

The impact of CEOs' accounting backgrounds on earnings management and conservatism

Nan Hu

Stevens Institute of Technology, Hoboken, New Jersey, USA

Rong Huang

Stan Ross Department of Accountancy, Baruch College, New York, New York, USA

Xu Li

The University of Hong Kong, Hong Kong, China, and

Ling Liu

University of Wisconsin-Eau Claire, Eau Claire, Wisconsin, USA

Abstract

Purpose – Existing literature in experimental accounting research suggests that accounting professionals and people with accounting backgrounds tend to have a lower level of moral reasoning and ethical development. Motivated by these findings, this paper aims to examine whether chief executive officers (CEOs) with accounting backgrounds have an impact on firms' earnings management behavior and the level of accounting conservatism.

Design/methodology/approach – The authors classify CEOs into those with and without accounting backgrounds using BoardEx data. Using discretionary accruals from several different models, they do not find that CEOs with accounting backgrounds are more likely to engage in income-increasing accruals. However, the authors find that CEOs with accounting backgrounds exhibit lower levels of conservatism, proxied by C-scores and T-scores (Basu, 1997). This finding suggests that CEOs with accounting backgrounds recognize bad news more quickly than good news, consistent with the accounting principle of "anticipating all losses but anticipating no gains".

Findings – The authors show that firms whose CEOs have accounting backgrounds exhibit lower levels of accounting conservatism. However, these firms do not exhibit higher levels of income-increasing discretionary accruals. This study documents the impact of CEOs' educational backgrounds on firms' accounting choices and confirms prior findings in experimental accounting research using large sample archival data.

Originality/value – This paper is the first study that investigates the impact of CEOs' accounting backgrounds on firms' financial reporting policy. The findings may have some policy implications. If accounting backgrounds of CEOs can make a significant difference on firms' behavior, it is reasonable to make CEOs accountable for the quality of financial reporting. This paper is one of the first to empirically test

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inferences drawn by experimental accounting research. There has been a gap between archival and experimental accounting studies. The authors propose that interesting research questions can be addressed by filling in such a gap.

Keywords CEO, Earnings management, Accounting conservatism, Accounting backgrounds

Paper type Research paper

1. Introduction

Existing literature in experimental accounting research suggests that accounting professionals and people with accounting backgrounds tend to have a lower level of moral reasoning and ethical development (Tull, 1982; Armstrong, 1984, 1987; Ponemon, 1988, 1990; Shaub 1989; Ponemon and Gabhart, 1990; Ponemon and Glazer, 1990). Motivated by these findings, this paper examines whether chief executive officers (CEOs) with accounting backgrounds have an impact on firms' earnings management behavior and the level of accounting conservatism. Consistent with the hypotheses developed from the experimental accounting research, we find that firms whose CEOs have accounting backgrounds exhibit lower levels of accounting conservatism, but not higher levels of income-increasing discretionary accruals.

Prior literature in finance documents that CEOs' past experiences, such as their formative educational and early career experiences, have an impact on their firms' financing and investment policies (Bretrand and Schoar, 2003; Graham and Narasimhan, 2004; Xuan, 2009). Following this line of research, recent accounting and finance studies have examined the association between firms' financial reporting choices and "styles" of their top executives/CFOs (Li *et al.*, 2011; Aier *et al.*, 2005; Bamber *et al.*, 2010; Yang, 2010; Dyreng *et al.*, 2010; Ge *et al.*, 2011). Another stream of literature investigates the effect of CEOs' educational backgrounds on firm performance, CEO turnover, disclosure policies, etc. For example, Jalbert *et al.* (2009) investigate CEOs' educational backgrounds (rank of undergraduate and graduate program) on firm performance. Bhagat *et al.* (2010) examine the association between CEOs' education and CEO turnover, as well as firm performance. Matsunaga and Yeung (2008) investigate whether there are systematic patterns in financial reporting and disclosure policies for those with CEOs who have previously served as chief financial officers (CFOs). However, to the best of our knowledge, prior studies have not examined the impact of one important and educational background variable – accounting education – on earnings management and accounting conservatism.

Previous literature has studied accounting conservatism in various perspectives. For example, Alama and Petruska (2012) investigate the temporary changes in conservative reporting in the short-term for fraud firms; Kim and Pevzner (2010) document that higher current conditional conservatism is associated with lower probability of future bad news. Li (2010) studies whether auditor tenure influences accounting conservatism. We investigate the impact of CEOs' accounting backgrounds on firms' financial reporting policy, as it is commonly agreed that accounting education shapes students' ethical standards.

As discussed above, findings in experimental accounting research suggest that business people with accounting education are more likely to have a lower level of moral reasoning and ethical development. These findings are all based on experiments and surveys. These experimental studies suggest that accountants are "not ethically developed" in that they are "stuck" in conventional ethical reasoning modes about adherence to norms, codes and rules. However, this might be exactly what we would like our accountants to be, as US general accepted accounting principle (GAAP) is rule-based and requires accountants to strictly follow the rules. Therefore, these findings suggest that CEOs with accounting backgrounds

may be less likely to engage in income-increasing earnings management and less likely to report conservatively.

Healy and Wahlen (1999) state that:

[...] earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company, or to influence contractual outcomes that depend on reported accounting number.

We use discretionary accruals as one proxy for earnings management. Accounting conservatism is an important characteristic of the accounting information system. Basu (1997) defines conservatism as accountants' tendency to require a higher degree of verification for recognizing good news in earnings than for recognizing bad news (asymmetric treatment of gains and losses).

