Managerial tenure and earnings management

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Abstract

Purpose – The purpose of this paper is to understand the impact of tenure on earnings management.

Design/methodology/approach – Analytical model; multivariate regression analysis.

Findings – The paper predicts that managers are conservative in managing earnings when they first start to take top managerial positions, and then become aggressive in the next few years. Once they reach the maximum level of earnings management, they will become conservative again and report earnings less aggressively. This inverted U-shaped relationship between tenure and earnings management is confirmed by the data from the Chinese stock market.

Research limitations/implications – It is based on China stock market data. Generalization of the research results to other countries is limited.

Practical implications – With the knowledge of when earnings management is more likely to occur, regulators can set up policies targeting firms and managers with certain characteristics, instead of requiring observances from all firms and managers. This limited scope can greatly reduce the costs of preventing and identifying earnings management, while effectively maintaining the quality of earnings in the meantime.

Social implications – This paper examines the earnings management behavior related to CEO tenure. It is hoped that the research results can improve the overall understanding of earnings management, then social wealth spent on preventing and identifying it could be reduced.

Originality/value – It is an original work.

Keywords Earnings management, Managerial tenure

Paper type Research paper

1. Introduction

This paper examines the pattern of earnings management throughout a manager's tenure and provides insights for standard setters or policy regulators on when earnings management is more likely to occur and why it is the case. The result from extant literature is mixed. Zhang (2009) suggests that earnings management decreases as time elapses except for the year before the CEO's departure. Ghosh and Moon (2005) argue that CEOs with longer tenure are more likely to use their managerial power to

manipulate earnings. This literature derives such results based on a simple view of the work, focusing on only reputation benefits or costs from manipulating earnings. Erickson and Wang (1999) suggests that the decision of earnings management should be a tradeoff by weighing the benefits of earnings management versus its costs. Hence, the documented linear association between earnings management and tenure may not be correct, which might mislead policy makers into designing wrong policies for regulating financial reporting.

In this paper, we model a manager's optimal earnings management strategy during his/her tenure. The benefits of earnings management are the pecuniary gain from improved perception of managerial ability by achieving good earnings performance via accounting manipulation. The information update along the manager's tenure plays a prominent role in this model. With incomplete information about a manager's ability, the market updates its belief about the manager's ability based on each observation of the firm's performance. At the early stage of a manager's tenure, this Bayesian update is drastic. However, in the meantime, the manager usually cannot materialize this reputation gain because he is prohibited from exercising options during the vesting period, and options typically count for the largest component of his compensation package (Core and Guay, 1999). Therefore the benefits from earnings management in the early executive stage could be low. Only when all the compensation options become exercisable, can the CEO fully and financially gain from the improved reputation obtained through earnings management. This pecuniary gain will decrease monotonically from that point on, as the information update will be lower over tenure. The cost of earnings management include the manager's time and efforts spent on manipulation and being identified and terminated from the CEO position due to aggressive reporting. As the manager stays in office longer, the time and effort devoted to earnings management will decline because he/she becomes more experienced with it. In the meantime, he accumulates expertise due to his experience and knowledge with the firm, making the board more dependent on him and less likely to fire him. Thus, we conjecture that the cost of earnings management will also decrease with tenure. Moreover, due to the steep learning curve experienced by every new CEO, we expect this cost curve is convex, that is, the cost will decline, and the speed to decrease will slow down over tenure Combining the benefits and costs, we predict that the association between earnings management and tenure is non-linear; and in particular, it is an inverted U-shaped relationship.

We use data from the Chinese stock market to empirically test the hypothesis. Consistent with our analytical prediction, we find that there is a non-linear relationship between a manager's tenure and his/her engagement in earnings management. We find that on average, the earnings management reaches a maximum level around the 5th and 6th years after the manager is in office. Before this peak, the level of earnings management increases with a decreasing rate. After this peak, he/she becomes less aggressive for the rest of his/her career except the last year.

This paper contributes to the extant literature in the following aspects. First, we build a theoretical model to predict how earnings management changes with respect to tenure. Both the benefits and the costs of manipulating earnings are functions of tenure, that is, the number of years that the manager is in office. Thus, the strategy at equilibrium depends on the stage of the manager's career, and it is a quadratic function of tenure. This is different from the prior literature, which documents either a decreasing (Zhang,

2009) or an increasing (Ghosh and Moon, 2005) linear relationship between tenure and earnings management.

Second, we contribute to the literature by providing another piece of evidence that earnings management can be implemented by tools and in ways other than discretionary accruals in China. It is documented that different regions or countries have different ways to practice earnings management. For example, Wang *et al.* (2010) suggest firms usually inflate their earnings by selling long-term assets and investments. In China, earnings management through discretionary items is rare due to rigid, rule-based accounting standards (Chen *et al.*, 2008). However, many listed firms are the spin-offs of state-owned enterprises (SOEs), and they are still closely related with these SOEs in various aspects such as related-party transactions, and loans. Moreover, the local governments are also involved in earnings management by providing subsidies, tax rebates, etc. (Chen *et al.*, 2008). Therefore, the mechanism to manage earnings is different from developed countries. To better capture this opportunistic behavior, we use total accruals (i.e. earning less cash from operations) and industry-year adjusted total accruals to measure earnings management. It is worth noting that both measurements include the profits (or loss) from related-party transactions, subsidies, tax rebates etc.

