	N
Exp. Sign	+/-	-	-	-	+	-	-	+	+/-	+/-	+/-			
ROA_{it+1}	-0.035 (-1.33)	-0.012 (-3.4***)	-0.026 (-2.7**)	-0.016 (-1.67*)	0.001 (0.96)	-0.043 (-5.7***)	-0.003 (-6.1***)	0.656 (28.5***)	0.046 (7.5***)	Inc.	Inc.	75.5***	0.35	4670
ROA_{it+2}	-0.046 (-1.44)	-0.012 (-2.9***)	-0.018 (-1.55)	-0.039 (-1.89*)	0.001 (0.96)	-0.061 (-6.8***)	-0.003 (-4.9***)	0.491 (17.7***)	0.053 (7.21***)	Inc.	Inc.	38.1***	0.21	4670
ROA_{it+3}	-0.168 (-3.1***)	-0.001 (-0.17)	-0.025 (-1.28)	-0.136 (-3.2***)	0.005 (2.07**)	-0.030 (-1.98**)	0.0005 (0.48)	0.501 (10.8***)	0.038 (3.12***)	Inc.	Inc.	11.1***	0.07	4670

* ***: significant at the 1% level, **: significant at the 5% level, *: significant at the 10%

** Subsequent performances are based on the year of earnings management and Year t of [Model 1] is the year earnings management, i.e., one year prior to the SEO

*** The variables are defined as follows: ROA_{it+j} : Return on Assets of firm i in year t ($j=1,2,3$)($EBT_{it+j} / \text{Total Assets}_{it+j-1}$), EBT_{it} : Earnings before corporate tax of firm i in year t , SEO_{it} : SEO dummy equals 1 if there is a SEO of firm i in year t and 0 otherwise, RM_Proxy_{it} : Sum of standardized abnormal cash flow from operations, abnormal production costs, abnormal discretionary expense, and abnormal gains from asset sales of firm i in year t (We multiply Ab_OCF and Ab_EXP by negative one so that the sum of the four variables will be indicative of overall real earnings management), $SEORM_Proxy_{it}$: Interaction variable between SEO and RM_Proxy of firm i in year t , AM_{it} : Abnormal accruals of firm i in year t estimated by the Modified Jones model (Ab_ACC_i), $Mills_{it}$: Inverse Mills Ratio of firm i in year t from the 1st stage regression. Refer to the notes of Table2 for other variables

Panel C: The 2nd stage regression(Individual abnormal real activity)

$$\text{[Model 2-2]} \quad ROA_{it+j} = a_0 + a_1 SEO_{it} + a_2 Ab_OCF_{it} + a_3 SEOAb_OCF_{it} + a_4 SIZE_{it} + a_5 LEV_{it} + a_6 BTM_{it} + a_7 ROA_{it} + a_8 Mills_{it} + a_9 Ind_Dummy + a_{10} YEAR_Dummy + e_{it}$$

Coefficient (t-statistics)	a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	a_9	a_{10}	F-value	Adj.R ²	N
Exp. Sign	+/-	-	-	-	+	-	-	+	+/-	+/-	+/-			
ROA_{it+1}	-0.047 (-1.61)	-0.011 (-3.2***)	-0.005 (-0.16)	-0.072 (-1.7*)	0.001 (1.18)	-0.044 (-5.8***)	-0.003 (-6.0***)	0.674 (23.2***)	0.049 (5.0***)	Inc.	Inc.	75.1***	0.35	4670
ROA_{it+2}	-0.055 (-1.56)	-0.012 (-2.7***)	-0.008 (-0.21)	-0.067 (-1.69*)	0.001 (1.11)	-0.062 (-6.8***)	-0.003 (-4.9***)	0.504 (14.3***)	0.056 (4.7***)	Inc.	Inc.	37.8***	0.21	4670
ROA_{it+3}	-0.240 (-4.0***)	-0.004 (-0.62)	-0.087 (-1.21)	0.423 (4.8***)	0.006 (2.6***)	-0.032 (-2.15**)	0.0008 (0.73)	0.599 (10.2***)	0.080 (4.0***)	Inc.	Inc.	12.0***	0.07	4670