We classify CEOs into those with and without accounting backgrounds using BoardEx data. Using discretionary accruals from several different models, we do not find that CEOs with accounting backgrounds are more likely to engage in income-increasing accruals. However, we find that CEOs with accounting backgrounds exhibit lower levels of conservatism, proxied by C-scores and T-scores (Basu, 1997). These findings are consistent with prior evidence in experimental studies that accountants strictly follow norms, codes and rules and are less likely to report conservatively.

We perform a few additional analyses to ensure the robustness of our findings. First, we use market-to-book ratio as another accounting conservatism measure. We obtain similar results. Second, we control for the level of CEO over-confidence, as CEO over-confidence is shown to affect a company's policies on investing, financing, dividend payout, etc. We find that our main results are robust to including the CEO over-confidence measure. Third, we perform the analysis after 2002, the post-SOX period. The passage of the Sarbanes-Oxley Act, which requires that CEOs be responsible for the quality of the financial reporting system, is clear evidence of the important role played by CEOs in the post-SOX period. Sub-period analysis reveals that our findings hold after 2002.

Our study makes several contributions to the literature. First, this paper is the first study that investigates the impact of CEOs' accounting backgrounds on firms' financial reporting policy, namely, earnings management and accounting conservatism. Although prior accounting and finance research has studied the impact of CEOs' various educational backgrounds on firm performance, we are the first to concentrate on an intuitive and straight-forward link: the impact of CEOs' accounting backgrounds on firms' financial reporting policies. One essential role of accounting researchers is to aid understanding how markets, organizations, societies and individuals shape the role of accounting. In this paper, we provide evidence on how the backgrounds of CEOs shape the role of accounting.

Second, our findings have important policy implications for government policy makers, such as the Securities and Exchange Commission (SEC). Our findings suggest that holding CEOs accountable for financial reporting quality is reasonable, as CEOs do have an impact on firms' financial reporting behavior. In addition, the SEC is always looking for ways to improve the quality and transparency of financial reporting. Our results reveal the existence of a connection between CEOs' educational backgrounds and the quality of financial reports.

Third, our paper is an empirical accounting study motivated by findings in experimental accounting literature. Although both methods of accounting studies have coexisted for a long time, they are viewed independently and the cross reference is limited. We believe that empirically testing some of the findings from experimental studies can enrich our understanding of the accounting world. We hope that this paper may encourage future studies to link the two areas of accounting research.

The rest of the paper is organized as follows. Section 2 reviews the literature and develops the hypotheses. Section 3 discusses our sample, empirical models and variable definition. Section 4 presents the empirical analysis, and Section 5 concludes the paper.

2. Literature review and hypotheses development

In the finance literature, it is empirically well-established that a CEO's personal experience impacts their firm's investment and financing policies. The evidence is largely related to formative educational and early career experience, which affect a CEO's future corporate decisions by creating a fixed character trait. For example, [Bretrand and Schoar \(2003\)](#) investigate how individual managers affect corporate behavior and performance. They find that executives from earlier birth cohorts appear to be more conservative; on the other hand, managers who hold an MBA degree seem to follow on average more aggressive strategies.

[Graham et al. \(2010\)](#) studied corporate performance during and after the Great Depression for all industrial firms on the New York Stock Exchange. They find that the Depression experience appears to have affected the preference to use debt, even after the economic environment has improved: firms that were highly leveraged during the Depression used relatively little debt in the 1940s. Moreover, this behavior appears to be individual-specific because the use of debt increased in the 1940s at companies for which the Depression-era company president retired or otherwise left the firm.

[Xuan \(2009\)](#) investigates how the job histories of CEOs influence their capital allocation decisions when they preside over multidivisional firms. The paper finds that after the CEO turnover, divisions not previously affiliated with the new CEO receive significantly more capital expenditures than divisions through which the new CEO has advanced. The pattern of reverse-favoritism in capital allocation is more pronounced if the new CEO has less authority or if the unaffiliated divisions have more bargaining power. The evidence suggests that having a specialist CEO negatively affects segment investment efficiency.

Following this line of research, recent accounting papers study the impact of executives' "styles" on firms' accounting-related choices. For example, [Bamber et al. \(2010\)](#) examine accounting/finance backgrounds, MBA status and managerial style with respect to forecasting behavior. [Dyreg et al. \(2010\)](#) examine accounting degrees and managerial style with respect to tax aggressiveness. [Ge et al. \(2011\)](#) examine CPA certification and style related to a variety of financial reporting choices, including discretionary accruals. The latter two papers find limited evidence of a relation between style and accounting backgrounds. [Li et al. \(2011\)](#) find that a CFO's accounting knowledge and experience as CFO are negatively associated with a company's internal control quality. [Aier et al. \(2005\)](#) examine whether accounting restatements are associated with proxies for the financial expertise of CFOs and find that firms are less likely to have accounting errors if their CFOs have prior experience at another company, have MBA degrees and/or have CPA credentials.

A stream of finance and accounting literature that is more closely related to our research questions focuses on CEOs' educational background. For example, [Jalbert et al. \(2009\)](#) find that CEOs having an undergraduate degree and a graduate degree do not explain ROAs, but having a Top 25 undergraduate degree negatively affects ROAs, while having a Top 10 graduate degree positively affects ROAs. [Bhagat et al. \(2010\)](#) show that CEOs with MBA degrees can enhance firms' short-term operating performance, but there is no relationship between CEOs' educational backgrounds and firms' long-run performance. [Matsunaga and Yeung \(2008\)](#) document that CEOs with previous CFO experience are associated with income-decreasing accruals and that analysts' forecasts for these firms are more accurate, less dispersed and less volatile[1].