The paper is organized as follows. The next section reviews the related literature based on which we derive the main hypothesis through analytical modeling. Section 3 presents empirical evidence from the Chinese capital markets to support our hypothesis. Finally, we reconcile the differences between our result and the conclusion reported by Zhang (2009) and conclude the paper.

2. Literature review and hypotheses development

2.1 Benefits of earnings management

Efficient markets impound information into stock prices immediately. However, this reaction can be strong sometimes, but low at other times (Baek *et al.*, 2008). Holmstrom (1999) and Milbourn *et al.* (2001) suggest that the market learns the agents' innate ability by observing their performance over time and gives more weight to their performance in the early period than after their reputations are established. In the same vein, we conjecture that for a less experienced manager whose ability is more uncertain, the market substantially updates its perception about that manager's ability with every new observation of the firm's performance. Therefore, a less experienced manager is more motivated to show good performance, even through earnings management. Zhang (2009) provides evidence that CEOs with short tenures report earnings more aggressively than those with long tenures except for the last year before their departure.

We formally prove the above idea in the following model. The key assumption of the model is that the market is not completely aware of the manager's earnings manipulations. The same assumption is used in Trueman and Titman (1988). Investors who fixate on earnings derive the ability of a manager based upon the reported earnings.

We assume in a multi-period case, two types of managers are in the labor markets: high type and low type. High (low) type managers are more (less) competent at creating wealth and more likely to have high (low) economic earnings[1, 2]. For a high (low) type manager, the possibility of having high (low) economic earnings is p, where $p > 0.5$. The market has a prior belief about the manager's type, with a probability of γ being classified as a high type, and a probability of $1 - \gamma$ of being a low type. At the beginning

of the case, $\gamma = 0.5$. Once the firm announces the accounting earnings (AE), the market will update its prior belief of the manager's ability and reassess the value of the firm, which, in turn, will be reflected in the manager's compensation package through the ownership and options held by the manager.

In the market, sophisticated investors can "undo" earnings management to correctly derive whether the economic earnings are low or high. In contrast, naïve investors do not distinguish between AE and economic earnings due to their ignorance of earnings manipulation. They believe that AE truly represent economic earnings. We obtain their posterior belief about whether a manager is of high or low type after observing the announced high AE in the nth period[3]:

$$\gamma'\,(T = H \mid AE_n = 1, AE_{n-1} = 1, \ldots, AE_2 = 1, AE_1 = 1)$$
$$= \frac{p^n\gamma}{p^n\gamma + (1 - p)^n(1 - \gamma)} \tag{1}$$

AE_i: The firm's accounting earnings in the nth period. $AE_n = 1$ if the accounting earnings are high, and 0, otherwise.

γ': the market's posterior belief about the manager's type after the earnings announcement in the first period.

T: the manager's type. $T = H$ if the manager is of high type, and L, otherwise.

Thus the information update (Δ) from $n - 1$th to nth period is:

$$\Delta = \gamma'(T = H|AE_n = 1, AE_{n-1} = 1, \ldots, AE_2 = 1, AE_1 = 1)$$
$$\gamma'(T = H|AE_{n-1} = 1, \ldots, AE_2 = 1, AE_1 = 1)$$
$$= \frac{p^n\gamma}{p^n\gamma + (1 - p)^n(1 - \gamma)} - \frac{p^{n-1}\gamma}{p^{n-1}\gamma + (1 - p)^{n-1}(1 - \gamma)}$$
$$= \frac{p^{n-1}(1 - p)^{n-1}\gamma(1 - \gamma)(2p - 1)}{[p^n\gamma + (1 - p)^n(1 - \gamma)]\,[p^{n-1}\gamma + (1 - p)^{n-1}(1 - \gamma)]} > 0 \tag{2}$$

The price of the firm is determined by both the sophisticated investors and the naïve investors. By manipulating earnings, a manager can "window dress" low economic earnings as high AE. Due to the existence of naïve investors who update their perception of the manager's type based on AE, the market is more likely to label the manager as a high type and price the firm upward when AE are high. To investigate the speed of the market's update of the prior belief over time, we obtain the first derivative of Δ with respect to n:

$$\frac{\partial\Delta}{\partial n} = \frac{p^{n-1}(1 - p)^{n-1}\gamma(1 - \gamma)(2p - 1)[(1 - p)^{2n-1}(1 - \gamma)^2 - p^{2n-1}\gamma^2]}{[p^n\gamma + (1 - p)^n(1 - \gamma)]^2\,[p^{n-1}\gamma + (1 - p)^{n-1}(1 - \gamma)]^2}In\frac{p}{1 - p} < 0 \tag{3}$$

Equation (2) shows that the information update is toward the high type perception whenever the AE are high. However, equation (3) suggests that this information update will accrue less for each reported high AE over the CEO's tenure. As the updated information about the managerial ability will be impounded into the stock price, the

stock price will increase, but at a declining rate. We note that sophisticated investors can see through this and appropriately price the firm (i.e. the CEO's ability). But, due to the existence of a large number of naive investors, the market still awards earnings management by pricing the firm at a higher value, thus reflecting the beliefs of all the investors. This is consistent with Cianci and Kaplan's (2010) experiment results.

