Interaction between and within EM measurements used by REITs

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Abstract

This is an empirical study investigating how various accrual and real earnings management (EM) measurements of Real Estate Investment Trusts (REITs) interact with each other and themselves in last accounting period. This research is based on a panel database containing financial information for all equity REITs in the U.S from 2000 to 2013. The findings through statistical test by performing GMM estimator include that: the magnitude of accrual EM in current accounting period is negatively correlated with itself in last accounting period, but the value of accrual EM in current accounting period is positively correlated with itself in last accounting period. These findings imply that capacity of using accrual EM by REITs is limited in short term (one to three accounting years). However, the direction of accrual EM is not constrained by the reversal effects of accrual EM which has been documented in pervious literature for firms who are suspected to have engaged in income-increasing EM. Moreover, the amount of real EM used by REITs is positively correlated with the magnitude of using accrual and real EM in last accounting period. This estimated result indicates that: different from accrual EM, the capacity of using real EM by REITs is not limited in short term. Moreover, REITs tend to increase the real EM approaches based on property transactions to make up the reduction of using accrual EM, if REITs over-use accrual EM in last accounting period. Furthermore, these findings also imply that the REIT is unique in terms of the strategy and motivation of using accrual and real EM, thus the EM used by REITs requires specific research.

Key words: Real Estate Investment Trusts, accrual earnings management, real earnings management, GMM estimator

Introduction

This empirical research investigates how various accrual and real earnings management (EM) measurements by REITs interact with themselves and other EM measurements in last accounting period. The financial disclosure behavior of listed firms has always been an important area of research in accounting and finance, because the research in this field can improve the market transparency and efficiency, and further reduce the risk of market

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failure. Moreover, as a sub field of financial disclosure behavior research, the issue of earnings management which is defined as the managerial approaches used to discretionarily influence the disclosed financial information (Healy, Paul and Palepu, 2001), has aroused increasing attentions and interests from both scholars and practitioners. According to main stream accounting literature, the EM can be further classified into two categories: accrual EM which is based on accrual item manipulation, and real EM which is based on business activities discretionary management. Literature has confirmed that accrual and real EM measurements are strongly correlated with themselves and other EM measurements in last accounting period (Zang. 2011; Baber, Kang and Li, 2011; Cheng and Warfield, 2005; Cohen et al., 2007). However, most of this existing literature only focuses on listed firms which are suspected have engaged in EM activities to increase earnings to meet analyst forecast. Thus the findings from this literature are likely to be inapplicable for REITs, because REITs are also motivated by other factors to engage in EM such as the incentives to fit in the REITs regulatory regime (Edelstein, 2007), and the EM behavior of REITs is strongly influenced by other factors from real estate market. Therefore, this research aims to close this gap by investigating the interaction between and within various EM measurements in the context of REITs.

The empirical test is based on a panel base containing accounting information for all equity REITs in the U.S from 2000 to 2012. The findings from empirical test include that : Firstly, the magnitude of accrual EM in current accounting period is negatively correlated with itself in last accounting period, but the value of accrual EM in current accounting period is positively correlated with itself in last accounting period. Moreover, the amount of real EM used by REITs is positively correlated with the magnitude of using accrual and real EM in last accounting period. These findings provide the following implications:

- The capacity of using accrual EM by REITs is limited in short term (one to three accounting years).
- The direction of accrual EM is not constrained by the reversal effects of accrual EM which has been documented in pervious literature for firms who are suspected to have engaged in income-increasing EM.
- Different from accrual EM, the capacity of using real EM by REITs is not limited in short term.
- REITs tend to increase the real EM approaches based on property transactions to make up the reduction of using accrual EM, if REITs over-use accrual EM in last accounting period
- Furthermore, these findings also imply that the REIT is unique in terms of the strategy and motivation of using accrual and real EM, thus the EM used by REITs requires specific research.

The findings and their implications above can help investors, auditors and regulators to better interpret the disclosed financial information of REITs, and further improve the REITs market transparency. Moreover, these findings and implications can also help researchers to improve their empirical research concerning the financial disclosure behavior of REITs. The rest of the paper is structured as following: Firstly, the knowledge gap will be identified by reviewing literature concerning the interaction between and within various earnings management, and then the hypothesis will be developed. Moreover, the econometrics technics used in the empirical test will be introduced, along with the construction of econometrics models. Furthermore, the statistical summary of the database and the estimated results will be presented, and the findings and implication will be summarized next.

Literature Review

Review on EM measurements

Earnings management was defined by Healy and Wahlen (1999) as: "Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers".

Moreover, in order to conduct empirical test for earnings management in research, scholars of accounting devised measurements to quantify the extent of using earnings management approaches by employing econometrics models. More details concerning these econometrics models will be provided in next chapter of Methodologies. Furthermore, these measurements of EM are classified into two categories: accrual EM measurements and real EM measurements. Accrual EM means the managers utilize discretionary judgment in handling the accrual items on the financial report of (Dechow, 1994; Jones, 1991). There are three measurements for accrual EM in this research; they are discretionary accrual, current discretionary accrual and long-term discretionary accrual which are corresponding to manipulation of total accrual, current accrual and long-term accrual on the financial report respectively (Dechow, 1994; Francis, 2005).

Furthermore, the real earnings management is defined as the managerial approaches which are discretionarily used in order to influence the financial report, rather than to cater for the need the needs of companies' development and operation (Roychowdhury, 2006). The measurements for real EM in this research include: abnormal Research and Development Expense, abnormal Selling, General and Administrative Expenses, abnormal gain or loss from property transactions, abnormal revenue and abnormal Cost of Goods Sold (COGS). Moreover, the items of Research and Development Expense, and Selling, General and Administrative Expenses are combined to form a new item: Expenditure to estimate the real EM measurement in this research, because the old two items are relative small in value on the financial report for REITs (Cohen et al., 2008; Roychowhury ,2006).

Besides the accrual and real EM measurements mentioned above, this research also calculates the abnormal Funds from Operation (FFO) as another measurement of EM for the U.S. REITs. In the U.S., REITs are required to disclose Funds from Operation (FFO) in their financial report. However, the calculation process of FFO is subject to the discretionary judgment of REITs managers, thus REITs managers are able to discretionarily influence the value of FFO reported to public (Vincent, 1999; Zhu et al., 2010; Anglin et al., 2013).

The paper of Zang (2011) has confirmed that the listed corporations need to trade off the usages between accrual earnings management and real earnings management, by taking into the cost of using EM approaches and the capacity of discretionary accrual manipulation into consideration. However, their research only focus on listed firms which are suspected to have engaged in EM approaches to meet the analyst forecast. Thus the implication of his research is limited because existing literature has proved that listed firms are motivated by other factors to engage in EM such as managers' compensation incentives (Bergstresser and Philippon, 2006). More importantly, REITs are also suspected to have engaged in EM to trim their financial report to fit in the REITs regulatory regime (Edelstein, 2007). Thus his research, which only focuses on listed firms which are suspected to engage in EM to reach analyst forecast, cannot provide explanation for the EM behavior used by REITs. Furthermore, the research of Zang (2011) only includes the discretionary manipulation of expenditure and production volume as two measurements for real earnings management. The abnormal gain or loss from property transaction, which is a very important real earnings management measurement for REITs, is not investigated in his research. Thus this research aims to close the knowledge gaps by investigating the interaction of different accrual and real EM approaches, especially the abnormal gain or loss from property transaction, in the context of REITs.

Moreover, existing research has confirmed the existence of Accrual EM revision effect which means that the usage of Accrual EM in the past constrains the magnitude of using Accrual EM in next period (Baber, Kang and Li, 2011; Cheng and Warfield, 2005; Cohen et al., 2007). However, their research mainly focuses on earnings-increasing EM approaches, but REITs are motivated by other factors such as complying REITs regulatory regimes to engage in EM. Thus the Accrual EM revision effect may not be applicable for REITs. Moreover, the impacts of Real EM used in past period in relation to Real EM used in current period have not been tested yet according to the author's knowledge. Thus this research aims to investigate these issues in the context of REITs.

As it was discussed above, the existing empirical research investigating the interaction between and within various EM measurements are conducted on the firms which are suspected to have engaged in earnings-increase incentives. However, REITs are motivated by other incentives to engage in EM such as incentives of reaching REITs regulatory regime requirements. Therefore, the time reversal effects of using Accrual EM approaches (Baber, Kang and Li, 2011; Cheng and Warfield, 2005; Cohen et al., 2007) and trade-off effects between Real and Accrual EM approaches (Zang ,2011) may not hold for the REITs. Moreover, discretionarily property transaction is an important Real EM approach used by REITs, but the interaction between Real EM approaches based on discretionarily property transaction and other EM measurements has not been tested. Thus this research, which investigates interactions between various EM measurements used by REITs, can close the above knowledge gaps. Furthermore, the empirical research in this section can also identify the factors influencing the financial behavior of REITs, so the impacts of regulatory factors on EM used by REITs can be better estimated.

