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CEO Age, Earnings Management and Mergers & Acquisitions Evidence from China

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Abstract This paper explores the relationship between CEO age in target firms, earnings management, mergers and acquisitions decision-making, and performance by using a sample of Chinese firms from 2008 to 2017. We found that CEO age is negatively correlated with M&A decision-making and target firms engage in a higher degree accrual-based earnings management (AEM) than non-target firms. In addition, target firms with young CEOs exhibit a greater extent of AEM in the pre-M&A period. We also found that the relationship between CEO age and M&A performance is inverted U-shaped. AEM of pre-M&A is negatively correlated with M&A performance, indicating that M&A performance is affected by AEM of pre-M&A.

Keywords CEO age; M&A decisionmaking; M&A performance; AEM

1 Introduction

M&As are important corporate events and China's economy has been in a period of transition, and there is an increasing number of companies have adopted Mergers and Acquisitions (M&A) as a strategic approach to enhance their competitiveness and enhance the sustainability of their development in recent years. Wind database statistics show that a total of 5,378 transactions were completed in China's M&A market in 2017, an increase of 72.5% from 3,116 in 2016; the transaction amount involved in M&A totalled 4.93 trillion yuan, an increase of 54.03% year-on-year, of which domestic M&A accounted for 92.88%.

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CEOs in both parties play a vital role in the M&A decision-making process. Extant literature exhibits several CEO characteristics (e.g., CEO overconfidence, power, and education) that affect their decision-making process[1, 2]. However, the relationship between the age of managers and M&A decisions has not been extensively studied. CEO age is commonly controlled for, but few studies have systematically explored the effect of CEO age on M&A decisions[3]. More importantly, unlike the managers on the acquirer side, managers from the acquiree side may face a greater risk of being replaced in the post-M&A[4]. Therefore, we add to this literature by demonstrating that CEO age in the target firms can also influence M&A decisions significantly.

According to the leading view presented in the literature, considering older CEOs' retirement preferences make them face lower job replacement costs in the post-M&A period, they are easier to agree to be acquired. However, other researchers hold the opposite view and argue that compared with younger CEOs with age advantages, older CEOs are more difficult to adopt a changing environment since their learning ability, energy, physical strength, and cognitive abilities are declined with ageing. Given the competing arguments in the literature, it is not clear ex-ante whether older CEO is willing to accept M&A projects. We examine this issue empirically over 2008 to 2017 period in the Chinese A-share market. Our results exhibit that CEO age is significantly negatively correlated with M&A decision-making, which means younger CEOs are less willing to accept the M&A projects. But we also find that CEO age is significantly positively related to M&A performance. This indicates younger CEOs are most likely to seek business success, which may result in higher firm growth and performance, therefore, showing a desirable post-M&A performance. In addition, we test for the effect of accrued earnings management (AEM) on the association between CEO age and M&A performance in pre-and post-M&A, and the main results show that younger CEOs will use negative AEM of pre-M&A to ingratiate acquirer, lower the value of the company, and improve M&A performance through AEM to reduce their professional risks.

Our study differs from the limited literature on the relation between CEO demographic characteristics (i.e., age and gender) and M&A activities in the following ways: 1) Our study contributes to existing M&A literature by exploring the impact of CEO features from acquiree side. Previous studies mainly concentrate on managerial behaviors from acquirer side and have not reached a conclusive result, only a few attention have been paid to managerial activities in acquire. Given managers in target firms also play a crucial role in the success of the M&A, it is worth investigating their features; 2) We added new evidence to the limited literature on the relationship between CEO age and M&A activities, especially in the target firms. CEO age is commonly controlled for, but few studies have systematically explored the effect of CEO age on firm outcomes. So far, only a few articles examined how CEO age in target firms affect mergers and acquisitions worldwide. Considering the great impact managerial demographic characteristics (i.e., age, gender) have on corporate decision-making and strategic choice. It is essential to understand how CEO age influences corporate decision-making, such as M&A decisions; 3) We also extend current studies on the association between CEO age and M&A performance by examining the effect of earnings management. To clarify how earnings management, play a role in the link between CEO age and M&A performance may help us to better understand the "M&A profit and loss mystery". However, to the best of our knowledge, there is only a little

research paying attention to this issue.

The rest of the paper is structured as follows. Section 2 reviews the related literature and develops the hypotheses. Section 3 explains sample selection and research design issues. Section 4 presents the empirical results. Section 5 offers additional analyses and Section 6 concludes the paper.

2 Literature Review and Hypotheses

2.1 CEO Age and M&A Decision-Making

The upper echelons theory which was proposed by Mason[5], who believes that the demographic characteristics of top management (i.e., age, gender) have a great impact on corporate decision-making and strategic choice. This is because these demographic characteristics are an effective reflection of psychological factors and influence the formation of their personal values and cognition. Previous studies on the CEO age and corporate decision-making have shown that older CEOs tend to make decisions with less risk[6, 7]. This is because managers' learning ability, energy, physical strength, and cognitive abilities will decline with ageing. Older managers feel more difficult to deal with challenging situations, and they are more likely to make decisions based on past experiences and avoid making critical changes, thus, they are willing to adopt a more conservative management style[8]. Moreover, unlike the younger CEOs, who are eager to show their outstanding abilities, elder CEOs consider more about the accumulated reputation in the market, therefore they are willing to follow the industry standards or historical experiences, but unwilling to break conventions, which may damage their reputation[9]. Younger CEOs are more energetic and work hard for success since their capability can be better proved. However, after a certain age, those younger CEOs may step into the "the spirit is willing, but the flesh is weak" situation and hope to "retire after winning merit" by selling the company.

