

Real Earnings Management, Liquidity Risk and REITs SEO Dynamics

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Abstract We analyze how REITs managers use real earnings management to address issues of liquidity risk and increased cost of capital they face during seasoned equity offerings. We show that REITs managers engage in real earnings management instead of accrual earnings management to attract more uninformed trading in order to provide the liquidity service at a lower cost during seasoned equity offerings. We find REITs with higher liquidity risk are more likely to manipulate earnings prior to equity offerings and uninformed trading is higher following real earnings management. Firms set the offer price at a smaller discount after engaging in real earnings management and stock returns decline in the long run. The findings are consistent with real option and liquidity risk explanations for equity offerings.

JEL Classification G14 · G23 · G32 · M41

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Introduction

Regardless of recent advances in securitized real estate, understanding real estate in the context of capital market remains obscure. Due to the lack of sufficient information on

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their risk characteristics, both corporate and individual investors are uncertain about how far to invest in Real Estate Investment Trusts (REITs). Particularly, the dividend pay-out requirement and restriction on property investment imply market microstructure differences. This is unwanted for REITs who are unable to fund investment activities through internally generated profits. Microstructure differences are likely to result in a heightened liquidity risk, which captures the sensitivity of its stock returns to market liquidity shocks and plays a vitally important role in determining the expected stock return as well as external financing.¹

In this paper, we explore how REITs managers use real earnings management to address issues of liquidity risk and cost of capital during seasoned equity offerings. We focus on real earnings management instead of accrual based earnings management² since the latter, achieved by discretion over accounting policies, does not affect the cash flow of the firm and liquidity risk. Unlike accrual earnings management which may affect firm performance indirectly through distorting accounting information or FFO (Zhu et al. 2010), real earnings manipulation results in direct cash flow consequences, altering the firm's ratio of the future cash flows to the covariance with all the cash flows in the market, i.e. the liquidity risk. This channel on liquidity risk is supported by Lambert et al. (2007) who demonstrate that the quality of accounting information can influence cost of capital either directly via the firm's assessed covariance with other firms' cash flows or indirectly via the firm's expected future cash flow. Furthermore, Ambrose and Bian (2010)'s investigation on the information generated from stock market trading implies that real earnings management is utilized to affect equity stock pricing in REITs.

We define real earnings management as real economic actions that managers take to disguise real economic performance. Examples for real earnings management that can influence the earnings of REITs include timing the revenue recognition, boosting or cutting the discretionary expenses and timing the asset disposition. We hypothesize that a REIT facing a heightened liquidity risk during equity offering may engage in real earnings management activities to address microstructure differences in order to lower the cost of capital.

REITs are highly leveraged in comparison with general firms, which makes REITs issue equity periodically not only to maintain their long term capital structure but also to fund their investment activities. Corporate finance literature suggests that firms time seasoned equity offerings by exploiting the time-varying risk to minimize the cost of equity (the risk-trade off hypothesis). Eckbo and Norli (2005) examine the risk factor associated with stock returns around seasoned equity offerings, concluding that liquidity risk determines post-SEO stock returns. DeAngelo et al. (2010) document that "most issuers would have run out of cash by the year after the SEO had they not received the offer proceeds". Lin and Wu (2013) find a decrease in liquidity risk prior to SEO filing helps to reduce firms' cost of equity. As REITs face a higher level of liquidity risk compared with common stocks, their incentive to monitor liquidity risk during the equity offering should be strong.

¹ Academic literature have emphasized the considerable importance of liquidity in expected stock return and equity offering decision. See Acharya and Pedersen (2005), Liu (2006), Pastor and Stambaugh (2003), Amihud (2002), Eckbo and Norli (2005), Korajczyk and Sadka (2008), and Sadka (2006).

² Accrual based earnings management is defined as a way to generate a desired level of reported earnings in the umbrella of GAAP.

Meanwhile, previous studies also suggest that firms will issue equity by selling the overpriced shares (the window of opportunity/behavioral hypothesis) via earnings manipulation. Recent studies show that SEO firms are found to engage in real earnings management during seasoned equity offerings and the decline in post-SEO firm performance is more severe compared to accrual manipulation³(Cohen and Zarowin 2010; Rangan 1998). The finding is intriguing. Since real earnings management could distort the information quality to inflate prices like accrual-based earnings management, their direct cash flow consequences could affect the stock volatility and liquidity risk, thus stock prices. The relationship among information transparency, liquidity risk and the cost of capital is unclear in this regard. Our paper fills the gap.

REITs managers are inclined to engage in real earnings management activities over accrual based manipulation for several reasons. First, restricted with investment options on real estate assets, REIT managers cannot simply boost their compensation through activities like merger and acquisitions while the dual performance measurement by net income and funds from operation also limits agency problems. Second, the dual performance measurement by net income and funds from operation (FFO) mitigates the possibility to manipulate earnings within the accounting discretion. Ambrose and Bian (2010) indicate that REITs who are suspected of accrual earnings management do not seem to be more mispriced than the non-suspected. Moreover, a firm can generate additional cash flows by disposing fixed assets at a loss. Since REITs with less cash flow from operations are less probable to external financing, their incentive to real earnings management is stronger compared with general firms.

Specifically, we apply a recently developed liquidity-augmented asset pricing model to measure liquidity risk and market risk for REITs. We focus on REITs' exposures to liquidity risk in relation to the level of real earnings management around SEO to (1) test the role of real earnings management in REITs SEO timing, and (2) examine whether real earnings management will play a role in SEO firms' stock performance. We find that REITs managers engage in real earnings management to attract more uninformed trading in order to provide the liquidity service at a lower cost during seasoned equity offerings. REITs with higher liquidity risk are more likely to manipulate earnings prior to equity offerings and uninformed trading is higher following real earnings management. Firms set the offer price at a smaller discount after engaging in real earnings management and stock returns decline in the long run.

Contribution of this paper is manifold. First, we contribute to the REITs seasoned equity issuance literature by providing the empirical evidence on how REITs deploy real earnings management to manage liquidity risk during equity offering. Second, we provide evidence on how real earnings management influences REITs equity offering decision, supporting the notion that managers distort earnings to time the market. Third, we contribute to determinants of SEO discounting by providing another important determinant - real earnings management. Fourth, we contribute to accounting literature by providing another setting where real earnings management plays a nontrivial role in market timing and price formation, supporting recent debates on information quality and liquidity risk.

³ The evidence of accrual based earnings management around seasoned equity offerings (DuCharme et al. 2004; Rangan 1998; Teoh et al. 1998) suggest that firms distort earnings report to inflate share prices to benefit existing shareholders at the expense of potential shareholders.

This paper proceeds as follows. We review the relevant literature in “Literature Review” section and construct our hypotheses in “Hypothesis” section. “Data and Sample Description” section describes the data. “Research Design” section discusses the empirical results. “Empirical Results” section presents the robustness test. “Robustness Test” section concludes.

Literature Review

Real Earning Management

Real earning management happens when managers disguise real economic performance by taking real economic actions. In Graham et al. (2005)’s survey on more than 400 executives of U.S. firms, managers are willing to sacrifice small economic value for meeting earnings targets. Strong evidence is reported that managers take real economic actions, like decreasing discretionary expenditures to burn real cash flow for desired reported earnings (Bartov 1993; Kim et al. 2011; Roychowdhury 2006). Real earnings management masks a firm’s current unbiased economic performance, and may endanger a firm’s competitiveness in the long run (Wang and D’Souza 2006; Zang 2012). Unlike accrual-based earnings management, real earnings management could negatively impact on the level of future net cash flows and increase volatility. Gunny (2010) tests consequences of real earning management activities and results indicate that reported income increases through real earnings management activities. By reducing research and development (R&D) expenses for instance, real earnings management negatively influences the firm’s future operating performance (Cohen et al. 2008).

It is hard for outsiders to distinguish the suboptimal decisions from the optimal. After Sarbanes-Oxley Act (SOX) imposed more stringent reporting standards, firms started to switch from accrual-based earnings management to real earnings management methods. Though real earnings management costs higher (Roychowdhury 2006), it is more opaque and more difficult for outsiders to detect (Cohen and Zarowin 2010; Zang 2012). Later, Lobo et al. (2008) confirm the time pattern of manager’s preference on alternatives of earning management and indicate that the decrease in accrual earnings management was smaller for firms with better corporate governance. Consistent with this hypothesis, in Mizik and Jacobson (2007)’s test around seasoned equity offerings, financial markets overvalue the firms who engage in earnings inflation linked to real activity manipulation.

In REITs, real earnings management is a sparsely explored topic. Anglin et al. (2013) document that REITs engage in significant real activities manipulation, which, however, are constrained by the effect of corporate governance. In their paper, REITs engage in certain forms of earnings management but their ability to manipulate earnings is reduced with better corporate governance. Edelstein et al. (2011) indicate that REITs may employ real earnings management when confronting constrained capability for meeting their legal dividend payout requirements. They find that these firms are inclined to reduce their taxable income, and hence their required dividend payment, by deferring the recognition of revenue and incurring expenses sooner. They further find that REITs which can generate less cash flow from operations and which

have fewer opportunities to obtain external funding are more likely to engage in real earnings management. Ambrose and Bian (2010) investigate whether the information generated from stock market trading influences managers' incentives to engage in earnings management in REITs and whether investors can anticipate earnings management. Their findings imply real earnings management is utilized to affect equity stock pricing.

REITs Seasoned Equity Offering

The literature on REITs seasoned equity offerings is well established. There is a large literature providing estimates of the market reaction to security issue announcements. Like general stocks, a significant negative reaction is identified under the implication of pecking-order theory. Using REITs data from 1970 to 1985, Howe and Shilling (1988) document a negative stock price reaction to equity offerings and a positive stock price reaction to debt offerings. Ghosh et al. (2000) report a significant negative market reaction using REITs equity offering in 1990s.

Another strand of literature on REITs seasoned equity offerings is concerned with capital structure change. Since trade-off and pecking order rationales are almost silent due to REITs unique characteristics, previous literature on REIT capital structure largely focuses on the signaling effects of equity and debt offerings of REITs (Howe and Shilling 1988; Brown and Riddiough 2003). Recent empirical results show that REITs time market within a general targeted debt ratio environment. Ooi et al. (2010) examine the timing attempts in REITs public offerings and targeted debt ratios. They point out that REITs time market within a general targeted debt ratio environment. Studies by Boudry et al. (2010) and Ghosh et al. (2011) also recorded strong evidence supporting the market timing theory in explaining the issuance decisions of REITs.

However, limited studies are conducted on REITs SEO pricing. Ghosh et al. (2000) document that REITs SEO underpricing is significantly related with institutional ownership, issue size, and underwriter reputation. Goodwin (2013) further argues that when there is high placement cost and value uncertainty with new REITs shares, investors will ask for a greater discounting. Short-selling and IPO returns indicate the strong evidence for behavioral trading in REITs market (Blau et al. 2011). Surprisingly, there is no work relating real earnings management to REITs seasoned equity issuance and its pricing process.