Core and Guay (1999) document that in the period of 1992-1996, options contributed approximately one-third to the value of the median CEO's equity portfolio and contributed roughly half of the median CEO's total equity incentives. In addition, the use of stock options to provide CEO compensation and incentives has been increasing dramatically recently (Core *et al.*, 2003). As the stock market plays an important role in determining managerial compensation, managers are incentivized to manipulate earnings to influence the stock price and exercise options accordingly to maximize personal income (Liang, 2004).

As the incremental increase in stock price due to high AE at the early stage of the executive career exceeds that in the late stage, it appears that managers can benefit most from earnings management as soon as they take the complete responsibility of the firms' performance. However, in the first few years in office, CEOs are not able to fully realize the benefits from the improved perception of their abilities and the inflated stock price, due to vesting period prohibitions and the sticky salary. Boschen and Smith (1995) find that the pay is sticky as the response of pay to a one-time innovation in firm performance is usually four to five years behind. Vesting periods usually run for three to five years, and options usually become exercisable gradually during this period and fully so after the vesting period. The manager can sell the stock at any time after she exercises the option, which is a window of time that extends over many years (Bernhardt, 1999; Huddart, 1994). Thus we hypothesize that the benefit from earnings management is:

$$B_t = T(n) \times \Delta(n),$$

and

$$T(n) = bn, \ 0 < b < 1, \ when \ n < i, \ i \ is \ the \ vesting \ period, \ and \ usually \ is \ three \ to$$
$$five \ years;$$

$$T(n) = 1, \ when \ n \geq i.$$

$T(n)$ increases over tenure until the end of the vesting period. Therefore in the early stage of a career, the benefits from earnings management can increase, or decrease slowly, or remain same, depending on the change rate of $T(n)$ and $\Delta(n)$ with respect to tenure. In contrast, once all the compensation options granted become exercisable, then the benefits from earnings management will decrease monotonically[4].

2.2 Costs of earnings management
The cost of manipulating earnings $c(e_t)$ arises from the manager's time and effort devoted to manipulation and his/her intrinsic personal dislike of lying. In the meantime, he/she bears the cost of being terminated and having fewer future employment opportunities due to aggressive reporting (Liang, 2004; Hazarika *et al.*, 2012). However, we note that the cost of earnings management varies over tenure, and specifically, it will decrease over tenure. The line of reasoning is listed as follows.

First, the long-tenured CEO is more likely to accumulate power from a variety of sources, including building a coalition and a power base, establishing credibility and influence, stacking the board with the members who are beholden to him, establishing strong social relationship, etc. (Elhagrashy *et al.*, 1999; Ghosh and Moon, 2005). A tenured CEO may also develop expertise due to his hands-on experience and knowledge with the firm (Elhagrashy *et al.*, 1999). The CEO's power and expertise increases the board's dependence on him or her to provide the information that the board needs to govern the firm. Therefore, it is commented that "CEOs with longer tenures were monitored and evaluated less by the board of directors than new CEOs" (Mattioli, 2011). Long-serving CEOs are, hence, less likely to be terminated by the boards due to earnings management. Second, the time and effort involved in finance and accounting and spent on earnings management will decline as CEOs have more experience with financial reporting.

Moreover, we postulate that this cost will decrease at a declining rate due to the steep learning curve effect experienced by every new CEO who must undertake new, sometimes unfamiliar, functions. CEOs from outside the business, as well as CEOs who are selected from within the same industry, face a steep learning curve. For example, Robert J. Frankenberg was the vice president of Hewlett-Packard Co. of Cupertino, Calif., and was named the new CEO for Novell Inc. in 1994. Though successful in building Hewlett-Packard's software and network businesses, he admitted he would "be into a very steep learning curve at Novell" (Haddock, 1994). Alan J. Lacy was the CFO at Sears before being appointed as the CEO in 2000. In spite of his expertise in finance and accounting, he admits he will be in "deep-dive mode" to figure out retail (Carpenter, 2000). Put in our context, the cost of earnings management will drop more slowly over a CEO's office time. Therefore, the cost of earnings management, C(n), as a function of CEO's nth year in office, should possess the following features (which is convex):

$$\frac{\partial c(n)}{\partial n} < 0, \frac{\partial^2 c(n)}{\partial^2 n} > 0.$$

It is difficult to quantify when the learning curve will get flat theoretically. Lois Schoenbrun, CEO of the American Academy of Optometry, commented that it "took one-and-a-half years for everything to finally make sense" (Mann, 2002). Before Hank Jackson was named as the CEO for the Society for Human Resource Management (SHRM), he played the role as a senior executive and interim CEO for five years at SHRM. Before he joined SHRM, he held senior positions with several other organizations. It is suggested that "obviously, there's going to be no need for a learning curve for the new CEO leading up to a first meeting" (Shadovitz, 2011). It appears that it takes a new CEO several years to get through the steep learning curve, which will get flat after that early stage in office.