Another important factor that influences M&A decision-making is CEOs' career development. Normally, in terms of M&A activities, the CEOs' career development may have conflicts with the shareholders' interests[10, 11]. After the M&A is completed, the CEO of the acquired company may face replacement, but it is difficult for him to find similar positions in any other company[4, 12]. Acquiring a company will be at the expense of the CEO's career development of the acquired party[13]. As for younger CEOs, their career development is still on the rise, however, as they grow older or reach a certain age, the need for stability in career and life gradually will increase. During that time, they are less likely to make M&A decisions that make them at the risk of job replacement. Therefore, younger CEOs are more cautious about the consideration of their personal careers and agree to the company being acquired.

In contrast, older CEOs, whose careers have entered a recession stage, have less demand for career development than younger CEOs. If the company is acquired, older CEOs also face the risk of being replaced, but the difference between being replaced and retirement is relatively small. Given older CEOs' retirement preferences make them face lower job replacement costs in the post-M&A period, they are easier to agree to be acquired. In addition, other researchers hold the opposite view and argue that compared with younger CEOs with age advantages, older CEOs are more difficult to find a similar job after the company is acquired. But such

risk can be mitigated if compensation losses caused by potential replacement become smaller. Overall, based on the foregoing discussion, younger CEOs are unwilling to agree to be acquired for career concern, but the willingness will increase when they meet a certain age. Following this logic, we state our first testable hypothesis as follows:

H1 The CEO age of the targeting company has a positive U-shaped relationship with M&A decision-making.

2.2 CEO Age and M&A Performance

As one of the dominant players in M&A activities, CEOs' age has significant implications on M&A performance. Their aspirations and personal goal orientations may change across adulthood. For example, Ebner, et al.[14] documented that young adults regard growth as their primary goals, while older adults lean toward maintenance and loss prevention. This implies that younger CEOs are most likely to seek self-fulfilment and success, which may result in higher firm growth and performance, while older CEOs may desire to maintain stable income with a flexible lifestyle[15]. All these considerations can motivate older CEOs to follow less aggressive strategies and in turn to lower the average growth and performance of their firms. Therefore, compared with older CEOs, young CEOs are still in a career ascension period, therefore, to obtain opportunities for retention, they will promote M&A progress actively and help acquirers to gain positive M&A performance. However, as mentioned before, older CEOs do not report career development as the primary targets and at the same time, their learning ability, energy, physical strength, and cognitive abilities become weaker, thereby may lead to undesirable performance. Taken together, post-M&A performance will increase with CEO age, but it will suffer a decline when CEO reach a certain age. Following this logic, we state our second testable hypothesis as follows:

H2 The CEO age of the targeting company has an inverted U-shaped relationship with M&A performance.

3 Research Design

3.1 Data Source and Sample Selection

We start with Chinese A-share listed companies for the period spanning 2008–2017. The CEO personal characteristics data, M&A data, financial data, and discretionary accruals and non-discretionary accruals data were all collected from the China Stock Market and Accounting Research (CMASR) database. Our sample was divided into two groups: Companies that have undergone M&As, and companies that have not undergone M&As. We excluded 1) firms in the financial services industry, since they are under a different regulatory environment; 2) ST companies, and 3) companies with missing data; and 4) we also winsorized all continuous variables at their 1st and 99th percentiles.

Furthermore, the following aspects were carried out on the sample of companies that undergo M&As. 1) We exclude samples with M&A of asset divestiture, asset swap, debt restructuring and share repurchase; 2) Eliminate companies whose M&A deals have not been completed; 3) And if a company has multiple M&A deals in the same year, we take the largest amount of M&A as our sample. Finally, we derive an unbalanced dataset of 18,096 firm-year observations,

of which 5,889 observations belonged to the group that companies have undergone M&As. We define the date of M&A as the first announcement date of M&A.

3.2 Measures and Methods

The explained variables in this paper are ΔROA (M&A performance and MA (M&A decision-makings). ΔROA is the difference in ROA between the year of M&A and the year pre-M&A. MA is a dummy variable for whether to be acquired. The key independent variable is CEO age in the year pre-M&A. In the spirit of Zhou, et al.[16], we adopted an indicator variable to compare older CEOs (experientially mature group) with younger (early career group) CEOs. We created a "CEO age dummy", which equals 1 if a firm's CEO age in a given year is greater than or equal to the sample median value of CEO age in that year and 0 if it is less than the sample median value. We have taken this method based on the view that a CEO's experience, learning aptitude, and risk-taking behavior will change over time. Due to career concerns, environmental familiarity and relative power with the board, a CEO's behavior differs significantly between early and later years[17–19]. We also include a set of control variables for both firms and corporate governance-level in our regression models. See variable definitions in Appendix A.

