Earnings Management and Agency Costs: Evidence from China

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Abstract

In this paper, we investigate the link between agency costs (AC) and earnings management (EM) using data of listed public companies in China from 1999 to 2014. We find a significant and positive relationship between AC and EM based on the static model that suggests opportunistic EM in China. However, we find an insignificant relationship between AC and EM when we use the dynamic model that takes into account the endogeneity issue. Therefore, our results provide further support to the growing literature on the concerns of endogeneity issues in corporate governance studies since failing to take these into account can lead to spurious results.

1. Introduction

Earnings are vital in the decision-making process by managers and companies' business activities. However, earnings may not always reflect the real picture because of earnings management (EM). EM is defined as "active manipulation of accounting results for the purpose of creating an altered impression of business performance" (Mulford & Comiskey, 1996, p. 360). EM activities are often motivated by management incentives, such as the ownership and management conflict (i.e., agency conflict). Agency costs (AC) occur in an effort to resolve agency conflicts and better align the interests of ownership and management. A high level of AC indicates inefficient monitoring activities and weak corporate governance (CG) (Jensen & Meckling, 1976; Shleifer & Vishny, 1997). Based on agency theory, Jiraporn, Miller, Yoon, and Kim (2008) posit that agency conflicts could induce managers to exploit the flexibility in accounting policies to manage earnings, and they find that EM mitigates AC in the US market.

In this paper, we examine the AC/EM nexus in China. We choose China for three reasons. First, the legal environment in China is relatively underdeveloped compared to the US and the other developed countries (Chen, Firth, Gao, & Rui, 2006). It is important to study how the AC/EM nexus differs in countries with relatively underdeveloped legal environment such as China, considering legal environment has significant implications for firm performance and corporate governance (e.g., La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998, 2002)

Second, differently from the western market, the Communist Party has a strong influence on CG in China. For example, the majority shareholder of listed companies in China is often the State; China's company law requires the Chinese companies to establish a supervisory board that typically includes officials from the company's internal Communist Party committee; and

senior management typically start their careers as government bureaucrats, and tend to have a different mindset to their counterparts in the developed markets (Chen et al., 2006) .

Third, China is important as the largest emerging economy and the largest recipient of foreign direct investment among developing countries (United Nations Conference on Trade and Development, 2017). The establishment of the Asian Infrastructure Investment Bank (AIIB) and implementation of the Belt and Road Initiative further boost the interests of foreign investors, financial institutions, multinational companies, and academics in Chinese economy. Therefore, it is important to study the CG issue in China to provide a better understanding for the interested parties.

To examine the AC/EM relationship, we employ both static and dynamic modelling frameworks. The prevalent endogeneity issue in CG studies often leads to spurious results (Wintoki, Linck, & Netter, 2012). By considering the dynamic nature of corporate governance and other sources of endogeneity (e.g., simultaneity, omitted variable, measurement error), we expect to achieve more reliable inferences about the causal relation between AC and EM. Based on the static model employed, we find that EM increases AC; however, the result of the dynamic model where the possible impact of historical AC on the current AC is fully controlled indicates no significant relation between AC and EM. Thus, our result casts doubt on a causal relation between AC and EM.

We contribute to the corporate governance literature in two ways. First, we extend the literature beyond developed markets by providing the first empirical evidence on the role of EM in agency conflicts in China and show that there is no significant relationship between AC and EM. Second, we provide further support to the growing literature that has raised concerns on endogeneity issue in CG studies (e.g., Pham, Suchard, & Zein, 2011; Schultz, Tan, & Walsh, 2010; Wintoki et al., 2012) since our results indicate that failing to take

endogeneity issues into account can lead to spurious results. The remainder of the paper is organized as follows: Section 2 provides the relevant literature on the relationship between AC and EM and discusses endogeneity issue in CG studies; Section 3 describes data and methods; Section 4 provides empirical results; and the final section concludes the paper.

2. Literature Review

2.1 Agency costs and Earnings management

The potential to adjust earnings numbers, either fraudulently or through astute use of financial reporting rules, is not a new phenomenon. Research on EM originates in the US market and dates back to the 1980s. For example, Healy (1985) finds that managers choose accounting procedure selectively in order to maximise the value of their compensation or bonus. EM activities are found prior to the period of the management buyout (e.g., Perry & Williams, 1994) and the period of an equity offering (e.g., Teoh, Welch, & Wong, 1998a, 1998b) to fit the stock market purposes. EM activities are also prevalent in the Chinese companies where managers manage earnings to meet certain regulatory benchmarks and accounting thresholds to obtain permission to issue shares (e.g., Chen & Yuan, 2004; Haw, Qi, Wu, & Wu, 2005; Kao, Wu, & Yang, 2009).

Several theories explain the rationale for EM. The most noteworthy are agency theory (Jensen & Meckling, 1976), stakeholders theory (Hill & Jones, 1992) and legitimacy theory (Preston & Post, 1981). According to agency theory, managers are motivated to undertake EM and resolve the agency problems. Hill and Jones (1992) extend agency theory and argue that managers act as the agent for all the interest-related parties not only for the owners; therefore, they are motivated to undertake EM activities to coordinate the nexus of various stakeholders. According to legitimacy theory, managers manage earnings to meet the expectation of the internal stakeholder and the public to acquire and maintain the legitimacy

of the firm (e.g., Djelic, 2001; Guler, Guillén, & Macpherson, 2002; Sun, Salama, Hussainey, & Habbash, 2010).

AC occurs through the separation between and divergence of ownership and management (Jensen & Meckling, 1976). The managers (i.e., agents) tend to be interested in pursuing their objectives, instead of always maximizing the benefits of the shareholders (i.e., principal). AC has been considered as one of the fundamental problems in improving the corporate governance mechanism (Shleifer & Vishny, 1997). Even in the advanced economies, such as the US market, where the governance mechanism is extensively studied, there is still ongoing debate on how to better align the owner-manager interests and to mitigate managerial expropriation (e.g., Bates, Kahle, & Stulz, 2009; Bebchuk, Cohen, & Ferrell, 2008; Harford, Mansi, & Maxwell, 2008; Lazonick & O'sullivan, 2000).

Agency problem is an important subject for CG in China (Clarke, 2003). Although China has borrowed the CG setups from the developed market, only the form of CG has been inherited not the substance (Backman, 1999). For example, unlike the widespread shareholders in the developed market, the ownership structure in Chinese listed companies is often State-concentrated. Previous studies in developed markets suggest that the managerial ownership may moderate agency conflict (e.g., Ang, Cole, & Lin, 2000; Singh & Davidson III, 2003). However, owner management is not a panacea for eliminating the agency problem (Schulze, Lubatkin, Dino, & Buchholtz, 2001). Especially in China, managers are rarely significant shareholders in listed companies[1] (Jiang & Kim, 2015), thus indicating serious agency problems (e.g., Lin, Ming & Xu, 2006; Xu, Zhu, & Lin, 2005).