Much has been done in the areas of seasoned equity offerings but questions remain. Recent research indicates that security issuers often exercise large real investment options around equity offerings, suggesting that endogenous corporate investment/financing decisions are determined by firms' asset-in-place. Since firm's real earnings management activities distort the cash flow, this would be interesting to ask how real earnings manipulation will affect the corporate financing decisions like seasoned equity offerings or how this will contribute to the expected stock returns.

Liquidity Risk

Liquidity risk is defined in Pastor and Stambaugh (2003) as a stock's return sensitivity to unexpected market liquidity changes. Empirical evidence supports the pricing of liquidity risk, including the work of Pastor and Stambaugh (2003), Acharya and

Pedersen (2005), and Sadka (2006). Pastor and Stambaugh (2003) incorporate their concept of liquidity into empirical tests by estimating the correlation of a firm's stock return to aggregate liquidity (liquidity beta). Acharya and Pedersen (2005) further address four possible types of systematic risk between the firm and the market in return and liquidity. Several studies highlight the difference between liquidity risk and liquidity (Acharya and Pedersen 2005; Korajczyk and Sadka 2008; Sadka 2011; Watanabe and Watanabe 2008). The liquidity risk of a particular stock is viewed as the stock return sensitivity to unexpected changes in market liquidity. However, the liquidity means the ability to trade large quantities efficiently at a low cost.

As discussed in the introduction, this study is largely motivated by Lambert et al. (2007)'s theoretical work on the effect of information quality on the liquidity risk. They demonstrate that the quality of accounting information can influence the cost of capital either directly via the firm's assessed covariance with other firms' cash flows or indirectly via the firm's expected future cash flow. Since real earnings management distorts firm's information quality, the substantial effect of information quality on the cost of capital through liquidity risk might be significant.

Hypothesis

Given the importance of liquidity risk in asset pricing, studies on equity issuance with liquidity risk show that issuing firms tend to file for SEOs at a low liquidity risk level, when investors have the least liquidity risk concerns (Lin and Wu 2013). Managers monitor the market to time the issuance at a lower liquidity risk level, consistent with the study by Pastor and Veronesi (2005) in which IPO waves are highly correlated with both improvements in market conditions and declines in expected market returns.

Since REITs are facing higher liquidity risk compared with common stocks, REITs managers are inclined to monitor the time-varying market liquidity closely when going for external financing. It is rational to argue that REITs have stronger incentives to reduce liquidity risk by changing firms' sensitivity to the market liquidity, so as to reduce the cost of capital prior to equity offerings. Real earnings manipulations could serve as a tool in this regard, given the relative opacity of real earnings manipulation over accrual earnings management (Ambrose and Bian 2010). Ng (2011) further evidences a negative relation between information quality and liquidity risk. Moreover, the direct cash flow consequences via real earnings manipulation change the ratio of the future cash flows to the covariance with all the cash flows in the market, i.e. liquidity risk. This channel on liquidity risk is supported by Lambert et al. (2007) who demonstrate that the quality of accounting information can influence the cost of capital either directly via the firm's assessed covariance with other firms' cash flows or indirectly via the firm's expected future cash flow. Given the prevalence of real earnings management over accrual management activities in REITs, our first objective is to examine whether REITs adopt real earnings management to address the heightened liquidity risk they face during equity offerings. Since real earnings manipulations result in both direct cash flow consequences and information quality distortions, REITs with higher liquidity risk are more likely to manipulate earnings and less concerned about information quality as a higher level of real earnings management indicates lower information quality. Therefore, our first hypothesis is

- Hypothesis 1 The decision by REITs to manage earnings via real activities manipulation is determined by its pre-liquidity risk profile.

Our second objective is to analyze the economic impact of real earnings management on REITs trading activities. Given that the market liquidity is time-varying, a firm's liquidity risk plays a vital role in determining its liquidity, thus trading activities. If certain firms manage earnings via real activities to alleviate their liquidity risk, the direct cash flow consequences would change firm's ratio of the expected cash flows to the covariance with the market liquidity, resulting in a lower liquidity risk level and more stock trading. Meanwhile, as it is hard for outsiders to distinguish the suboptimal decisions from the optimal, the stock market might temporarily overvalue the firm who engage in earnings inflation linked to real activity manipulation. All these could attract more uninformed trading to further alleviate the liquidity risk temporarily. Therefore, our second hypothesis is

- Hypothesis 2 Pre-SEO abnormal trading is positively related with real earning management prior to SEO.

Last but not least, our third objective is to examine the impact of real earnings management on the cost of equity. Should real earnings management be attributable to good pre-filing stock performance, SEO firms with real earnings management will be less prone to market liquidity shocks. When investors become low concerns of liquidity risk, issuing REITs face a relatively lower cost of equity capital, allowing them to issue shares at a relatively higher price and lead investors to require smaller discount when buying shares. This is in line with liquidity service cost (floatation) reduction. Meanwhile, as pointed out in Hypothesis 1, higher betas prior to equity issuance will make firms inclined to real earnings management, which would further increase the systematic risk in turn. The negative announcement effect is likely to lead investors to demand a larger discount. Hence, the impact of real earnings management on the discount of offer price becomes an empirical question. Therefore, we hypothesize

- Hypothesis 3 (A) SEO discounting is negatively related with the level of real earnings management prior to SEO.
- Hypothesis 3 (B) SEO discounting is positively related with the level of real earnings management prior to SEO.

Data and Sample Description

We analyze SEOs in US market conducted by equity REITs during January 1, 2000 and December 31, 2011, as reported in SDC database. Till 2011, the capitalization of equity REITs in US amounts to 407.5 billion USD, which accounts for 90% of total REITs capitalization in the market. The study period begins from 2000, since real earnings management activities are found to increase over accrual based earnings management in the recent decade.⁴ We further restrict the sample to 1) common share offerings 2) listed on NYSE, Nasdaq, or Amex, 3) nonmissing values on COMPUSTAT and CRSP. This finally generates 508 seasonal equity offerings from 119 equity REITs.

⁴ Given that Sarbanes-Oxley Act (SOX) imposed more stringent reporting standards, firms started to switch from accrual-based earnings management to real earnings management.

Research Design

Real Earning Management Measure

We follow prior studies to construct our proxies for real earnings management (Roychowdhury 2006; Cohen et al. 2008; Kim et al. 2011). We focus on the following three types of real earnings management activities.⁵

1. Timing the revenue recognition through cash flow from operations CFO.
2. Timing the recognition of cost of goods sold COGS (i.e. property operating expenses for REITs).
3. Timing the property disposition.

We first estimate the normal level of CFO, property operating expenses and assets disposition by using the models implemented by Roychowdhury (2006). We express normal level of CFO as a linear function of sales in the last period and change in revenue in the last period. We estimate the following function by each year.

$$\frac{CFO_{it}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{REV_{it}}{Assets_{i,t-1}} + k_3 \frac{\Delta REV_{it}}{Assets_{i,t-1}} + \varepsilon_{it} \quad (1)$$

Abnormal CFO (*ABCFO*) is the actual CFO minus the CFO estimated using the model.

We next model the property operating expenses as a linear function of contemporaneous revenue.

$$\frac{Xopr_{it}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{REV_{it}}{Assets_{i,t-1}} + k_3 D + k_4 \frac{REV_{it}}{Assets_{i,t-1}} D + \varepsilon_{it} \quad (2)$$

D is a dummy variable if revenue decreases compared with its last period.

Abnormal cost of goods sold (*ABEXP*) is the actual property operating expenses *Xopr* minus the *Xopr* estimated using the model.

For the normal level of asset disposition, we model it as a linear function of market capitalization, fixed asset sales and capital expenditure.

$$\frac{GAIN_{it}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 MV_t + k_3 \frac{ASALES_{it}}{Assets_{i,t-1}} + k_4 \frac{CAPX_{it}}{Assets_{i,t-1}} + \varepsilon_{it} \quad (3)$$

Unlike general firms, REITs may have more freedom to decide recurring CAPEX allowances and the timing of those expenditures. Abnormal property disposition (*ABDISP*) is Gain/Loss from the Sale of Property, Plant and Equipment

⁵ There are other alternative real earnings management tools such as changing discretionary expenses including advertising, R&D, and SG&A expenses. However, they are not available to real estate firms.

and Investments minus Gain/Loss estimated using the model.

All data used in regressions are retrieved from COMPUSTAT, where *CFO* is the cash flow from operation, *Assets* is the total book value, *REV* is the total revenue, ΔREV is the revenue growth, *Xopr* is the actual property operating expenses, *GAIN* is the gain from assets sales and income from assets sales/disposition, *MV* is the market value, *Q* is Tobin-Q, *ASALES* is long-lived assets sales, and *CAPEX* is long-lived investment sales.

We use abnormal CFO (*ABCFO*), abnormal cost of goods sold (*ABEXP*) and abnormal property disposition (*ABDISP*) as proxies for real earnings management in this paper. Given sales levels, REITs that manage earnings upwards are likely to have unusually low cash flow from operations, unusually high property operating expenses, and/or unusually low gain (even loss) from assets sales and income from assets sales/disposition (Cohen and Zarowin 2010).

Liquidity-Augmented CAPM

To measure the liquidity risk of each individual REIT prior to equity offerings, we deploy the liquidity-augmented CAPM model. In a liquidity-augmented CAPM, the risk premium on stock *i* can be expressed as

$$E(R_{i,t}) - r_{f,t} = \beta_{m,t} [E(R_{m,t}) - r_{f,t}] + \beta_{liq,t} E(LIQ_t) \quad (4)$$

Where $E(R_{m,t})$ is the expected return of the market portfolio, $E(LIQ_t)$ is the expected value of the mimicking liquidity factor (Pástor and Stambaugh 2003), $\beta_{m,t}$ and $\beta_{liq,t}$ are firm *i*'s market beta and liquidity beta, respectively.

To reflect the risk profile of each individual REIT, we calculate firm's betas prior to SEO by regressing their past 36 month returns on both market and liquidity factors obtained from WRDS website. Observations with less than 12 months return data in their prior 36 months are excluded. In the primary results, we use the liquidity factor developed by Pástor and Stambaugh (2003) to estimate firm's pre-betas. For the robustness check, we use factors developed in Sadka (2006), which are based on the transitory-fixed and permanent-variable components of price impact.

Control Variables

We control for other determinants of SEO issuance and its price dynamics that have been documented in prior studies.

We include a set of control variables for firms' characteristics. We use the natural logarithm of firm's market capitalization (*Size*) to control for firm size. We also include REITs growth level (*Growth*), percentage change of total assets from last period. We calculate firms' market-to-book ratio (*logMB*) as the logarithm of firms' market value divided by its book value in the most recent quarter. Cash and short-term investment (*Cash*) and return on assets (*ROA*) are applied to control firm's financial slack. The second set of control variables included is the SEO characteristics. *Urinking* is the underwriter reputation (Carter and Manaster 1990; Safieddine and Wilhelm Jr 1996). *SeqREIT* is constructed as the current SEO sequence regarding the REIT itself to

account for the clustering and frequency of SEO (Ghosh et al. 1999, 2000). *Age* is the number of years between the SEO year and the IPO year to measure the stage in firm life cycle as suggested in DeAngelo et al. (2010).