3.3 Empirical Model

To investigate the impact of CEO age on M&A activity, we construct the regression models as shown below:

$$\mathrm{MA}_{i,t} = \partial_0 + \partial_1 \mathrm{age}_{i,t-1} + \partial_2 \mathrm{Controls}_{i,t-1} + \partial_3 \mathrm{Year}_{t,t-1} + \partial_4 \mathrm{Industry}_{i,t-1} + \epsilon_{i,t}, \quad (1)$$

$$\Delta\mathrm{ROA}_{i,t} = \partial_0 + \partial_1 \mathrm{age}_{i,t-1} + \partial_2 \mathrm{age}^2_{i,t-1} + \partial_3 \mathrm{Controls}_{i,t-1} + \partial_4 \mathrm{Year}_{i,t-1} + \partial_5 \mathrm{Industry}_{i,t-1} + \epsilon_{i,t}. \quad (2)$$

4 Empirical Results

4.1 Descriptive Statistics

4.1.1 Descriptive Statistics of the Full Sample

The descriptive statistics of the full sample are shown in Table 1. The mean CEO age in the Chinese A-share market is 48.34 years old. The CEO has a richer life experience, is more mature and stable, and has more energy to manage the company. The average CEO gender is 0.940, indicating that most CEOs are male. The average education level is 0.5, indicating that half of the CEOs have a master's degree or above. The average educational background is 0.160, indicating that most CEOs have financial and economic education backgrounds. Through descriptive statistics on CEO characteristics, we can find that the appointment of listed companies in China is more reasonable. The average value of discretionary accruals is 0.07, the minimum is −0.410, and the maximum is 0.490, indicating that Chinese A-share listed companies generally have earnings management in different directions, and most of them are positive earnings management. The mean of ROA is −0.01, the minimum is −0.23, and the maximum is 0.24, indicating that the financial performance of Chinese A-share listed companies is poor.

Table 1 Full-sample descriptive statistics

Variables	Observations	Mean	S.D.	Min.	Median	Max.
Age	14635	48.340	6.2000	33.000	48.000	64.000
DA	13129	0.0200	0.0900	−0.410	0.0200	0.490
|DA|	13129	0.0700	0.0700	0.000	0.0400	0.490
ROA	15424	−0.0100	0.0500	−0.230	0.000	0.240
First	15425	36.04	14.92	9.450	34.300	75.000
Second	15423	23.16	13.50	1.840	22.000	56.050
B_size	15343	2.170	0.200	1.610	2.200	2.710
Depend	15343	0.370	0.0500	0.290	0.330	0.570
Dual	14635	0.280	0.450	0.000	0.000	1.000
Holder	18096	0.640	0.480	0.000	1.000	1.000
LEV1	15424	0.430	0.220	0.0400	0.430	0.980
C_size	15424	21.770	1.270	19.210	21.600	25.810
Growth	15408	0.210	0.470	−0.560	0.130	3.190
Soe	15402	0.380	0.490	0.000	0.000	1.000
Opinion	15425	0.970	0.180	0.000	1.000	1.000
Gender	14635	0.940	0.240	0.000	1.000	1.000
Edu	14635	0.500	0.500	0.000	1.000	1.000
Background	14635	0.160	0.370	0.000	0.000	1.000

4.1.2 Descriptive Statistics for Grouped M&A and Non-M&A Samples

Descriptive statistics for grouped M&A and non-M&A samples are shown in Table 2. The descriptive statistics of the two sets of CEO characteristics find that the CEO of M&A samples has a higher degree of education than the CEO of the non-M&A samples, but the non-financial education background is more. From the point of view of discretionary accruals, the mean of M&A samples is more inclined to negative AEM; the maximum of non-M&A samples is more inclined to positive AEM. From the point of view of AEM (the absolute value of discretionary accruals), the mean of the M&A samples is greater than that of the non-M&A samples, and the Standard deviation (S.D.) of the M&A samples is also larger than that of the non-M&A samples. This shows that the acquired company generally has a greater AEM tendency of pre-M&A, and the direction and range are quite different.

4.2 Empirical Result

4.2.1 CEO Age and M&A Decision-Making

Table 3 shows the regression results of CEO age and M&A decision-making described in model 1. From the overall sample of M&A, CEO age in the year of pre-M&A is negatively correlated with M&A decision-making; CEO age is divided into older age group and younger age group according to 54 years old. We find that the CEO age in the older age group is

Table 2 Grouped descriptive statistics of M&A and non-M&A samples

	Descriptive statistics of M&A samples						Descriptive Statistics of Non-M&A Samples					
Variables	Observations	Mean	S.D.	Min.	Median	Max.	Observations	Mean	S.D.	Min.	Median	Max.
Age	5174	48.01	6.19	33.00	48.00	64.00	9461	48.52	6.2	33	48	64
|DA|	4608	0.02	0.10	−0.41	0.02	0.47	8521	0.02	0.09	−0.37	0.02	0.49
|DA|	4608	0.07	0.07	0.00	0.05	0.47	8521	0.06	0.07	0	0.04	0.49
ROA	5452	0.00	0.05	−0.23	0.00	0.24	9972	−0.01	0.06	−0.23	0	0.24
First	5454	35.78	14.66	9.45	34.36	75.00	9971	36.18	15.06	9.45	34.29	75
Second	5454	24.04	13.41	1.84	23.10	56.05	9969	22.68	13.52	1.84	21.46	56.05
B_size	5428	2.16	0.20	1.61	2.20	2.71	9915	2.17	0.2	1.61	2.2	2.71
Depend	5428	0.37	0.05	0.29	0.33	0.57	9915	0.37	0.05	0.29	0.33	0.57
Dual	5174	0.29	0.45	0.00	0.00	1.00	9461	0.27	0.44	0.00	0.00	1.00
Holder	5889	0.72	0.45	0.00	1.00	1.00	12207	0.6	0.49	0.00	1.00	1.00
LEV1	5452	0.43	0.22	0.04	0.42	0.98	9972	0.44	0.22	0.04	0.43	0.98
C_size	5452	21.81	1.23	19.21	21.65	25.81	9972	21.75	1.29	19.21	21.57	25.81
Growth	5450	0.27	0.50	−0.56	0.17	3.19	9958	0.18	0.46	−0.56	0.1	3.19
Soe	5444	0.33	0.47	0.00	0.00	1.00	9958	0.41	0.49	0.00	0.00	1.00
Opinion	5453	0.98	0.14	0.00	1.00	1.00	9972	0.96	0.19	0.00	1.00	1.00
Gender	5174	0.94	0.24	0.00	1.00	1.00	9461	0.94	0.24	0.00	1.00	1.00
Edu	5174	0.52	0.50	0.00	1.00	1.00	9461	0.49	0.5	0.00	0.00	1.00
Background	5174	0.17	0.38	0.00	0.00	1.00	9461	0.16	0.36	0.00	0.00	1.00
Payment	5889	0.16	0.36	0.00	0.00	1.00	-	-	-	-	-	-
T_size	5452	0.21	0.60	0.00	0.03	4.37	-	-	-	-	-	-