Hypothesis development

As it was discussed above, listed firms need to trade off the usages between accrual EM and real EM based on expenditure and production manipulation, according to the relative cost of using different EM approaches (Zang, 2011). More importantly, Zang's research proves that listed firms tend to adjust the magnitude of accrual EM according to the previous unexpected outcome of Real EM based on expenditure and production volume manipulation. Besides discretionary manipulation of expenditure and production volume, Real EM based on property transaction manipulation is also an important EM approach used by REITs, because real estate asset transaction is one of the main business activities conducted by REITs. Thus the abnormal gain or loss from property transaction, which is a Real EM measurement, should be included into the research concerning the interaction between different EM measurements.

According to the research from Zang (2011), the Accrual EM approaches are used by listed firms to offset the unexpected outcome of using Real EM approaches based on expenditure and production volume manipulation. Thus similar correlation is expected to exist between Accrual EM approaches and unexpected outcome of using Real EM approaches based on property transaction manipulation. Therefore the magnitude of using Accrual EM approaches should be positively correlated with the magnitude of using previous Real EM approaches, because higher magnitude of using Real EM is more likely to induce more unexpected Real EM outcome.

H.1 The magnitude of using Accrual EM should be positively correlated with the magnitudes of various Real EM measurements in last accounting period.

Moreover, existing research has confirmed that the earnings-increasing Accrual EM approaches have revision effect because these approaches are based on shifting value of accrual items on financial reporting, so the effect of using AEM in current period will be offset by financial performance in the future (Baber, Kang and Li, 2011;Cheng and Warfield, 2005; Cohen et al., 2007). Moreover, accrual EM approaches does not create value for listed firms directly, and the accrual items manipulation capacity keeps constant in a business cycle. Furthermore, too aggressive accrual EM will arouse the notice of auditors. Thus although REITs may be motivated by factors other than earnings-increasing incentives to engage in accrual EM, the revisal effect of accrual EM should still hold for REITs. Therefore the author assumes that:

H.2 The magnitude of accrual earnings management measurements by REITs in current period should be negatively correlated with that in the past periods.

H.3 The value of accrual earnings management measurements by REITs in current period should be negatively correlated with that in the past periods.

Furthermore, the usage of Accrual EM by REITs is limited by the amount of Accrual EM used in previous periods because of the revision effect as mentioned above. Thus REITs are suspected to utilize the Real EM approaches to make up the reduction of using Accrual EM if the Accrual EM approaches are aggressively conducted in past accounting period. Therefore the author assumes that:

H.4 The magnitude of real earnings management used by REITs in current period should be positively correlated with the accrual earnings management used in the last accounting period.

Finally, Real EM approaches are different from Accrual EM approaches that Real EM is more difficult to be detected (Cohen, Dey and Lys, 2008), thus listed firms do not have to become conservative after they engage in real EM heavily. Moreover, the usage of Real EM is not based on the accrual items, so it is not constrained by the amount of accruals on the financial reports and limited by the business cycle. Therefore, I assume that:

H.5 The extent of real earnings management used by REITs managers in current period should be not negatively correlated with the real earnings management used in the past.

Methodologies

Estimation of accrual and real EM measurements

This section presents the models which are used to estimate the EM measurements for the U.S. REITs. These EM measurements include three accrual EM (discretionary accrual, current discretionary accrual and long-term discretionary accrual), four real EM (abnormal expenditure, abnormal gain or loss from property transactions, abnormal revenue and abnormal COGS) and abnormal Fund from Operation (FFO). Firstly, the abnormal FFO will be computed as the difference between the actual reported FFO and normal FFO, and the normal FFO is calculated by the below equation which is developed from previous literature (Zhu et al., 2010; Anglin et al., 2012).

$$\text{Normal FFO} = NI - EI - DO - GLPS + \text{Depreciation} \quad (1)$$

Where the NI is the net income, EI stands for the Extraordinary Item, DO is the discontinued operations and GLPS is the gain or loss from property sales. Furthermore, the abnormal FFO is equal to the difference of actual reported FFO and Normal FFO computed by equation (1). Moreover, the discretionary accrual is estimated by following models (2) and (3)

$$TA_{i,t}/A_{i,t-1} = \alpha_1 + \beta_1 \times (\Delta REV_{i,t}/A_{i,t-1}) + \beta_2 \times (PPE_{i,t}/A_{i,t-1}) + \varepsilon_{i,t} \quad (2)$$

$$NDA_{i,t}/A_{i,t-1} = \alpha_1 + \beta_1 \times (\Delta REV_{i,t} - \Delta REC_{i,t})/A_{i,t-1} + \beta_2 \times (PPE_{i,t}/A_{i,t-1}) \quad (3)$$

In these models, the Total Accrual (TA), which is calculated as the difference between income before extraordinary items and cash flow from operation, will be used as dependent variable in model (2) to estimate the coefficients α1, β1 and β2 which are incorporated into (3) to calculate the Non-Discretionary Accrual (NDA). Then the Discretionary Total Accrual (TDA) is computed as the difference between Total Accrual and Non-Discretionary Accrual (Dechow , 1994; Jones ,1991; Dechow, Ge, and Schrand, 2010). Furthermore, this research follows the methods from Dechow (1994) and Francis (2005) to estimate the current accruals as bellows:

$$TCA_{i,t} = \Delta CA_{i,t} - \Delta CL_{i,t} - \Delta Cash_{i,t} + \Delta STDEBT_{i,t} \quad (4)$$

$$TCA_{i,t}/A_{i,t-1} = \alpha_1 + \beta_1 \times CFO_{,i,t-1}/A_{i,t-1} + \beta_2 \times CFO_{i,t}/A_{i,t-1} + \beta_3 \times CFO_{i,t+1}/A_{i,t-1} + \beta_1 \times (\Delta REV_{i,t}/A_{i,t-1}) + \beta_2 \times (PPE_{i,t}/A_{i,t-1}) + \varepsilon_{i,t} \quad (5)$$

Where $TCA_{i,t}$ means the current accruals for company i in year t. $\Delta CA_{i,t}$ is the change of current asset compared to last period. $\Delta CL_{i,t}$ is the change in current liabilities. $\Delta Cash_{i,t}$ is the change in cash and $\Delta STDEBT_{i,t}$ is change in debt in current liabilities, and CFO stands for cash from operation. In these models, the total current accrual (TCA) computed in equation (4) is used as dependent variable in the equation (5). The error term in equation (5) stands for the abnormal current accruals which cannot be explained by the variation of cash flow and economic conditions of the companies, but the discretionary decision of management over the current accrual.

Then Long-term accrual is calculated as the difference between total accrual and total current accrual as below.

$$LA_{i,t} = TA_{i,t} - TCA_{i,t} \quad (6)$$

Furthermore, discretionary Long-term Accrual, which is the measurement of EM based on Long-term accruals, will be estimated by using the methods developed from Jones (1991) and Dechow (1994) where the Long-term Accrual scaled by last-period total asset will be used as dependent variable in the following model to estimate the discretionary long-term accrual which is the error term.

$LA_{i,t}/A_{i,t-1}= \alpha_1+\beta_1\times(\Delta REV_{i,t}/A_{i,t-1}) +\beta_2\times(PPE_{i,t}/A_{i,t-1}) +\varepsilon$ (7)

Finally, this research follows the methods from Roychowhury (2006) and Cohen et al. (2007), Gunny (2010) and Bartov (1993) to estimate the real EM measurement using following models:

$EXP_{i,t}/ A_{i,t-1}= \alpha_1 + \beta_1\times(1/ A_{i,t-1}) + \beta_2\times(REV_{i,t}/A_{i,t-1})+\beta_3\times(\Delta REV_{i,t}/A_{i,t-1}) + \beta_3\times Q_{i,t} +\varepsilon$ (8)

$GLPS_{i,t}/A_{i,t-1} =\alpha_1 + \beta_1\times(1/ A_{i,t-1}) +\beta_2\times REV_{i,t}/ A_{i,t-1} +\beta_3\times\Delta REV_{i,t}/ A_{i,t-1} + \beta_3\times Q_{i,t} +\varepsilon$ (9)

$REV_{i,t}/ A_{i,t-1} = \alpha_1 + \beta_1\times(1/ A_{i,t-1}) + \beta_2\times Q+\beta_3\times(\Delta REV_{i,t}/A_{i,t-1}) +\varepsilon$ (10)

$COGS_{i,t}/ A_{i,t-1} = \alpha_1 + \beta_1\times(1/ A_{i,t-1}) + \beta_2\times(REV_{i,t}/A_{i,t-1}) + \beta_3\times Q+\beta_4\times(\Delta REV_{i,t}/A_{i,t-1})+ \varepsilon$, (11)

The predicted error terms in these models are interpreted as real earnings management measurements such as abnormal expense (DEXP, which is the combination of Research and Development Expense and Selling, General and Administrative Expenses), abnormal gain/loss from property transaction (DGLPS), abnormal revenue (DREV) and abnormal cost of goods sold (DCOGS).