* For easy interpretation, we multiply Ab_OCF by negative one

** $SEOAb_OCF_{it}$: Interaction variable between SEO and Ab_OCF (multiplied by -1) of firm i in year t

〈Table 6〉 Subsequent Performance (Regression approach) (continue)

$$\text{[Model 2-2]} \quad ROA_{it+j} = a_0 + a_1 SEO_{it} + a_2 Ab.PROD_cost_{it} + a_3 SEOAb.PROD_cost_{it} + a_4 SIZE_{it} + a_5 LEV_{it} + a_6 BTM_{it} + a_7 ROA_{it} + a_8 Mills_{it} + a_9 Ind_Dummy + a_{10} YEAR_Dummy + e_{it}$$

Coefficient (t-statistics)	a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	a_9	a_{10}	F-value	Adj. R^2	N
Exp. Sign	+/-	-	-	-	+	-	-	+	+/-	+/-	+/-			
ROA_{it+1}	-0.044 (-1.70*)	-0.012 (-3.4***)	-0.053 (-3.3***)	-0.005 (-0.14)	0.001 (1.14)	-0.043 (-5.8***)	-0.003 (-6.2***)	0.663 (30.9***)	0.051 (9.4***)	Inc.	Inc.	75.8***	0.34	4670
ROA_{it+2}	-0.053 (-1.71*)	-0.012 (-2.9***)	-0.033 (-1.68*)	-0.082 (-1.78*)	0.001 (1.08)	-0.061 (-6.8***)	-0.003 (-4.9***)	0.497 (18.8***)	0.058 (8.8***)	Inc.	Inc.	38.3***	0.21	4670
ROA_{it+3}	-0.162 (-3.1***)	-0.0001 (-0.02)	-0.033 (-1.02)	0.019 (0.25)	0.004 (2.01**)	-0.029 (-1.95*)	0.0005 (0.47)	0.490 (11.0***)	0.035 (3.32***)	Inc.	Inc.	10.7***	0.06	4670

* $SEOAb.PROD_cost_{it}$: Interaction variable between SEO and $Ab.PROD_cost$ of firm i in year t

$$\text{[Model 2-2]} \quad ROA_{it+j} = a_0 + a_1 SEO_{it} + a_2 Ab.EXP_{it} + a_3 SEOAb.EXP_{it} + a_4 SIZE_{it} + a_5 LEV_{it} + a_6 BTM_{it} + a_7 ROA_{it} + a_8 Mills_{it} + a_9 Ind_Dummy + a_{10} YEAR_Dummy + e_{it}$$

Coefficient (t-statistics)	a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	a_9	a_{10}	F-value	Adj. R^2	N
Exp. Sign	+/-	-	-	-	+	-	-	+	+/-	+/-	+/-			
ROA_{it+1}	-0.053 (-2.06**)	-0.012 (-3.4***)	-0.050 (-1.77*)	-0.143 (-1.87*)	0.001 (1.30)	-0.044 (-5.8***)	-0.003 (-6.0***)	0.684 (32.5***)	0.054 (10.9***)	Inc.	Inc.	75.2***	0.34	4670
ROA_{it+2}	-0.062 (-2.00)	-0.012 (-2.9***)	-0.034 (-1.00)	-0.050 (-0.54)	0.001 (1.23)	-0.062 (-6.9***)	-0.003 (-4.9***)	0.515 (20.2***)	0.061 (9.3***)	Inc.	Inc.	37.8***	0.20	4670
ROA_{it+3}	-0.164 (-3.1***)	0.0001 (0.03)	-0.089 (-1.57)	-0.332 (-2.14**)	0.004 (1.99**)	-0.029 (-1.96*)	0.0005 (0.50)	0.500 (11.7***)	0.037 (3.4***)	Inc.	Inc.	10.9***	0.06	4670

* For easy interpretation, we multiply $Ab.EXP$ by negative one

** $SEOAb.EXP_{it}$: Interaction variable between SEO and $Ab.EXP$ (multiplied by -1) of firm i in year t

(Table 6) Subsequent Performance (Regression approach) (continue)