positively correlated with M&A decision-making but not significant, while CEO age in the younger age group is significantly negatively correlated with M&A decision-making. It can explain to a certain extent that younger CEOs are unwilling to be acquired. Because once a company is acquired, CEO will face the danger of unemployment. At the same time, for younger CEOs, as they grow older, their accumulation of experience and resumes makes them more and more confident in running and managing their own company, and they are not willing to give up the company. When the age has grown to a certain level, due to personal energy, health and other reasons, older CEOs will gradually feel "the spirit is willing, but the flesh is weak". In order to make the company develop better, as they get closer to retirement, they are more inclined to be acquired. M&A decision-making and CEO age have different correlations in the process of group testing. Although the positive correlation is not significant, to a certain extent, it can be considered that Hypothesis 1 is established, that is, the target CEO age has a positive U-shaped relationship with the M&A decision-making. In addition, it can be found from Table 3 that the education level and educational background of CEOs are also related to

Table 3 Regression results of age and M&A decision-making

	Total	Older age	Younger age
Variables	MA	MA	MA
Age	−0.0119***	0.0255	−0.00837**
	(4.87×10^{-5})	(0.139)	(0.0386)
Gender	0.0238	0.274	−0.00152
	(0.743)	(0.187)	(0.984)
Edu	0.0662*	0.138	0.0552
	(0.0621)	(0.162)	(0.150)
Background	0.205**	0.331	0.187**
	(0.0180)	(0.138)	(0.0480)
ROA	3.193***	3.182***	3.160***
	(0.000)	(0.000809)	(0.000)
LEV1	−0.138	−0.00422	−0.181*
	(0.128)	(0.986)	(0.0646)
CFO	−0.000**	-7.15×10^{-11}**	−0.000
	(0.0399)	(0.0277)	(0.257)
IND	YES	YES	YES
YEAR	YES	YES	YES
Constant	−0.767***	−3.061***	−0.923***
	(0.00235)	(0.00698)	(0.00179)
Observations	14,631	2,318	12,298

M&A decision-making. In terms of economic significance, the reported coefficient implies that when the CEO's age increases by 1 year, the possibility of mergers and acquisitions decreases by 1.19%. More specifically, in the older age group, CEO age does not affect the possibility of M&A decision-making, while in the younger age group, when the CEO's age increases by 1 year, the possibility of M&A decision-making decreases by 0.84%. This result is consistent with previous studies[20, 21] which found that older managers tend to make less risky decisions. This is because younger managers will consistently exhibit overconfidence in entrepreneurial decisions motivated by their eagerness to demonstrate personal competence. In addition, we found the positive coefficients on Gender and the negative coefficient on LEV1 are consistent with previous studies[22, 23]. It can be found from Table 3 that the education level and educational background of CEOs are also related to M&A decision-making[22, 23].

CEOs with high education levels tend to accept being acquired, and CEOs with no financial background are more inclined to accept being acquired.

4.2.2 Target CEO age and M&A performance

Table 4 shows the regression results of the target CEO age and M&A performance described in Model 2. The regression results of the M&A overall sample show that there is a significant inverted U-shaped relationship between the target CEO age and M&A performance. After grouping and regression of age inflection points, it is found that CEO age in the older age group is negatively correlated with M&A performance, but not significant. Although the CEO age in the younger age group is positively correlated with M&A performance, it is not significant. The regression result of Model 2 can explain to a certain extent that there is an inverted U-shaped relationship between CEO age and M&A performance, but more in-depth testing is needed. The main regression results of Model 2 and Figure 1 show that before the age of 50, CEOs will gradually accumulate management and business experience as they grow older, which will improve M&A performance. After the age of 50, due to the decline in energy and health, they feel unable to improve M&A performance, and the older the age, the worse the M&A performance.