[1] The State is a major shareholder in many public listed companies in China, managers/agents of the State-owned companies are often simply government officials (professional managers) appointed (hired) by the State, and they do not take responsibility for the results of business operations. In practice, government officials may as well pursue their welfare (e.g., job promotions or increases in salaries and other benefits) at the expense of the interests of the state (Lin, Ming, & Xu, 2006).

Management's incentive to change a firm's financial picture to become more favourable connects AC with EM. The practice of EM can bring reported earnings to the desired level, hence, it is natural for the managers to engage in EM to satisfy self-interest (Schipper, 1989; Scott, 1997). The case for a nexus between AC and EM has been strongly asserted in prior studies. For instance, based on agency theory, Lambert (1984) examines the impact of principal and manager relations on earnings and finds that the EM (income smoothing) incentives arise with the presence of AC. Dye (1988) argues that not only the agency conflict but also the perception of a potential investor about the firm value triggers EM. EM can be used to add information value, reduce information asymmetry, and mitigate AC (e.g., Arya, Glover, & Sunder, 2003; Louis & Robinson, 2005; Warfield, Wild, & Wild, 1995). However, EM can also be used opportunistically to deteriorate AC when managers undertake EM to benefit themselves (e.g., Bergstresser & Philippon, 2006; Dechow & Sloan, 1991; Guidry, Leone, & Rock, 1999; Healy, 1985; Holthausen, Larcker, & Sloan, 1995).

Despite the strong assertion on the linkage between AC and EM suggested in the literature, the empirical research on this issue is scant. To the best of our knowledge, Jiraporn et al. (2008) is the only study that empirically examines the relation between AC and EM, and they find that EM reduces AC in the US market. However, EM may also deteriorate AC when managers undertake EM to benefit themselves. Therefore, it is important to examine whether EM reduces or deteriorates AC in a country such as China with severe agency problems in spite of the concentrated State-ownership.

2.2 Endogeneity

It is widely acknowledged that the endogeneity issue is pervasive in empirical corporate finance studies. "The combination of complex decision processes facing firms and limited information available to researchers ensures that endogeneity concerns are present in every

study" (Roberts & Whited, 2012, p. 6). Endogeneity results in biased and inconsistent parameters that make regression estimators unreliable (e.g., Schultz et al., 2010; Wintoki et al., 2012).

Raheja (2005), and Harris and Raviv (2008) argue that there is a dynamic nature inherent in the corporate governance circumstances, the past corporate governance characteristics tend to be carried forward, which lead to an impact on the current CG characteristics. Similarly, Wintoki et al. (2012) propose that, despite omitted variable and simultaneity, the dynamic nature inherent in CG as a source of endogeneity is often ignored. Thus, the assumption of governance variables' current values completely independent of past value is not realistic. Therefore, Wintoki et al. (2012) suggest the dynamic panel Generalised method of moments (GMM) estimator to capture the influence of lagged dependent variable on the current outcome by including lagged dependent variables as explanatory variables.

The two-step system GMM was developed by Blundell and Bond (1998), and considered as the most feasible solution for endogeneity issues in a dynamic panel setting (e.g., Antoniou, Guney, & Paudyal, 2008; Schultz et al., 2010). The advantages of the dynamic panel GMM estimator are three-fold. First, the dynamic panel GMM estimator accounts for the firm-specific fixed effect to mitigate the unobservable heterogeneity (Blundell & Bond, 2000). Second, the dynamic panel GMM estimator accounts for the impact of past dependent variable values on the current values to keep only exogenous attributes. The third advantage relates to the instrument. In the traditional instrumental variable approach, it is difficult to find proper external instruments in CG studies (Flannery & Hankins, 2013). The dynamic panel GMM estimator utilizes some combination of variables from the entity's history as valid instruments. Therefore, for the dynamic panel GMM estimator, the instruments are internal, that is already contained in the panel data, and thus more convenient compared to

the traditional instrumental variable approach where valid external instruments are never an easy task to find.

3. Data and Methods

We collected data from two sources, the Chinese Stock Market and Accounting Research (CSMAR) and DataStream International over the period of 1999 to 2014[2]. Consistent with previous literature, we exclude finance and banking industries where the liquidity and governance can be influenced by different regulatory factors (e.g., Bauer, Frijns, Otten, & Tourani-Rad, 2008; Dittmar & Mahrt-Smith, 2007). Since the computation of statistic parameters can be heavily influenced by extreme values, we winsorize all the variables at 97.5 percent and 2.5 percent.

3.1 Measurement of agency costs

Ang et al. (2000) and Singh and Davidson III (2003) use the asset utilization ratio to measure AC. They argue that the asset utilization ratio evaluates the efficiency of how a company's asset is being used by managers. In other words, the asset utilization ratio indicates managerial effectiveness by measuring the relationship between a firm's investment or input (assets) and the manager's output (sales or income). AC is inversely related to the asset utilization ratio. A weak asset utilization ratio implies a manager's poor output (sales), and hence poor managerial effectiveness with higher AC. McKnight and Weir (2009) argue that the ratio of assets utilization as a proxy for AC has many potential drawbacks. For example, total sales do not represent the managers' output or ability to create value because sales are not always generated from profitable activities. However, the assets utilization ratio still

[2] CSMAR and DataStream do not share company code; these two databases have a very different code for the same company; at the same time, both databases have a distinct code for each company. To merge the CSMAR and DataStream data, we combined the CSMAR company code and DataStream company code by the unique full name of the company.

provides a useful indicator to detect agency conflict. Thus, we will employ the asset utilization ratio as the first proxy to gain an insight into agency conflict.

$$\mathrm{AC}_{\mathrm{asset\_utilisation}} = \frac{\text{Annual Sales}}{\text{Total Assets}}$$

In addition, we use SGA expenses standardized by total assets as the second proxy for agency conflict, aligning with Singh and Davidson III (2003). SGA expenses refer to the selling, general, and administrative expenses reported on firms' income statements. Since SGA expenses occur as a non-production cost, a high level of SGA expenses is considered a sign of poor managerial effectiveness. Without being assigned to the cost of products, SGA expenses, as a percentage of total sales, indicate whether managers are spending firms' resources efficiently or wasting valuable cash flow. Thus, a high percentage of SGA expenses in total sales reflects a severe agency conflict.

$$\mathrm{AC}_{\mathrm{SGA}} = \frac{\text{SGA expenses}}{\text{Total Sales}}$$

3.2 Measurement of earnings management

To examine whether US companies manage earnings for import relief benefits, the Jones (1991) Model uses discretionary accruals as a measurement of EM, and has been employed by standard accounting literature (e.g., Kasznik, 1999; Klein, 2002; Teoh et al., 1998a).