Interaction between and within EM measurements

Firstly, I construct the following model (12) to investigate if the level of using accrual EM approaches is affected by the magnitude of using real and accrual EM approaches in last accounting period. This estimated coefficients β_1 and β_p in the following model are corresponding to hypothesis H 2 and H1 respectively.

$Ln(abs(DA_{i,t})) = \alpha_o + \beta_1\times Ln(abs(DA_{i,t-1}))+ \sum\beta_K\times Ln(abs(OtherAEM_{K,i,t})) + \sum\beta_L\times Ln(abs(OtherAEM_{L,i,t-1})) + \sum\beta_N\times Ln(abs(REM_{N,i,t}))+ \sum\beta_P\times Ln(abs(REM_{P,i,t-1}))+ \sum\beta_m\times CON_{m,i,t}+ \varepsilon_{i,t}$ (12)

In the model (12), the "DA" stands for discretionary accrual, "OtherAEM" stands for the other two accrual EM measurements: discretionary current accrual and discretionary long-term accrual. "REM" stands for four Real EM measurements: abnormal expenditure, abnormal gain/loss from property transactions, abnormal revenue and abnormal COGS. The controlling variables "CON" include leverage ratio (LR), total asset size (TA), sales growth (SG), gross income change (GIC), return on assets (ROA), REITs type (Type) and Dummy variable "POR" indicating REITs which are suspected to utilize EM to comply with dividend payout ratio requirement (Edelstein, 2007). Moreover, prior accounting literature from Cohen et al. (2008) has documented the usage of EM approaches changes over time, thus the variable "Time" ,which is equal to the difference between the fiscal year and year "2000", is also included as a controlling variable. Furthermore, this research also includes a dummy variable "DGFC" to indicate it the observation is collected after the outbreak of GFC in 2007. All the EM measurements in models (12) are converted into logarithmic value of their absolute term, because volatilities of these EM measurements in absolute term after they are scaled by total asset size in last accounting period. Thus the volatilities of these EM measurements in absolute term can be enhanced after they are converted into logarithmic term, and further improve the estimation results.

Moreover, I build the following model (13) to investigate if the value of Accrual EM measurements by REITs in current period is affected by the value of Accrual EM in last period. The estimated coefficient β_1 in the model below tests for the hypothesis H.3.

$$DA_{i,t} = \alpha_o + \beta_1 \times DA_{i,t-1} + \sum\beta_K \times OtherAEM_{K,i,t} + \sum\beta_L \times OtherAEM_{L,i,t-1} + \sum\beta_N \times REM_{N,i,t} + \sum\beta_P \times REM_{P,i,t-1} + \sum\beta_m \times CON_{m,i,t} + \varepsilon_{i,t} \quad (13)$$

All the EM measurements in the model are in normal value, because the directions of Accrual EM measurements need to be considered in the test for the reversal effects of Accrual EM approaches. Furthermore, I construct the following four models (14) to (17) to research how the magnitude of using Real EM approaches are influenced by the magnitudes of using Real EM and Accrual EM in last accounting period. The estimated coefficients β_l and β_p in these following models are corresponding to Hypothesis H.5 and H.4.

$$Ln(abs(DEXP_{i,t})) = \alpha_o + \beta_1 \times Ln(abs(DEXP_{i,t-1})) + \sum\beta_K \times Ln(abs(OtherREM_{K,i,t})) + \sum\beta_L \times Ln(abs(OtherREM_{L,i,t-1})) + \sum\beta_N \times Ln(abs(AEM_{N,i,t})) + \sum\beta_P \times Ln(abs(AEM_{P,i,t-1})) + \sum\beta_m \times CON_{m,i,t} + \varepsilon_{i,t} \quad (14)$$

$$Ln(abs(DGLPS_{i,t})) = \alpha_o + \beta_1 \times Ln(abs(DGLPS_{i,t-1})) + \sum\beta_K \times Ln(abs(OtherREM_{K,i,t})) + \sum\beta_L \times Ln(abs(OtherREM_{L,i,t-1})) + \sum\beta_N \times Ln(abs(AEM_{N,i,t})) + \sum\beta_P \times Ln(abs(AEM_{P,i,t-1})) + \sum\beta_m \times CON_{m,i,t} + \varepsilon_{i,t} \quad (15)$$

$$Ln(abs(DREV_{i,t})) = \alpha_o + \beta_1 \times Ln(abs(DREV_{i,t-1})) + \sum\beta_K \times Ln(abs(OtherREM_{K,i,t})) + \sum\beta_L \times Ln(abs(OtherREM_{L,i,t-1})) + \sum\beta_N \times Ln(abs(AEM_{N,i,t})) + \sum\beta_P \times Ln(abs(AEM_{P,i,t-1})) + \sum\beta_m \times CON_{m,i,t} + \varepsilon_{i,t} \quad (16)$$

$$Ln(abs(DCOGS_{i,t})) = \alpha_o + \beta_1 \times Ln(abs(DCOGS_{i,t-1})) + \sum\beta_K \times Ln(abs(OtherREM_{K,i,t})) + \sum\beta_L \times Ln(abs(OtherREM_{L,i,t-1})) + \sum\beta_N \times Ln(abs(AEM_{N,i,t})) + \sum\beta_P \times Ln(abs(AEM_{P,i,t-1})) + \sum\beta_m \times CON_{m,i,t} + \varepsilon_{i,t} \quad (17)$$

The "DEXP", "DGLPS", "DREV" and "DCOGS" stand for abnormal expenditure, gain/loss from property transaction, revenue and COGS in these models. "OtherREM" stands for three Real EM measurements other than the dependent variable, and "AEM" stand for three Accrual EM measurements. The selection of controlling variable "CON" is same as models (12) and (13) above. Moreover, all the EM measurements are converted into logarithmic term of absolute value to improve the estimation results. Furthermore, the one-year lagged independent variables in these models are very likely to correlated with each other, and induce the problems of autocorrelation and endogeneity. Thus I will employ Generalized Method of Moments (GMM) to copy with these possible problems (Windmeijer, 2006). More detail concerning the GMM estimator will be provided in the following section.

Data description and statistical test results

All the models developed about will be performed on a panel dataset containing accounting information for all the U.S equity REITs from 2000 to 2013. All the EM measurements have been estimated by models (1) to (11) above will be presented in the following table (1), together with the controlling variables used in models (12) to (17) .

Table (1) Summary of EM measurements and controlling variable in models (12) to (17)

Variable	Description	Obs	Mean	Std. Dev.	Min	Max
Panel A: EM measurements						
DA	Discretionary Accrual	1612	0.01	0.14	-2.15	2.03
DCA	Discretionary Current Accrual	1656	0.00	0.55	-14.08	8.21
TLDA	Discretionary Long-term Accrual	1656	0.00	0.60	-13.14	12.94
DEXP	Discretionary Expenditure	1047	0.00	0.04	-0.78	0.24
DGLPS	Discretionary Gain/Loss from Property Sales	946	0.00	0.03	-0.20	0.78
DREV	Discretionary Revenue	1750	-0.02	0.26	-1.03	7.57
DCOGS	Discretionary COGS	1750	0.00	0.13	-2.84	2.58
DFFO	Discretionary Fund from Operation	815	18.82	54.68	-107.96	225.93
lnabsDA	Logarithmic term of DA in absolute value	1612	-4.21	1.31	-10.89	0.77
lnabsDCA	Logarithmic term of DCA in absolute value	1656	-3.28	1.31	-11.24	2.65
lnabsDLA	Logarithmic term of DLA in absolute value	1656	-3.27	1.31	-10.42	2.58
lnabsDExp	Logarithmic term of DEXP in absolute value	1047	-5.56	1.46	-13.04	-0.25
lnabsGLPS	Logarithmic term of DGLPS in absolute value	946	-5.25	1.22	-10.87	-0.25
lnabsDREV	Logarithmic term of DREV in absolute value	1750	-2.63	0.88	-12.17	2.02
lnabsCOGS	Logarithmic term of DCOGS in absolute value	1750	-3.90	1.23	-10.32	1.04
lnDFFO	Logarithmic term of DFFO in absolute value	809	2.15	2.88	-36.74	5.42
Panel B: Controlling variables						
DGFC	Dummy variable =1 if the observation is after 2007	2100	0.38	0.49	0.00	1.00
LR	Leverage ratio	2039	0.61	0.26	0.00	4.88
TA	Total asset	2039	2756.50	4092.07	0.18	32586
SG	Sales Growth	1751	31	191	-4403	3701
GIC	Growth Income Chang	1751	2	106	-1315	1342
ROA	Return on assets	2017	0.20	0.54	-0.08	21
PORS	Dummy variable indicating REITs which are suspected to utilize EM to comply with dividend payout ratio requirement	1869	0.02	0.12	0.00	1.00
office	Dummy variables indicating office type REIT	2100	0.19	0.39	0.00	1.00
retail	Dummy variables indicating retail type REIT	2100	0.27	0.44	0.00	1.00
residential	Dummy variables indicating residential type REIT	2100	0.19	0.39	0.00	1.00
hospital	Dummy variables indicating hospital and health care type REIT	2100	0.12	0.33	0.00	1.00
industrial	Dummy variables indicating industrial type REIT	2100	0.09	0.29	0.00	1.00
time	Dummy variables indicating hotel type REIT	2100	5.92	3.75	0.00	12.00

As the table above shows, the volatilities of EM measurements improve significantly after they are converted into logarithmic terms. Moreover, the correlation coefficients of these variables summarized above are presented in the following table (2).