Table 4 Target CEO age and M&A performance regression results

	Total sample	Younger age group	Older age group
Variables	Δ ROA	Δ ROA	Δ ROA
Age	0.00213*	−0.000377	0.000229
	(0.0689)	(0.243)	(0.286)
Age^2	-2.20×10^{-5}*	-	-
	(0.0680)	-	-
Gender	−0.00249	0.00304	−0.00361
	(0.342)	(0.515)	(0.279)
Edu	-9.09×10^{-5}	−0.00425*	0.000810
	(0.944)	(0.0611)	(0.623)

Table 4 (continued) Target CEO age and M&A performance regression results

	Total sample	Younger age group	Older age group
Variables	Δ ROA	Δ ROA	Δ ROA
Background	0.00283	6.13×10^{-5}	0.00304
	(0.350)	(0.992)	(0.402)
First	−0.000233***	−0.000117	−0.000304***
	(5.49×10^{-6})	(0.170)	(5.81×10^{-6})
Second	−0.000327***	−0.000263***	−0.000368***
	(9.29×10^{-9})	(0.00758)	(5.25×10^{-7})
B_size	−0.00351	−0.00983	−0.00132
	(0.384)	(0.151)	(0.799)
Depend	−0.0140	−0.0436*	−0.00464
	(0.326)	(0.0737)	(0.803)
Dual	−0.00461***	−0.00186	−0.00657***
	(0.00252)	(0.449)	(0.00126)
Holder	−0.000813	−0.00305	0.000474
	(0.625)	(0.284)	(0.824)
CFO	0.000	−0.000	0.000
	(0.538)	(0.327)	(0.277)
LEV	0.0246***	0.00557	0.0275***
	(7.31×10^{-10})	(0.414)	(9.32×10^{-8})
C_size	−0.00152*	0.000742	−0.00193*
	(0.0714)	(0.599)	(0.0800)
Growth	0.0250***	0.0281***	0.0240***
	(0.000)	(0.000)	(0.000)
Soe	0.00240	0.00577**	0.00150
	(0.154)	(0.0483)	(0.490)
Opinion	−0.00581	−0.000780	−0.0112*
	(0.232)	(0.924)	(0.0762)
T_size	6.83×10^{-5}	−0.00331	0.00254
	(0.959)	(0.152)	(0.125)
Payment	−0.000149	−0.00148	−0.000604
	(0.942)	(0.667)	(0.817)
IND	YES	YES	YES
YEAR	YES	YES	YES
Constant	0.00501	0.0452	0.0585**
	(0.883)	(0.228)	(0.0352)
Observations	5,136	1,748	3,078
Adjusted R^2	0.120	0.126	0.139

Figure 1 shows the relationship between the target CEO age and M&A performance. As can be seen from Figure 1, there is an inverted U-shaped relationship between the target CEO

age and M&A performance, and the inflection point is around 50. It indicates that before the age of 50, CEO age is positively correlated with M&A performance, while after the age of 50, CEO age is negatively correlated with M&A performance. Therefore, the main regression results of Model 2 and Figure 1 show that before the age of 50, CEOs will gradually accumulate management and business experience as they grow older, which will improve M&A performance. After the age of 50, due to the decline in energy and health, they feel unable to improve M&A performance, and the older the age, the worse the M&A performance.

When the age has grown to a certain level, due to personal energy, health and other reasons, older CEOs will gradually feel "the spirit is willing, but the flesh is weak". In order to make the company develop better, as they get closer to retirement, they are more inclined to be acquired. M&A decision-making and CEO age have different correlations in the process of group testing. Although the positive correlation is not significant, to a certain extent, it can be considered that Hypothesis 1 is established, that is, the target CEO age has a positive U-shaped relationship with the M&A decision-making. In addition, it can be found from Table 3 that the education level and educational background of CEOs are also related to M&A decision-making. CEOs with high education levels tend to accept being acquired, and CEOs with no financial background are more inclined to accept being acquired.

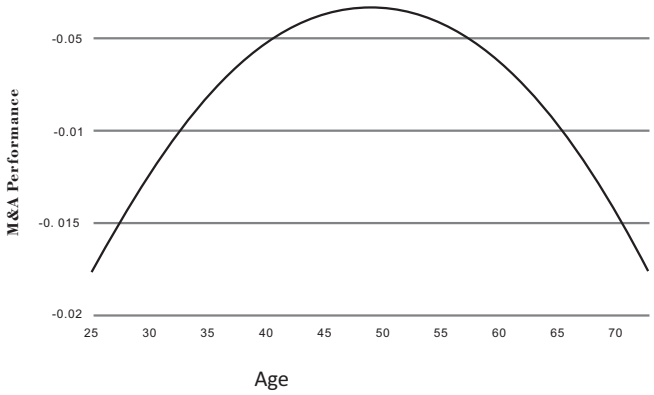

Figure 1 The relationship between target CEO age and M&A performance

4.3 Robustness Tests

To verify the robustness of the model, we perform the Hausmann test on Mode 2 and Model 3 respectively, confirming that the fixed-effects model is better than the random-effects model, and the fixed-effects model is used for regression. The regression results are not consistent with the previous regression results. The substantial difference shows that the regression results of the previous model are robust. The regression results of the fixed-effects model are shown in Table 5 below.