We rely on the findings from experimental accounting research to develop and test hypotheses regarding the impact of accounting backgrounds of CEOs. Evidence in the experimental accounting research suggests that business people in the accounting profession and those with accounting backgrounds tend to have a lower level of moral reasoning and ethical development. Compared to people with similar educational and socioeconomic backgrounds, accountants and accounting students, on average, do not develop high-enough moral reasoning capacities.

For example, using the defining issues test (DIT) method, [Armstrong \(1987\)](#) conducted an experimental study to investigate the moral maturation of a sample of accounting students and professionals. His results suggest that instead of maturing to the level of college students, CPAs appear to have reached only the moral maturation level of adults in general. In addition, overall CPAs' moral maturation level is much less than that of the college graduates. [Armstrong \(1987\)](#) further argues that for these CPAs, their college education may not have fostered continued moral growth.

Drawing on the moral development theory, [Ponemon \(1990\)](#) examines the ethical judgments of accounting (CPA) practitioners at different corporate positions. He shows that there is an association between CPAs' hierarchical positions in their firms and their capacity for ethical reasoning. This capacity for ethical reasoning increases in the staff and supervisory ranks and then decreases in the manager and partner levels. One possible explanation of these findings is that conflicting social influences affect CPA practitioners at different hierarchical levels. This effect is further mediated by differential screening and self-selection processes within the firm. This surprising conclusion may suggest that CEOs tend to have the lowest level of moral reasoning.

Furthermore, [Ponemon and Glazer \(1990\)](#) find that only accounting seniors and alumni of liberal arts colleges progress to the levels of moral reasoning comparable to the DIT norms published by [Rest \(1986\)](#). This finding clearly shows that the influence of college education on an accountant's ethical development is not satisfactory, as accounting seniors should have achieved higher levels of moral reasoning. [Ponemon and Gabhart \(1990\)](#) focus on auditors in their experiments and find that auditors with lower DIT scores are more likely to engage in underreporting of audit time, which is believed to be unethical and dysfunctional.

Collectively, both the DIT and Kohlberg moral development model-based studies assume that one wants to evolve to being a "post-conventional" ethical reasoner who is not bound by rules and conventions but interprets all ethical decisions through the lens of fundamental ethical norms (i.e. the classical reason to go to university to become a better person). Therefore, when this literature suggests that accountants are "not ethically developed", it indicates that they are "stuck" in conventional ethical reasoning modes about adherence to norms, codes and rules. Being a conventional moral reasoner would suggest closer adherence to rules and regulations. The US GAAP does not encourage any aggressive earnings management (income-increasing) and does not encourage conservative accounting. Hence, we have the following two predictions:

- (1) no tendency to engage in increasing discretionary accruals to window dress earnings; and
- (2) a greater likelihood of less conservative accounting.

Following the financial reporting rules, managers with accounting backgrounds should behave as described above. First, while accounting rules provide some discretion to accountants, following rules suggests less incentives for earnings management. Second, the Financial Accounting Standards Board contends that financial reporting rules are not conservative and that a good accountant will interpret them neutrally.

We note that financial reporting choices can be jointly determined by both CEOs and CFOs. Prior studies find that equity incentives provided to both CEOs and CFOs are associated with accruals management and the likelihood of beating analyst forecasts (Bergstresser and Philippon, 2006; Cheng and Warfield, 2005; Jiang *et al.*, 2010). We focus on the effect of CEO accounting backgrounds on conservatism and earnings management for two reasons. First, because CFOs' primary responsibility is financial reporting and budgeting, most CFOs have accounting or finance backgrounds. Therefore, there is not much variation in CFOs' backgrounds. However, CEOs may have various non-accounting backgrounds such as engineering, operation, sales and marketing, etc. Therefore, it is interesting to study whether CEOs' accounting backgrounds affect companies' financial reporting choices. Second, as CEOs have a higher rank than CFOs, CFOs are usually considered as CEOs' agents (Graham and Harvey, 2001, p. 194). CEOs have the power to replace CFOs who do not follow CEOs' guidance (Mian, 2001; Fee and Hadlock, 2004). As a result, CFOs may simply follow their CEOs' preferences (Jiang *et al.*, 2010). If a CEO has an accounting background, we expect that the CEO has better knowledge of the company's financial status and the CFO is more likely to follow the CEO's financial reporting choices. On the other hand, if a CEO has a non-accounting background, it is likely that the CEO delegates the financial reporting decisions to the CFO. Overall, we expect that financial reporting choices are more likely to be subject to CEO decisions when CEOs have accounting backgrounds.

Based on the above arguments, we develop the following two hypotheses to examine whether there is an association between CEOs' accounting backgrounds and their firms' earnings management and level of accounting conservatism in financial reporting:

- H1.* CEOs with accounting backgrounds are less likely to engage in income-increasing discretionary accruals.
- H2.* CEOs with accounting backgrounds are more likely to exhibit a lower level of accounting conservatism.

The hypotheses discussed above have not been tested using empirical data. Therefore, we make an empirical investigation as to whether.

3. Data collection and empirical models

3.1 Data collection

We examine the relation between a CEO's accounting backgrounds and his or her behaviors, such as accounting conservatism and earnings management. We obtain CEO educational backgrounds from the BoardEx database[2]. Boardex supplies biographical information on the current employment, past employment, education and other activities for each individual. With respect to education information, BoardEx provides a list of all the undergraduate and graduate programs attended, with details on the institution, degree awarded, concentration and degree date.