[Model 2-2] $ROA_{it+j} = a_0 + a_1SEO_{it} + a_2Ab.GSA_{it} + a_3SEOAb.GSA_{it} + a_4SIZE_{it} + a_5LEV_{it} + a_6BTM_{it} + a_7ROA_{it} + a_8Mills_{it} + a_9Ind_Dummy + a_{10}YEAR_Dummy + e_{it}$

Coefficient (t-statistics)	a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	a_9	a_{10}	F-value	Adj.R ²	N
Exp. Sign	+/-	-	-	-	+	-	-	+	+/-	+/-	+/-			
ROA_{it+1}	-0.046 (-1.80*)	-0.011 (-3.2***)	-0.418 (-1.99**)	-2.564 (-4.5***)	0.001 (0.98)	-0.044 (-5.9***)	-0.003 (-6.1***)	0.687 (32.8***)	0.054 (10.9***)	Inc.	Inc.	77.3***	0.35	4670
ROA_{it+2}	-0.059 (-1.89*)	-0.012 (-2.8***)	-0.324 (-1.67*)	-1.152 (-1.70*)	0.001 (1.11)	-0.062 (-6.9***)	-0.003 (-4.9***)	0.517 (20.3***)	0.061 (9.33***)	Inc.	Inc.	38.1***	0.20	4670
ROA_{it+3}	-0.168 (-3.2***)	-0.0004 (-0.06)	-0.317 (-1.59)	-1.296 (-1.68*)	0.005 (2.05**)	-0.029 (-1.97**)	0.0005 (0.44)	0.503 (11.8***)	0.037 (3.38***)	Inc.	Inc.	10.7***	0.06	4670

* $SEOAb.GSA_{it}$: Interaction variable between SEO and $Ab.GSA$ of firm i in year t

Panel D: The 2nd stage regression(High ownership group VS. Low ownership group)

[Model 2-3] $ROA_{it+j} = a_0 + a_1SEO_{it} + a_2RM_Proxy_{it} + a_3L_OWNER_{it} + a_4SEORM_Proxy_{it} + a_5SEOOWNER_{it} + a_6SEORMOWNER_{it} + a_7SIZE_{it} + a_8LEV_{it} + a_9BTM_{it} + a_{10}ROA_{it} + a_{11}Mills + a_{12}Ind_Dummy + a_{13}YEAR_Dummy + e_{it}$

Coefficient (t-statistics)	a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	a_9	a_{10}	a_{11}	a_{11}	a_{12}	F-value	Adj.R ²	N
Exp. Sign	+/-	-	-	-	-	-	-	+	-	-	+	+/-	+/-	+/-			
ROA_{it+1}	-0.036 (-1.38)	-0.007 (-1.32)	-0.026 (-2.6***)	-0.006 (-2.2**)	-0.028 (-1.65*)	-0.006 (-1.91*)	-0.072 (-1.85*)	0.001 (1.11)	-0.042 (-5.6***)	-0.003 (-6.3***)	0.651 (28***)	0.045 (7.4***)	Inc.	Inc.	63.2***	0.35	4670
ROA_{it+2}	-0.048 (-1.51)	-0.004 (-0.67)	-0.018 (-1.52)	-0.009 (-2.7***)	-0.027 (-1.67*)	-0.011 (-1.78*)	-0.113 (-2.4**)	0.001 (1.17)	-0.060 (-6.6***)	-0.003 (-5.2***)	0.482 (17***)	0.053 (7.15***)	Inc.	Inc.	34.8***	0.21	4670
ROA_{it+3}	-0.164 (-3.0***)	-0.013 (-1.11)	-0.024 (-1.23)	-0.010 (-1.76*)	-0.043 (-1.9**)	-0.020 (-1.38)	-0.055 (-1.95*)	0.005 (2.09**)	-0.030 (-1.9**)	0.0004 (0.41)	0.004 (1.97**)	0.495 (10.6***)	Inc.	Inc.	10.2***	0.06	4670

* ***: significant at the 1% level, **: significant at the 5% level, *: significant at the 10%

** Subsequent performances are based on the year of earnings management and Year t of [Model 1] is the year earnings management, i.e., one year prior to the SEO