Lastly, we include variables for alternative explanations. Information asymmetry (*InfoAs*) is the abnormal return around earning announcements (Lowry 2003). Investors' sentiment is included to control for the possibility that managers issue equities when investors are over-optimistic. Investors' sentiment index (*Sentiment*) is constructed from University of Michigan's Consumer Sentiment Index, using the methodology described in Lemmon and Portniaguina (2006).

Empirical Results

This section reports the empirical evidence of real earnings management around REITs seasoned equity offerings. The results overall support hypotheses on how real earnings management affects SEO performance of real estate firms.

Table 1 summarizes descriptive statistics of our REITs SEO sample. Panel A summarizes the issue characteristics. The mean of liquidity risk (*Liq_beta*) is -0.06 , compared with 0.01 with the market risk (*Mkt_beta*), suggesting that REITs monitor the

Table 1 Correlation matrix

| Pearson correlation | | | |
|-----------------------|---------------------|----------------------|-----------------------|
| Panel A whole sample | | | |
| | <i>ABCFO</i> | <i>ABEXP</i> | <i>ABDISP</i> |
| <i>ABCFO</i> | 1 | | |
| <i>ABEXP</i> | -0.138 | 1 | |
| <i>ABDISP</i> | 0.875 | -0.106 | 1 |
| Panel B cross-section | | | |
| Year | <i>ABCFO- ABEXP</i> | <i>ABCFO- ABDISP</i> | <i>ABEXP - ABDISP</i> |
| 2000 | -0.388 | 0.077 | 0.073 |
| 2001 | -0.039 | -0.027 | -0.39 |
| 2002 | -0.002 | -0.172 | 0.443 |
| 2003 | -0.074 | -0.089 | 0.161 |
| 2004 | -0.088 | -0.031 | 0.052 |
| 2005 | -0.023 | 0.176 | -0.093 |
| 2006 | -0.162 | 0.003 | 0.121 |
| 2007 | -0.092 | 0.040 | 0.008 |
| 2008 | -0.209 | 0.060 | 0.326 |
| 2009 | -0.279 | 0.141 | -0.305 |
| 2010 | -0.749 | 0.994 | -0.721 |
| 2011 | -0.089 | -0.157 | 0.238 |

This table reports the correlation coefficients associated with real earnings management measures. Proxies for real earnings management are measured in acceleration of the timing of sales (abnormal sales), decreasing cost (abnormal cost) and abnormal asset disposition

market closely to issue the equity at a low market liquidity level. Amihud illiquidity prior to equity issuance (*Liquidity*) has a mean of 0.03, with a standard deviation of 0.02. Given the high payout ratio, it is not surprising that REIT firms conduct equity offerings at a higher frequency (median *SeqREIT* is 3). The SEO firms in our sample tend to have higher market to book value. This is expected, since firms tend to issue equity when their market valuations are overvalued. Panel B and Panel C present the SEO activities of REITs sector during the study period.

Empirical Evidence of Real Earnings Management

General firms often engage in upward earnings management where investment and dividend constraints are not usually an issue. In contrast, with the dividend pay-out constraint, REITs are inclined to generate additional cash flows by disposing the fixed assets at a loss to facilitate the external financing. Their inclination to real earnings management is higher compared to general firms. Figure 1 describes the average level of real earnings management activities in the SEO year and the year immediately preceding and following it using quarterly data. REITs that conduct SEOs generally exhibit unusually low cash flow from operations (negative), higher property operating expenses, and unusually low gain (negative) from assets sales and income from assets sales/disposition prior to issuance, indicating that REITs manipulate earnings upwards prior to equity issuance.⁶ Each of these metrics of real earnings management is correlated (see Table 2 for specific correlations for the whole sample and the cross-sectional correlations broken down into years.) In general, cash flow from operations and property operating expenses are negatively correlated, but the sign of their correlation with assets sales/disposition prior to issuance changes over the time. Real earnings management activities increase significantly prior to issuance and decline post issuance.

We report the average level of real earnings management activities of non-SEO REITs in the matching period. Consistent with Cohen and Zarowin (2010), we find significant negative abnormal CFO and positive abnormal property operating expenses in the SEO year for REITs. Most importantly, we report negative gains (loss) from abnormal assets sales and income from assets sales/disposition in the SEO year for REITs, which has not been documented in the study of general firms. This suggests that REITs are inclined to generate additional cash flows by disposing the fixed assets at a loss to facilitate the external financing. Occurring a loss at the disposition is not only benefiting the external financing by generating additional cash flow, but also reducing the dividend payout (Edelstein et al. 2011).

Determinants of Real Earnings Management

Unlike accrual earnings management, real earnings manipulations have direct cash flow consequences and could affect the stock volatility, thus impact stock prices. Therefore, we analyze determinants of real earnings management around SEO issuance in the

⁶ Given sales levels, REITs that manage earnings upwards are likely to have unusually low cash flow from operations, unusually high property operating expenses, and/or unusually low gain (even loss) from assets sales and income from assets sales/disposition (Cohen and Zarowin 2010).

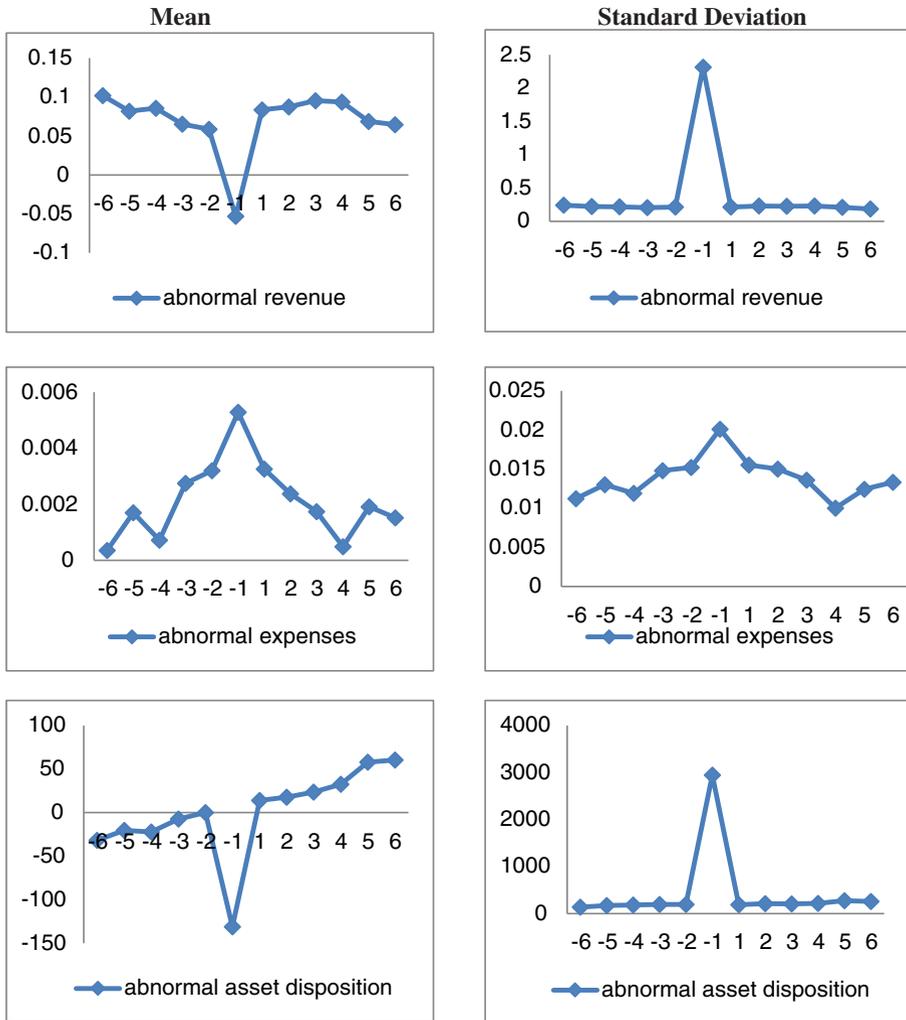


Fig. 1 Real earnings management around REITs SEOs. Figure 1 describes the average level and standard deviation of real earnings management activities in the SEO year-quarter and the years immediately preceding and following it using quarterly data. Proxies for real earnings management are measured in acceleration of the timing of sales (abnormal sales), decreasing cost (abnormal cost) and abnormal asset disposition. In later analysis, we scale down abnormal asset disposition by total assets for better explanation

Table 2 Univariate comparisons of real earnings management measures

| | Mean (SEO firm quarters) | Mean (non-SEO firm quarters) | Mean Difference | t-test |
|---------------|--------------------------|------------------------------|-----------------|---------|
| <i>ABCFO</i> | -0.09 | 0.058 | -0.11 | 3.52*** |
| <i>ABEXP</i> | 0.55 | 0.23 | 0.32 | 3.34*** |
| <i>ABDISP</i> | -1.22 | 0.21 | -1.43 | 3.54*** |

This table presents the univariate test of differences in mean for real earnings management measures between SEO REITs and non SEO matching REITs

following multivariate model.

$$REM_{jt} = \alpha_0 + \alpha_1Liq_beta_{jt} + \alpha_2Mkt_beta_{jt} + Controls_{jt} + Time + PropertyType + \varepsilon \quad (5)$$

Liquidity beta and market beta are calculated by regressing their past 36 month returns⁷ on market and liquidity factors using Liquidity-Augmented CAPM model. The liquidity factor used in this study is developed by Pástor and Stambaugh (2003) (WRDS website). Observations with less than 12 months return data in their prior 36 months are excluded.

Table 2 shows the OLS results on what determinates real earnings management around SEOs. The coefficients of liquidity risk are all with predicted signs and significant for all three real earnings management proxies, indicating that REITs managers take liquidity risk into consideration when they engage in real manipulation activities prior to SEO.⁸ REITs with higher pre-liquidity beta, that is, more vulnerable to liquidity shocks, are more likely to manipulate their earnings upwards via real earnings management activities (lower-than-average abnormal CFO, higher-than-average abnormal property operating expenses, and lower-than-average gains (loss) from abnormal assets sales and income from assets sales/disposition). In contrast, the signs on market risk indicate that this liquidity channel amplifies with improvement of market conditions with an influence from market liquidity.

Table 2 also presents the relationship between real earnings management and other variables. The coefficients of cash and short-term investment is negative, indicating that REITs are more likely to manipulate earnings via timing the revenue and asset disposition around SEO when they are financially slack. *Growth*, *ROA* and *Sentiment* affect differently across real earnings management proxies, suggesting that firms adopt different real earnings management tools based on the firms' attribute and market conditions.

Overall, our findings are consistent with the hypothesis that the decision by REITs to manage earnings via real activities manipulation around SEO is dependent on its liquidity risk profile, supporting that REITs exploit the time-varying risk when conducting seasoned equity offerings.

Uninformed Trading and Real Earnings Management

As discussed in the previous section, firms with higher liquidity risk are more likely to engage in real earnings management. Our next question is what the economic consequences of real earnings management are (Table 3).

If certain firms manage earnings via real activities to offset their heightened stock liquidity risk and fool the investors, all these could attract more uninformed trading to further alleviate liquidity risk in short term as stated in Hypothesis 2.

⁷ Considering that repeated SEO of REITs are often observed, 36 month instead of 60 month returns are used to circumvent the overlapping of event period that may contaminate the study.