By evaluating accrual-based models for perceiving EM, Dechow, Sloan, and Sweeney (1995) claim that a modified version of the Jones (1991) Model is the most efficient and robust. We follow the Modified Jones Model approach (Dechow et al., 1995), and estimate the discretionary accruals as the proxy for EM level.

Discretionary accruals (DA) can be estimated using time-series or cross-sectional approaches. Both time-series approach and cross-sectional approach are subject to some disadvantages.

For example, time-series analysis requires a relatively longer length of observation periods to obtain reliable parameter estimates for a linear regression (DeFond & Jiambalvo, 1994). Another disadvantage of the time series approach is that the variables used in time series estimation and the generated coefficient may not be stationary. The disadvantage of the cross-sectional approach is that it assumes the coefficients are same for all firms within a particular year and a particular industry (Kasznik, 1999). Following the literature (e.g., Cohen, Dey, & Lys, 2008; DeFond & Jiambalvo, 1994; Kasznik, 1999), we employ both time-series and cross-sectional approaches to estimate DA that acts as the proxy of EM.

The DA estimated for the firm is a proxy for the quality of the firm's earnings. A large absolute value of DA indicates active EM behaviour, while the signs of DA indicate the strategy adopted by firms (Ding, Zhang, & Zhang, 2007). Positive DA show maximisation of earnings, negative DA show minimisation of earnings. Following the literature (e.g., Bartov, Gul, & Tsui, 2000; Cohen et al., 2008; Jiraporn et al., 2008; Warfield, Wild, & Wild, 1995), we employ the unsigned absolute value of DA to capture the extent of EM. The DA from a modified Jones model has been employed as a proxy for EM in the developed markets (e.g., Dechow et al., 1995; Kasznik, 1999; Klein, 2002; Kothari, Leone, & Wasley, 2005). In order to better capture the non-operation related EM in emerging markets, the ratio of non-operating income to sales is applied as EM proxy in addition to DA, following Ding et al. (2007) and Bertrand, Mehta, and Mullainathan (2002).

3.3 Control variables

We employ several internal CG factors as control variables. In general, CG is viewed as a system of rules and factors that organizes and controls a company's daily operation and pertains to the firm as a nexus of contracts (Gillan & Starks, 1998). For a firm to perform competitively and enter the international capital market, good corporate governance is vital.

An internal CG mechanism that more closely relates to the company's management plays an especially important role in monitoring and constraining agency conflicts.

Following the prior literature, we include (i) board independence (e.g., Lipton & Lorsch, 1992; Reddy, Locke, & Scrimgeour, 2010; Rosenstein & Wyatt, 1990); (ii) board size (e.g., Eisenberg, Sundgren, & Wells, 1998; Muth & Donaldson, 1998; Sonnenfeld, 2002); (iii) CEO duality (e.g., Sundaramurthy, Mahoney, & Mahoney, 1997; Yan Lam & Kam Lee, 2008); (iv) leverage (e.g., Grossman & Hart, 1982; Jensen, 1993); and (v) firm size (e.g., Baker & Hall, 2004; Black, Jang, & Kim, 2003; Klapper & Love, 2004), as independent variables. To control for unobserved heterogeneity and to alleviate the potential bias caused by omitted variables, we include industry dummy, stock exchange dummy and year dummy in the model. The definitions and acronyms of the variables used are summarised in Table 1.

<Table 1 about here>

3.4 Model specification

Jiraporn et al. (2008) use AC as one of the variables to explain EM. We examine the causality relationship between AC/EM using the Granger causality test[3], and find that the causality relation occurs in both directions (see Appendix Table A2). Since our objective is to examine the impact of EM on AC, we use AC as the dependent variable. First, we employ the following static model:

[3] The Granger causality test requires the data to be stationary, or in the other words not possessing any unit roots, prior to the causality analysis. Therefore, we conducted a unit root test prior to the Granger causality test, and the result of the unit root test indicates stationary data. The result of the unit root test is available in Appendix Table A1.

$$AC_{it} = a_0 + a_1 EM_{it} + a_2 board\_size_{it} + a_3 board\_independence_{it} + a_4 leverage_{it}$$
$$+ a_5 firm\_size_{it} + a_6 CEOduality + stock\ exchange\ dummy$$
$$+ industry\ dummy + year\ dummy + \varepsilon$$

Where: i indexes firms in sample and t indexes time;

Schultz et al. (2010) and Wintoki et al. (2012) suggest that a dynamic model, where lagged performance is used as one of the explanatory variables, should be the appropriate empirical model in the context of internal corporate governance research. In order to capture the impact of the past corporate governance characteristics, following Wintoki et al. (2012), we firstly added two lags of dependent variables and found that the coefficients on the second lag were not statistically significant. Therefore, we added 1-year lagged dependent variable as one explanatory variable. The dynamic model is described as follows:

$$AC_{it} = b_0 + b_1 AC_{it-1} + b_2 EM_{it} + b_3 board\_size_{it} + b_4 board\_independence_{it}$$
$$+ b_5 leverage_{it} + b_6 firm\_size_{it} + b_7 CEOduality$$
$$+ stock\ exchange\ dummy + industry\ dummy + year\ dummy + \varepsilon$$

Where: i indexes firms in sample and t indexes time.

4. Empirical Results

4.1 Summary statistics

Table 2 reports the summary statistics of the key dependent and independent variables of the winsorized levels data. The mean of ACasset suggests, on average, the companies in the sample generate about 62 percent of total assets as annual sales. The mean of ACsga suggests that, on average, 16 percent of total assets were spent on the selling, general, and administrative expenses in our sample. The average of time-series DA (EM1) is -24.30, which is similar to the average of cross-sectional DA (EM3). The mean of EM2 suggests, on

average, 1.61 percent of total sales are income from non-operating activities. The maximum (minimum) board size shows that that the largest (smallest) board in the sample contains 19 (3) members. The summary statistics of board independence show that the maximum (minimum) number of independent directors on board in percentage is 44 percent (0 percent). The leverage mean of our sample is 47 percent, indicating that firms on average have almost an equal amount of debt to equity. The mean of dummy variable CEO duality is about 20 percent, suggesting that only a small number of firms in the sample have a CEO who is also acting as the chair of the board.