*** The variables are defined as follows: ROA_{it+j} : Return on Assets of firm i in year t ($j=1,2,3$)($EBT_{it+j} / Total Assets_{it+j-1}$), EBT_{it} : Earnings before corporate tax of firm i in year t , SEO_{it} : SEO dummy equals 1 if there is a SEO of firm i in year t and 0 otherwise, L_OWNER_{it} : Ownership dummy equals 1 if the largest shareholder's ownership of firm i in year t is below the median, and 0 otherwise, RM_Proxy_{it} : Sum of standardized abnormal cash flow from operations, abnormal production costs, abnormal discretionary expense, and abnormal gains from asset sales of firm i in year t (We multiply $Ab.OCF$ and $Ab.EXP$ by negative one so that the sum of the four variables will be indicative of overall real earnings management), $SEORM_Proxy_{it}$: Interaction variable between SEO and RM_Proxy of firm i in year t , $SEOOWNER_{it}$: Interaction variable between SEO and L_OWNER of firm i in year t , $SEORMOWNER_{it}$: Interaction variable among SEO , RM_Proxy , and L_OWNER of firm i in year t , Refer to the notes of Panel B for other variables

Taken together, the evidence is consistent with prior results in that firms engaged in earnings management report significant declines immediately after the year of earnings management. In the case of real activity based earnings management, the effect on subsequent performance is also negative and continues for a longer time. So, both H2-a and H2-b are supported. *Panel C* shows subsequent operating performances followed by each abnormal real activity: abnormal cash flows from operations, abnormal production, abnormal discretionary expense, and abnormal gains from asset sales. The less abnormal cash flows from operations or abnormal discretionary expenses firms have, the more likely those firms are engaged in earnings management. On the other hand, firms having more abnormal production costs or more abnormal gains from asset sales are likely to be engaged in earnings management. For easy interpretation, we multiply *Ab.OCF* and *Ab.EXP* by negative one in *Panel C* of <Table 6> so that higher *Ab.OCF* or *Ab.EXP* means large sales discount or cutting discretionary expenses. So we expect negative signs for every proxies of earnings management in explaining subsequent performance and find them as we expect. Results from each individual proxy of real activity based earnings management are consistent with result of *RM_Proxy*. In the case of discretionary expense, we get a significance on the year $t+1$

and the year $t+3$ after controlling for firm's size, leverage, and performance, where no significance is found on univariate analysis of <Table 4>. Regarding the ownership hypothesis, H2-c, we get a consistent result in *Panel D*. All signs of *L_OWNER* are negative and significant, implying that the largest shareholder's ownership positively influence on subsequent performance in general. Both coefficients of *SEOOWNER* and *SEORMOWNER* have all negative signs even though it is insignificant on the 3rd year of *SEOOWNER*'s. It means that firms having lower ownership show lower performances when they offer new shares. In particular, firms having lower ownership and higher abnormal real activity report underperformance for a long time after that. Those results imply that the largest shareholder's ownership positively influence on firm's operating performance especially when they offer new shares. As firms are engaged in real activity based earnings management for the SEO, low ownership negatively influence on firm's subsequent performance. From these results, we infer lower ownership is one of factors to earnings management and negatively effects on subsequent performance.

V. Conclusion

This paper examines earnings management and the subsequent performance using a sample of SEO firms. Managers have incentives to inflate earnings in order to enhance stock price before the SEO, even at the cost of long term profits. We examine whether managers manage earnings upward in the year prior to the SEO, focusing on abnormal real activities. It is found that abnormal accruals and abnormal gains from asset sales are significantly positive, whereas abnormal cash flows from operations are significantly negative in the fiscal year prior to the SEO. Earnings management through abnormal production costs or abnormal discretionary expenses is not observed around the SEO. It is found that managers inflate earnings through real activities such as aggressive price discount or lenient credit terms and gains from asset sales as well as accruals in the fiscal year just prior to the SEO. The timing of earnings management for the SEO is consistent using both abnormal accruals and abnormal real activities as a proxy of earnings management, where prior results using only abnormal accruals are inconsistent. The result also indicates that the earnings management for the SEO has significantly negative impacts on the subsequent operating performance. ROAs

significantly decline in subsequent years, up to the second year after the income increasing earnings management for the SEO. We find abnormal real activities to inflate earnings have a negative effect on the future performance for a longer period of time, especially for the H-RM group. We also find that firms having lower largest shareholder's ownership show significant underperformance after earnings management.