Using this biographical information, we classify CEOs who hold professional accounting certifications (e.g. Certified Public Accountant, Chartered Accountant, Certified Management Accountant, Chartered Management Accountant, Fellow Chartered Accountant, Certified Accountant, Certified General Accountant, Chartered Certified Accountant, Certified Practicing Accountant, Certified Professional Accountant) or accounting degrees (e.g. Master of Accountancy, BS in Accounting) as CEOs with accounting backgrounds. We also control executives' experience such as time to retirement, time in current role, time in current organization, etc. We obtain the financial variables for the companies from the Compustat database and the stock return data from the Center for

Research in Security Prices (CRSP) database. The trading ticker or CUSIP or GVKEY is not provided for companies listed in BoardEx; they use their own company identifiers. Therefore, to match companies between the two databases, for each company in BoardEx, we first use Spedis functions in SAS to find its closest match in Compustat, based on company name. Then, out of the potentially matched firms, we manually go through the list to identify the final list of matched firms. For each firm-year, to identify the accounting background for its CEO, we take a three-step approach, which requires merging the insider trading data with the BoardEx data (listed below). We did not use BoardEx data to identify the years during which a manager works at a particular firm, because even though BoardEx provides the year an executive starts or ends his or her position with a firm, there are a lot missing values for these two fields. We also did not rely on the ExecuComp database to identify such information because ExecuComp only includes companies in S&P1500 index, while the insider trading data includes all firms in the CRSP database:

- Based on the insider trading data from Thomson Financial, we identify the insider trading transactions conducted by CEOs using the ROLECODE variable.
- As CEOs of a given company might not conduct insider trading every year, we use his or her first insider trading year as the year he or she starts to work for that company and his or her last insider trading year as the year he or she leaves that company. Any years in between are classified as the years that CEO works for that firm. This is a more conservative way of identifying the years a CEO works for one particular firm.
- We match CEOs' first and last names from BoardEx with those from insider trading data to identify the background of each CEO.

We present detailed information on variable definitions in [Appendix 1](#).

[Table I](#) shows the summary statistics of our key variables, including accounting background, gender, age, qualification and other board-related activities. The results show that about 4.9 per cent of firm-years in our sample are CEOs with accounting backgrounds. More than 96.8 per cent of CEOs are male. On average, the CEOs are 60 years old, with 10.4 years of remaining tenure before retirement[3]. They normally have served for 5.167 years in their current role, 9.571 years on their current company's board and 9.108 years on another company's board. On average, they hold 5.92 qualifications.

[Table II](#) shows both the Pearson and the Spearman correlations among accounting backgrounds and other firm characteristics. We find that accounting education and C-score are negatively correlated, while accounting education and discretionary accruals as measured by DA, DA_Adjust or DA_ROA are positively correlated. Preliminary results presented in [Table II](#) suggest that CEOs with accounting backgrounds are less conservative and are more likely to engage in earnings management.

3.2 Research model

To examine whether CEOs with accounting backgrounds are more likely to engage in earnings management, we examine the association between discretionary accruals and CEOs' backgrounds after controlling for other factors that are likely to influence earnings management ([Call et al., 2011](#)). We use the following empirical model:

Model 1

$$DA = \beta_0 + \beta_1 Acct_Back + \beta_2 Gender + \beta_3 Age + \beta_4 Lev + \beta_5 Market-to-Book + \beta_6 Operating_Cycle + \beta_7 Capital-Intensity + \beta_8 stdopca + \beta_9 Size + \beta_{10} Loss, + Other_experiences_Controls + Industry\ effects + Year\ effects,$$

Variable	<i>N</i>	Mean	SD	Lower quartile	Median	Upper quartile
C-score	12,296	0.5476	0.4155	0.3132	0.4833	0.7377
totalscore	12,296	0.4545	0.3819	0.2339	0.3881	0.6577
DA	12,328	-0.0412	1.7803	-0.0848	-0.0132	0.0501
DA_adjust	12,270	-0.0061	1.3784	-0.0870	-0.0146	0.0500
DA_ROA	12,270	-0.0447	0.4204	-0.1046	-0.0276	0.0297
Acc_Back	12,328	0.0490	0.2159	0.0000	0.0000	0.0000
Gender	12,328	0.9686	0.1744	1.0000	1.0000	1.0000
Age	12,327	60.2906	8.6779	54.0000	60.0000	66.0000
Time_to_Retirement	7,990	10.4592	7.9175	5.0000	10.5000	16.0000
Time_in_Role	7,991	5.1669	5.5901	1.5000	3.5000	6.8000
Time_on_Board	7,991	9.5771	8.3217	3.5000	7.2000	13.4000
Time_in_Org	7,991	13.0644	10.1942	5.2000	10.2000	18.9000
Avg_time_Other_Comp	7,994	9.1085	7.9987	3.4000	6.7000	12.6000
Num_Qualifications	7,994	2.0126	0.8794	1.0000	2.0000	3.0000
LEV	12,297	0.1556	0.1671	0.0004	0.1093	0.2666
MTB	12,328	4.7072	53.6103	1.5201	2.4029	4.0660
OPCYCLE	11,961	4.5787	0.8277	4.1818	4.6587	5.0653
CAPINT	12,262	0.0577	0.0647	0.0195	0.0378	0.0704
Stdopca	10,022	0.1156	1.2047	0.0351	0.0570	0.1011
Loss	12,328	0.7089	0.4543	0.0000	1.0000	1.0000
Size	12,231	5.9146	2.2756	4.4526	6.0085	7.4430
ROA	12,228	-0.0052	0.1879	-0.0128	0.0403	0.0840

Notes: This table presents summary statistics of sample characteristics. CEO demographic information (age and gender), corporate governance-related information (e.g. time to retirement, time in role, time on board and time in organization) and CEO qualification information (Num_Qualifications) are obtained from the BoardEx database. Financial information is obtained from Compustat