<Table 2 about here>

4.2 Correlation

We use natural log values for the explanatory variables of board independence, leverage, and EM to address the skewed data and non-normal distribution of residuals. Table 3 of correlation matrix presents the pairwise correlation coefficients between sets of variables. The correlation matrix shows that most of the independent variables are not highly correlated with each other, (i.e., less than 0.30). However, some of the variables are highly correlated. For example, the correlation between EM1 and firm size is 0.608. The underlying problem for highly correlated variables in regression is multicollinearity. Therefore, we computed the VIFs (variance of inflation factors) to examine whether there is a multicollinearity issue in the current model. We found the VIFs for all the variables employed in the AC/EM model were well below the cut-off point of 5 (see Appendix Table A3), therefore indicating the absence of multicollinearity.

<Table 3 about here>

4.3 Static model

4.3.1 Heteroscedasticity test

One of the assumptions of the ordinary least squares (OLS) is that the variance of the error term is constant. Violation of this assumption indicates a heteroscedasticity problem, and hence the pooled OLS estimation is no longer optimal. Therefore, it is important to test whether or not the models are subject to a heteroscedasticity problem. We employed Breusch and Pagan's (1979) and Cook and Weisberg's (1983) test to examine the presence of heteroscedasticity and report the results in Table 4. All the chi-squared statistics are highly significant, hence suggesting the presence of heteroscedasticity issue in the model, so that pooled OLS estimation is not recommended.

<Table 4 about here>

4.3.2 Fixed-effect OLS and GLS

We controlled for the heteroscedasticity problem in the static model using fixed-effect OLS with heteroscedasticity-consistent standard errors. We used Hausman (1978) test to decide whether to choose fixed-effect or random-effect OLS and report the results in Table 5. All the p-values of the Hausman test are lower than 1 percent significance level; thus, rejecting the null hypothesis. The rejection of the null hypothesis of Hausman test suggests the use of fixed-effect OLS estimation.

<Table 5 about here>

Table 6 reports the results of the fixed-effect OLS regression based on two proxies of EM (EM1 and EM2). Column (2) shows that EM1 is negatively associated with ACasset, which indicates that higher level of EM1 increases AC, since a decrease in ACasset (asset utilization ratio) represents an increase in AC. The coefficient of EM1 in column (2) is (β=-0.00260, t=-1.74) statistically significant at the 10 percent level, thus suggesting that one unit increase in

EM1 on average increases AC by 0.26 percent, holding all other factors fixed. Column (4) shows that EM1 is positively associated with the second proxy of AC (ACsga) which indicates that an increase in EM1 increases AC. The coefficient of EM1 in column (4) is (β=0.00156, t=2.63) statistically significant at the 1 percent level, thus suggesting that one unit increase in EM1 on average increases AC by 0.156 percent, holding all other factors fixed.

<Table 6 about here>

Our results remain consistent when we use EM2 as a proxy of EM. For example, the coefficient of EM2 in column (6) is (β=-0.0276, t=-12.90) statistically significant at the 1 percent level, thus suggesting that one unit increase in EM1 on average increases AC by 2.76 percent, holding all other factors fixed. The coefficient of EM2 in column (8) is (β=0.00891, t=11.63) statistically significant at the 1 percent level, thus suggesting that one unit increase in EM1 on average increases AC by 0.891 percent, holding all other factors fixed.

The literature (e.g., Asteriou & Hall, 2015; Dougherty, 2011; Greene, 2012) also recommends the use of the generalised least squares (GLS) estimator to address the issue of heteroscedasticity. White (1980) reports a significant improvement in heteroscedasticity using generalised (or weighted) least squares compared to the OLS estimator. Therefore, we also employ the GLS estimator to control for the heteroscedasticity problem and report the results in Table 7.

<Table 7 about here>

The results of GLS estimation reported in Table 7 are consistent with the fixed-effect OLS estimation results reported in Table 6. For example, Column (2) reports the coefficient of EM1 is (β=-0.0111, t=-2.66) statistically significant at the 1 percent level, hence, EM1 is

negatively associated with ACasset, which indicates that higher level of EM1 increases AC, since a decrease in ACasset represents an increase in AC. Column (4) reports the coefficient of EM1 is (β=0.00386, t=2.97) statistically significant at the 1 percent level, indicating that EM1 is positively associated with the second proxy of AC (ACsga), thus suggesting that an increase in EM1 increases AC.

We find similar results when we use EM2 as a proxy of EM in Table 7. For example, the coefficient of EM2 in column (6) is (β=-0.08640, t=-40.24) statistically significant at the 1 percent level, thus suggesting that one unit increase in EM1 on average increases AC by 8.640 percent, holding all other factors fixed. The coefficient of EM2 in column (8) is (β=0.02510, t=33.91) statistically significant at the 1 percent level, thus suggesting that one unit increase in EM1 on average increases AC by 2.510 percent, holding all other factors fixed.

In sum, our results in Tables 6 and 7 show that EM is significantly positively related to AC, indicating that EM in China is overall opportunistic since it deteriorates agency conflicts. These findings are inconsistent with Jiraporn et al. (2008) who report a significant negative relation between EM and AC, indicating that EM, on average, is not detrimental. Our results so far are based on the static model that is also used by Jiraporn et al. (2008). The static model has a major limitation since it fails to take into account the endogeneity sources (e.g., dynamic nature, omitted variable, measurement error). Therefore, in the next section, we employ the dynamic model using two-step system GMM estimation that is robust to all forms of endogeneity.

4.4 Dynamic model

First we tested for the presence of endogeneity in regressors before employing the dynamic model. We used the Durbin- (Durbin, 1954) and Wu-Hausman (Hausman, 1978; Wu, 1974)

(DWH) to test for endogeneity issues for all regressors and report the results in Table 8. The rejection of the null hypothesis indicates the presence of endogeneity. All the p-values reported in Table 8 are lower than 1 percent significance level, rejecting the null hypothesis. Thus, the OLS and GLS estimation of the static model could be biased due to the presence of endogeneity.

<Table 8 about here>

4.4.1 Two-step system GMM

We treat the CG explanatory variables (EM, board size, board independence, firm size, leverage, CEO duality) as endogenous, and industry dummy, stock exchange dummy and year dummy as exogenous in the dynamic model. The second and further lags of endogenous variables are employed as instruments in the two-step system GMM estimation.

The consistency of system GMM estimator is highly dependent on the validity of the instruments set. Therefore, we employed two sets of specification tests to check the validity of the instrument sets. The two sets of specification tests were autocorrelation test of residuals developed by Arellano and Bond (1991) and over-identification test of instruments developed by Sargan (1958) and Hansen (1982).

First, we employed the Arellano and Bond (1991) autocorrelation (AR) test to choose the length of lags as instruments. “If a significant AR(2) statistic is encountered, the second lags of endogenous variables will not be appropriate instruments for their current values” (Baum, 2010, p. 65). Based on the results of AR tests reported in Table 9, we used up to three lags of endogenous variables to construct the GMM instruments. Second, we tested whether the model was appropriately specified using an over-identification test, where the null /\ indicates a well-specified model and valid instruments set.