This paper contributes to research on earnings management in several ways. First, real activity based earnings management in addition to accruals based one is examined when firms offer new issues. Second, this study considers abnormal real activities more extensively by including disposal of assets which was neglected in prior studies. Third, our results reconfirm when firms are engaged in earnings management for the SEO by providing a consistent timing of earnings management using both abnormal accruals and abnormal real activities, where prior results are inconsistent on timing in Korea. Finally, we find that real activity based earnings management negatively affects the subsequent operating performance without reversion. These are the first empirical findings in Korea and we expect these results provide better understanding on real activity based studies. The finding that underperformance after earnings management is associated with the largest shareholder's

ownership using SEO event is final contribution of this paper. It could be used as an additional explanation of accrual anomaly, the negative relationship between accounting accruals and subsequent stock returns. In particular, real activity based earnings management can be used as another explanation for underperformance after the SEO in the stock market besides abnormal accruals. We suggest studies on the relationship between accruals and real activity based earnings management for future research because we focused only on the real activity based earnings management in this paper as an initial attempt to observe real activity based earnings management for the SEO firms in Korea. It would be interesting if one can separate real activity based earnings management and accrual based earnings management and/or measure relative importance of two types of earnings management in the future. The analysis in this paper is based on the proxies of earnings management that are calculated from models developed in prior studies, and thus subject to any biases embedded in the models.

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실질활동을 이용한 이익조정 의 차기 성과: 한국의 유상증자사례

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요 약

본 논문은 기업의 이익조정과 이익조정이 차기 성과에 미치는 영향을 분석한다. 이익의 상향조정이 의심되는 표본을 추출하기 위해 기업의 유상증자사건을 중심으로 유상증자 이전의 이익조정여부와 이후의 성과를 실증 검증하고 이익조정의 방법으로는 발생액 외에 실질활동을 이용한 이익조정방법을 추가하여 분석한다. 이를 위해 1995년부터 2007년까지의 연구기간 동안 381개의 유상증자표본을 이용하여 발생액과 실질활동을 이용한 이익조정행위가 존재하는 지 여부와 이익조정 이후의 영업성과를 단일변량분석과 다변량 회귀분석을 이용하여 분석한다.

연구결과, 경영자는 유상증자 직전 회계연도 이익을 증가시키기 위해 발생액 외에 실질활동을 이용하는 것으로 나타났고 이익조정후의 영업성과는 유의하게 감소하였다. 이익조정 이후의 저조한 영업성과는 표본 전체기업을 대상으로 했을 때 발생액의 반전으로 인하여 2차년도 까지만 지속되나, 실질활동을 이용한 이익조정그룹으로 분류된 기업들은 유상증자 이후의 저조한 영업성과가 장기간 지속되었다. 특히 내부통제가 상대적으로 취약할 것으로 예상되는 최대주주의 지분율이 낮은 기업의 경우에도 유상증자를 위한 이익조정이 발견되고 이익조정이후에도 저조한 성과가 지속 되는 것으로 나타났다. 이에 따라 최대주주의 지분율이 이익조정 시 하나의 요인으로 작용하여 차기성과에 부정적인 영향을 미치는 것이 확인되었다.

기존의 연구에서는 유상증자 전 이익조정 시점에 대한 일관된 결과를 보이지 않았으나, 본 연구에서는 이익조정의 대응치인 비정상실질활동을 추가로 검증함으로써 일관된 이익조정시점을 확인할 수 있었다. 또한 유상증자를 위한 이익조정 이후 저조한 성과는 기존에 알려진 재량적발생액 외에도 비정상적인 실질활동치들로 인해 야기된다는 점을 검증하였다는 점에서 본 논문의 의의가 있다. 이러한 실증연구결과는 이익조정의 대응치를 추정모형에 의존하고 있다는 점에서 그 한계점이 있지만, 이익조정방법을 선택하기 위한 경영자의 동기 및 차후 실질활동과 관련된 연구에 기여할 것으로 기대된다.

주제어: 이익조정, 유상증자, 비정상 발생액, 실질활동을 이용한 이익조정, 소유구조

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