⁸ In robustness test, we find a weaker result for REITs during non-SEO years, as reported in the Appendix 3. The coefficients of liquidity risk are of smaller magnitude compared with SEO years, suggesting that SEO firms are more aggressive in real earnings management in all periods.

Table 3 Determinants of real earnings management prior to SEO

| | Abnormal CFO(<i>ABCFO</i>) | | Abnormal Operating Expense(<i>ABEXP</i>) | | Abnormal Asset Disposition(<i>ABDISP</i>) | |
|-------------------------------|------------------------------|----------------------|--|----------------------|---|----------------------|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| <i>Liq_beta</i> | | -1.458*** (-3.91) | | 0.454** (2.36) | | -0.103** (-2.21) |
| <i>Mkt_beta</i> | -0.086 (-0.76) | -0.337*** (-2.62) | 0.193*** (3.34) | 0.270*** (4.08) | 0.014 (1.04) | 0.004 (0.24) |
| <i>Cash</i> | -5.788*** (-3.76) | -5.103*** (-3.34) | -1.088 (-1.37) | -1.314* (-1.65) | -0.119 (-0.64) | -0.091 (-0.48) |
| <i>Size</i> | 0.061 (0.90) | 0.019 (0.28) | -0.037 (-1.06) | -0.024 (-0.67) | -0.012 (-1.48) | -0.014* (-1.67) |
| <i>LogMB</i> | 0.006 (0.02) | 0.008 (0.03) | -0.002 (-0.01) | 0.002 (0.02) | 0.044 (1.44) | 0.044 (1.44) |
| <i>Growth</i> | 1.242*** (3.39) | 1.265*** (3.50) | 0.233 (1.23) | 0.224 (1.19) | 0.039 (0.88) | 0.040 (0.90) |
| <i>ROA</i> | 0.036 (0.67) | 0.025 (0.46) | -0.161*** (-5.75) | -0.156*** (-5.63) | -0.023*** (-3.52) | -0.024*** (-3.59) |
| <i>SeqREIT</i> | -0.031 (-1.32) | -0.029 (-1.24) | 0.008 (0.64) | 0.007 (0.58) | 0.003 (1.05) | 0.003 (1.08) |
| <i>Uranning</i> | -0.042 (-0.91) | -0.038 (-0.83) | -0.004 (-0.16) | -0.004 (-0.17) | -0.003 (-0.54) | -0.003 (-0.51) |
| <i>InfoAs</i> | -0.142 (-0.11) | -0.171 (-0.14) | -1.216* (-1.89) | -1.237* (-1.93) | -0.149 (-0.98) | -0.150 (-0.99) |
| <i>Sentiment</i> | -0.009 (-1.05) | -0.013 (-1.51) | 0.008* (1.72) | 0.009* (1.96) | 0.003** (2.45) | 0.003** (2.28) |
| <i>Constant</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Time effect</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Property Type</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>No. of Obs</i> | 499 | 499 | 499 | 499 | 499 | 499 |
| <i>Adjusted R²</i> | 0.066 | 0.094 | 0.172 | 0.180 | 0.098 | 0.099 |
| <i>F Stat</i> | 2.971 | 3.736 | 7.511 | 7.346 | 3.858 | 3.944 |

This table presents determinants of real earnings management around SEO. Dependent variables are measures for real earnings management *ABCFO*, *ABEXP* and *ABDISP*, respectively. The variables of interest are *Liq_beta*. The independent variables are *Mkt_beta*, *Cash*, *Size*, *LogMB*, *Growth*, *ROA*, *SeqREIT*, *Uranning*, *InfoAs*, and *Sentiment* as defined in Appendix 1. Coefficients for the variables of interest are presented, and T-statistics are included in parentheses. *, ** and *** represent the 10%, 5% and 1% significance levels, respectively

We test the impact of real earnings management on trading activities. We use abnormal trading volume to proxy for the uninformed trading activities. Using standard event study method, we calculate abnormal trading volume prior to SEO. For each REIT, we use a maximum of 70 daily volume observations for the period around its respective SEO, starting at day -70 and ending at day -1 relative to the event. The first 65 days (three months) in this period (-70

through -5) is designated the ‘estimation period’, and the following 5 days (-5 through -1) is designated the ‘event period’. Abnormal trading volume⁹ prior to SEO is estimated as

$$AV_{jt} = V_{jt} - \bar{V}_j \quad (6)$$

where V_{jt} and \bar{V}_j are average trading volume for REIT j during the event period and the estimation period, respectively.

We analyze the impact of real earnings management around SEO issuance on uninformed trading in the following multivariate model,

$$AV_{jt} = \alpha_0 + \alpha_1 REM_{jt} + Controls_{jt} + Time + PropertyType + \varepsilon \quad (7)$$

where REM are proxies for real earnings management.

Table 4 presents the OLS results. It shows that the level of real earnings management is positively related with the uninformed trading in the market. The coefficients of real earnings management proxies are with predicted signs and significant, suggesting that the direct cash flow consequences from real earnings manipulation change firm’s ratio of the expected cash flows to the covariance with the market liquidity. Model’s explanatory power (adjusted R square) significantly increases by 4.60% after incorporating real earnings management variables, where the effect of abnormal asset disposition is considerable, contributing 2.4% in explaining the abnormal trading activities. The low liquidity risk level and earnings inflation due to real earnings manipulation attract more uninformed trading and further alleviate the liquidity risk temporarily.¹⁰ Increased uninformed trading will reduce the liquidity risk during seasoned equity offerings, which is exactly wanted for REITs. We also control the pre-issuance stock liquidity in the regression to isolate the effect of real earnings manipulation. The results report that *InfoAs* and *Sentiment* are positively related with the level of abnormal trading, supporting information asymmetry and behavioural explanations around equity offerings. Consistent with prior studies documenting that more share turnover, more trades per day, and lower bid–ask spread are observed around SEO (Denis and Kadlec 1994; Eckbo and Norli 2005; and Lease et al. 1991), we highlight the role of liquidity improvement on the SEO decisions through the alleviated liquidity risk.

In panel B, we report results of the interaction term on real earnings management measures and the liquidity prior to issuance. The significant signs on the interaction terms indicate that the effect of the stock liquidity on the trading activity around equity issuance is amplified with the manipulation through real earnings management. Overall, Table 4 supports the hypothesis that the higher liquidity risk are more likely to manipulate earnings prior to equity offerings and uninformed trading is higher following real earnings management.

⁹ In robustness test, we measure abnormal trading volume using 22 days (one month), 44 days (two months) prior to SEO as the event period.

¹⁰ A difference-in-difference analysis is performed based on REITs pre-SEO liquidity in robustness check.

Table 4 Real earnings management and abnormal trading volume prior to SEO

| Panel A | | | | | | |
|-----------------------------------|------------------------|----------------------|---------------------|---------------------|----------------------|----------------------|
| Abnormal Trading Prior to SEO(AV) | | | | | | |
| | <i>Predicted Signs</i> | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
| <i>ABCFO</i> | – | | –5.657* (–1.92) | | | –6.588** (–2.25) |
| <i>ABEXP</i> | + | | | 0.103*** (2.60) | | 0.128*** (3.26) |
| <i>ABDISP</i> | – | | | | –3.063*** (–3.50) | –3.071*** (–3.55) |
| <i>Liquidity</i> | | 8.686*** (4.46) | 8.513*** (4.38) | 8.400*** (4.34) | 8.705*** (4.54) | 8.148*** (4.31) |
| <i>Cash</i> | | 0.815 (1.05) | 0.931 (1.20) | 0.497 (0.63) | 0.833 (1.08) | 0.571 (0.75) |
| <i>Size</i> | | 0.170*** (3.70) | 0.167*** (3.64) | 0.184*** (4.00) | 0.149*** (3.25) | 0.162*** (3.59) |
| <i>LogMB</i> | | –0.200 (–1.40) | –0.235 (–1.63) | –0.175 (–1.23) | –0.183 (–1.29) | –0.192 (–1.37) |
| <i>Growth</i> | | 0.0114 (0.06) | 0.0157 (0.08) | 0.0167 (0.09) | 0.0194 (0.11) | 0.0311 (0.17) |
| <i>ROA</i> | | –0.006 (–0.34) | –0.008 (–0.43) | –0.001 (–0.03) | –0.008 (–0.49) | –0.004 (–0.21) |
| <i>SeqREIT</i> | | 0.002 (0.21) | 0.001 (0.10) | 0.001 (0.12) | 0.003 (0.41) | 0.001 (0.14) |
| <i>Uranging</i> | | 0.006 (0.29) | 0.004 (0.17) | 0.012 (0.56) | 0.013 (0.61) | 0.017 (0.82) |
| <i>InfoAs</i> | | 2.018*** (3.39) | 1.874*** (3.13) | 2.051*** (3.47) | 1.960*** (3.34) | 1.833*** (3.15) |
| <i>Sentiment</i> | | 0.0156*** (3.36) | 0.0154*** (3.35) | 0.0151*** (3.29) | 0.0146*** (3.21) | 0.0139*** (3.10) |
| <i>Constant</i> | | Yes | Yes | Yes | Yes | Yes |
| <i>Time effect</i> | | Yes | Yes | Yes | Yes | Yes |
| <i>Property Type</i> | | Yes | Yes | Yes | Yes | Yes |
| <i>No. of Obs</i> | | 499 | 499 | 499 | 499 | 499 |
| <i>Adjusted R²</i> | | 0.260 | 0.266 | 0.272 | 0.284 | 0.306 |
| <i>F Stat</i> | | 7.777 | 7.630 | 7.848 | 8.241 | 8.349 |
| Panel B | | | | | | |
| Abnormal Trading Prior to SEO(AV) | | | | | | |
| | <i>Predicted Signs</i> | Model 2 | Model 3 | Model 4 | Model 5 | |
| <i>ABCFO* Liquidity</i> | – | –1.674*** (–2.76) | | | –1.228** (–2.21) | |
| <i>ABEXP* Liquidity</i> | + | | 3.208*** (3.51) | | 3.519*** (4.20) | |
| <i>ABDISP* Liquidity</i> | – | | | –0.216*** | –0.217*** | |