2.3 Earnings management strategy over tenure
Liang (2004) suggests that earnings management is better understood in a strategic context that involves various economic trade-offs. We combine the benefit and cost resulting from earnings management to derive the utility function:

$$B(n) = T(n) \times \Delta(n) - c(n).$$

In the early stage of a career, the benefits from earnings management can increase, or remain same, or decrease slowly. In contrast, the costs from earnings management decrease fast. We therefore expect the net benefits from the earnings

management will increase. Later on, when CEOs experience flat learning curve and can exercise their options granted when they get started, both the benefits and costs of earnings management will decrease, but the former will decline faster than the latter, leading to a decreasing net benefits from earnings management.

Due to the above analysis, we predict a non-linear relationship between optimal earnings management and tenure, which is different from Zhang's (2009) conclusion that earnings quality and tenure are negatively associated. In particular, we predict that in their early career, managers are more conservative in managing earnings. They start to report earnings more aggressively as time elapses, until their earnings management levels reach a maximum level. After that, they are less incented to manage earnings.

We note that our above analysis is not applicable for the first and last years the manager is in office, during which many other factors are involved in the earnings management decision (Francis *et al.*, 1996; Dechow and Sloan, 1991; Zhang, 2009).

3. Empirical test and result
3.1 Sample selection
We chose data from the Chinese stock market to test our analytical model. China provides a unique setting to study the markets' dynamic process of learning managers' capabilities, since the Chinese stock markets are relatively new and the investors are less sophisticated. Thus, the assumption that earnings management can bias the market's perception of the manager's ability in his/her favor is likely to hold. Moreover, earnings management is more flexible in China. Besides accruals management, Chinese managers have a variety of other mechanisms to inflate earnings, including related-party transactions, earnings distributed to related parties, subsidies, etc. When earnings management is more likely to be identified, the research examining the association between earnings management and other variables is more likely to be a high power test. Last but not least, many managers in China are appointed by the government. They do not necessarily have a background in accounting and finance and, hence, the learning experience effect plays an important role in their earnings management strategy.

Our sample period is the years of 2003, 2004 and 2005. Among all the listed firms available in the Chinese Stock Market Accounting Research financial database (CSMAR), we excluded the firms in the financial sector. We also deleted the observations when the firm was designated as either a special treatment (ST) or a particular transfer (PT)[5], because their managers are motivated to do whatever it takes to report a profit so as to keep listed. This incentive to manage earnings is not the topic of this paper. We included chairs of the boards of directors and CEOs as managers in our empirical analysis, since both of them play important roles in managing earnings[6]. Chairs of the boards of directors are usually appointed by the controlling shareholders. Under Chinese company law, shareholders can exercise power at shareholders' meetings that give them absolute sovereignty over corporate affairs.

We hand collected the managers' tenure for each firm during the years of 2003, 2004 and 2005 by reading the proxy statements and news releases. We obtained the financial data from CSMAR. We finally deleted the observations when the manager was in either his or her first or last year in office.

Our final sample included 1,712 firm-year-manager observations, and the components of the observations are presented in Table I. Panel A shows 569, 587 and 556 observations from 2003, 2004 and 2005, respectively. Among them, 898 observations are from the chairs, and the rest are from the CEOs[7]; 171(10 per cent) observations are from Industry 2 (public service), 71 (4.15 per cent) from Industry 3 (real estate and construction), 129 (5.73 per cent) from Industry 4 (others), 1,182 (69 per cent) from Industry 5 (manufacturing) and 159 (9.29 per cent) from Industry 6 (wholesale and retailing). Panel B shows that among the 1,712 observations, there are 999 individual firm-year observations. For each year-industry group, there are at least 13 observations.

3.2 Measurements of earnings management

3.2.1 Discretionary accruals from the Jones model. Jones (1991) proposes a model that attempts to control for the effects of changes in a firm's economic circumstances on non-discretionary accruals. The Jones model for non-discretionary accruals in the event year is:

$$NTAcc_{i,t} = \alpha_0'(1 / TA_{i,t-1}) + \alpha_1'(\Delta Sales_{i,t} / TA_{i,t-1}) + \alpha_2'(PPE_{i,t} / TA_{i,t-1}). \quad (4)$$

Where,

$NTAcc_{i,t}$ is non-discretionary accruals in year t scaled by lagged total assets;

$\Delta Sales_{i,t}$ is the change in revenue from period $t - 1$ to t;

$PPE_{i,t}$ is gross plant property and equipment at the end of year t; and

$TA_{i,t-1}$ is total assets at the end of year $t - 1$.