Table 9 reports the results based on the dynamic two-step system GMM estimation. In Section 4.3; we found AC is significantly positively related to EM based on the static model (fixed-effect OLS and GLS estimation). However, the results based on the dynamic model show that none of the EM proxies has a significant influence on AC. For example, the coefficient of EM1 in column (2) is positive (β =0.0129, z=0.24) but statically insignificant. Most importantly, we find that the coefficients of 1-year lagged AC are all positive and statistically significant, suggesting that lagged values of AC are significant in controlling unobserved historical factors in the AC/EM relation. Our results based on the dynamic model provide further support to the arguments of Wintoki et al. (2012) that there is a dynamic nature inherent in corporate governance context. Therefore, it is imperative to use the dynamic model in CG studies when the past governance values show significant influence on the current performance since ignoring the dynamics of internal CG may lead to spurious results.

<Table 9 about here>

4.5 Robustness check

4.5.1 Discretionary accruals using a cross-sectional approach

As an additional test, we re-estimated the dynamic two-step system GMM model to check whether the results remained robust when we estimated DA (EM3) using cross-sectional approach and report the results in Table 10[4]. In a cross-sectional approach, we ran the regression within each industry, so that the influence from different industries on DA can be controlled (e.g., Cohen et al., 2008; Ding et al., 2007).

[4] The result of static models using EM3 is attached in the Appendix. Fixed effect OLS is chosen based on Hausman specification test shown in Appendix Table A4; the result of fixed-effect OLS and GLS estimator using EM3 is demonstrated in Appendix Table A5.

The coefficients on 1-year lagged AC in Table 10 remain positive and statistically significant, suggesting that past values of AC are significant in controlling unobserved historical factors in the relationship between AC and EM. These findings are consistent with the results reported in Table 9 using the other two EM proxies. These results provide further evidence of the dynamic nature inherent in CG context.

<Table 10 about here>

4.5.2 Earnings management as dependent variable

The Granger Causality tests (see Appendix A2) show that the causality link between AC/EM runs two ways, suggesting simultaneity/ reverse causality. In order to check the robustness of the estimations of Table 9 and Table 10, we re-estimated our model following Jiraporn et al. (2008) and employed EM as the dependent variables, with AC and other CG variables as explanatory variables. The results of adjusted model using dynamic two-step system GMM are reported in Table 11.

Consistent with those of Table 9 and Table 10, results reported in Table 11 suggest there is no significant relation between AC and EM even when using EM as a dependent variable. In Table 9 and Table 10, the lagged values of AC have a significant impact on the current values of AC. Similarly, we find that significant impact of one-year-lagged values of EM on the current values of EM across all tests in Table 11. Therefore, it is important to incorporate the inherent dynamic nature when studying CG issues.

<Table 11 about here>

5. Concluding Remarks

In this paper, we examine whether earnings management (EM) reduces or deteriorates agency costs (AC) in China where companies suffer from agency problems. Using the static and

dynamic model to test AC/EM nexus, we find a significant and positive relationship between AC and EM based on the static model that suggests opportunistic EM in China. These results are consistent with the suggestions in the literature that EM can be used opportunistically by managers and AC (e.g., Dechow & Sloan, 1991; Guidry et al., 1999; Healy, 1985; Holthausen et al., 1995). However, we find an insignificant relationship between AC and EM when we use the dynamic model that takes into account the endogeneity issue. Therefore, our results suggest that the engagement in EM has no significant influence on AC in China. Furthermore, board size, board independence, firm size, leverage, and CEO duality, which are conventionally thought to be important in explaining AC, do not have a significant impact.

Our paper contributes to the existing literature in two ways. First, we extend the literature beyond developed markets by providing the first empirical evidence on the role of EM in agency conflicts in China, and shows that there is no significant relationship between AC and EM. As AC is a fundamental problem of CG worldwide, this study is expected to be of interest to regulatory and supervisory authorities, investors, and financial analysts. Our findings are inconsistent with what is implied by Agency theory, suggesting that CG in China is different, and conventionally western market conceived theory might not fully incorporate the CG dilemma in emerging economies. Therefore, in agreement with researchers such as Young, Ahlstrom, and Bruton (2004), we suggest that creative solutions need to be explored by countries in emerging economies to resolve their particular agency conflicts under their own specific institutional contexts, which indicate fruitful avenues for future research. Second, we add new empirical evidence to support the growing literature on the concerns of endogeneity issues in corporate governance studies. Consistent with the prior studies of Wintoki et al. (2012) and Schultz et al. (2010), we show that failing to take into account the endogeneity issue can lead to spurious results, therefore, it is subject to caveat to make policy implications based on empirical results failing to address endogeneity issues. We expect our

results to be of great interest to academics involved in researching CG topics that have inherited dynamic nature and endogeneity issues.

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Table 1: Variables and definitions.

Acronym	Description
ACasset	Annual Sales/ total assets
ACsga	SGA expenses/ total assets
EM1	Discretionary accruals estimated using time-series approach (absolute value)
EM2	Non-operating income/ sales
EM3	Discretionary accruals estimated using cross-sectional approach (absolute value)
board_size	Natural log of the total number of the directors on the board
board_independence	Percentage of inside directors on the board
CEOduality	Dummy variable, one if CEO duality exists; 0, otherwise
leverage	Total liability/ total assets
firm_ size	Natural log of total assets
Industry type	A dummy variable for each of the five industries: properties, conglomerates, Industrials, commerce, and utilities. Utilities is omitted to avoid dummy variable trap.
Stock exchange dummy	A dummy variable for each of the stock exchange type, including Shanghai stock exchange share, Shenzhen stock exchange share, and GEM[5]. Shanghai stock exchange share is omitted to avoid dummy variable trap.
Year dummy	A dummy variable for each year from 1999 to 2014. The year 1999 is omitted to avoid a dummy variable trap.

[5] GEM, growth enterprise market, is the second board market, subordinate to the main board market. China's GEM refers to Shenzhen GEM. It differs greatly from the main board in listing threshold, regulatory system, information disclosure, trader requirement, investment risks, etc. It aims to support small and medium enterprises, typically high-growth enterprises, build up normal exit mechanism for venture capital and provide a strategic financing platform for countries with independent innovation.