Table 4 (continued)

| | | | | | |
|-------------------------------|----------|----------|-------|----------|----------|
| | | | | (-7.37) | (-7.57) |
| <i>Liquidity</i> | 8.608*** | 8.861*** | | 7.895*** | 8.028*** |
| | (4.46) | (4.62) | | (4.35) | (4.55) |
| <i>Cash</i> | 1.001 | 0.416 | | 0.968 | 0.665 |
| | (1.29) | (0.54) | | (1.33) | (0.93) |
| <i>Size</i> | 0.174*** | 0.187*** | | 0.134*** | 0.155*** |
| | (3.80) | (4.10) | | (3.11) | (3.67) |
| <i>LogMB</i> | -0.242* | -0.150 | | -0.155 | -0.131 |
| | (-1.70) | (-1.06) | | (-1.16) | (-1.00) |
| <i>Growth</i> | 0.008 | -0.004 | | 0.031 | 0.012 |
| | (0.05) | (-0.02) | | (0.18) | (0.07) |
| <i>ROA</i> | -0.007 | -0.002 | | -0.008 | -0.005 |
| | (-0.43) | (-0.12) | | (-0.52) | (-0.33) |
| <i>SeqREIT</i> | 0.001 | 0.001 | | 0.005 | 0.003 |
| | (0.04) | (0.06) | | (0.65) | (0.34) |
| <i>Uranging</i> | 0.00481 | 0.009 | | 0.021 | 0.023 |
| | (0.23) | (0.42) | | (1.05) | (1.18) |
| <i>InfoAs</i> | 1.826*** | 1.936*** | | 2.013*** | 1.783*** |
| | (3.07) | (3.30) | | (3.63) | (3.28) |
| <i>Sentiment</i> | 0.015*** | 0.014*** | | 0.014*** | 0.011*** |
| | (3.28) | (2.98) | | (3.18) | (2.66) |
| <i>Constant</i> | Yes | Yes | Yes | Yes | |
| <i>Time effect</i> | Yes | Yes | Yes | Yes | |
| <i>Property Type</i> | Yes | Yes | Yes | Yes | |
| <i>No. of Obs</i> | 499 | 499 | 499 | 499 | |
| <i>Adjusted R²</i> | 0.274 | 0.284 | 0.359 | 0.395 | |
| <i>F Stat</i> | 7.910 | 8.246 | 11.24 | 11.88 | |

This table presents the effect of real earnings management on abnormal trading volume prior to SEO. The dependent variable is abnormal trading volume prior to SEO, which is calculated using standard event study method. *ABCFO*, *ABEXP* and *ABDISP* are the measures for real earnings management. The independent variables are *Cash*, *Size*, *LogMB*, *Growth*, *ROA*, *SeqREIT*, *Uranging*, *InfoAs*, and *Sentiment* as defined in Appendix 1. Coefficients for the variables of interest are presented, and T-statistics are included in parentheses. *, ** and *** represent the 10%, 5% and 1% significance levels, respectively

Real Earnings Management and Cost of Equity(Discounting)

As discussed in section “*Hypothesis*”, the relation between real earnings management activities and stock price is an empirical question. To examine the relationship between the level of real earnings management and cost of equity, we specify the following regression,

$$Discounting_{jt} = \alpha_0 + \alpha_1 REM_{jt} + Controls_{jt} + Time + PropertyType + \varepsilon \quad (8)$$

We define discounting as the (negative of) percentage difference between the offer price and the closing price on the prior trading day (Altinkilic and Hansen 2003;

Corwin 2003; Goodwin 2013). Note that this variable is positive if the offer price is lower than the previous day's closing price.

Table 5 shows the OLS results. The coefficients for real earnings management proxies are all significant. Model's explanatory power (adjusted R square) significantly increases by 5.20% after incorporating real earnings management variables. We

Table 5 Real earnings management and SEO discounting

| SEO Discounting | | | | | | |
|-------------------------------|------------------------|-------------------|--------------------|----------------------|--------------------|----------------------|
| | <i>Predicted Signs</i> | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
| <i>ABCFO</i> | + | | 0.614*** (2.64) | | | 0.441* (1.92) |
| <i>ABEXP</i> | - | | | -0.991*** (-3.49) | | -1.103*** (-3.85) |
| <i>ABDISP</i> | + | | | | 0.024*** (3.24) | 0.028*** (3.81) |
| <i>Cash</i> | | -8.546 (-1.48) | -9.180 (-1.60) | -7.417 (-1.30) | -8.450 (-1.48) | -7.632 (-1.36) |
| <i>Size</i> | | -0.069 (-0.28) | -0.046 (-0.18) | -0.188 (-0.75) | 0.026 (0.10) | -0.073 (-0.29) |
| <i>LogMB</i> | | -1.472 (-1.56) | -1.246 (-1.33) | -1.286 (-1.38) | -1.558* (-1.67) | -1.204 (-1.31) |
| <i>Growth</i> | | -0.700 (-0.51) | -0.822 (-0.60) | -1.138 (-0.83) | -0.584 (-0.43) | -1.139 (-0.85) |
| <i>ROA</i> | | 0.123 (0.60) | 0.149 (0.73) | -0.0344 (-0.17) | 0.202 (0.99) | 0.059 (0.29) |
| <i>SeqREIT</i> | | 0.024 (0.27) | -0.007 (-0.08) | 0.038 (0.43) | 0.033 (0.38) | 0.028 (0.32) |
| <i>Uranging</i> | | -0.055 (-0.33) | -0.044 (-0.27) | -0.022 (0.14) | -0.067 (-0.41) | -0.024 (-0.15) |
| <i>InfoAs</i> | | 2.908* (1.68) | 2.061 (1.48) | 3.249** (2.16) | 3.821* (1.90) | 3.751* (1.89) |
| <i>Sentiment</i> | | 0.097** (1.98) | 0.096** (2.47) | 0.098** (2.14) | 0.119** (2.49) | 0.122*** (3.66) |
| <i>Constant</i> | | Yes | Yes | Yes | Yes | Yes |
| <i>Time effect</i> | | Yes | Yes | Yes | Yes | Yes |
| <i>Property Type</i> | | Yes | Yes | Yes | Yes | Yes |
| <i>Number of Obs</i> | | 508 | 508 | 508 | 508 | 508 |
| <i>Adjusted R²</i> | | 0.032 | 0.043 | 0.059 | 0.046 | 0.084 |

This table presents the effect of real earnings management on SEO discounting. The dependent variable is discounting, which is the percentage change in the price between the offer price and the closing price of the day prior to SEO issuance. *ABCFO*, *ABEXP* and *ABDISP* are the measures for real earnings management. The independent variables are *Cash*, *Size*, *LogMB*, *Growth*, *ROA*, *SeqREIT*, *Uranging*, *InfoAs*, and *Sentiment* as defined in Appendix 1. Coefficients for the variables of interest are presented, and T-statistics are included in parentheses. *, ** and *** represent the 10%, 5% and 1% significance levels, respectively

observe that firms set the offer price at a smaller discount after engaging in real earnings management to manipulate earnings upwards. Since real earnings management should be attributable to good pre-filing stock performance, it attracts more uninformed trading to issuing firms temporally as suggested in Table 4. When investors become low concerns of liquidity risk, issuing REITs face relatively low cost of equity capital, allowing them to issue shares at relatively high price and lead investors to require smaller discount when buying shares. This is in line with liquidity service cost (floatation) reduction. As a consequence, those REITs who engage in real earnings management are less prone to market liquidity shocks, and investors will require a lower liquidity risk premium at and after the SEOs.

Meanwhile, we are aware that in our sample, there are observations with zero discounting, that is, firms simply set the offer price at the market price. To investigate the impact of real earnings management on this phenomenon, we specify the following probit test.

$$DisATM_{jt} = \alpha_0 + \alpha_1 REM_{jt} + Controls_{jt} + Time + \varepsilon \quad (9)$$

DisATM is a binary variable, indicating if the firm sets offer price at the market price.

Shown in Table 6, the coefficients of real earnings management proxies are all significant with predicted signs. Firms are more likely to set offer price at the market price if they engage in real earnings management prior to SEO.

As for other control variables, sentiment is positively related with SEO discounting level, consistent with behavioral explanations for seasoned equity offerings. Besides, Loderer et al. (1991) argue that many of IPO theories based on asymmetric information can be applied to seasoned equity offerings. Corwin (2003) provides analysis of these theories in the context of SEOs, whereas Goodwin (2013) examines the information asymmetry theories in the context of REITs SEO. All these theories predict positive relationship between the level of information asymmetry and discounting. The positive and significant relation between *InfoAs* and discounting is consistent with the reasoning, suggesting that our hypothesis is complementary to the time-varying adverse selection theories. Since the focus of our study is the impact of real earnings management on the dynamics of liquidity risk around SEO, the result indicate that managing liquidity risk via real earnings manipulation allows firms to lower their cost of capital at equity issuance.

Above all, empirical evidence shows that firms set the offer price at a lower discount after engaging in real earnings management as the result of liquidity service cost (floatation) reduction.

Robustness Test

Pre SEO Stock Valuation and Real Earnings Management

Another question associated with real earnings management is whether uninformed investors can see through the manipulation.

Market timing theory argues that firms time seasoned equity offerings either by selling the overpriced shares (window of opportunity/behavioural hypothesis) or by exploiting

Table 6 Real earnings management and SEO discounting (Probit Model)

| SEO Offering at the market price(=1) | | | | | | |
|--------------------------------------|------------------------|-------------------|---------------------|-------------------|---------------------|---------------------|
| | <i>Predicted Signs</i> | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
| <i>ABCFO</i> | – | | –15.23** (–2.35) | | | –15.95** (–2.47) |
| <i>ABEXP</i> | + | | | 7.150** (2.13) | | 7.181** (2.11) |
| <i>ABDISP</i> | – | | | | –6.645** (–2.06) | –6.610** (–2.04) |
| <i>Cash</i> | | 0.230 (0.12) | 0.239 (0.13) | 0.522 (0.27) | 0.395 (0.21) | 0.717 (0.37) |
| <i>Growth</i> | | 0.266 (0.75) | 0.364 (1.01) | 0.225 (0.63) | 0.233 (0.66) | 0.300 (0.82) |
| <i>ROA</i> | | –0.301 (–0.06) | –2.079 (–0.43) | 1.621 (0.33) | –2.296 (–0.47) | –2.361 (–0.46) |
| <i>SeqREIT</i> | | 0.042** (2.18) | 0.042** (2.22) | 0.038** (1.96) | 0.034* (1.73) | 0.031 (1.58) |
| <i>Uranking</i> | | –0.009 (–0.20) | –0.011 (–0.25) | –0.008 (–0.20) | –0.013 (–0.29) | –0.015 (–0.35) |
| <i>InfoAs</i> | | 0.137 (0.10) | 0.143 (0.10) | 0.153 (0.11) | 0.103 (0.07) | 0.066 (0.05) |
| <i>Sentiment</i> | | 0.014 (1.47) | 0.014 (1.53) | 0.008 (0.91) | 0.018* (1.94) | 0.014 (1.44) |
| <i>Number of Obs</i> | | 508 | 508 | 508 | 508 | 508 |
| <i>Pseudo R²</i> | | 0.0129 | 0.0226 | 0.0202 | 0.0198 | 0.0372 |

This table presents the result of testing the effects of real earnings management on SEO discounting. The dependent variable is binary variable, indicating if the firm sets the offer price at the market price. *ABCFO*, *ABEXP* and *ABDISP* are measures for real earnings management. The independent variables are *Cash*, *LogMB*, *Growth*, *ROA*, *SeqREIT*, *Uranking*, *InfoAs*, and *Sentiment* as defined in Appendix 1. Coefficients for the variables of interest are presented, and T-statistics are included in parentheses. *, ** and *** represent the 10%, 5% and 1% significance levels, respectively

the time-varying risk to minimize the cost of equity (the risk-trade off hypothesis). In light of real earnings management, the manager invests inefficiently by engaging in real earnings management activities (exercising the investment option too early) to attempt to fool the market into overestimating the project's NPV before seasoned equity issuance.