α'_0, α'_1 and α'_2 are firm-specific parameters, which are obtained by using the following model in the estimation period:

	2003		2004		2005			
	Chairs	CEOs	Chairs	CEOs	Chairs	CEOs	Total	(%)
Panel A: number of chair-firm-year observations and CEO-firm-year observations								
Industry 2	30	25	30	28	30	28	171	0.09988318
Industry 3	12	13	13	11	12	10	71	0.04147196
Industry 4	22	21	22	19	23	22	129	0.07535047
Industry 5	204	185	217	194	199	183	1,182	0.69042056
Industry 6	32	25	25	28	27	22	159	0.09287383
Total	300	269	307	280	291	265	1,712	1
Panel B: number of individual firm-year observations								
Industry 2	33		32		34		99	
Industry 3	14		13		15		42	
Industry 4	25		24		25		74	
Industry 5	231		233		227		691	
Industry 6	34		31		28		93	
Total	337		333		329		999	

Notes: Industry 2: public service; industry 3: real estate and construction; industry 4: others; industry 5: manufacturing; industry 6: wholesale and retailing

Table I.
Compositions of
observations

$$TAcc_{i,t} = \alpha_0(1 / TA_{i,t-1}) + \alpha_1(\Delta Sales_{i,t} / TA_{i,t-1}) + \alpha_2(PPE_{i,t} / TA_{i,t-1}) + \varepsilon_{i,t}. \quad (5)$$

Where,

$TAcc_{i,t}$ is total accruals, and equal to (earnings from operations − cash from operations)/$TA_{i,t-1}$;

$\varepsilon_{i,t}$ is the error term used to capture the firm-specific discretionary portion of total accruals; and

α_0, α_1 and α_2 denote the OLS estimates of α'_0, α'_1 and α'_2.

Discretionary accruals (DA_J) are derived by subtracting non-discretionary accruals from total accruals:

$$DA\_J_{i,t} = TAcc_{i,t} - NTAcc_{i,t}. \quad (6)$$

We ran equation (5) by each industry to obtain industry-specific parameters, α'_0, α'_1 and α'_2. Plugging them into equation (4) and (6), we derived the discretionary and non-discretionary accruals.

3.2.2 Total accruals and industry-year adjusted total accruals. The tools of earnings management in China are quite different from those in other nations (Chen *et al.*, 2008). Chinese firms usually keep their books open until the completion of audit. Before closing the books, they have a variety of means and ways to increase non-operating income, including backdating the sales of investments or properties to the previous year, managing the profits of investee companies accounted by the equity method, and adjusting prior-period earnings (Chen and Yuan, 2004). Due to concentrated ownership, weak corporate governance and a primitive legal system, earnings management in Chinese listed companies may be mainly induced by the controlling owners' related party transactions (Liu and Lu, 2007; Aharony *et al.*, 2010; Wang and Xiao, 2011). In fact, most listed companies were spin-offs from their parent SOEs. The parent-SOEs are motivated to assist the managers of the listed firms in manipulating earnings to meet various requirements to protect their interests as controlling shareholders in the listed firms.

We followed Liu and Lu (2007) and used total accruals, defined as the difference between net income and operating cash flows, to proxy earnings management. This measurement includes not only the inflated earnings through related party transactions, but also the earnings from extraordinary items, discontinued operations, non-operating activities, etc., over which a manager has discretionary control. Specifically, we have:

$$TA = \text{net income-cash flow from operations}$$

Considering the communal determinants of accruals among firms within the same industry and during the same year, we also compute the mean of total accruals for each industry-year group, and subtract this mean from the individual firm's total accruals to obtain adjusted total accruals as our third measurement of earnings management:

$$AdjTA = TA - \text{industry-year mean TA} \quad (7)$$

3.3 Empirical test and the results

3.3.1 Summary statistics. Table II provides descriptive statistics of the variables used in our study. To make the coefficient of size comparable with other variables'

Variable	Mean	SD	Median	Lower quartile	Upper quartile
Tenure	4.8946	2.5416	4.5	3	6.5
Age	49.0584	7.1815	49	43	54
Lnsize	21.4919	0.8546	21.4360	20.8566	21.9963
Leverage	0.4832	0.1853	0.5009	0.3580	0.6192
Csales	−0.0873	0.6289	−0.1428	−0.2518	−0.0349
ROA	0.0264	0.0632	0.0236	0.0069	0.0534
CFO	0.0626	0.0927	0.0591	0.0173	0.1073
Discretionary accruals and non-discretionary accruals from cross-sectional Jones model					
TA	−0.0362	0.0889	−0.0371	−0.0754	0.0015
AdjTA	0.0001	0.0872	0.0013	−0.0388	0.0388
DAJ	−0.0017	0.0810	−0.0039	−0.0414	0.0354
Discretionary accruals obtained from related party transactions					
PFO	0.0380	0.0706	0.0306	0.0065	0.0664
PFI	0.0030	0.0218	0.0002	−0.0010	0.0038
PFF	0.0000	0.0002	0	0	0
Subsidies	0.0022	0.0059	0.0001	0	0.0017
RevFNO	0.0017	0.0057	0.0004	0.0001	0.0012
ExpFNO	0.0043	0.0134	0.0011	0.0005	0.0030
Distearnings	0.0017	0.0057	0.0004	0.0001	0.0012
IncTax	0.0116	0.0141	0.0073	0.0025	0.0152
Minointerest	0.0032	0.0112	0.0002	−0.0002	0.0039
UnrealizeLI	0.0006	0.0036	0	0	0