Table I.
Summary statistics

where *DA* is discretionary accruals measured using Jones (1991) model, modified Jones (1991) model and performance matched discretionary accruals method. Lower values of the residuals from the Jones (1991) model and the modified Jones (1991) model indicate higher earnings quality. We include the ratio of debt to equity (*LEV*) in our regression model, as previous research documents that managers of highly leveraged firms are more likely to manipulate earnings (DeFond and Jiambalvo, 1994). Additionally, growth firms are more likely to engage in earnings management to avoid being penalized by the market for its negative earnings surprise (Skinner and Sloan, 2002). To control for this effect, we include *market-to-book* ratio as a proxy for firm growth. We also include *capital intensity* as a control variable, as prior research finds that more capital-intensive firms have higher quality earnings (Cohen, 2008). To control for the impact of operating cycle (Dechow and Dichev, 2002) and standard deviation of operating cash flows (Hribar and Nichols, 2007) on earnings quality, we include *Operating_Cycle* and *stdopca* (standard deviation of operation cash flows) variables. We further control for firm performance (*Loss*), *SIZE* and other board activity-related variables. Finally, we control for year and industry effects by including year and industry dummies.

To investigate whether CEOs with accounting backgrounds are less likely to be conservative, we first need to estimate the level of accounting conservatism for each firm. Following Khan and Watts (2009), we estimate the C-score and the T-score to measure accounting conservatism. C-score is the firm-year measure of conservatism or incremental bad news timeliness, and T-score is the total bad news timeliness. These are firm-year

Table II.
Correlation matrix
(Pearson top and
Spearman bottom)

	C-score	T-score	DA	DA_adjust	DA_ROA	Acc_Back	Gender	Age	Time_to_Retirement	Time_in_Role	Time_on_Board
cscore											
totalscore	0.9545	0.9568	-0.0198	-0.0027	0.0665	-0.0004	-0.0206	-0.1153	0.0454	0.0047	0.0159
DA	-0.0602	-0.0628	-0.0196	-0.0032	0.0704	0.0041	-0.0176	-0.1286	0.0446	0.0064	0.0147
DA_adjust	-0.0219	-0.0218	0.5986	0.7291	0.0398	0.0021	0.0021	0.0006	-0.0030	-0.0025	-0.0056
DA_ROA	0.0280	0.0343	0.4365	0.7301	0.2244	0.0020	-0.0032	-0.0012	0.0047	-0.0026	-0.0060
Acc_Back	-0.0008	0.0029	0.0245	0.0193	0.0184	0.0097	-0.0152	-0.0145	0.0133	-0.0074	0.0142
Gender	-0.0161	-0.0136	0.0141	0.0013	-0.0043	0.0129	0.0129	-0.0497	0.0019	-0.0072	-0.0310
Age	-0.1082	-0.1194	0.0576	0.0156	0.0118	-0.0564	0.0718	0.0633	-0.0602	0.0113	0.0394
Time_to_Retirement	0.0434	0.0421	-0.0530	-0.0015	-0.0017	0.0088	-0.0602	-0.9012	-0.8986	0.2262	0.3985
Time_in_Role	-0.0091	-0.0067	0.0336	0.0322	0.0210	-0.0173	0.0058	0.1598	-0.1639	-0.2377	0.6055
Time_on_Board	0.0182	0.0178	0.0388	0.0403	0.0314	-0.0281	0.0319	0.3437	-0.3292	0.5820	0.7763
Time_in_Org	0.0003	0.0005	0.0448	0.0328	0.0106	0.0176	0.0370	0.3048	-0.2964	0.4164	0.9732
Avg_time_Other_Comp	0.0211	0.0202	0.0447	0.0432	0.0312	-0.0226	0.0273	0.3291	-0.3136	0.5686	0.9732
Num_Quality	-0.0021	-0.0036	0.0030	-0.0014	0.0217	0.1079	0.0046	0.0622	-0.0418	0.0172	-0.0026
Lev	-0.0465	-0.0436	0.0688	0.0341	0.0567	0.0446	0.0306	0.1263	-0.1327	0.0007	-0.0212
MTB	0.0895	0.0945	-0.0476	0.0276	0.0017	-0.0425	-0.0165	-0.0043	0.0625	-0.0053	0.0071
OPCYCLE	-0.0187	-0.0210	0.0774	0.0179	-0.0123	-0.0102	0.0314	0.0966	-0.0643	0.0497	0.0753
CAPINT	-0.1562	-0.1587	0.0490	0.0179	-0.0176	-0.0002	0.0174	0.1554	-0.1022	-0.0143	0.0210
stdopca	0.0806	0.0799	-0.0745	-0.0227	-0.0266	-0.0108	-0.0201	-0.2352	0.2152	0.0332	-0.0145
Loss	-0.0118	-0.0089	0.0861	0.0878	0.0079	0.0586	0.0219	0.1381	-0.1169	0.0319	0.0811
Size	-0.0204	-0.0109	0.0176	-0.0065	-0.0144	0.0472	0.0132	0.1703	-0.2022	-0.1025	-0.0641
ROA	-0.0300	-0.0200	0.0700	0.0900	-0.0100	0.0300	0.0100	0.1300	-0.1100	0.0300	0.1000

(continued)