To examine the impact of real earnings management on misvaluation before SEO, we decompose pre-issue market-to-book (m-b) ratios into misvaluation (m-v) and growth opportunities (v-b) following the methodology developed by Rhodes-Kropf et al. (2005)¹¹ (RKR, thereafter), and utilized in several recent papers (Fu et al. 2013; Hertz and Li 2010; Hoberg and Phillips 2010). We analyze the relation between real earnings management and pre-issuance mispricing of SEO firms in the following multivariate model.

¹¹ See the Appendix 1.

$$PreMis_{jt} = \alpha_0 + \alpha_1 REM_{jt} + Controls_{jt} + Time + PropertyType + \varepsilon \quad (10)$$

REM are the three proxies for real earnings management.

Table 6 shows the results. The coefficients for real earnings management proxies are all significant with predicted signs. Real earnings management activities deviate stock price from the fundamental value, indicating that managers manipulate earnings to issue the equity at the expense of potential investors. The mispricing story hinges on the motivation for managers to take advantage of pre-existing exposures to systematic risks (liquidity, market). Intuitively, real earnings management brings about additional information of the issuer which would lead to information flow and liquidity trading, thereby push up stock price. Model’s explanatory power (adjusted R square) significantly increases after incorporating real earnings management variables. The signs on *Sentiment* are significantly and positively related with the level of mispricing, suggesting that our hypothesis on real earnings management is different from the market timing via the mispricing. Overall, our findings show that uninformed investors cannot see through the real earnings manipulation, lending support to window of opportunity/behavioural hypothesis of seasoned equity offerings. A stronger corporate governance and internal monitoring over the management team may help to mitigate real earnings management in REITs, as supported by the study by Anglin et al. (2013) who document that REITs engage in significant real activities manipulation, the effect of which are constrained by the corporate governance (Table 7).

SEO Long Run Performance and Real Earnings Management

In “Empirical Results” section, we show that real earnings management is attributable to good pre-filing stock performance and decreases liquidity service cost (floatation cost) in the short run. However, as real earnings management masks a firm’s current unbiased economic performance, it will endanger a firm’s competitiveness in the long term. Therefore, the impact of real earnings management on the long-run stock price becomes an empirical question.

We define long-run abnormal return as SEO risk adjusted return for 3, 6, and 12 months using Fama-French four factor model.

$$R_{i,t} = \alpha + r_{f,t} + \beta_{1t} [E(R_{m,t}) - r_{f,t}] + \beta_{2t} SMB + \beta_{3t} HML + \beta_{4t} UMD + \varepsilon \quad (11)$$

Where $R_{i,t}$ is the REIT’s rate of return, $r_{f,t}$ is the risk-free return rate, $R_{m,t}$ is the return of the stock market, SMB stands for return of “small minus big” portfolio, HML stands for return on “high book-to-market minus low book-to-market” portfolio, and UMD stands for momentum factor (MOM), which is long prior-month winners and short prior-month losers. We specify a following multivariate regression to test the impact of real earnings management on long-run returns.

$$Lret_{jt} = \alpha_0 + \alpha_1 REM_{jt} + Controls_{jt} + Time + PropertyType + \varepsilon \quad (12)$$

Shown in Table 8, we observe the lower long-run underperformance after seasoned equity offerings (Loughran and Ritter 1995) as real earnings management deviates firm from optimal business practice, which is consistent with previous findings on post-SEO

Table 7 Real earnings management and pre SEO valuation

| Pre SEO stock mispricing | | | | | | |
|-------------------------------|------------------------|--------------------|----------------------|--------------------|----------------------|----------------------|
| | <i>Predicted Signs</i> | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
| <i>ABCFO</i> | – | | –0.029*** (–3.70) | | | –0.024*** (–2.95) |
| <i>ABEXP</i> | + | | | 0.054*** (2.93) | | 0.053*** (2.94) |
| <i>ABDISP</i> | – | | | | –0.042*** (–3.34) | –0.033** (–2.58) |
| <i>Cash</i> | | –0.183 (–0.05) | –0.557 (–0.17) | –0.302 (–0.09) | 0.752 (0.22) | 0.131 (0.04) |
| <i>Size</i> | | 0.256 (0.51) | 0.214 (0.44) | 0.249 (0.51) | 0.767 (1.49) | 0.617 (1.21) |
| <i>LogMB</i> | | 1.057*** (2.59) | 1.176*** (2.91) | 1.132*** (2.79) | 1.091*** (2.70) | 1.253*** (3.14) |
| <i>Growth</i> | | 0.520 (0.69) | 0.454 (0.61) | 0.483 (0.65) | 0.360 (0.48) | 0.305 (0.42) |
| <i>ROA</i> | | –0.064 (–0.68) | –0.059 (–0.64) | 0.070 (0.67) | 0.027 (0.28) | 0.144 (1.37) |
| <i>SeqREIT</i> | | 0.129*** (3.94) | 0.119*** (3.68) | 0.124*** (3.81) | 0.121*** (3.72) | 0.110*** (3.41) |
| <i>Uranning</i> | | –0.022 (–0.26) | –0.013 (–0.16) | –0.021 (–0.25) | –0.039 (–0.47) | –0.027 (–0.33) |
| <i>InfoAs</i> | | –4.269 (–1.52) | –3.079 (–1.11) | –3.726 (–1.34) | –4.699* (–1.69) | –3.107 (–1.13) |
| <i>Sentiment</i> | | 0.553** (2.21) | 0.453* (1.83) | 0.589** (2.37) | 0.524** (2.12) | 0.485** (1.98) |
| <i>Constant</i> | | Yes | Yes | Yes | Yes | Yes |
| <i>Time fixed effect</i> | | Yes | Yes | Yes | Yes | Yes |
| <i>Property Type</i> | | Yes | Yes | Yes | Yes | Yes |
| <i>Number of Obs</i> | | 499 | 499 | 499 | 499 | 499 |
| <i>Adjusted R²</i> | | 0.119 | 0.143 | 0.133 | 0.138 | 0.168 |

This table presents the relationship between stock mispricing prior to issuance and real earnings management activities. Dependent variable is the mispricing level (*PreMis*) prior to SEO issuance. *ABCFO*, *ABEXP* and *ABDISP* are the measures for real earnings management. The independent variables are *Cash*, *Size*, *LogMB*, *Growth*, *ROA*, *SeqREIT*, *Uranning*, *InfoAs*, and *Sentiment* as defined in Appendix 1. Coefficients for the variables of interest are presented, and T-statistics are included in parentheses. *, ** and *** represent the 10%, 5% and 1% significance levels, respectively

underperformance on operating (Cohen and Zarowin 2010). Since the level of mispricing is greater for frequent equity issuers found in the previous analysis, the underperformance of stock return in the long run lines up with the market efficiency that post-SEO price corrects price based on how much real earnings management took place prior to SEO, which makes it difficult in profiting from inefficiency. The decline in the post-SEO stock price associated with the level of real earnings management is

Table 8 Real earnings management and SEO long run performance

| Long run risk adjusted stock return | | | | | | |
|-------------------------------------|----------|----------|-----------|-----------|----------|-----------|
| | 3 Month | | 6 Month | | 12 Month | |
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| <i>ABCFO</i> | | 0.911* | | 1.100* | | 2.124** |
| | | (1.85) | | (1.66) | | (2.38) |
| <i>ABEXP</i> | | -0.923** | | -1.653*** | | -1.985*** |
| | | (-2.41) | | (-3.21) | | (-2.82) |
| <i>ABDISP</i> | | 0.688** | | 0.843** | | 1.010* |
| | | (2.41) | | (2.19) | | (1.95) |
| <i>Cash</i> | 0.019 | 0.073 | 0.149 | 0.218 | 0.166 | 0.305 |
| | (0.12) | (0.45) | (0.68) | (1.00) | (0.56) | (1.03) |
| <i>Size</i> | 2.366*** | 2.167*** | 1.864** | 1.548* | 3.569*** | 3.201*** |
| | (3.56) | (3.27) | (2.08) | (1.73) | (2.89) | (2.61) |
| <i>LogMB</i> | -0.290 | -0.280 | 2.216 | 2.048 | 3.444 | 3.746 |
| | (-0.11) | (-0.11) | (0.64) | (0.59) | (0.73) | (0.80) |
| <i>Growth</i> | -1.532 | -1.488 | -2.196 | -1.980 | -7.292 | -7.616 |
| | (-0.40) | (-0.39) | (-0.42) | (-0.38) | (-1.03) | (-1.09) |
| <i>ROA</i> | -0.561 | -0.177 | -0.641 | -0.270 | -1.095 | -0.536 |
| | (-1.01) | (-0.30) | (-0.86) | (-0.34) | (-1.02) | (-0.48) |
| <i>SeqREIT</i> | 0.074 | 0.174 | 0.159 | 0.324 | 0.385 | 0.590 |
| | (0.35) | (0.82) | (0.56) | (1.14) | (0.99) | (1.52) |
| <i>Uranking</i> | -0.414 | -0.348 | -0.626 | -0.446 | -0.658 | -0.595 |
| | (-0.90) | (-0.74) | (-1.01) | (-0.70) | (-0.76) | (-0.69) |
| <i>InfoAs</i> | 0.621*** | 0.608*** | 0.893*** | 0.867*** | 0.992*** | 0.957*** |
| | (4.46) | (4.40) | (4.75) | (4.66) | (3.90) | (3.81) |
| <i>Sentiment</i> | -0.239** | -0.197** | -0.451*** | -0.400*** | -0.426** | -0.341** |
| | (-2.57) | (-2.10) | (-3.60) | (-3.17) | (-2.49) | (-1.99) |
| <i>Constant</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Time Fixed Effect</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Property Type</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Number of Obs</i> | 508 | 508 | 508 | 508 | 508 | 508 |
| <i>Adjusted R²</i> | 0.052 | 0.075 | 0.053 | 0.081 | 0.036 | 0.064 |

This table presents the effect of real earnings management on SEO long run adjusted return. The dependent variable is the post SEO adjusted return in 3 month, 6 month and 12 month. *ABCFO*, *ABEXP* and *ABDISP* are the measures for real earnings management. The independent variables are *Cash*, *Size*, *LogMB*, *Growth*, *ROA*, *SeqREIT*, *Uranking*, *InfoAs*, and *Sentiment* as defined in Appendix 1. Coefficients for the variables of interest are presented, and T-statistics are included in parentheses. *, ** and *** represent the 10%, 5% and 1% significance levels, respectively

also consistent with the real option explanation which predicts that SEO firms are less risky as growth options are converted to assets in place. Our SEO timing hypothesis argues that issuing firms time their SEOs with real earnings manipulation to periods of low liquidity risk.

Real Earnings Management and Accrual Earnings Management

Our hypotheses emphasize on the role of real earnings management on the cost of capital via the alleviated liquidity risk, which is different from the rationale using the accrual earnings management. First, unlike the accrual earnings management, the real earnings manipulation has the direct cash flow consequences, which change the ratio of the future cash flows to the covariance with the sum of all the cash flows in the market, i.e. the liquidity risk. Second, in contrast to the behavioural explanation that firms exploit overpricing via accrual based management, our results suggest that REITs employ real earnings management to alter the risk profile directly and minimize their cost of equity capital, which is not applicable to accrual based management. Third, REITs issuing SEOs are aggressive in manipulating FFO than earnings using the accrual management (Zhu et al. 2010), suggesting that cash flow plays an importance role in equity issuance, which is directly tied to real earnings manipulation. Fourth, considering that accrual earnings management is easily detected by the market and the market does not seem to overvalue the firms who engage in accrual management, REITs managers are less inclined to use the accrual based management.