Notes: Tenure: the number of the years that the chair of the board (or CEO) takes positions as the chair or CEO; age: the age of the chair of the board (or CEO) in the year when they are in office; lnsize: natural log of total assets; leverage: debt/market value of equity; csales: change in sales, defined as (sales $_{i,t}$ − sales $_{i,t−1}$)/ sales $_{i,t−1}$; ROA: return on asset, defined as earnings$_{i,t}$/asset $_{i,t−1}$; CFO: cash from operations, defined as cash from operations scaled by lagged total assets; TA: discretionary accruals, defined as the difference between cash from operations and earnings, then scaled by lagged total assets; AdjTA: year-industry adjusted discretionary accruals, defined as the difference between TA and the mean of the TA for the year-industry group that the observation belongs to; DA_J: discretionary accruals, residual values of the Jones model estimated cross-sectionally; PFO: Profits from operations scaled by lagged total assets; PFI: profits from investment (B130202) scaled by lagged total assets; PFF: profits from future (B130301) scaled by lagged total assets; subsidies: subsidies (B130402) scaled by lagged total assets; RevFNO: revenue from non-operating activities (B130501) scaled by lagged total assets; ExpFNO: expenditure from non-operating activities (B130603) scaled by lagged total assets; distearning: earnings distributed to related parties (B130501) scaled by lagged total assets; IncTax: income taxes (B140204) scaled by lagged total assets; minointerest: minority interests (B140304) scaled by lagged total assets; unrealizedLI: unrealized investment losses (B140701) scaled by lagged total assets

Table II.
Descriptive statistics

coefficients, we used the natural logarithm of the total asset to proxy the size effect. Earnings and net cash flows from operations were scaled by the lagged total assets. The mean (median) of total accruals as a percentage of lagged total assets is −3.62 per cent (−3.71 per cent). The mean of industry-year adjusted total accruals is as small as 0.0010, though there is a large variation in this earnings measurement proxy. The mean of the lower (upper) quartile is −0.0388 (0.0388); the standard deviation is 0.0872. It is worth noting that the mean of discretionary accruals obtained from the Jone's model is −0.17 per cent, much higher than the data in the US market, which is −2 per cent, according to Sloan (1996) and Fairfield *et al.* (2003). This indicates a lower quality of earnings in China. Leverage is defined as the ratio of debt to the market value of equity, and its mean (median) is 0.4832 (0.1853), which is similar to the ratio (around 0.5) reported in the US markets by Dichev and Skinner (2002). We also note that the CFO and ROA are much lower in Chinese firms than those for US firms (ROA is 0.114, and CFO is 0.134 in Sloan, 1996), indicating the lower profitability and lower cash generating ability of Chinese firms.

The mean (median) of tenure years that the managers were in office is 4.9 (4.5). Both the mean and the median for the managers' age are 49. We also present the descriptive data for the below-the-line items on the income statement. For example, on average, the earnings from investment is 0.003, subsidies from the government are about 0.0022, revenue from non-operating activities is 0.0017, expenditure on non-operating activities is 0.0043 and the earnings distributed to the related parties is 0.0017.

3.3.2 Univariate analysis. Table III reports the Pearson correlations among our independent and dependent variables. With Chinese stock market data, we confirm the relationship among earnings and components of earnings as documented by Sloan (1996) and Xie (2001) with the US data. In particular, we find that earnings and CFO are positively related, earnings and total accruals are positively related, CFO and three measures of earnings management are negatively related and all are at significant levels. We also find that three measures of earnings management are highly correlated, substantiating that our measures for earnings management are appropriate.

The remaining variables in Table III indicate several significant associations between earnings management and other variables. In particular, the correlations between sales growth and earnings management obtained from three approaches are significantly negative. Observations with higher leverage tend to have a lower extent of earnings management.

Finally, we note that the association between tenure and age is significantly positive. However, tenure appears to be irrelevant to earnings management, since none of the measurements of earnings management is significantly related to tenure. However, this uncorrelated univariate relationship can arise due to the incorrect conjecture of the linear relationship between two variables and omission of other relevant variables. To determine the distinct effect of tenure on earnings management, we conducted the following multivariate analysis, expressed in quadratic equation format.

3.3.3 Multivariate analysis. We use the following regression, in which the dependent variable (EM) measures the degree of earnings management:

	Tenure	Age	lnsize	Leverage	Csales	ROA	CFO	TA	AdjTA	DA_J
Tenure	1.0000									
Age	0.4228	1.0000								
	<0.0001									
lnsize	0.1419	0.1498	1.0000							
	<0.0001	<0.0001								
Leverage	0.0223	−0.0274	0.1920	1.0000						
	0.3566	0.2567	<0.0001							
Csales	0.0248	0.0133	−0.0224	0.1459	1.0000					
	0.3056	0.5834	0.3551	<0.0001						
ROA	0.0270	0.0668	0.2731	−0.4262	−0.1168	1.0000				
	0.2649	0.0057	<0.0001	<0.0001	<0.0001					
CFO	0.0192	0.0673	0.1661	−0.1365	−0.0166	0.3987	1.0000			
	0.4275	0.0053	<0.0001	<0.0001	0.4932	<0.0001				
TA	−0.0007	−0.0224	0.0220	−0.1621	−0.0661	0.2986	−0.7562	1.0000		
	0.9757	0.3541	0.3630	<0.0001	0.0062	<0.0001	<0.0001			
AdjTA	0.0213	−0.0105	0.0048	−0.1695	−0.0636	0.2876	−0.7448	0.9802	1.0000	
	0.3775	0.6637	0.8440	<0.0001	0.0085	<0.0001	<0.0001	<0.0001		
DA_J	0.0056	−0.0115	0.0275	−0.1699	−0.0655	0.2882	−0.6263	0.8574	0.8634	1.0000
	0.8155	0.6349	0.2550	<0.0001	0.0067	<0.0001	<0.0001	<0.0001	<0.0001	