Table 2: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ACasset	27768	0.62	0.39	0.13	1.59
ACsga	27262	0.16	0.12	0.03	0.51
EM1 (millions)	18772	-24.30	347.00	-921.00	712.00
EM2	27608	0.0161	0.0236	0.0002	0.0915
EM3 (millions)	18821	-24.50	352.00	-930.00	725.00
board_size (person)	23816	9.23	2.05	3.00	19.00
board_indepedence	23797	0.31	0.12	0.00	0.44
firm_size	27911	21.48	1.09	19.74	23.80
leverage	26549	0.47	0.21	0.11	0.84
CEOduality	17483	0.20	0.40	0.00	1

Note: This table reports descriptive statistics based on all the variables. The number of observations varies because of missing values. For interpretation purpose, the logarithmic form of the variables is not used as the basis of descriptive statistics. Instead, the descriptive statistics of variables are calculated on the basis of levels winsorized at 97.5% and 2.5%.

Table 3: Correlation analysis

	ACasset	ACsga	EM1	EM2	board_size	board_independence	firm_size	leverage	CEOduality
ACasset	1								
ACsga	-0.349***	1							
EM1	0.0560***	-0.235***	1						
EM2	-0.326***	0.325***	-0.0786***	1					
board_size	0.0666***	-0.120***	0.136***	-0.0886***	1				
board_independence	-0.0301***	0.0162	0.0224*	0.0904***	-0.372***	1			
firm_size	0.115***	-0.381***	0.608***	-0.153***	0.253***	0.0213*	1		
leverage	0.163***	-0.268***	0.298***	-0.122***	0.143***	-0.0326***	0.351***	1	
CEOduality	-0.0577***	0.119***	-0.0817***	0.0786***	-0.160***	0.0784***	-0.146***	-0.170***	1

Note: This table presents pair-wise correlation coefficients for all the variables. The variables are defined in Table 1. Asterisks of *, **, ***, indicate significance at 10% , 5%, 1% level, respectively.

Table 4: Breusch-Pagan / Cook-Weisberg test for heteroscedasticity

Ho: constant variance		
Model	chi2	Prob > chi2
ACasset-EM1	419.16	0.0005
ACasset-EM2	1778.31	0.0000
ACsag-EM1	1340.81	0.0000
ACsga-EM2	1888.22	0.0000

Note: This table reports the result of the heteroscedasticity test. Rejection of the null hypothesis of Breusch-Pagan / Cook-Weisberg test for heteroscedasticity suggests the presence of heteroscedasticity, and pooled OLS is not optimal.

Table 5: Hausman specification test

Ho: difference in coefficients not systematic		
Model	chi2	Prob > chi2
ACasset-EM1	309.81	0.0000
ACasset-EM2	761.76	0.0000
ACsag-EM1	209.22	0.0000
ACsga-EM2	519.63	0.0000

Note: This table reports the results of the Hausman test.

Table 6: Fixed-effect OLS estimation, static model

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	ACasset		ACsga		ACasset		ACsga	
		t		t		t		t
EM1	-0.00260*	-1.74	0.00156***	2.63				
	(0.00150)		(0.000591)					
EM2					-0.0276***	-12.90	0.00891***	11.63
					(0.00214)		(0.000767)	
board_size	0.00662	0.34	-0.000277	-0.02	0.0275	0.97	-0.0100	-1.03
	(0.0194)		(0.0113)		(0.0285)		(0.00972)	
board_independence	-0.0198	-0.99	-0.00384	-0.36	-0.0364	-1.54	-0.0124	-1.27
	(0.0199)		(0.0106)		(0.0237)		(0.00976)	
firm_size	-0.0650***	-13.79	-0.0421***	-10.10	-0.0927***	-8.83	-0.0352***	-10.55
	(0.00471)		(0.00417)		(0.0105)		(0.00334)	
leverage	0.00772	1.09	0.0201***	4.18	0.0427***	3.62	0.0175***	4.42
	(0.00710)		(0.00480)		(0.0118)		(0.00397)	
CEOduality	-0.0119*	-1.66	-0.00147	-0.37	0.00182	0.18	-0.00396	-1.14
	(0.00720)		(0.00400)		(0.0102)		(0.00348)	
Constant	1.975***	9.33	1.041***	11.29	2.188***	8.95	0.935***	7.35
	(0.212)		(0.0922)		(0.245)		(0.127)	
Industry dummy	No		no		no		no	
Stock exchange dummy	No		no		no		no	
Year dummy	Yes		yes		yes		yes	
Observations	12,442		12,321		16,953		16,789	
Number of stock	2,017		2,017		2,531		2,530	
R-squared	0.047		0.080		0.090		0.098	
F statistics	25.73		16.17		27.34		24.07	
Prob > F	0.0000		0.0000		0.0000		0.0000	

Note: This table reports the result of fixed-effect OLS static. Two AC costs proxies (i.e., ACasset, ACsga) are employed to run the regression against the EM proxies (i.e., EM1, EM2) and the other controlling CG variables. Asterisks of *, **, ***, indicate significance at 10%, 5%, 1% level, respectively. Standard errors are reported in parentheses.

Table 7: GLS estimation, static model

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	ACasset		ACsga		ACasset		ACsga	
		t		t		t		t
EM1	-0.0111***	-2.66	0.00386***	2.97				
	(0.00416)		(0.00130)					
EM2					-0.08640***	-40.24	0.02510***	33.91
					(0.00215)		(0.00074)	
board_size	0.119***	3.50	-0.0419***	-3.91	0.00823	0.43	0.01028	1.55
	(0.0341)		(0.0107)		(0.01926)		(0.00662)	
board_independence	-0.107**	-2.31	-0.0330**	-2.40	0.00160	0.06	0.00883	0.99
	(0.0463)		(0.0137)		(0.02593)		(0.00894)	
firm_size	0.0497***	7.15	-0.0435***	-20.76	-0.00473	-1.23	-0.02655***	-21.67
	(0.00695)		(0.00210)		(0.00355)		(0.00122)	
leverage	0.145***	13.92	-0.00283	-0.96	0.11301***	19.37	-0.03115***	-15.48
	(0.0104)		(0.00295)		(0.00584)		(0.00201)	
CEOduality	-0.0241*	-1.91	-0.00214	-0.53	-0.01119	-1.59	0.00892***	3.67
	(0.0126)		(0.00401)		(0.00705)		(0.00243)	
Constant	-2.726***	-5.88	1.235***	21.06	-0.01334	-0.12	0.85324***	22.61
	(0.464)		(0.0586)		(0.10945)		(0.03774)	
Industry dummy	Yes		yes		yes		yes	
Stock exchange dummy	Yes		yes		yes		yes	
Year dummy	Yes		yes		yes		yes	
Observations	12,442		12321		16,953		16,789	
Number of stock	2017		2017		2,531		2,530	
R-squared	0.181		0.053		0.2956		0.2631	
F statistics	105.19		27.64		179.65		153.04	
Prob > F	0.0000		0.0000		0.0000		0.0000	

Note: This table reports the result of GLS static model. Two AC costs proxies (i.e., ACasset, ACsga) are employed to run the regression against the EM proxies (i.e., EM1, EM2) and the other controlling CG variables. Asterisks of *, **, ***, indicate significance at 10%, 5%, 1% level, respectively. Standard errors are reported in parentheses.