Table (2) Pearson Correlation

	DA	DCA	DLA	DEXP	DGLPS	DREV	DCOGS	DFFO	LnDA	lnDCA	lnDLA	lnDEX	lnGL
DA	1.00												
DCA	0.33	1.00											
DLA	0.06	-0.92	1.00										
DEXP	-0.16	-0.15	0.10	1.00									
DGLPS	-0.21	0.01	-0.10	-0.13	1.00								
DREV	-0.30	-0.02	-0.10	0.39	0.68	1.00							
DCOGS	-0.44	0.07	-0.25	0.01	0.69	0.66	1.00						
DFFO	0.34	-0.02	0.16	-0.02	0.08	-0.05	-0.04	1.00					
lnabsDA	0.26	0.17	-0.08	0.00	0.14	0.17	0.04	0.21	1.00				
lnabsDCA	0.10	0.31	-0.28	-0.15	0.09	0.03	0.03	-0.05	0.09	1.00			
lnabsDLA	0.19	0.32	-0.26	-0.04	0.06	0.09	0.04	0.09	0.19	0.62	1.00		
lnabsDExp	0.11	0.09	-0.05	-0.16	-0.13	-0.07	-0.08	-0.03	0.10	0.19	0.20	1.00	
lnabsGLPS	-0.18	-0.02	-0.06	0.36	0.07	0.35	0.17	-0.11	0.06	0.01	0.05	0.02	1.00
lnabsDREV	0.09	0.03	0.00	-0.21	0.03	-0.13	0.05	0.06	-0.02	0.01	0.01	0.02	0.08
lnabsCOGS	0.08	0.07	-0.04	0.16	0.26	0.47	0.18	0.04	0.31	0.11	0.22	0.02	0.26
lnDFFO	-0.01	-0.13	0.14	0.14	0.16	0.00	0.12	0.30	0.03	-0.10	-0.02	-0.12	-0.12
DGFC	0.04	0.15	-0.14	-0.07	0.01	-0.08	0.13	0.06	0.03	-0.04	0.01	-0.11	-0.12
LR	-0.16	0.03	-0.09	-0.29	0.38	0.21	0.34	-0.10	0.06	0.03	0.02	0.07	-0.15
TA	0.03	-0.07	0.09	0.10	-0.06	-0.14	-0.02	0.11	-0.05	-0.11	-0.06	-0.08	-0.03
SG	0.08	-0.09	0.12	0.18	-0.01	-0.03	-0.19	0.16	0.10	0.06	0.02	0.00	0.02
GIC	0.26	-0.04	0.15	0.02	-0.09	-0.11	-0.17	0.23	0.13	-0.01	0.02	0.05	-0.01
ROA	-0.38	-0.09	-0.06	0.38	0.67	0.95	0.63	-0.06	0.19	0.06	0.10	-0.07	0.37
PORS	0.01	0.03	-0.03	-0.02	0.03	0.00	0.02	-0.02	0.00	0.02	-0.04	0.01	0.02
office	0.12	-0.05	0.11	-0.22	-0.04	-0.23	-0.06	0.07	-0.06	-0.01	0.01	0.06	-0.20
retail	0.09	0.10	-0.06	-0.08	-0.14	-0.24	-0.21	-0.05	-0.02	-0.06	-0.08	0.08	-0.12
residential	0.00	0.00	0.00	-0.02	-0.13	-0.07	0.02	0.00	-0.06	0.01	-0.01	-0.07	-0.10
hospital	0.00	-0.03	0.03	0.29	-0.20	0.01	-0.14	-0.03	0.08	-0.07	0.05	-0.05	0.24
industrial	-0.04	0.06	-0.08	-0.10	-0.05	-0.08	-0.03	0.05	0.01	0.04	-0.01	0.05	-0.09
time	0.11	0.11	-0.07	0.01	-0.08	-0.12	0.05	0.07	0.15	-0.04	0.05	-0.09	-0.07

	lnCOGS	lnDFFO	DGFC	LR	TA	SG	GIC	ROA	PORS	office	retail	residential	hospital
lnabsCOGS	1.00												
lnDFFO	-0.04	1.00											
DGFC	-0.06	0.10	1.00										
LR	0.00	-0.01	0.06	1.00									
TA	-0.18	0.27	0.17	-0.05	1.00								
SG	0.03	0.07	-0.05	-0.15	0.20	1.00							
GIC	-0.01	0.09	0.03	0.00	0.11	0.34	1.00						
ROA	0.44	0.02	-0.10	0.23	-0.15	0.04	-0.10	1.00					

PORS	-0.05	-0.01	0.04	-0.02	-0.01	0.00	0.01	0.01	1.00				
office	-0.10	0.12	0.04	0.02	0.08	-0.03	-0.04	-0.24	0.04	1.00			
retail	-0.15	0.05	0.00	0.08	-0.02	-0.11	0.09	-0.24	0.00	-0.31	1.00		
residential	-0.19	-0.04	-0.06	0.10	0.01	-0.03	-0.01	-0.10	-0.04	-0.19	-0.28	1.00	
hospital	0.22	0.00	-0.04	-0.20	0.03	0.15	0.01	0.02	-0.03	-0.17	-0.24	-0.15	1.00
industrial	-0.10	-0.14	0.06	-0.09	0.00	-0.09	-0.09	-0.09	-0.03	-0.15	-0.22	-0.14	-0.12
time	-0.05	0.14	0.75	-0.03	0.20	0.08	0.15	-0.12	0.02	0.03	-0.01	-0.07	-0.02

As the table above shows, the correlation coefficients are high for some variables. For example, the correlation coefficient between “ROA” and “DREV” is 0.95. Thus the strong correlation between independent variables, which is also known as multicolinearity, is very likely to induce estimation bias. Therefore, the variance inflation factor (VIF) statistics should be estimated to help to identify the independent variables suffers from multicolinearity, and reduce the problem by deleting these problematic variables. Then I can proceed to estimate the adjusted models with GMM estimator. The utilization of GMM estimator requires identification of endogenous variables which are significantly correlated with disturbance term in the models (Blundell et al., 2001). The problem of endogeneity will make the estimation of the coefficients bias and inconsistent, thus the problem should be fixed in estimation by identifying endogenous variables with Durbin-Wu-Hausement (DWH) test and then instrumenting endogenous variables with exogenous variables (Davidson and MacKinnon, 1993). In order to improve estimation efficiency, I only perform DWH test for the independent variables which are related to hypothesis H.1 to 5 in each model. The results of DWH test are present in the following table (3).

Table (3) Durbin-Wu-Hausement (DWH) test results for models (12) to (17)

	Model (12)	Model (13)	Model (14)	Model (15)	Model (16)	Model (17)
Ln(abs($DA_{i,t-1}$))	0.0028		0.6476	0.0129	0.7618	0.3557
Ln(abs($DEXP_{i,t-1}$))	0.5128		0.5232			
Ln(abs($GLPS_{i,t-1}$))	0.5128			0.0203		
Ln(abs($REV_{i,t-1}$))	0.5128				0.2588	
Ln(abs($COGS_{i,t-1}$))	0.5128					0.1008
$DA_{i,t-1}$		0.0018				

In the table (6.5.6) above, the variables with DWH test results lower than 0.05(significant at 5% level) are suffering from the disturbance of endogeneity, the others are considered as exogenous (Davidson and MacKinnon, 1993). Moreover, the controlling variables which have been tested in previous literature are considered as exogenous. Finally, the other EM measurements which have not been tested are considered as predetermined endogenous. In GMM estimation, the exogenous variables will be used as instrument variables, and the endogenous variable will be converted into one-year-lag term, and then be instrumented in GMM matrix. Furthermore, the predetermined endogenous variables will be directly instrumented in GMM matrix (Blundell et al., 2001). After testing problems of multicolinearity and endogeneity, I proceed to estimate these models using OLS, fixed effect and GMM estimators. The reasons why I include the OLS and fixed effect estimators into the research is that: the coefficients of lagged independent variables in OLS estimators suffer from individual effect which attributes the explaining power of individual effect to lagged independent variables. Thus the coefficients of independent variables are inflated in OLS estimator and can be used as upper-bound of the range that the unbiased value locates in. Moreover, the fixed effect model overcomes the problem of fixed effect but suffers from endogeneity which weakens the explaining power of lagged independent variables, thus the coefficients in fixed effect model can be used as lower-bound for robust check (Blundell et al., 2001). The good GMM estimations of coefficients for lagged independent variables should locate within the range of coefficients estimated by OLS and fixed effect estimators. The GMM estimators will be used in this research include one-step system GMM, two-step system GMM, one-step difference GMM and two step difference GMM. The tables (4) to (9) below present the estimation results for models (12) to (17). According to the regression results of models below, problems of autocorrelation and over-identification are not bothering the estimation for GMM estimators according to the results of Arellano-Bond test, Sargan test and Hansen test. Moreover, the individual effect test results indicate that the problem of individual effect is significant for models (12), (14), (16) and (17), suggesting that the coefficients in OLS estimator are inflated in these models. Furthermore, the estimated results for the key independent variables and statistical tests are presented in the following tables (4) to (9).