Table 5 Fixed-effects model regression results

Target CEO age and M&A performance		AEM and M&A performance	
Variables	ΔROA	Variables	ΔROAROA
Age	0.00380*	|DA|	−0.0880***
	(0.0858)		(9.70×10^{-11})
Age^2	-4.06×10^{-5}*	First	3.39×10^{-5}
	(0.0741)		(0.835)
Gender	−0.00375	Second	-2.69×10^{-5}
	(0.518)		(0.846)
Edu	0.000573	B_size	−0.00995
	(0.842)		(0.340)
Background	−0.00707***	Depend	−0.0442
	(0.00719)		(0.160)
First	−0.000176	Dual	−0.00600*
	(0.241)		(0.0811)
Second	−0.000342***	Holder	0.00190
	(0.00585)		(0.633)
B_size	−0.0187**	CFO	−0.000*
	(0.0455)		(0.0538)
Depend	−0.0721**	LEV1	0.0739***
	(0.0115)		(0.000)
Dual	−0.00606*	C_size	−0.00279*
	(0.0566)		(0.0989)
Holder	0.00211	Growth	0.0307***
	(0.561)		(0.000)
CFO	−0.000	Soe	0.00871
	(0.257)		(0.218)
LEV	0.0586***	Opinion	0.0144*
	(0.000)		(0.0603)
C_size	0.000362	*T*_size	−0.00186
	(0.822)		(0.372)
Growth	0.0302***	Payment	−0.000534
	(0.000)		(0.849)
Soe	0.00229	-	-
	(0.718)	-	-
Opinion	0.00708	-	-
	(0.334)	-	-
T_size	−0.00100	-	-
	(0.611)	-	-
Payment	0.000656	-	-
	(0.807)	-	-

Table 5 (continued) Fixed-effects model regression results

Target CEO age and M&A performance		AEM and M&A performance	
Variables	ΔROA	Variables	ΔROAROA
Constant	−0.0537	Constant	0.0463
	(0.417)		(0.328)
Observations	5,136	Observations	4,362
N	1,951	N	1,755
Adjusted R^2	0.120	Adjusted R^2	0.133

4.4 Multicollinearity Tests

This paper conducts a VIF test on Principal component regression (PCR) for the relationship between CEO age and M&A performance and earnings management and M&A performance, separately. We find that there is no serious multicollinearity between the principal variables and the controlled variables. The results of the VIF inspection report are shown in Table 6 below.

Table 6 Robustness test: VIF inspection report

Model 1 VIF test		Model 3 VIF test	
Variables	VIF	Variables	VIF
Age	1.12	|DA|	1.07
Gender	1.01	First	1.35
Edu	1.03	Second	1.41
Background	1.09	B_size	1.51
First	1.37	Depend	1.34
Second	1.44	Dual	1.12
B_size	1.52	Holder	1.15
Depend	1.34	CFO	1.51
Dual	1.19	LEV	1.61
Holder	1.16	C_size	2.18
CFO	1.48	Growth	1.05
LEV	1.64	Soe	1.41
C_size	2.23	Opinion	1.09
Growth	1.04	-	-
Soe	1.45	-	-
Opinion	1.09	-	-
T_size	1.48	T_size	1.47
Payment	1.36	Payment	1.34
Mean VIF	1.34	Mean VIF	1.38

5 Additional Analysis

According to existing literature, whether target firms engaged in earnings management in terms of M&A deals is still under debate. Some scholars find that the targeting company did not conduct earnings management significantly before the share transfer[24, 25]. However, others hold a conflicting view and claim that targeting company will be engaged in either upward earnings management[26–28] or downward earnings management at the cost of the seller's benefit[29–31]. Therefore, in this section, we further discuss whether and how earnings management affects the association between CEO age and M&A deals.

5.1 CEO Age and Pre-M&A Earnings Management

Most scholars believe that earning quality will be improved significantly with the increases of the CEO age[27, 32–34]. However, Wang[35] showed that top managers' age has a significant negative impact on earnings quality. In terms of M&A deals, young CEOs concern more about their future careers. Therefore, they are highly likely to conspire with the acquirer to perform downward earnings management in order to remain in office after being acquired. In contrast, since older CEOs are about to retire, they face less serious employment risk as compared with younger CEOs. Hence, they may not collude with the acquirer to conduct downward earnings management. Instead, they consider more about their shareholders' interests and try to enlarge firm value by upward earnings management.

It can be seen from Table 7 that the earnings management level of the acquired company before the acquisition is 0.068, the earnings management level of non-merger companies is 0.063, and the accrued earnings management level of acquired companies and non-merger companies is 1%. The level is significantly higher than that of non-merger companies.

Table 7 The comparison of earnings management between M&A and non-M&A samples

Variable	Observation	non-M&A	Observation	M&A	Difference
|DA|	9944	0.063	5448	0.068	−0.004***

Table 8 shows the impact of different age groups on earnings management in the pre-M&A period. We created a dummy variable, it equals 1, if CEO age is greater than the mean, and 0, otherwise. The results show that the negative earnings management level is significantly higher in younger CEO group (−0.063) as compared with the older ones (−0.055). But there is no significant difference in the positive earnings management between these two groups. Overall, younger CEOs (the difference is 0.138) are more likely to engage in earnings manipulation than older CEOs (the difference is 0.126). This indicates that older CEOs are less motivated to do earnings manipulation in the pre-M&A period. Consistent with our assertion, CEO age affects the degree and direction of earnings management before the M&As.