	Time_in_Org	Avg_time_Other_Comp	Num_Quality	Lev	MTB	OPCYCLE	CAPINT	stdopca	Loss	Size	ROA
escore	-0.0086	0.0183	0.0015	-0.0242	0.2858	-0.0132	-0.1032	0.0036	-0.0336	-0.0191	-0.0300
totalscore	-0.0099	0.0171	0.0006	-0.0222	0.2592	-0.0160	-0.1048	0.0037	-0.0284	-0.0113	-0.0200
DA	-0.0085	-0.0044	0.0010	0.0026	-0.0096	0.0127	-0.0027	0.0143	-0.0117	-0.0302	-0.0200
DA_adjust	-0.0039	-0.0052	-0.0005	0.0083	-0.0122	-0.0087	-0.0069	0.0111	-0.0096	-0.0309	-0.0100
DA_ROA	0.0084	0.0137	-0.0163	0.0314	-0.0089	-0.0246	-0.0164	-0.0014	0.0057	-0.0014	0.0000
Acc_Back	0.0061	-0.0262	0.0936	0.0394	-0.0076	-0.0069	0.0009	-0.0073	0.0586	0.0479	0.0400
Gender	0.0453	0.0350	-0.0178	0.0215	-0.0016	0.0235	0.0168	-0.0032	0.0219	0.0114	0.0100
Age	0.3661	0.3797	0.0515	0.0887	-0.0054	0.0907	0.0849	-0.0154	0.1386	0.1436	0.1200
Time_to_Retirement	-0.3563	-0.3706	-0.0341	-0.1010	0.0035	-0.0760	-0.0558	0.0080	-0.1156	-0.1661	-0.0900
Time_in_Role	0.4380	0.5919	0.0100	-0.0051	0.0277	0.0544	0.0189	-0.0146	0.0368	-0.0889	0.0400
Time_on_Board	0.7654	0.9691	-0.0350	-0.0313	0.0241	0.0564	0.0292	-0.0212	0.0969	-0.0350	0.1000
Time_in_Org	0.7434	0.7272	-0.0749	0.0010	0.0165	0.0637	0.0284	-0.0336	0.1971	0.1724	0.1800
Avg_time_Other_Comp	-0.0463	-0.0129	-0.0428	-0.0487	0.0258	0.0544	0.0234	-0.0197	0.0911	-0.0675	0.0900
Num_Quality	0.0244	-0.0439	-0.0159	-0.0088	0.0043	0.0773	-0.0698	-0.0071	-0.0732	-0.0713	-0.0800
Lev	0.0181	0.0030	0.0288	-0.1186	0.0500	-0.1099	0.1353	-0.0359	0.0524	0.2986	0.0400
MTB	0.0759	0.0710	0.0858	-0.1035	-0.0258	-0.0074	-0.0066	0.0019	-0.0275	-0.0100	-0.0200
OPCYCLE	0.0789	0.0138	-0.0533	0.1878	0.0578	-0.1691	-0.1591	0.0046	-0.0478	-0.1308	-0.0200
CAPINT	-0.1786	0.0085	0.0113	-0.3878	0.1471	0.0646	-0.2286	0.0046	0.0850	0.0507	0.0900
stdopca	0.1953	0.0751	-0.0695	0.1053	0.0630	-0.0489	0.1830	-0.3457	-0.0591	0.4401	0.6800
Loss	0.1427	-0.1028	-0.0487	0.4035	-0.0045	-0.1403	0.1989	-0.5744	0.4175	0.4401	0.6800
Size	0.2100	0.0900	-0.0900	-0.0900	0.2800	-0.0300	0.2000	-0.1700	0.7700	0.3300	0.4700
ROA											

Table II.

conservatism measures based on an extension of the Basu's (1997) asymmetric timeliness model[4]. We then associate the C-score and the T-score to accounting education and other CEO characteristics and board activities.

Based on Basu's (1997) measure of asymmetric timeliness, Khan and Watts (2009) estimate a firm-year measure of conservatism. Then, Basu (1997) cross-sectional regression is specified as: $X_i = \alpha_1 + \alpha_2 D_i + \alpha_3 R_i + \alpha_4 D_i R_i + e_i$, where X_i represents the earnings of firm X in year i , R_i is returns (measuring news), D_i is a dummy variable equal to 1 when $R < 0$ and equal to 0 otherwise. The good news timeliness measure (g-score) is α_3 , while the conservatism measure (C-score) is α_4 and the total bad news timeliness (T-score) is $\alpha_3 + \alpha_4$:

Model 2

$$\begin{aligned} c_score = & \beta_0 + \beta_1 Acct_Back + \beta_2 Gender + \beta_3 Age + \beta_4 Time_To_Retire \\ & + \beta_5 Time_in_Role + \beta_6 Time_on_Board + \beta_7 Time_in_Org + \beta_8 Time_Other_Org, \\ & + \beta_9 Num_Qualifications \end{aligned}$$

$$\begin{aligned} Total_score = & \beta_0 + \beta_1 Acct_Back + \beta_2 Gender + \beta_3 Age + \beta_4 Time_To_Retire \\ & + \beta_5 Time_in_Role + \beta_6 Time_on_Board + \beta_7 Time_in_Org + \beta_8 Time_Other_Org. \\ & + \beta_9 Num_Qualifications \end{aligned}$$

4. Empirical results

4.1 Chief executive officer accounting backgrounds and earnings management

To investigate whether CEOs with accounting backgrounds are more likely to engage in earnings management, we estimate Model 1 and present the results in Table III. The estimated coefficient on accounting backgrounds (coefficient = 0.0436; p -value = 0.2733) is positive but statistically insignificant. The findings suggest that firms with CEOs having accounting backgrounds do not exhibit higher level of income-increasing discretionary accruals, compared to firms whose CEOs do not have such backgrounds. Consistent with prior literature, our results show that size is significantly negatively associated with the discretionary accrual of a firm (coefficient = -0.0103 ; p -value = 0.0338), while leverage is significantly positively associated with the discretionary accrual of a firm (coefficient = 0.1334; p -value = 0.0033). We also use alternative models to estimate discretionary accruals, such as the Jones (1991) model and the performance matched discretionary accrual method. Our results are qualitatively the same with these alternative discretionary accruals measures. Overall, the results show that CEOs' accounting education and their earnings management behavior are not significantly associated after controlling for various firm and CEO characteristics.