Table (4) Estimation results for model (12)

	OLS	Fixed	one-step Diff-GMM	two-step Diff-GMM	one-step Sys-GMM	two-step Sys-GMM
L1.lnDA	***0.261****	***-0.234***	***-0.346****	***-0.368***	***0.148***	***0.116***
	(3.040)	***(-1.820)***	***(-3.090)***	***(-1.830)***	***(1.300)***	***(0.950)***
lnDGLPS	-0.061	0.025	0.171	0.179	-0.080	-0.162
	(-0.550)	(0.160)	(1.110)	(0.750)	(-0.680)	(-0.950)
L1.lnDGLPS	***-0.018***	***-0.110***	***0.035***	***0.021***	***-0.085***	***-0.141***
	(-0.200)	***(-0.860)***	***(0.470)***	***(0.120)***	***(-0.690)***	***(-0.990)***
lnDEXP	0.030	-0.007	0.118	0.143	0.006	0.120
	(0.360)	(-0.060)	(1.180)	(1.000)	(0.060)	(1.100)
L1.lnDEXP	***-0.098***	***-0.073***	***-0.039***	***-0.038***	***-0.052***	***-0.125***
	(-1.140)	***(-0.620)***	***(-0.570)***	***(-0.340)***	***(-0.500)***	***(-0.980)***
lnDCA	0.000	-0.020	0.104	0.141	-0.015	-0.015
	(-0.010)	(-0.170)	(1.410)	(0.890)	(-0.180)	(-0.130)
L1.lnDCA	0.001	0.013	0.088	0.070	-0.039	-0.086
	(0.010)	(0.120)	(1.110)	(0.370)	(-0.590)	(-0.850)
lnDLA	0.158	0.015	0.130	0.181	0.180	0.187
	(1.810)	(0.110)	(1.370)	(0.860)	(1.500)	(1.050)
L1.lnDLA	0.121	0.073	0.068	0.040	0.081	0.122
	(1.530)	(0.700)	(0.880)	(0.290)	(0.970)	(1.250)
lnDREV	0.308	0.014	0.493*	0.483	0.275	0.340
	(1.620)	(0.040)	(1.900)	(0.850)	(1.060)	(0.910)
L1.lnDREV	***-0.408****	***-0.251***	***0.381***	***0.373***	***-0.498***	***-0.514***
	(-2.090)	***(-0.610)***	***(0.700)***	***(0.720)***	***(-1.650)***	***(-1.130)***

lnDCOGS	0.198**	0.362**	0.300**	0.205	0.417**	0.395**
	(1.990)	(2.570)	(2.000)	(1.390)	(2.500)	(1.960)
L1.lnDCOGS	***0.066***	***0.328****	***0.117***	***0.125***	***0.155***	***0.102***
	(0.650)	***(1.850)***	***(0.840)***	***(0.380)***	***(0.730)***	***(0.390)***
lnDFFO	-0.033	0.012	-0.036	0.001	-0.029	0.001
	(-1.060)	(0.120)	(-0.560)	(0.000)	(-0.510)	(0.010)
L1.lnDFFO	0.010	0.047	-0.009	0.032	0.016	0.037
	(0.350)	(0.540)	(-0.150)	(0.210)	(0.300)	(0.630)
… … …. …..	… …	… …	… …	… …	… …	… …
time	0.211**	0.273**	0.402***	0.351**	0.255**	0.242**
	(2.810)	(2.360)	(3.050)	(2.160)	(2.790)	(2.790)
Number of obs	176.000	176.000	83.000	83.000	176.000	176.000
Number of groups		87.000	53.000	53.000	83.000	87.000
Prob > F(chi2)	0.000	0.002	0.000	0.000	0.000	0.000
Adj R-squared	0.274	0.066				
Prob > F (individual effect test)		0.024				
Z for Arellano-Bond test AR(1)			-2.010	0.123	0.017	0.068
Z for Arellano-Bond test AR(2)			0.306	0.715	0.060	0.300
Sargan test(Prob > chi2)			0.010	0.101	0.000	0.000
Hansen test (Prob > chi2)			0.976	0.976	0.993	0.993

***Significant at 1% level
**Significant at 5% level
*Significant at 10% level

As it was discussed above, the unbiased estimation for the coefficients of "L1.lnDA" which is the one-year lagged magnitude of accrual EM usage, should be within or near the range from 0.261(coefficient of "L1.lnDA" in OLS estimator) to -0.234 (coefficient of "L1.lnDA" in Fixed effect estimator). Furthermore, only the coefficient of "L1.lnDA" in one-step difference GMM (-0.346) is significant at 1% level, but stays lower than the lower-bound (-0.234) estimated by fixed effect estimator. However, the coefficient in one-step difference GMM should still be chosen because the coefficient of "L1.lnDA" in fixed effect model is not significant, thus the "true" lower-bound could be lower than -0.234. Thus -0.346, which is the significant coefficient of "L1.lnDA" in one-step diff-GMM, could be a good estimation. Thus the estimated results of model (12) supports hypothesis H 2.

Furthermore, the coefficients of all lagged real EM variables ("L1.lnDGLPS", "L1.lnDEXP", "L1.lnDREV" and "L1.lnDCOGS") in GMM estimators are not significant. Thus these estimated results prove that the magnitude of using accrual EM is not significantly influenced by the magnitude of using real EM approaches in last accounting period. Thus these estimated results do not support the hypothesis H.1.

Table (5) Estimation results for model (13)

	OLS	Fixed	one-step diff-GMM	two-step diff-GMM	one-step sys-GMM	two-step sys-GMM
L1.DA	***0.280****	***-0.025***	***-0.098***	***-0.154***	***0.127*****	***0.134****
	(5.220)	***(-0.270)***	***(-1.150)***	***(-1.500)***	***(2.250)***	***(1.920)***
DCA	0.044**	0.084**	0.090***	0.079*	0.018	0.020
	(2.130)	(2.620)	(2.720)	(1.960)	(0.650)	(0.640)
DEXP	-2.107***	-4.894***	-4.686***	-5.006***	-2.173**	-2.146*
	(-2.860)	(-3.540)	(-3.480)	(-3.390)	(-2.270)	(-1.970)
DGLPS	-0.215	-0.733	-0.982	-1.315	-0.194	-0.208
	(-0.520)	(-0.950)	(-1.550)	(-1.620)	(-0.330)	(-0.310)
DCOGS	-0.577***	-0.779***	-0.716***	-0.765***	-0.648***	-0.648***
	(-6.530)	(-4.860)	(-3.500)	(-3.260)	(-4.400)	(-3.820)
DFFO	0.000***	0.000***	0.000***	0.000**	0.000***	0.000***
	(4.720)	(3.390)	(3.610)	(2.080)	(5.300)	(4.490)
L1.DLA	0.060***	0.010	-0.010	-0.021	0.035	0.037
	(3.410)	(0.400)	(-0.470)	(-0.710)	(1.660)	(1.410)
L1.DEXP	1.916**	0.538	0.560	0.279	2.073**	2.050
	(2.810)	(0.380)	(0.350)	(0.130)	(2.020)	(1.520)
L1.DGLPS	0.727**	1.360	1.167	1.397	0.895**	0.645
	(2.370)	(1.720)	(1.360)	(1.250)	(2.850)	(1.770)
L1.DREV	0.026	0.182	0.195	0.159	0.022	0.038
	(0.510)	(1.240)	(1.360)	(0.840)	(0.260)	(0.400)
L1.DCOGS	0.158	-0.076	-0.104	-0.121	0.051	0.055
	(1.620)	(-0.400)	(-0.600)	(-0.530)	(0.480)	(0.500)
L1.DFFO	0.000	0.000	0.000	0.000	0.000	0.000
	(-1.150)	(-0.780)	(-0.540)	(-0.330)	(0.270)	(0.430)
… … …	… …	… …	… …	… …	… …	… …
time	0.001	0.002	0.005	0.003	0.002	0.001
	(0.890)	(0.920)	(1.620)	(0.900)	(0.910)	(0.560)
_cons	-0.013	-0.009			-0.018	-0.015
	(-0.770)	(-0.230)	(0.000)	(0.000)	(-1.090)	(-0.770)
Number of obs	176.000	176.000	83.000	83.000	176.000	176.000
Number of groups		87.000	53.000	53.000	87.000	87.000
Prob > F(chi2)	0.000	0.000	0.000	0.000	0.000	0.000
Adj R-squared	0.677	0.459				
Prob > F (individual effect test)		0.372				
Z for Arellano-Bond test AR(1)			0.048	0.178	0.009	0.043
Z for Arellano-Bond test AR(2)			0.196	0.369	0.141	0.118
Sargan test(Prob > chi2)			0.023	0.023	0.000	0.000
Hansen test (Prob > chi2)			0.994	0.994	0.985	0.985