Table 8 CEO age and pre-M&A earnings management

	Negative AEM		Positive AEM		
Groups	|DA|	Observation	|DA|	Observation	Difference
Younger CEO	−0.063	904	0.076	1567	−0.138**
Older CEO	−0.055	829	0.072	1380	−0.126**
Difference	−0.008***	-	0.004	-	-

5.2 Pre-M&A Earnings Management and Post-M&A Performance

Referring to previous studies, we believe that the post-M&A performance is related to the pre-M&A earnings management. The companies that performed negative AEM had higher post-merger performance than those that performed positive earnings management in the pre-M&A. Luo, et al.[36] found that the earnings management before equity refinance would reverse after equity finance, which would affect company performance and cause a decline for future performance. Louis[37] found that companies will carry out obvious AEM before M&A, and there is a significant negative correlation between earnings management and excess stock returns, and it also shows a significant negative correlation with the long-term performance of the acquirer. Zhang[31] found that managers in the target firms had the motivation to carry out positive accrual and real earnings manipulation in the early and current phases of the M&A. This helps to explain the decline in firm performance in the first year after the M&A. Moreover, Xu, et al.[39] stated that the financial performance of M&A is negatively correlated with earnings management. From the perspective of the target firm, Wang, et al.[32] found that the CEOs in target firms are more likely to conduct earnings management in the pre-M&A period. Because of the more severe the corporate earnings management, the lower the share transfer price, and the more benefits the executives would gain after M&A. Accordingly, young CEOs concern more about their future careers. Therefore, they are highly likely to conspire with the acquirer to perform downward earnings management in order to remain in office after being acquired. In contrast, since older CEOs are about to retire, they face less serious employment risk as compared with younger CEOs. Given the reversal effect of earnings management, managerial negative/downward earnings manipulation behaviours before M&A may be reversed after M&A, which make M&A performance higher than that of positive/upward earnings management before M&A.

Figure 2 shows the relationship between the earnings management level (that is, the absolute value of manipulative accrued profits) and post-M&A performance. From Figure 2, the association between earnings management level and post-M&A performance shows the first increase and then a decline. However, it is basically negatively correlated with M&A performance, and overall, the larger the accrued earnings management range, the worse the performance after M&A. Figure 3 shows the relationship between AEM and post-merger performance. It can be seen from the figure that the higher the negative AEM, the better the post-merger performance, while the positive AEM is the opposite, that is, the post-merger performance will Decrease as the management of positive accrued earnings increases.

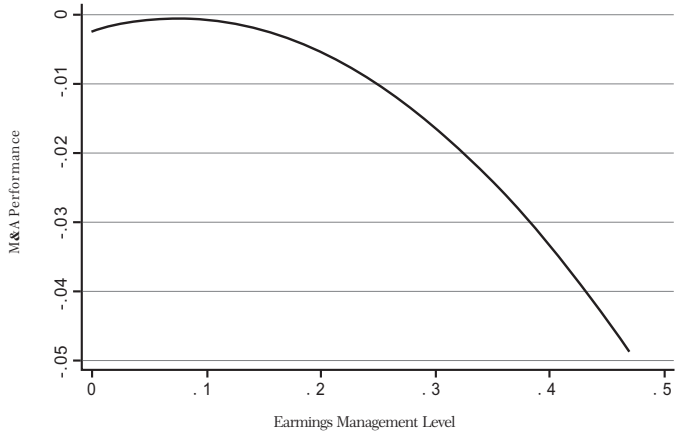

Figure 2 Relationship between earnings management level and M&A Performance

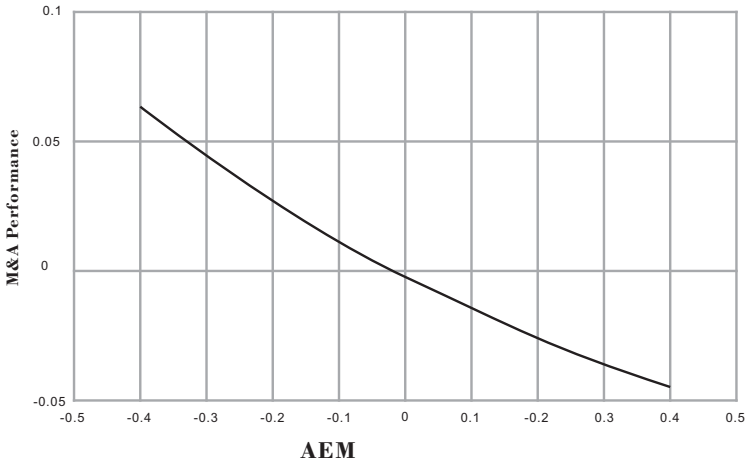

Figure 3 Relationship between AEM and M&A Performance

Table 9 shows that earnings manipulation activities in the target firms before the acquisition is significantly negatively correlated with post-M&A performance. This implies that the earnings management before the acquisition will damage the company's post-M&A performance. We further divided earnings manipulation activities into two groups: Positive earnings management and negative earnings management. The results show that positive earnings management in the per-M&A period is negatively associated with post-M&A performance, while it holds an opposite result for negative earnings manipulation group. Overall, although pre-M&A earnings management affects post-M&A performance negatively, further analysis needs to be done to justify whether this impact really damages the firm value or is only caused by the reversal effect of earnings management.