Table 8: Endogeneity test

Ho: variables are exogenous		
Model	chi2	Prob > chi2
ACasset-EM1	76.29	0.0000
ACasset-EM2	342.844	0.0000
ACsag-EM1	131.949	0.0000
ACsga-EM2	297.564	0.0000

Note: This table reports the result of endogeneity test.

Table 9: AC/EM model, two-step system GMM, dynamic model

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	ACasset				ACsga			
		z		z		z		z
Lagged ACasset	0.808***	11.44	0.811***	11.66				
Lagged ACsga					1.121***	8.48	1.054***	7.47
EM1	0.0129	0.24			-0.000202	-0.01		
EM2			0.00776	0.30			-0.00596	-0.50
board_size	-0.0573	-0.39	-0.0859	-0.84	0.0346	0.66	-0.0188	-0.48
board_independence	0.524*	1.82	0.354	1.09	-0.0653	-0.58	-0.110	-1.13
firm_size	-0.0191	-0.28	-0.000181	-0.01	0.0152	0.76	0.0120	1.32
leverage	0.0121	0.24	-0.0242	-0.58	-0.0117	-0.68	-0.0155	-1.54
CEOduality	0.00121	0.03	-0.0112	-0.26	-0.00182	-0.11	0.00731	0.42
Constant	1.084	1.62	0.800	1.36	-0.515*	-1.95	-0.373	-1.55
Industry dummy	Yes		Yes		yes		yes	
Stock exchange dummy	Yes		Yes		yes		yes	
Year dummy	Yes		Yes		yes		yes	
Observations	12,440		15,700		12,260		15,450	
Number of stock	2,017		2,481		2,017		2,480	
Number of instruments	33		31		34		35	
Wald chi2	2444.15		1529.44		2138.44		1724.53	
Prob > chi2	0.000		0.000		0.000		0.000	
AR(1) (p-value)	0.000		0.000		0.000		0.000	
AR(2) (p-value)	0.551		0.718		0.123		0.032	
AR(3) (p-value)	0.374		0.126		0.352		0.768	
Sargan test (p-value)	0.117		0.238		0.195		0.119	
Hansen test (p-value)	0.177		0.355		0.464		0.526	

Note: This table reports the result of the dynamic two-step system GMM regression of AC on lagged AC, EM proxies, and other control variables. Asterisks of *, **, ***, indicate significance at 10%, 5%, 1% level, respectively. The z-statistics are reported for large sample size on the basis of Windmeijer (2005)-corrected standard errors. Industry dummy, stock exchange dummy, and year dummy are treated as exogenous. The other variables are treated as endogenous, lag2 and beyond the endogenous variables are employed as instruments. Standard errors are not reported for the sake of brevity.

Table 10: Robustness Check, AC/EM3 model, two-step system GMM, dynamic model

(1)	(2)	(3)	(4)	(5)
VARIABLES	ACasset		ACsga	
		z		z
Lagged ACasset	0.920***	24.46		
	(0.0376)			
Lagged ACsga			1.086***	7.76
			(0.140)	
EM3	-0.0138	-0.27	-0.00226	-0.12
	(0.0516)		(0.0191)	
board_size	0.122	1.12	0.0244	0.48
	(0.109)		(0.0506)	
board_independence	0.251	0.90	-0.0755	-0.67
	(0.279)		(0.113)	
firm_size	-0.00326	-0.08	0.0143	0.68
	(0.0392)		(0.0209)	
Leverage	0.0420	1.24	-0.00827	-0.47
	(0.0340)		(0.0177)	
CEOduality	-0.0258	-0.34	-0.00299	-0.18
	(0.0761)		(0.0163)	
Constant	0.395	0.96	-0.429	-1.57
	(0.411)		(0.273)	
Industry dummy	Yes		yes	
Stock exchange dummy	Yes		yes	
Year dummy	Yes		yes	
Observations	12,459		12,300	
Number of stock	2,018		2,017	
Number of instruments	35		34	
Wald chi2	11915.66		2156.51	
Prob > chi2	0.000		0.000	
AR(1) (p-value)	0.000		0.000	
AR(2) (p-value)	0.151		0.101	
AR(3) (p-value)	0.315		0.485	
Sargan test (p-value)	0.271		0.189	
Hansen test (p-value)	0.435		0.489	

Note: This table reports the result of the dynamic two-step system GMM regression of AC (i.e., ACasset and ACsga) on lagged AC, EM proxy, and other control variables. Discretionary accrual estimated through cross-sectional analysis is employed as EM proxy. Asterisks of *, **, ***, indicate significance at 10%, 5%, 1% level, respectively. The Windmeijer (2005)-corrected standard errors are reported in parentheses. The z-statistics are reported for large sample size, on the basis of Windmeijer (2005)-corrected standard errors. Industry dummy, stock exchange dummy, and year dummy are treated as exogenous. The other variables are treated as endogenous, lag2 and beyond the endogenous variables are employed as instruments.

Table 11: Robustness Check, EM as dependent variable, two-step system GMM, dynamic model

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
VARIABLES	EM1				EM2				EM3			
		z		z		z		z		z		z
Lagged EM1	-0.681**	-1.98	-0.601*	-1.96								
Lagged EM2					58.01**	2.29	50.19**	2.22				
Lagged EM3									-0.786**	-2.31	-0.685**	-2.36
ACasset	-0.471	-1.32			-0.0189	-0.03			-0.443	-1.20		
ACsga			-1.110	-0.53			1.670	0.71			-1.491	-0.66
board_size	-1.855	-1.32	-1.426	-1.13	0.204	0.15	0.196	0.15	-1.726	-1.15	-1.373	-1.03
board_independence	-3.752	-1.01	-3.352	-0.94	3.150	0.95	3.228	1.04	-3.202	-0.85	-3.356	-0.95
firm_size	1.380***	4.35	1.255***	4.57	0.122	0.46	0.133	0.60	1.452***	4.73	1.292***	4.96
leverage	0.607**	1.99	0.636**	2.29	-0.104	-0.28	0.0122	0.03	0.498	1.53	0.509*	1.73
CEOduality	-2.131*	-1.73	-1.472	-1.41	-0.575	-0.66	-0.303	-0.39	-2.280*	-1.75	-1.687	-1.60
Constant	3.344	0.81	3.981	0.89	-4.170	-0.53	-3.944	-0.57	3.853	0.87	4.573	1.02
Industry dummy	yes		yes		yes		yes		yes		yes	
Stock exchange dummy	yes		yes		yes		yes		yes		yes	
Year dummy	yes		yes		yes		yes		yes		yes	
Observations	11200		11091		15619		15471		11220		11127	
Number of stock	1911		1910		2484		2483		1912		1912	
Number of instruments	34		34		34		34		34		34	
Wald chi2	448.27		522.43		1093.39		1116.75		396.82		470.75	
Prob > chi2	0.000		0.000		0.000		0.000		0.000		0.000	
AR(1) (p-value)	0.722		0.668		0.002		0.002		0.789		0.721	
AR(2) (p-value)	0.032		0.032		0.045		0.064		0.015		0.012	
AR(3) (p-value)	0.579		0.533		0.274		0.400		0.712		0.684	
Sargan test (p-value)	0.571		0.449		0.727		0.700		0.425		0.391	
Hansen test (p-value)	0.750		0.648		0.729		0.793		0.647		0.628	