***Significant at 1% level
**Significant at 5% level

*Significant at 10% level

According to the regression results of model (13), the good estimation for coefficient of “L1.DA” in GMM estimators should be within the range of 0.280 (OLS) and -0.025 (fixed). Most of the four estimated coefficients of “L1.DA” in GMM are within this range except for two-step difference GMM (-0.154). Moreover, in these for coefficients, only the one in one-step system GMM is significant at 5% and within the reasonable range, thus it is chosen to interpret. According to one-step system GMM estimator, the discretionary accrual is positive correlated with that in last accounting period, and this result rejects the hypothesis H3.

Table (6) Estimation results for model (14)

	OLS	Fixed	One-step Diff-GMM	Two-step Diff-GMM	One-step Sys-GMM	Two-step Sys-GMM
L1.lnDEXP	***0.406****	***-0.141***	***-0.148***	***-0.160***	***0.268****	***0.254***
	(5.240)	***(-1.250)***	***(-2.610)***	***(-1.210)***	***(3.490)***	***(2.680)***
lnDA	0.029	-0.007	0.096	0.013	0.031	0.013
	(0.360)	(-0.060)	(0.880)	(0.060)	(0.370)	(0.230)
L1.lnDA	***0.040***	***-0.040***	***0.034***	***-0.024***	***0.082***	***0.098***
	(0.460)	***(-0.320)***	***(0.270)***	***(-0.130)***	***(0.960)***	***(1.050)***
lnGLPS	0.101	-0.038	-0.064	0.006	0.064	0.053
	(0.920)	(-0.250)	(-0.720)	(0.050)	(0.660)	(0.490)
L1.lnGLPS	0.076	-0.095	-0.051	-0.044	0.093	0.075
	(0.870)	(-0.770)	(-0.520)	(-0.480)	(1.110)	(0.870)
lnDCA	0.038	-0.134	-0.160**	-0.135*	0.028	0.030
	(0.470)	(-1.180)	(-2.770)	(-1.910)	(0.470)	(0.490)
L1.lnDCA	0.037	0.020	-0.026	-0.001	0.065	0.048
	(0.470)	(0.200)	(-0.200)	(-0.010)	(0.990)	(0.600)
lnDLA	0.092	0.015	-0.023	-0.002	0.084	0.080
	(1.070)	(0.110)	(-0.240)	(-0.020)	(1.140)	(1.200)
L1.lnDLA	-0.026	-0.070	-0.094	-0.073	-0.013	0.007
	(-0.330)	(-0.700)	(-0.640)	(-0.480)	(-0.240)	(0.180)
lnDREV	-0.162	-0.302	-0.455	-0.390	-0.111	-0.095
	(-0.860)	(-0.940)	(-1.840)	(-1.240)	(-0.830)	(-0.610)
L1.lnDREV	0.033	-0.748*	-0.772**	-0.911	-0.007	0.084
	(0.170)	(-1.920)	(-2.350)	(-1.460)	(-0.040)	(0.450)
lnCOGS	0.028	-0.018	0.026	0.097	0.028	0.024
	(0.280)	(-0.130)	(0.320)	(0.680)	(0.380)	(0.260)
L1.lnCOGS	-0.020	0.071	0.102	0.097	-0.034	-0.017
	(-0.200)	(0.410)	(0.710)	(0.410)	(-0.320)	(-0.190)
lnDFFO	-0.002	0.125	0.067	0.099	-0.010	-0.018
	(-0.070)	(1.390)	(1.220)	(1.470)	(-0.750)	(-1.260)
L1.lnDFFO	0.017	0.152	0.095**	0.115	0.016	0.001
	(0.590)	(1.850)	(2.140)	(1.880)	(0.850)	(0.060)
… … …	… …	… …	… …	… …	… …	… …

time	0.032	-0.243**	-0.214	-0.162	0.020	-0.026
	(0.420)	(-2.150)	(-1.860)	(-1.360)	(0.260)	(-0.310)
_cons	-1.928	-4.138			-2.704**	-2.519
	(-1.380)	(-1.670)	(0.000)	(0.000)	(-2.060)	(-1.680)
Number of obs	176.000	176.000	83.000	83.000	176.000	176.000
Number of groups		87.000	53.000	53.000	87.000	87.000
Prob > F(chi2)	0.000	0.140	0.000	0.000	0.000	0.000
Adj R-squared	0.194	0.008				
Prob > F (individual effect test)		0.018				
Z for Arellano-Bond test AR(1)			0.183	0.263	0.151	0.194
Z for Arellano-Bond test AR(2)			0.122	0.359	0.118	0.195
Sargan test(Prob > chi2)			0.045	0.045	0.000	0.000
Hansen test (Prob > chi2)			0.993	0.993	1.000	1.000

***Significant at 1% level
**Significant at 5% level
*Significant at 10% level

According to the regression results of model (14), the good estimation of coefficient for "L1.lnDEXP" should be within the range of 0.406 (OLS) to -0.141 (Fixed). Both the coefficients of "L1.lnDEXP" in One-step system GMM and two-step system GMM are within this range and significant at 1% and 5% level respectively, so they are chosen to interpret. The two selected coefficients are both positive, so the it is reckoned that the magnitude of using real EM based on expenditure manipulation is positively correlated with that in last period. This result is consistent with hypothesis H5. Furthermore, the coefficients of "L1.lnDA" in OLS, fixed effect and GMM estimators are all not significant, thus the magnitude of using accrual EM in the past does not significantly influence the real EM based on expenditure manipulation. This finding is not supporting hypothesis H4.

Table (7) Estimation results for model (15)

	OLS	Fixed	One-step Diff-GMM	Two-step Diff-GMM	One-step Sys-GMM	Two-step Sys-GMM
L1.lnGLPS	***0.373****	***0.084***	***0.013***	***0.103***	***0.371****	***0.346****
	(6.380)	***(0.850)***	***(0.100)***	***(0.900)***	***(4.950)***	***(3.140)***
lnDA	-0.033	0.015	0.115	0.165	-0.037	-0.032
	(-0.550)	(0.160)	(1.010)	(1.520)	(-0.690)	(-0.510)
L1.lnDA	***0.160***	***0.034****	***0.331***	***0.324****	***0.159***	***0.148****
	(2.520)	***(3.570)***	***(2.680)***	***(3.070)***	***(2.340)***	***(1.910)***
lnDCA	-0.064	-0.204**	-0.237**	-0.189	-0.067	-0.055
	(-1.060)	(-2.310)	(-2.490)	(-1.030)	(-1.140)	(-1.140)
L1.lnDCA	0.119**	0.042	-0.032	0.038	0.116	0.079
	(2.070)	(0.510)	(-0.600)	(0.310)	(1.490)	(1.010)
lnDLA	-0.097	-0.191	-0.208	-0.184	-0.080	-0.087
	(-1.510)	(-1.820)	(-1.750)	(-1.280)	(-1.270)	(-1.480)
L1.lnDLA	0.072	0.117	0.136	0.133	0.085	0.116
	(1.230)	(1.470)	(1.800)	(1.120)	(1.640)	(1.660)