4.2 Chief executive officer accounting backgrounds and accounting conservatism

In this section, we study whether CEOs with accounting backgrounds are less conservative. Column (1) of Table IV reports the effect of accounting backgrounds on the incremental bad news timeliness, measured by C-score. Column (2) shows the results of estimating the impact of accounting backgrounds on the total bad news timeliness, measured by T-score. Our results show that accounting background is significantly negatively associated with C-score (coefficient = -0.0162 ; p -value = 0.0151) and T-score (coefficient = -0.0125 ; p -value = 0.0261). The results suggest that CEOs with accounting backgrounds exhibit low conservatism, as measured by both incremental bad news timeliness and the total bad news timeliness. The results provide support for $H2$ that CEOs with accounting backgrounds are more likely to exhibit a lower level of accounting conservatism.

Parameter	Estimate	Pr > t
Acc_Back	0.0436	0.2733
Gender	-0.0671	0.1757
Age	-0.0014	0.6727
Time_to_Retirement	0.0005	0.8830
Time_in_Role	-0.0029	0.1367
Time_on_Board	-0.0011	0.8064
Time_in_Org	0.0021	0.1183
Avg_time_Other_Comp	0.0019	0.6681
Num_Qualifications	0.0125	0.2281
Lev	0.1334***	0.0033
MTB	-0.0003***	0.0053
OPCYCLE	0.0000	0.8308
CAPINT	0.0105	0.9446
σ (cash-flow)	-0.0006	0.9255
Loss	0.0048	0.8356
Size	-0.0103**	0.0338
Industry fixed effects	Included	
Year fixed effects	Included	
Adjusted R^2	0.10202	
N	6,950	

Notes: This table presents the results of estimating the association between discretionary accruals and CEOs' accounting background. We estimate discretionary accrual using a modified Jones (1991) model. For robustness check, we also estimate discretionary accrual based on the Jones (1991) model and the performance matched accrual model. Results are qualitatively the same. We include year fixed effect and industry (based on two-digit SIC code) fixed effect to control for the impact of year and industry on earnings management. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively, based on a two-tailed t -statistic.

Table III.
CEO accounting
background and
discretionary accruals

Parameter	C-score		T-score	
	Estimate	Pr > t	Estimate	Pr > t
Acc_Back	-0.0162**	0.0151	-0.0125**	0.0261
Gender	-0.0097	0.2446	-0.0067	0.3410
Age	-0.0003	0.5096	-0.0002	0.6273
Time_to_Retirement	0.0002	0.6293	0.0003	0.5396
Time_in_Role	-0.0001	0.7412	-0.0001	0.7738
Time_on_Board	0.0009	0.2940	0.0009	0.2399
Time_in_Org	-0.0004	0.1300	-0.0003	0.2417
Avg_time_Other_Comp	-0.0002	0.8148	-0.0003	0.6267
Num_Qualifications	0.0018	0.3134	0.0013	0.3971
Industry fixed effects	Included		Included	
Year fixed effects	Included		Included	
Adjusted R^2	0.8136		0.8436	
N	10,540		10,540	

Notes: This table presents the results of estimating the association between accounting conservatism and CEOs' accounting background. Following Khan and Watts (2009), we measure accounting conservatism using C-score (incremental bad news timeliness) and T-score (the total bad news timeliness). We include year fixed effect and industry (based on two-digit SIC code) fixed effect to control for the impact of year and industry on accounting conservatism. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively, based on a two-tailed t -statistic.

Table IV.
CEO accounting
backgrounds and
C-score and T-score

4.3 Additional analysis

4.3.1 Chief executive officer over-confidence. Prior studies show that CEO overconfidence affects various corporate decisions such as investment, capital structure, dividend payout, mergers and acquisitions, etc. (Ben-David *et al.*, 2007; Malmendier and Tate, 2005, 2008; Malmendier *et al.*, 2011; Hirshleifer *et al.*, 2012). It is likely that CEO overconfidence may also influence the association between CEO accounting backgrounds and earnings management, as well as accounting conservatism. To address this concern, we include CEO over-confidence as a control variable in our main analysis. Following prior studies (Malmendier and Tate, 2005, 2008, Malmendier *et al.*, 2011), we define over-confident CEOs as those who hold stock options that are more than 67 per cent in the money (i.e. the stock price exceeds the exercise price by more than 67 per cent).

Table V shows that our main results remain after we control for CEO over-confidence. We continue to find that CEOs' accounting backgrounds are associated with lower levels of conservatism and not associated with discretionary accruals. Furthermore, the coefficients on CEO over-confidence are not significant, suggesting that over-confident CEOs do not exhibit lower levels of accounting conservatism or manage earnings upward using discretionary accruals.