Note: This table reports the result of the dynamic two-step system GMM regression of EM (i.e., EM1,EM2 and EM3) on lagged EM, AC proxies, and other control variables. Asterisks of *, **, ***, indicate significance at 10%, 5%, 1% level, respectively. The z-statistics are reported for large sample size, on the basis of Windmeijer (2005)-

corrected standard errors. Industry dummy, stock exchange dummy, and year dummy are treated as exogenous. The other variables are treated as endogenous, lag3 and beyond the endogenous variables are employed as instruments. Standard errors are not reported for the sake of brevity.

Appendix

Table A1: Unit root test

Variables	Levin, Lin & Chu	Im, Pesaran & Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-square
ACasset	-382.633	-54.0915	7915.31	9246.23
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
ACsga	-16646.2	-1430.96	7575.92	8901.27
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
EM1	-547.222	-115.468	4259.45	4931.37
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
EM2	-7975.17	-451.792	10226.7	11716.3
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
EM3	-887.405	-105.461	10880.5	12727.0
	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Note: This table presents the result of unit root test on the basis of levels. The Levin, Lin and Chu test is employed to test the common unit root, while Im, Pesaran, and Shin, Fisher-ADF and Fisher-PP test the presence of individual root. P-values are reported in the parenthesis. Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. Rejection of the null indicates no presence of unit root or stationary.

Table A2: Granger causality test of EM and AC

Null Hypothesis:	Obs	F-Statistic	Prob.
EM1 does not Granger Cause ACasset	14229	5.51260***	0.0040
ACasset does not Granger Cause EM1		15.7840***	1.E-07
ACsga does not Granger Cause EM1	13924	19.9465***	2.E-09
EM1 does not Granger Cause ACsga		101.010***	3.E-44
ACasset does not Granger Cause EM2	21986	67.5630***	6.E-30
EM2 does not Granger Cause ACasset		6.62916***	0.0013
ACsga does not Granger Cause EM2	21491	178.280***	2.E-77
EM2 does not Granger Cause ACsga		30.5562***	6.E-14
ACasset does not Granger Cause EM3	14278	41.8349***	8.E-19
EM3 does not Granger Cause ACasset		15.3591***	2.E-07
ACsga does not Granger Cause EM3	14000	13.1521***	2.E-06
EM3 does not Granger Cause ACsga		19.2192***	5.E-09

Note: This table reports the result of Granger causality test between EM1 and AC proxies. EM1 is discretional accruals computed using time series analysis of a modified Jones model. Asterisks of *, **, ***, indicate significance at 10%, 5%, 1% level, respectively.

Table A3: Variance inflation factors for multicollinearity test

	ACasset		ACsga	
Variable	VIF	VIF	VIF	VIF
EM1	1.61		1.61	
EM2		1.04		1.04
board_size	1.28	1.26	1.28	1.26
board_independence	1.18	1.18	1.18	1.18
firm_size	1.77	1.25	1.76	1.25
leverage	1.18	1.16	1.18	1.16
CEOduality	1.06	1.07	1.06	1.07
Mean VIF	1.34	1.16	1.34	1.16

Note: This table reports the variance inflation factors calculated for AC/EM model.

Table A4: Hausman specification test using EM3

Ho: difference in coefficients not systematic		
Model	chi2	Prob > chi2
ACasset-EM3	304.76	0.0000
ACsag-EM3	185.75	0.0000

Note: This table reports the Hausman test that is applied to choose from fixed-effect and random-effect. Rejection of the null of Hausman test suggests Fixed-effect OLS estimation is preferred.

Table A5: Relationships between ACs and EM3, static model

	Fixed effect OLS				GLS			
VARIABLES	ACasset		ACsga		ACasset		ACsga	
		T		t		t		t
EM3	-0.00286*	-1.91	0.00156***	3.14	-0.00989**	-2.40	0.00459***	3.55
	(0.00150)		(0.000496)		(0.00413)		(0.00129)	
board_size	0.0110	0.57	0.00291	0.45	0.129***	3.83	-0.0306***	-2.82
	(0.0193)		(0.00641)		(0.0338)		(0.0108)	
board_independence	-0.0241	-1.22	-0.00513	-0.78	-0.103**	-2.26	-0.0324**	-2.36
	(0.0198)		(0.00657)		(0.0456)		(0.0137)	
firm_size	-0.0601***	-12.75	-0.0416***	-26.57	0.0536***	7.76	-0.0436***	-20.74
	(0.00471)		(0.00157)		(0.00690)		(0.00210)	
leverage	0.00916	1.28	0.0194***	8.06	0.139***	13.46	-0.00159	-0.53
	(0.00716)		(0.00241)		(0.0103)		(0.00298)	
CEOduality	-0.00965	-1.34	-0.00141	-0.59	-0.0254**	-2.04	-0.00211	-0.53
	(0.00719)		(0.00238)		(0.0125)		(0.00400)	
Constant	1.874***	8.87	1.011***	27.12	-2.847***	-6.24	1.185***	20.34
	(0.211)		(0.0373)		(0.456)		(0.0583)	
Industry dummy	no		no		yes		yes	
Stock exchange dummy	no		no		yes		yes	
Year dummy	yes		yes		yes		yes	
Observations	12,461		12,357		12,461		12,357	
Number of stock	2,018		2,018		2,018		2,018	
R-squared	0.045		0.079		0.182		0.053	
F statistics	24.69		46.32		106.22		27.59	
Prob > F	0.0000		0.0000		0.0000		0.0000	

Note: This table reports the result of static model using fixed-effect OLS and GLS estimation. Two AC costs proxies (i.e., ACasset, ACsga) are employed to run the regression against the EM3 and the other controlling CG variables. EM3 is discretionary accruals estimated using cross-sectional approach. Asterisks of *, **, ***, indicate significance at 10%, 5%, 1% level, respectively. Standard errors are reported in parentheses