lnDEXP	0.057	-0.025	-0.043	0.022	0.056	0.025
	(0.920)	(-0.250)	(-0.760)	(0.210)	(1.080)	(0.420)
L1.lnDEXP	-0.022	-0.067	-0.045	-0.018	-0.024	-0.015
	(-0.350)	(-0.730)	(-0.580)	(-0.140)	(-0.420)	(-0.290)
lnDREV	0.333**	-0.123	-0.361	-0.555	0.332	0.346**
	(2.400)	(-0.470)	(-1.760)	(-1.520)	(3.140)	(2.350)
L1.lnDREV	-0.149	-0.218	-0.617**	-0.342	-0.144	-0.124
	(-1.030)	(-0.680)	(-2.060)	(-1.020)	(-1.260)	(-0.800)
lnDCOGS	0.019	0.034	0.026	-0.006	0.018	0.021
	(0.260)	(0.290)	(0.410)	(-0.060)	(0.310)	(0.300)
L1.lnDCOGS	0.053	0.234	0.267	0.223	0.048	0.087
	(0.710)	(1.690)	(1.420)	(1.540)	(0.530)	(0.830)
lnDFFO	-0.030	-0.099	-0.024	-0.076	-0.031**	-0.030
	(-1.320)	(-1.370)	(-0.350)	(-1.040)	(-2.290)	(-1.620)
L1.lnDFFO	-0.017	-0.052	0.009	-0.036	-0.019	-0.006
	(-0.810)	(-0.770)	(0.150)	(-0.540)	(-0.800)	(-0.180)
… … …	… …	… …	… …	… …	… …	… …
_cons	-1.591	-1.704			-1.567	-1.178
	(-1.520)	(-0.840)	(0.000)	(0.000)	(-1.790)	(-0.880)
Number of obs	176.000	176.000	83.000	83.000	176.000	176.000
Number of groups		87.000	53.000	53.000	87.000	87.000
Prob > F(chi2)	0.000	0.000	0.000	0.000	0.000	0.000
Adj R-squared	0.474	0.151				
Prob > F (individual effect test)		0.107				
Z for Arellano-Bond test AR(1)			0.035	0.074	0.035	0.103
Z for Arellano-Bond test AR(2)			0.143	0.408	0.249	0.264
Sargan test(Prob > chi2)			0.010	0.010	0.000	0.000
Hansen test (Prob > chi2)			1.000	1.000	1.000	1.000

***Significant at 1% level
**Significant at 5% level
*Significant at 10% level

According to the table (7) above, the good estimated coefficient of independent variable “L1.lnGLPS” should be within the range of 0.373 (OLS) and 0.084 (Fixed effect). Moreover, the estimated coefficients of “L1.lnGLPS” in one-step and two-step system GMM are both significant at 1% level, and they are all positive and close to the coefficient estimated by OLS model. Thus the estimated coefficients of “L1.lnGLPS” in system GMM should be trusted. Therefore, the magnitude of using real EM approaches through property transactions should be significant and positively correlated with that in last accounting period. This result is consistent with hypothesis H 5. Furthermore, the good estimation of coefficient for independent variable “L1.lnDA” should be located within the range of 0.16 (OLS) and 0.034(Fixed). Moreover, the estimated coefficients in system GMM are positive, significant and within the range, thus they should be trusted. Therefore, the magnitude of using real EM approaches through property transactions should be significant and positively correlated with accrual EM in last accounting period. Thus the hypothesis H4 is supported.

Table (8) Estimation results for model (16)

	OLS	Fixed	one-step diff-GMM	two-step diff-GMM	one-step sys-GMM	two-step sys-GMM
L1.lnDREV	***0.756****	***-0.203***	***-0.404****	***-0.458****	***0.753****	***0.697****
	(13.140)	***(-1.350)***	***(-2.750)***	***(-2.410)***	***(16.090)***	***(6.220)***
lnDA	0.057	0.002	0.071	0.057	0.057	0.056
	(1.620)	(0.040)	(2.550)	(1.080)	(1.720)	(1.580)
L1.lnDA	***-0.012***	***0.092****	***0.108****	***0.104****	***-0.010***	***-0.010***
	(-0.300)	***(1.960)***	***(2.380)***	***(2.470)***	***(-0.250)***	***(-0.230)***
lnDCA	0.039	0.025	-0.016	0.013	0.047	0.043
	(1.100)	(0.570)	(-0.540)	(0.300)	(1.310)	(1.200)
L1.lnDCA	-0.065*	0.033	0.017	0.042	-0.057	-0.049
	(-1.930)	(0.830)	(0.560)	(0.870)	(-1.800)	(-1.760)
lnDLA	0.023	-0.071	-0.098***	-0.108**	0.018	0.025
	(0.620)	(-1.410)	(-3.720)	(-2.710)	(0.440)	(0.580)
L1.lnDLA	0.003	0.005	-0.031	-0.021	0.001	-0.020
	(0.090)	(0.130)	(-1.430)	(-0.650)	(0.030)	(-0.440)
lnDEXP	-0.031	-0.044	-0.047	-0.036	-0.030	-0.026
	(-0.860)	(-0.940)	(-1.340)	(-1.200)	(-1.080)	(-0.980)
L1.lnDEXP	0.019	-0.036	0.038	-0.023	0.019	0.013
	(0.510)	(-0.840)	(0.050)	(-0.480)	(0.540)	(0.340)
lnDGLPS	0.113**	-0.027	-0.057	-0.080	0.113**	0.115***
	(2.400)	(-0.470)	(-1.640)	(-1.050)	(2.640)	(3.500)
L1.lnDGLPS	-0.024	0.003	-0.018	-0.003	-0.024	-0.032
	(-0.640)	(0.060)	(-0.430)	(-0.060)	(-0.630)	(-0.830)
lnDCOGS	-0.017	-0.013	-0.036	-0.039	-0.018	-0.018
	(-0.400)	(-0.240)	(-1.270)	(-1.470)	(-0.580)	(-0.500)
L1.lnDCOGS	-0.034	0.076	0.036**	0.089	-0.033	-0.029
	(-0.770)	(1.150)	(2.050)	(1.840)	(-0.880)	(-0.630)
lnDFFO	-0.003	-0.031	-0.003	0.008	-0.003	0.002
	(-0.210)	(-0.910)	(-0.110)	(0.340)	(-0.290)	(0.310)
L1.lnDFFO	-0.007	-0.018	0.023	0.014	-0.007	-0.010
	(-0.560)	(-0.560)	(0.150)	(0.580)	(-0.890)	(-0.940)
… … ..	… …	… …	… …	… …	… …	… …
_cons	-1.159*	-2.916***			-1.128	-1.240
	(-1.910)	(-3.260)	(0.000)	(0.000)	(-1.570)	(-1.530)
Number of obs	176.000	176	83.000	83.000	176.000	176.000
Number of groups		87	53.000	53.000	87.000	87.000
Prob > F(chi2)	0.000	0.522	0.000	0.000	0.000	0.000
Adj R-squared	0.573	0.0593				

Prob > F (individual effect test)		0.0001				
Z for Arellano-Bond test AR(1)			0.042	0.299	0.183	0.227
Z for Arellano-Bond test AR(2)			0.391	0.584	0.201	0.264
Sargan test(Prob > chi2)			0.001	0.001	0.000	0.000
Hansen test (Prob > chi2)			1.000	1.000	1.000	1.000

***Significant at 1% level
**Significant at 5% level
*Significant at 10% level

According to the estimated model (16), the estimated coefficients of "L1.lnDREV" in system GMM estimators are positive, significant (1% level) and within the reasonable range between 0.756 (OLS) and -0.203 (Fixed effect). Thus they can be trusted to interpret. Therefore, the magnitude of magnitude of using real EM approaches through sales volume controlling should be significant and positively correlated with that in last accounting period. This result is consistent with hypothesis H 5. Furthermore, estimated coefficients of "L1.lnDA" in OLS estimator is not significant and consistent, thus the higher-bound of reasonable range that the good estimation of coefficient for "L1.lnDA" cannot be identified. Moreover, the lower-bound of the range is also not trustable as the F test and R-squared statistics for fixed effect model indicate above. Thus the correlation between abnormal revenue as a measurement of real EM through sales volume controlling and accrual EM in last account period cannot be estimated by the model above. Thus the hypothesis H.4 cannot be verified by the estimation results above.

Table (9) Estimation results for model (17)

	OLS	Fixed	one-step diff-GMM	two-step diff-GMM	one-step sys-GMM	two-step sys-GMM
L1.lnDCOGS	***0.363****	***-0.133***	***-0.155***	***-0.242***	***0.323****	***0.363****
	(4.670)	***(-0.890)***	***(-1.120)***	***(-1.450)***	***(3.940)***	***(3.110)***
lnDA	0.133*	0.250**	0.218*	0.171	0.185**	0.186**
	(1.990)	(2.570)	(1.850)	(1.270)	(2.870)	(2.660)
L1.lnDA	***0.067***	***0.143***	***0.125***	***0.133***	***0.136***	***0.109***
	(0.930)	***(1.330)***	***(1.460)***	***(1.290)***	***(2.160)***	***(1.720)***
lnDCA	0.093	0.078	0.074	0.131	0.087	0.105
	(1.380)	(0.800)	(0.730)	(1.170)	(1.430)	(1.330)
L1.lnDCA	0.050	0.115	0.142	0.203	0.049	0.045
	(0.770)	(1.300)	(1.390)	(1.290)	(0.890)	(0.630)
lnDLA	0.097	0.108	0.091	0.064	0.104	0.119
	(1.350)	(0.940)	(0.760)	(0.370)	(1.360)	(1.190)
L1.lnDLA	-0.028	-0.052	-0.075	-0.064	-0.013	0.012
	(-0.430)	(-0.600)	(-0.650)	(-0.550)	(-0.220)	(0.140)
lnDEXP	0.019	-0.013	0.026	0.042	0.017	0.015
	(0.280)	(-0.130)	(0.360)	(0.840)	(0.340)	(0.220)
L1.lnDEXP	-0.069	-0.072	-0.037	-0.061	-0.071	-0.058
	(-0.990)	(-0.740)	(-0.670)	(-0.580)	(-1.140)	(-0.720)
lnDGLPS	0.024	0.038	0.033	-0.037	0.008	0.022