Table 9 AEM and post-M&A performance

		Positive AEM	Negative AEM
Variable	ΔROA	ΔROA	ΔROA
|DA|	−0.0746***	−0.150***	0.114***
	(0.000)	(0.000)	(1.38×10^{-7})
First	-8.59×10^{-5}	6.19×10^{-5}	−0.000203**
	(0.113)	(0.292)	(0.0382)
Second	−0.000116*	7.61×10^{-5}	−0.000152
	(0.0586)	(0.251)	(0.173)
B_size	−0.00129	−0.00367	0.000500
	(0.765)	(0.426)	(0.950)
Depend	−0.00441	−0.00556	−0.00897
	(0.770)	(0.733)	(0.742)
Dual	−0.00198	−0.00146	−0.00302
	(0.210)	(0.388)	(0.295)
Holder	−0.000823	0.00127	−0.00433
	(0.642)	(0.517)	(0.162)
CFO	0.000	−0.000***	−0.000
	(0.667)	(6.09×10^{-9})	(0.958)
LEV	0.0276***	0.00969**	0.0351***
	(1.12×10^{-10})	(0.0364)	(8.94×10^{-6})
C_size	−0.00407***	0.00166*	−0.00620***
	(6.24×10^{-6})	(0.0802)	(0.00118)
Growth	0.0260***	0.0225***	0.0289***
	(0.000)	(0.000)	(0.000)
Soe	0.00176	0.000573	0.00239
	(0.313)	(0.761)	(0.446)
Opinion	−0.000367	0.0406***	−0.0282***
	(0.942)	(0.000)	(0.000344)
T_size	0.000229	−0.00146	−0.000738
	(0.867)	(0.364)	(0.741)
Payment	−0.000284	0.00166	−0.000204
	(0.891)	(0.452)	(0.958)
Constant	0.0626***	−0.0939***	0.135***
	(0.00333)	(4.26×10^{-5})	(0.00203)
N	4,362	2,726	1,636
Adjusted R^2	0.119	0.182	0.184

6 Conclusion

This paper considers the impact of M&A decision-making on the AEM of pre-M&A, and the impact of AEM on M&A performance from the perspective of the target CEO age. We find that the target CEO age is negatively correlated with M&A decision-making and may have a positive U-shaped relationship. Younger CEOs may conduct AEM of pre-M&A out of self-interest, and they are more inclined to conduct negative AEM than older CEOs. The target CEO age and M&A performance are in an inverted U-shaped relationship. Group testing finds that the signs of the two groups are opposite, further verifying that the inverted U-shaped relationship does exist. The AEM of pre-M&A is overall negatively correlated with M&A performance. After group inspection, we find that the M&A performance is related to the direction of AEM of pre-M&A. It shows that the impact of earnings management on M&A performance is likely not to have a real impact on the company's financial performance, but only the reversal effect of AEM has an impact on the M&A performance. The findings of this paper enrich the research on the acquiree, the relationship between CEO age and M&A. We also find that earnings management is one of the reasons for the increase or decrease in M&A performance. In our future research, we can consider both the impact of AEM and REM on their M&A performance and the impact of CEO characteristics on REM.

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Appendix A

Main variable of interest	Variable definitions
MA	Dummy variable, take 1 when M&A occurs, otherwise take 0
Perf	The difference in ROA between the year of M&A and the year pre-M&A
Age	Target CEO age one year of pre-M&A
|DA|	The modified Jones[40] model is used to calculate the amount of discretionary accruals, and the absolute value is |DA|.

Controlled Variables	
Firm basic controls	Variable definitions
LEV	Total debts divided by total assets at the year-end in book value
CFO	Cash flow from operating activities
C_size	Natural logarithm of the company's total assets
Growth	Sales growth rate
Soe	Dummy variable, state-owned enterprise takes 1, otherwise 0
Opinion	Dummy variable, the standard audit opinion takes 1, otherwise 0
T_Size	Natural logarithm of transaction amount.
Payment	Payment method.

Corporate governance controls	Variable definitions
First	Proportion of the largest shareholder.
Second	Shareholding ratio of the second to tenth largest shareholders.
B_size	Natural logarithm of the total number of board members.
Depend	The number of independent directors as a percentage of the total number of board members.
Dual	Dummy variable, the chairman and general manager are combined to take 1, otherwise take 0.
Holder	Dummy variable, management holdings, take 1, otherwise take 0.
First	Proportion of the largest shareholder.
Second	Shareholding ratio of the second to tenth largest shareholders.

CEO characters	Variable definitions
Gender	Dummy variable, male takes 1, otherwise 0.
Edu	Dummy variable, if the CEO's education is a master's degree or above, take 1, otherwise take 0.
Background	Dummy variable, if there is no financial professional education background, take 1, otherwise take 0.

Appendix B

Among them, corresponding to the measurement of earnings management, we draw on the modified Jones model of Dechow, et al.[33] for calculation. The specific model is as follows:

Then use Formula (2) to calculate the discretionary accruals DA:

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_0 \frac{1}{A_{i,t-1}} + \alpha_1 \frac{\Delta REV_{i,t}}{A_{i,t-1}} + \alpha_2 \frac{PPE_{i,t}}{A_{i,t-1}} + \epsilon_{i,t}, \tag{3}$$

$$DA_{i,t} = \frac{TA_{i,t}}{A_{i,t-1}} - \left(\alpha_0 \frac{1}{A_{i,t-1}} + \alpha_1 \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} + \alpha_2 \frac{PPE_{i,t}}{A_{i,t-1}} \right). \tag{4}$$

Among them, Total accruals = Net profit-Cash flow from operating activities; Sale is the increase in operating revenue; ΔAR is the increase in net accounts receivable; PPE is the net fixed assets; the parameters of model 2 are the estimated values of the parameters of model 1; the absolute value of discretionary accruals |DA| is used to measure the degree of earnings management.