In Table 9, we report the main results using the accrual based management using Modified Jones Model (1991) in addition to real earnings management proxies. As expected, all the coefficients on accrual based management are insignificant, supporting our hypotheses and rationales on the role of real earnings management.

Alternative Measures for Liquidity Risk and Trading Volume

We estimate the liquidity risk loadings by using the factors developed in Sadka (2006), which are based on the transitory-fixed and permanent-variable components of price impact. As for the abnormal trading volume, we measure the abnormal trading volume using 22 days (one month), 44 days (two months) prior to SEO as the event period in the unreported analysis. We further performed a difference-in-difference analysis based on REITs pre-SEO liquidity. All the result remains significant and robust.

Finally, we are mindful that the equity issuance clustering effect might bias our estimates. We address this issue by clustering error terms (Petersen 2009). We estimate our models after clustering standard errors in unreported analysis.

Conclusions

In this paper, we examine the impact of real earnings management activities on the REITs SEO process to revisit the window of opportunity and risk-return trade-off hypotheses debated in the literature. Particularly, we apply a recently developed liquidity-augmented asset pricing model to measure the liquidity risk for SEO REITs. We focus on firms' exposures to liquidity risk in relation to the level of real earnings management around SEO to (1) test the role of real earnings management in SEO timing, and (2) examine whether real earnings management will impact SEO REITs' stock performance.

We find that REITs managers engage in real earnings management to attract more uninformed trading in order to provide the liquidity services at lower cost during

Table 9 Accrual earnings management

| | Accrual Management | Abnormal Trading Prior to SEO(AV) | | SEO Discounting | | Pre-SEO Mispricing | |
|-------------------------------------|----------------------|-----------------------------------|----------------------|---------------------|----------------------|--------------------|----------------------|
| | Model 1 | Model 1 | Model 2 | Model 1 | Model 2 | Model 1 | Model 2 |
| <i>Accrual</i> | | -0.168 (-0.11) | 2.355 (1.57) | -8.694 (-0.81) | -10.89 (-1.02) | 2.328 (0.32) | 2.751 (0.38) |
| <i>ABCFO</i> | | | -6.927** (-2.37) | | 0.463** (2.02) | | -0.025*** (-2.86) |
| <i>ABEXP</i> | | | 0.143*** (3.54) | | -1.142*** (-3.94) | | 0.051*** (2.84) |
| <i>ABDISP</i> | | | -3.412*** (-3.84) | | 0.0225*** (3.20) | | -0.033*** (-2.59) |
| <i>Liquidity</i> | | 8.704*** (4.45) | 7.839*** (4.13) | | | | |
| <i>Liq_beta</i> | -0.484 (-0.91) | 0.816 (1.05) | 0.517 (0.68) | | | | |
| <i>Mkt_beta</i> | -0.186 (-1.01) | 0.171*** (3.69) | 0.157*** (3.48) | | | | |
| <i>Cash</i> | -0.325 (-0.15) | -0.201 (-1.40) | -0.179 (-1.27) | -8.270 (-1.43) | -7.276 (-1.28) | 0.312 (0.09) | 0.793 (0.24) |
| <i>Size</i> | 0.185** (2.00) | 0.0121 (0.06) | 0.0233 (0.13) | -0.124 (-0.52) | -0.198 (-0.84) | 0.216 (0.43) | 0.612 (1.19) |
| <i>LogMB</i> | -1.128*** (-3.18) | -0.006 (-0.34) | -0.003 (-0.18) | -1.373 (-1.46) | -1.051 (-1.14) | 1.083*** (2.64) | 1.284*** (3.20) |
| <i>Growth</i> | 0.361 (0.69) | 0.002 (0.22) | 0.001 (0.08) | -0.634 (-0.46) | -1.038 (-0.77) | 0.235 (0.31) | 0.104 (0.14) |
| <i>ROA</i> | 0.251*** (3.26) | 0.006 (0.30) | 0.015 (0.72) | 0.194 (0.97) | 0.127 (0.63) | -0.068 (-0.63) | 0.144 (1.24) |
| <i>SeqREIT</i> | -0.042 (-1.26) | 2.018*** (3.38) | 1.822*** (3.14) | 0.084 (1.12) | 0.114 (1.50) | 0.119*** (3.62) | 0.102*** (3.18) |
| <i>Uranking</i> | 1.152 (0.65) | 0.016*** (3.36) | 0.013*** (2.91) | -0.047 (-0.29) | -0.001 (-0.01) | -0.007 (-0.08) | -0.021 (-0.25) |
| <i>InfoAs</i> | 0.005 (0.42) | 8.704*** (4.45) | 2.355 (1.57) | 0.256 (0.06) | -0.357 (-0.09) | -4.131 (-1.47) | -2.892 (-1.04) |
| <i>Sentiment</i> | -0.484 (-0.91) | 0.816 (1.05) | -6.927** (-2.37) | -0.085** (-2.55) | -0.102*** (-3.08) | -0.035 (-1.62) | -0.007 (-0.29) |
| <i>Constant</i> | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Time effect</i> | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Property Type</i> | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>No. of Obs</i> | 499 | 499 | 499 | 499 | 499 | 499 | 499 |
| <i>Adjusted R²</i> | 0.075 | 0.258 | 0.309 | 0.012 | 0.053 | 0.112 | 0.159 |
| Long run risk adjusted stock return | | | | | | | |
| | 3 Month | | 6 Month | | 12 Month | | |
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | |

Table 9 (continued)

| | | | | | | |
|-------------------------------|--------------------|---------------------|--------------------|----------------------|--------------------|----------------------|
| <i>Accrual</i> | 13.97 (0.40) | 10.12 (0.29) | 34.32 (0.73) | 27.51 (0.59) | 28.83 (0.45) | 23.61 (0.37) |
| <i>ABCFO</i> | | 0.913* (1.86) | | 1.105* (1.67) | | 2.128** (2.38) |
| <i>ABEXP</i> | | -0.920** (-2.40) | | -1.644*** (-3.19) | | -1.980*** (-2.81) |
| <i>ABDISP</i> | | 0.685** (2.40) | | 0.836** (2.17) | | 1.003* (1.93) |
| <i>Cash</i> | 0.153 (0.09) | 0.070 (0.43) | 0.139 (0.64) | 0.211 (0.96) | 0.159 (0.54) | 0.299 (1.01) |
| <i>Size</i> | 2.342*** (3.50) | 2.150*** (3.23) | 1.805** (2.00) | 1.501* (1.67) | 3.511*** (2.82) | 3.154** (2.56) |
| <i>LogMB</i> | -0.324 (-0.13) | -0.304 (-0.12) | 2.131 (0.61) | 1.983 (0.58) | 3.399 (0.72) | 3.711 (0.80) |
| <i>Growth</i> | -1.337 (-0.34) | -1.349 (-0.35) | -1.717 (-0.33) | -1.601 (-0.31) | -6.892 (-0.97) | -7.292 (-1.04) |
| <i>ROA</i> | -0.631 (-1.09) | -0.229 (-0.37) | -0.814 (-1.04) | -0.411 (-0.50) | -1.220 (-1.10) | -0.641 (-0.55) |
| <i>SeqREIT</i> | 0.079 (0.38) | 0.178 (0.84) | 0.173 (0.61) | 0.334 (1.17) | 0.396 (1.02) | 0.598 (1.54) |
| <i>Uranking</i> | -0.400 (-0.87) | -0.338 (-0.71) | -0.592 (-0.95) | -0.419 (-0.66) | -0.629 (-0.72) | -0.572 (-0.66) |
| <i>InfoAs</i> | 0.620*** (4.45) | 0.607*** (4.39) | 0.889*** (4.73) | 0.864*** (4.64) | 0.989*** (3.89) | 0.954*** (3.79) |
| <i>Sentiment</i> | 0.230** (2.42) | 0.191** (1.99) | 0.431*** (3.35) | 0.384*** (2.97) | 0.409** (2.33) | 0.327* (1.86) |
| <i>Constant</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Time Fixed Effect</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Property Type</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Number of Obs</i> | 508 | 508 | 508 | 508 | 508 | 508 |
| <i>Adjusted R²</i> | 0.051 | 0.073 | 0.052 | 0.079 | 0.035 | 0.063 |

This table presents the effect of accrual earnings management on SEO performance. The dependent variable is *Accrual Management*, *Abnormal Trading Prior to SEO(AV)*, *SEO Discounting*, *Pre-SEO Mispricing* and the post SEO adjusted returns, respectively. *ABCFO*, *ABEXP* and *ABDISP* are the measures for real earnings management. The independent variables are *Liquidity*, *Liq_beta*, *Mkt_beta*, *Cash*, *Size*, *LogMB*, *Growth*, *ROA*, *SeqREIT*, *Uranking*, *InfoAs*, and *Sentiment* as defined in Appendix 1. Coefficients for the variables of interest are presented, and T-statistics are included in parentheses. *, ** and *** represent the 10%, 5% and 1% significance levels, respectively

seasoned equity offerings. We document that REITs with higher liquidity risk are more likely to manipulate earnings prior to equity offerings and uninformed trading is higher following real earnings management. Firms set the offer price at a smaller discount after engaging in real earnings management and stock returns decline in the long run. The findings are consistent with risk and market efficiency explanations. Overall, our study

focus on the effect of real earnings management on the dynamics of liquidity risk around SEO, demonstrating that managing the liquidity risk via real earnings manipulation allows firms to lower their cost of capital at equity issuance.

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Appendix 1 Rhodes-Kropf et al. (2005) (RKR) methodology

Rhodes-Kropf et al. (2005) (RKR) methodology estimates the firm value v by estimating both industry level accounting multiples and long run firm accounting multiples using the following equation.

$$m_{it} - b_{it} = m_{it} - v(\theta_{it}; \alpha_{jt}) + v(\theta_{it}; \alpha_j) - v(\theta_{it}; \alpha_j) + v(\theta_{it}; \alpha_j) - b_{it} \quad (13)$$

The first component $m_{it} - v(\theta_{it}; \alpha_{jt})$ measures the difference between market value and fundamental value estimated using firm-specific accounting data and the contemporaneous industry accounting multiples. This component is the mispricing proxy we use in this paper. The third component $v(\theta_{it}; \alpha_j) - b_{it}$ captures the growth opportunities.

To empirically separate mispricing component, RKR (2005) adopt three different models to estimate firm value. We adopt RKR’s 3rd model to estimate the market value as follows¹²:

$$m_{it} = \alpha_{0jt} + \alpha_{1jt}b_{it} + \alpha_{2jt}\ln(NI)_{it}^+ + \alpha_{3jt}I_{(<0)}\ln(NI)_{it}^+ + \alpha_{4jt}LEV_{it} + \varepsilon_{it} \quad (14)$$

Where m is market value of equity, b is a book value of equity, $\ln(NI)_{it}^+$ is the natural logarithm of positive net income, I is an indicator function for negative net income observations, and LEV is leverage ratio.