Table III.
Contemporaneous
spearman correlations

$$EM_{i,t} = \beta_0 + \beta_1 \times Lnsize_{i,t} + \beta_2 \times leverage_{i,t} + \beta_3 \times Csales_{i,t} + \beta_4\, tenure_{i,t}^2$$
$$+ \beta_5\, tenure_{i,t} + industry\ indicators + year\ indicators + \varepsilon_{i,t} \qquad (8)$$

where,

Lnsize is the natural log of total assets.

Leverage is the ratio of total liabilities to the market value of equity.

Csales is the percentage change in sales revenue.

We included leverage to control for financial distress, ROA to control for firm performance and Csales to control for growth. We also controlled for the industry and year effect. Industry indictors are based on the six categories in China. Our variable of interest is tenure. To examine the non-linear relationship between earnings management and tenure, we included both the linear term and the square term in our regression analysis. We predicted an inverted U-shaped relationship between earnings management and tenure, that is, the sign of β_4 is negative, and β_5 is positive.

The empirical result from Table IV is consistent with our hypothesis. When the dependent variable is total accruals, the coefficient of *tenure²* is −0.0005 and significant at the 5 per cent level, and the coefficient of *tenure* is −0.0252 and significant at 10 per cent level. The *F*-value of the model is 48.45, and the *R*-square is 14.56 per cent, showing that the model specification is appropriate. When we use industry-year adjusted total accruals or discretionary accruals from the Jones model as the dependent variable, we obtain similar results. To alleviate potential outlier problems, we winsorize three measurements for earnings management at the top and bottom 2 per cent; the qualitative results remain unchanged.

$$EM_{i,t} = \beta_0 + \beta_1 \times Lnsize_{i,t} + \beta_2 \times leverage_{i,t} + \beta_3 \times Csales_{i,t} + \beta_4 tenure_{i,t}^2 + \beta_5 tenure_{i,t}$$
$$+ \text{ industry indicators} + \text{year indicators} + \varepsilon_{i,t} \tag{9}$$

	Exp. significance	Dependent variable = TA		Dependent variable = AdjTA		Dependent variable = DA_J	
		Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics
Intercept		0.0724	1.33	0.1392***	2.6	0.0627	1.23
Lnsize		−0.0061**	−2.34	−0.0076***	−2.96	−0.0038	−1.52
ROA		0.5013***	12.98	0.4764***	12.57	0.3681***	10.15
Leverage		0.0068	0.53	0.0023	0.18	−0.0174	−1.45
Csales		−0.0252***	−9.9	−0.0251***	−10.03	−0.0038	−1.6
Tenure	+	0.0058*	1.95	0.0067**	2.28	0.0067**	2.39
Tenure²	−	−0.0005**	−2.17	−0.0005**	−2.21	−0.00056**	−2.44
Industry		Yes		Yes		Yes	
Year		Yes		Yes		Yes	
F-value		48.45	$p < 0.0001$	47.72	$p < 0.0001$	28.76	$p < 0.0001$
R-Square		0.1456		0.1437		0.0919	

Table IV.
Results from ordinary least squares regressions in equation (9)

Notes: ***Significant at the 0.01 level; **significant at the 0.05 level; *significant at the 0.10 level

Furthermore, we also find that the coefficient on *Csales* (β_3) is significantly negative when the dependent variable is total accruals or industry-year adjusted total accruals, but not when it is discretionary accruals. In contrast, the research using US data finds a significantly positive relationship between earnings discretionary accruals and growth, as growth firms are more likely to have estimation errors in the accounting process. This difference can be explained by the unique institutional background in China, where the main purpose of earnings management is to meet certain profitability requirements stipulated by the China Securities Regulatory Commission to obtain additional issue rights or to stay listed (Chen and Yuan, 2004; Liu and Lu, 2007). High growth firms in the early stage of the product cycle, are able to achieve good earnings performance by generating economies of scale to meet the substantial market demand (Lee *et al.*, 2000). Therefore, they are less likely to boost earnings through related-party transactions.