	(0.260)	(0.290)	(0.410)	(-0.140)	(0.110)	(0.270)
L1.lnDGLPS	0.088	0.060	0.051	0.041	0.089	0.076
	(1.210)	(0.560)	(0.510)	(0.340)	(1.450)	(1.330)
lnDREV	-0.064	-0.066	-0.286	-0.225	-0.082	-0.083
	(-0.400)	(-0.240)	(-1.400)	(-0.590)	(-0.840)	(-0.640)
L1.lnDREV	0.081	-0.182	-0.315	-0.020	0.117	0.195
	(0.500)	(-0.530)	(-0.840)	(-0.060)	(1.050)	(1.360)
lnDFFO	-0.023	0.105	0.122	0.081	-0.027	-0.033
	(-0.910)	(1.360)	(1.320)	(0.800)	(-1.430)	(-1.370)
L1.lnDFFO	-0.008	0.090	0.103	0.058	-0.010	-0.021
	(-0.340)	(1.260)	(1.150)	(0.650)	(-0.380)	(-0.600)
… … …	… …	… …	… …	… ….	… …	… …
time	-0.125**	-0.217**	-0.174	-0.145	-0.150**	-0.154
	(-2.010)	(-2.240)	(-1.380)	(-0.760)	(-2.810)	(-1.800)
_cons	-0.144	-0.080			0.441	0.907
	(-0.120)	(-0.040)	(0.000)	(0.000	(0.440)	(0.480)
Number of obs	176.000	176.000	83.000	83.000	176.000	176.000
Number of groups		87.000	53.000	53.000	87.000	87.000
Prob > F(chi2)	0.000	1.190	0.000	0.000	0.000	0.000
Adj R-squared	0.470	0.283				
Prob > F (individual effect test)		0.027				
Z for Arellano-Bond test AR(1)			0.199	0.487	0.205	0.236
Z for Arellano-Bond test AR(2)			0.259	0.305	0.324	0.343
Sargan test(Prob > chi2)			0.008	0.008	0.000	0.000
Hansen test (Prob > chi2)			0.999	0.999	1.000	1.000

***Significant at 1% level
**Significant at 5% level
*Significant at 10% level

According to the estimation results, the coefficients of independent variable "L1.lnDCOGS" in system GMM estimators are within the reasonable range between 0.363 (OLS) and -0.133(Fixed effect). Moreover, the two coefficients are both positive and significant at 1% level. Thus the results prove that the magnitude of magnitude of using real EM approaches through sales volume controlling should be significant and positively correlated with that in last accounting period. This finding is consistent with hypothesis H5. Moreover, the estimated coefficients of "L1.lnDA" in OLS and Fixed effect estimators are not significant, thus the reasonable range that the good estimation for coefficient of "L1.lnDA" cannot be identified. Besides that, the estimated coefficient in one-step GMM is significant but lower than the lower-bound estimated by fixed effect estimator, and the rest of coefficients in other GMM estimators are not significant. Thus I conclude that the independent variable "L1.lnDA" is very likely to be not significantly correlated with dependent variable. Thus the hypothesis H.4 cannot be supported.

Summary and implications of interaction between EM by REITs

The finding s above are summarized and compared with the hypothesis H.1 to H.5 in the following table (10).

Table (10) Summary of findings

	abs(DA_{it})	DA_{it}	abs($DEXP_{it}$)	abs($GLPS_{it}$)	abs(REV_{it})	abs($COGS_{it}$)
absDA_{it-1}	H2:- Model12: – ***		H 4:+ Model 14:/	H 4:+ Model 15:+***	H.4:+ Model.16: ?	H.4:+ Model.17:/
abs$DEXP_{it-1}$	H1:+ Model 12: /		H 5: + Model 14: +***			
abs$GLPS_{it-1}$	H1:+ Model 12: /			H.5:+ Model.15:+***		
absREV_{it-1}	H 1:+ Model 12: /				H.5:+ Model.16:+***	
abs$COGS_{it-1}$	H 1:+ Model 12: /					H.5:+ Model.17:+***
DA_{it-1}		H 3: – Model 13:+**				

***Significant at 1% level
**Significant at 5% level
*Significant at 10% level
/Not significant
? Cannot be verified by this research

As the table above shows, the empirical test based on GMM estimator proves that the magnitude of using accrual EM is significantly (at 1% level) negatively correlated with the magnitude of accrual EM in last accounting period. Thus the hypothesis H2, which assumes that the usage of accrual EM by REITs is constrained by the usage of accrual EM in the past, is supported by this research. However, this empirical research finds that the magnitudes of using all real EM approaches are not significantly influencing the magnitude of using accrual EM in next accounting period. This research conflicts with hypothesis H.1which assumes that the REITs need to utilize accrual EM approaches to counterfeit the unexpected outcome of using real EM in the past as Zang (2011) found. One possible reason for the conflict is that the empirical research of Zang (2011) is based on a sample for firms which are suspected to have engaged in earning-increasing EM. However, REITs are motivated by other factors, such as meeting various regulatory requirements, to engage in EM. Thus the strategy of using EM by RETs should be different from other firms which engage in earnings-increasing EM.

Besides that, the estimation results for model (13) provide significant (at 5%) statistics evidence to prove that the value of discretionary accrual is positive correlated with itself in last accounting period. This finding contradicts with hypothesis H1.5.3 and accrual reversal effect documented by Baber, Kang and Li (2011), Cheng and Warfield (2005) and Cohen et al.(2007). Possible explanation is that the previous research concerning accrual reversal effect is based on the sample of listed firms which are suspected to have engaged in earnings-manipulation EM activities. However, REITs are motivated by other factors to engage in EM, thus the accrual reversal effects assumption may not hold for REITs. Therefore the accrual EM strategies used by REITs should be different from other listed firms.

Furthermore, estimation results of models (14) to (17) provide significant (at 1% level) statistical evidences to prove that the all real EM measurements using magnitudes are positively correlated with themselves in last accounting period. These results are consistent with hypothesis H.5, and imply that the amount of using real EM by REITs is not like that of accrual EM which is constrained by accrual items value and business cycle.

Finally, the estimated models (14) to (17) also prove that various real EM measurements exhibit different reactions to the magnitude of using accrual EM in last accounting period. Estimated models (6.5.3) and (6.5.6) found that the amount of using accrual EM in last accounting period does not impact the magnitude of using real EM based on expenditure and sales volume manipulation. However, the result of model (6.5.4) provide significant(at 1% level) evidence to prove that the higher amount of using accrual EM induce REITs to use more real EM based on property transaction discretionary controlling. This finding implies that if the REITs have used too much accrual EM in last accounting period, they will reduce the usage of accrual EM in next accounting period and turn to use more real EM based on property transaction discretionary controlling to make up the gap.

In conclusion, the estimated results prove that the estimated the amount of accrual EM by REITs is negatively correlated with itself in last accounting period, while the magnitudes of using all real EM by REITs are positively correlated with themselves in last accounting period. Moreover, the amount of real EM by REITs through discretionary property transaction is positively correlated with the amount of accrual EM in last accounting period. Therefore, future research concerning the impact of regulatory and non-regulatory factors on EM used by REITs should take the dynamic interaction between EM measurements into consideration.

Conclusion

This research investigates the dynamic interactions between and within accrual and real EM measurements by performing GMM estimators on a pane database containing financial information for equity REITs in the U.S from 2000 to 2013. The estimated results indicate that the magnitude of accrual EM in current accounting period is negatively correlated with itself in last accounting period, but the value of accrual EM in current accounting period is positively correlated with itself in last accounting period. Moreover, the magnitude of using real EM used by REITs is positively correlated with the magnitude of using accrual and real EM in last accounting period. These findings imply that the capacity of using accrual EM by REITs is limited in short term (one to three accounting years), and the direction of accrual EM is not constrained by the reversal effects of accrual EM which has been documented in pervious literature for firms who are suspected to have engaged in income-increasing EM. Moreover, different from accrual EM, the capacity of using real EM by REITs is not limited in short term. Furthermore, the REITs increase magnitude of using real EM approaches based on property transactions to make up the reduction of using accrual EM, if REITs over-use accrual EM in last accounting period.

These findings and implications emphasize that REITs are unique in terms of the strategy and motivation of engaging EM, thus the financial disclosure behavior of REITs requires specific research. Moreover, findings of this empirical study can help investors, auditors and regulators to better interpret the disclosed financial information of REITs, and further improve the transparency of REITs market. Furthermore, the conclusion of this research can also help future research to better investigate the financial disclosure behavior and quality of REITs.

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