To calculate the REITs industry wide accounting multiples, we run cross-sectional regressions for the REITs industry to obtain the estimated REITs industry accounting multiples $\hat{\alpha}_{jt}$ for each year t .

Hence, the estimated firm value is obtained in the following equation.

$$v(b_{it}, NI_{it}, LEV_{it}; \hat{\alpha}_{0jt}, \hat{\alpha}_{1jt}, \hat{\alpha}_{2jt}, \hat{\alpha}_{3jt}) = \hat{\alpha}_{0jt} + \hat{\alpha}_{1jt}b_{it} + \hat{\alpha}_{2jt}I_{(<0)}\ln(NI)_{it}^+ + \hat{\alpha}_{3jt}LEV_{it} \quad (15)$$

If investors overestimate the future cash flows or underestimate risks, market-to-value will capture the mispricing component of the market-to-book ratio. The difference between market value m_{it} prior to SEO issuance and the estimated firm value $v(b_{it}, NI_{it}, LEV_{it}; \hat{\alpha}_{0jt}, \hat{\alpha}_{1jt}, \hat{\alpha}_{2jt}, \hat{\alpha}_{3jt})$ is our proxy for stock mispricing.

¹² The 1st model includes book value and the 2nd model includes net income in addition to book value. Our results remain robust to either of these models. RKR provides a detailed discussion of the rationale behind these models.

Appendix 2 Variable Definition

| Variable name | Definition | Data Sources |
|-----------------------------------|--|---------------------------|
| Panel A: Variables of interests | | |
| Abnormal Trading Prior to SEO(AV) | Abnormal trading volume prior to SEO using the standard event study method. | CRSP |
| SEO discounting | The (negative of) percentage difference between the offer price and the closing price on the prior trading day | COMPUSTAT |
| SEO Offering at the market price | Equals to 1, if the firm sets the offer price at the market price. | SDC |
| Panel B: Real earnings management | | |
| ABCFO | The actual CFO minus the normal level of CFO, which is estimated as a linear function of sales in the last period and change in revenue in the last period. | COMPUSTAT |
| ABEXP | The actual property operating expenses minus the normal level of property operating expenses, which is estimated as a linear function of contemporaneous revenue. | COMPUSTAT |
| ABDISP | Gain/Loss from the Sale of Property, Plant and Equipment and Investments minus the Gain/Loss, which is estimated as a linear function of market capitalization, fixed asset sales and capital expenditure. | COMPUSTAT |
| Panel C: Control variables | | |
| Mkt_beta | The market beta estimated from the liquidity-augmented CAPM model. | CRSP |
| Liq_beta | The liquidity beta estimated from the liquidity-augmented CAPM model, in which the liquidity factor is developed by Pástor and Stambaugh (2003). | CRSP |
| Liquidity | The Amihud illiquidity measure | CRSP |
| Cash | Cash and short-term investment over total assets | COMPUSTAT |
| Size | The nature logarithm of firm's market capitalization | COMPUSTAT |
| logMB | The logarithm of firms' market value divided by its book value in the most recent quarter | COMPUSTAT |
| Growth | percentage change of total assets from last period | COMPUSTAT |
| ROA | Net income over total assets | COMPUSTAT |
| SeqREIT | The current SEO sequence regarding the REIT itself to account for the clustering and frequency of SEO | SNL |
| Uranning | The underwriter reputation | SDC |
| InfoAs | The abnormal return around earning announcement releases as a proxy for information asymmetry | CRSP, COMPUSTAT |
| Sentiment | Investors' sentiment index constructed from University of Michigan's Consumer Sentiment Index, using the methodology described in Lemmon and Portniaguina (2006) | University of Michigan |
| Accrual | Aggregate accruals estimated by modified Jones Model (1991) | COMPUSTAT |

Appendix 3 Determinants of real earnings management for REITs during non SEO years

This table presents the result of determinants of real earnings management for REITs during non SEO years. Dependent variables are measures for real earnings management *ABCFO*, *ABEXP* and *ABDISP*, respectively. The variables of interest are *Liq_beta*. The independent variables are *Mkt_beta*, *Cash*, *Size*, *LogMB*, *Growth*, *ROA*, *InfoAs*, and *Sentiment* as defined in Appendix 1. Coefficients for the variables of interest are presented, and T-statistics are included in parentheses. *, ** and *** represent the 10%, 5% and 1% significance levels, respectively.

| | Abnormal CFO(<i>ABCFO</i>) | | Abnormal Operating Expense(<i>ABEXP</i>) | | Abnormal Asset Disposition(<i>ABDISP</i>) | |
|-------------------------------|------------------------------|---------------------|--|-----------------------|---|-----------------------|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| <i>Liq_beta</i> | | -0.315** (-2.06) | | 0.238*** (2.75) | | -0.055* (-1.68) |
| <i>Mkt_beta</i> | -0.008 (-0.17) | -0.077 (-1.50) | 0.207*** (8.28) | 0.249*** (8.52) | 0.003 (0.36) | -0.006 (-0.55) |
| <i>Cash</i> | -1.307** (-2.17) | -1.275** (-2.12) | 1.445*** (4.53) | 1.371*** (4.29) | 0.491*** (4.03) | 0.508*** (4.16) |
| <i>Size</i> | -0.045** (-2.51) | -0.045** (-2.50) | -0.065*** (-6.80) | -0.063*** (-6.59) | -0.043*** (-11.66) | -0.043*** (-11.76) |
| <i>LogMB</i> | -0.122** (-1.97) | -0.117* (-1.90) | 0.015 (0.47) | 0.018 (0.55) | 0.032** (2.53) | 0.031** (2.48) |
| <i>Growth</i> | 0.291*** (10.00) | 0.292*** (10.07) | -0.098*** (-6.36) | -0.097*** (-6.25) | -0.008 (-1.35) | -0.008 (-1.42) |
| <i>ROA</i> | -0.025 (-1.56) | -0.023 (-1.50) | -0.112*** (-13.45) | -0.111*** (-13.35) | -0.007** (-2.12) | -0.007** (-2.18) |
| <i>InfoAs</i> | 0.493 (1.24) | 0.375 (0.94) | -0.381* (-1.81) | -0.302 (-1.42) | 0.234*** (2.90) | 0.216*** (2.65) |
| <i>Sentiment</i> | 0.002 (0.81) | 0.002 (0.81) | -0.004*** (-2.59) | -0.004** (-2.57) | 0.002*** (3.92) | 0.002*** (3.91) |
| <i>Constant</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Time effect</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Property Type</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>No. of Obs</i> | 4442 | 4442 | 4442 | 4442 | 4442 | 4442 |
| <i>Adjusted R²</i> | 0.047 | 0.047 | 0.197 | 0.198 | 0.044 | 0.044 |
| <i>F Stat</i> | 13.90 | 13.91 | 64.94 | 61.84 | 13.00 | 12.44 |

Table 10 Descriptive statistics for REITs firms conducting SEOs during 2000–2011

| Variable | Obs | Mean | Std | P50 | P1 | P99 |
|-------------------------------------|-------|----------|--------|-------|--------|-------|
| Panel A: REITs SEO Characteristics | | | | | | |
| <i>Abnormal Trading(AV)</i> | 499 | 0.16 | 0.63 | 0.01 | -0.06 | 2.51 |
| <i>SEO Discounting(%)</i> | 509 | 1.69 | 4.64 | 0.59 | -5.82 | 17.67 |
| <i>SEO ATM</i> | 509 | 0.08 | 0.27 | 0 | 0 | 1 |
| <i>ABCFO</i> | 509 | -0.02 | 0.2 | -0.01 | -0.58 | 0.54 |
| <i>ABEXP</i> | 509 | 0.6 | 0.68 | 0.49 | -0.87 | 2.55 |
| <i>ABDISP</i> | 509 | 1.22 | 2.76 | 0 | -3.92 | 3.5 |
| <i>Liq_beta</i> | 509 | -0.06 | 0.7 | -0.05 | -1.41 | 1.71 |
| <i>Mkt_beta</i> | 509 | 0.01 | 0.17 | 0 | -0.41 | 0.78 |
| <i>Liquidity</i> | 499 | 0.03 | 0.02 | 0.27 | 0.01 | 1.12 |
| <i>Cash</i> | 509 | 0.03 | 0.05 | 0.02 | 0 | 0.22 |
| <i>Size</i> | 509 | 7.18 | 1.01 | 7.21 | 5 | 9.52 |
| <i>LogMB</i> | 509 | -0.66 | 0.29 | -0.63 | -1.65 | -0.13 |
| <i>Growth</i> | 509 | 0.09 | 0.17 | 0.04 | -0.05 | 0.98 |
| <i>ROA</i> | 509 | 0.61 | 1.14 | 0.59 | -2.83 | 4.17 |
| <i>SeqREIT</i> | 509 | 3.97 | 3.09 | 3 | 1 | 14 |
| <i>Uranging</i> | 500 | 8.18 | 1.39 | 9 | 0 | 9 |
| <i>InfoAs</i> | 499 | 0 | 0.05 | 0 | -0.13 | 0.13 |
| <i>Sentiment</i> | 144 | 0.13 | 6.40 | 1.13 | -16.61 | 12.84 |
| <i>Accrual</i> | 509 | 0.01 | 0.02 | 0 | -0.13 | 0.18 |
| Year | Freq. | Percent% | Cum.% | | | |
| Panel B: Time Distribution | | | | | | |
| 2000 | 3 | 0.59 | 0.59 | | | |
| 2001 | 29 | 5.71 | 6.30 | | | |
| 2002 | 28 | 5.51 | 11.81 | | | |
| 2003 | 50 | 9.84 | 21.65 | | | |
| 2004 | 47 | 9.25 | 30.91 | | | |
| 2005 | 39 | 7.68 | 38.58 | | | |
| 2006 | 59 | 11.61 | 50.20 | | | |
| 2007 | 25 | 4.92 | 55.12 | | | |
| 2008 | 35 | 6.89 | 62.01 | | | |
| 2009 | 60 | 11.81 | 73.82 | | | |
| 2010 | 69 | 13.58 | 87.40 | | | |
| 2011 | 64 | 12.60 | 100.00 | | | |
| Total | 508 | | | | | |
| | Freq. | Percent | Cum. | | | |
| Panel C: Property Type Distribution | | | | | | |
| Diversified | 50 | 9.84 | 9.84 | | | |
| Health Care | 83 | 16.34 | 26.18 | | | |
| Industrial/Office | 116 | 22.83 | 49.02 | | | |
| Lodging/Resorts | 69 | 13.58 | 62.60 | | | |
| Residential | 46 | 9.06 | 71.65 | | | |

Table 10 (continued)

| Variable | Obs | Mean | Std | P50 | P1 | P99 |
|--------------------|-----|-------|--------|-----|----|-----|
| Retail | 118 | 23.23 | 94.88 | | | |
| Self Storage | 9 | 1.77 | 96.65 | | | |
| Specialty | 17 | 3.35 | 100.00 | | | |
| Total | 508 | | | | | |
| Total Equity REITs | 119 | | | | | |

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