3.4 Additional analysis
Based on our empirical test of the main hypothesis, we can infer that managers are more likely to engage in earnings manipulation around their sixth year in office[8]. Thus we compare the earnings management of managers in their fifth and sixth years (Group 1) with those of managers who have been in office for either less than five years or longer than six years (Group 2). Table V reports the mean (median) differences in earnings management between these two tenure groups. The mean (median) of total accruals is −0.0301 (−0.0309) for Group 1, and −0.0399 (−0.0398) for Group 2. The mean difference is 0.00984 between the two tenure groups and significant at 5.9 per cent level, and the median difference is statistically significant as well. The mean of industry-year adjusted accruals is 0.00540 for Group 1, and −0.00359 for Group 2, and the mean difference is 0.00898, which is significant at the

Group	Observation	Mean	Median	SD
TA				
1	419	−0.0301	−0.0309	0.0894
2	1090	−0.0399	−0.0398	0.0912
Difference		0.0098		
t-value		−1.76*		
z-value			2.0917**	
AdjTA				
1	419	0.0054	0.005821	0.0866
2	1090	−0.00359	−0.001137	0.0894
Difference		0.009		
t-value		−1.89*		
z-value			1.9643**	
DA_J				
1	419	0.00077	−0.0011	0.0803
2	1090	−0.0047	−0.0067	0.0834
Difference		0.0055		
t-value		−1.15		
z-value			1.5664	

Notes: **Significant at the 0.05 level; *significant at the 0.10 level

Table V.
The mean and median
difference in earnings
management between
the group whose
tenure is between five
and seven years
(Group 1) and the
group whose tenure is
outside the range
(Group 2) across three
measures

7.8 per cent level. The median difference between the two groups is also significant. For Jone's discretionary accruals, the mean difference is 0.00547 between the two tenure groups, though this difference is not statistically significant at the conventional level, nor is the median difference. In summary, the mean (median) of different proxies for earnings management for Group 1 always exceeds that for Group 2, and this difference is significant for two measures of earnings management, thus providing some evidence that earnings management peaks when the managers are in their fifth and sixth years in office.

4. Conclusion
Zhang (2009) documents that CEOs with long tenure report earnings less aggressively than those with short tenure, while Ghosh and Moon (2005) document a positive association between discretionary accruals and CEO tenure. In contrast, our paper predicts that managers are conservative in managing earnings when they first start to take top managerial positions, and then become aggressive in the next few years. Once they reach the maximum level of earnings management, they will become conservative again and report earnings less aggressively. This inverted U-shaped relationship between tenure and earnings management is confirmed by the data from the Chinese stock market. We find that Chinese managers manage earnings most aggressively around the fifth and sixth year in their managerial career.

Our study highlights the importance of understanding the impact of tenure on the earnings management strategy when analyzing financial information, especially in an emerging market where the investors are unsophisticated and the manager has a

variety of means and tools to manage earnings. We aim to enhance understanding of the motives for earnings management. This paper suggests that the level of earnings management varies across tenure. With the knowledge of when earnings management is more likely to occur, regulators can set up policies targeting firms and managers with certain characteristics, instead of requiring observances from all firms and managers. This limited scope can greatly reduce the costs of preventing and identifying earnings management, while effectively maintaining the quality of earnings in the meantime.

Notes

1. We define economic earnings (EE) as earnings before manipulation.

2. We define economic (accounting) earnings as high when they meet the market expectation, or show a small increase relative to prior AE, or meet the China Securities Regulatory Commission (CSRC)'s ROE requirement for the listed companies wishing to issue additional shares. If the economic (accounting) earnings cannot meet any of the above criteria, we define them as low economic (accounting) earnings.

3. It can be proved that the market's posterior belief about whether a manager is of high or low type after observing the announced low AE (i.e. when AE are not managed) in the nth period is lower than the ex-ante belief in the nth period, that is:

$$\gamma'(T = H \mid AE_n = 0, AE_{n-1} = 1, \ldots, AE_2 = 1, AE_1 = 1)$$
$$< \gamma'(T = H \mid AE_{n-1} = 1, \ldots, AE_2 = 1, AE_1 = 1)$$

Therefore, the CEO attempts to achieve the high AE as long as he can, and this earnings management behavior is the focus of this paper.

4. It is very likely that the CEO will continue to receive options during his time in office, besides before taking the position. Usually, the amount of options that are granted during his time in office and becomes exercisable is constant over his tenure. Since benefits from these options do not vary over tenure, we do not include them in the model. We only consider the benefits that vary over tenure.

5. Stocks are labeled ST if the exchanges believe the stock has potential trading risk by having a distressed financial status, such as posting negative net profits for two consecutive years, or are showing abnormalities; they are designated as PT firms if they fail to turn profitable within one year after being labeled as ST (Jiang and Wang, 2008).

6. In an untabulated analysis, we use only the CEOs' tenure (or only the tenure of chairs of the boards) to check the robustness, and the tenor of the conclusion remains qualitatively same.

7. If the company has a "dual CEO" where one person occupies both board chair and CEO positions, we count these observations only once as firm-year-CEO observations.

8. For a quadratic equation $y = -ax^2 + bx + c$, y takes the maximum value when $x = b/(2a)$. When we use TA, AdjTA and TA_J to measure earnings management, executives manage earnings most at 5.49 [0.005811/(2 * 0.00053)], 6.30 [0.00667/(2*0.00053)] and 5.96 [0.006677/(2*0.00056)], respectively.

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