4.3.2 Chief executive officers meeting or beating earnings benchmarks. Prior studies suggest that firms are more likely to manage earnings upward to avoid reporting a loss or an earnings decline (Burgstahler and Dichev, 1997; Roychowdhury, 2006). When firms are facing the pressure to meet these earnings benchmarks, it is possible that CEOs with

Parameter	Discretionary accrual		C-score	
	Estimate	Pr > t	Estimate	Pr > t
Acc_Back	0.0142	0.3999	-0.0164***	0.0140
CEO Over-Confidence	0.0027	0.8398	-0.0039	0.5400
Gender	0.0035	0.8667	-0.0096	0.2528
Age	-0.0014	0.2874	-0.0003	0.5087
Time_to_Retirement	-0.0006	0.6695	0.0002	0.6350
Time_in_Role	-0.0001	0.8933	-0.0001	0.7555
Time_on_Board	0.0000	0.9866	0.0010	0.3021
Time_in_Org	-0.0001	0.8111	-0.0004	0.1497
Avg_time_Other_Comp	0.0010	0.5775	-0.0002	0.8132
Num_Qualifications	0.0016	0.7168	0.0018	0.3096
Lev	0.0216	0.2602		
MTB	-0.0003**	0.0506		
OPCYCLE	0.01747***	0.0002		
CAPINT	0.0003	0.9967		
Stdopca	-0.0004	0.8775		
Loss	0.0182***	0.0097		
Size	0.0013	0.5316		
Industry fixed effects	Included		Included	
Year fixed effects	Included		Included	
Adjusted R ²	0.1044		0.8136	
N	6,950		10,540	

Table V. CEO accounting backgrounds, discretionary accrual and accounting conservatism controlling for CEO over-confidence

Notes: This table presents the results of estimating the association between accounting backgrounds and discretionary accruals, as well as C-score after controlling for CEO over-confidence. We include year and industry (based on two-digit SIC code) fixed effects. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively based on a two-tailed *t*-statistic

accounting backgrounds are more likely to manage earnings upward and report more positive discretionary accruals because their accounting expertise enables them to do so. We examine the association between CEOs' accounting backgrounds and earnings management behavior in the context when firms avoid reporting losses or earnings declines. Prior research argues that firms in the small interval just right of earnings benchmarks are likely to manage earnings to meet or beat these earnings benchmarks (Burgstahler and Dichev, 1997). As in Roychowdhury (2006), we identify suspect firms that are likely to manage earnings to avoid reporting losses. SUSPECT_NI is defined as firm-years that have net income scaled by total assets that is greater than or equal to 0 but less than 0.005. Table VI shows the result of estimating the association between CEOs' accounting backgrounds and discretionary accruals after including SUSPECT_NI. The coefficient on ACC_Back \times Suspect_NI is not significant (coefficient = -0.1573 ; p -value = 0.5567), suggesting that CEOs with accounting backgrounds do not report more or less discretionary accruals than CEOs without accounting backgrounds. In addition, we continue to find, as before, that CEOs with accounting backgrounds do not engage in earnings management when they face no pressure to meet or beat earnings targets (coefficient on Acc_Back = 0.0259 ; p -value = 0.2980). In addition, to capture firms that are likely to manage earnings to avoid earnings declines, we define SUSPECT_ΔNI as firm-years with changes in net income scaled by total assets greater than or equal to 0 but less than 0.0025 (Burgstahler and Dichev, 1997). The results are qualitatively the same when we replace SUSPECT_NI with SUSPECT_ΔNI.

Parameter	Discretionary accrual	
	Estimate	Pr > t
Acc_Back	0.0259	0.2980
Acc_Back \times Suspect_NI	-0.1573	0.5567
Suspect_NI	-0.0784*	0.0934
Gender	-0.0929***	0.0026
Age	0.0002	0.9273
Time_to_Retirement	0.0014	0.4668
Time_in_Role	-0.0030	0.0199
Time_on_Board	0.0026	0.3630
Time_in_Org	-0.0000	0.9236
Avg_time_Other_Comp	0.0006	0.8198
Num_Qualifications	-0.0061	0.3502
Lev	0.1119	0.0005
MTB	-0.0017	0.1724
OPCYCLE	-0.0594	0.0461
CAPINT	-0.1090	0.2825
Stdopca	-0.0182	0.7072
Loss	-0.0090	0.5361
Size	0.0012	0.7203
Industry fixed effects	Included	
Year fixed effects	Included	
Adjusted R^2	0.1055	
N	6,950	

Table VI.
CEO accounting
backgrounds and
discretionary accrual
conditional on CEOs'
incentives to avoid
losses

Notes: This table presents the results of estimating the association between accounting backgrounds and discretionary accruals conditional on CEOs' incentives to avoid losses. We include year and industry (based on two-digit SIC code) fixed effects. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively, based on a two-tailed t-statistic

Overall, the results presented in Table VI suggest that CEOs with accounting backgrounds do not seem to management earnings to meet income targets. It is possible that these CEOs strictly follow accounting rules and do not manipulate earnings when even facing pressure. An alternative explanation is that these CEOs are more sophisticated in earnings manipulation techniques and use real earnings management tools to manipulate income.

4.3.3 Post-SOX sub-period analysis. The Sarbanes-Oxley Act was enacted on July 30, 2002, in reaction to a number of major corporate and accounting scandals. The goal for this Act was to improve the integrity of financial reporting by imposing stringent requirements on corporate executives, and to increase the attention paid to the quality of reported earnings and the responsibility of corporate executive for these earnings. Under Sarbanes-Oxley, a company’s “principal officers” (typically the CEO or the CFO) need to certify and approve the integrity of their company financial reports. In addition, the CEOs should sign the company’s tax return. With the passage of the Sarbanes-Oxley Act, CEOs have broader financial reporting responsibilities and face higher risk (e.g. increased criminal and civil penalties) from misstatements of financial information. To study the impact of SOX on our main findings, we limit our analysis to the observations after year 2002 and re-run our earnings management analysis and accounting conservatism analysis.

Column (1) of Table VII presents the results of estimating the impact of CEOs’ accounting education backgrounds on earnings management in the post-SOX period. Similar as before, the coefficient on *ACC_Back* remains statistically insignificant (coefficient = 0.0569; *p*-value =

Parameter	Discretionary accrual		C-score	
	Estimate	Pr > t	Estimate	Pr > t
Acc_Back	0.0569	0.2165	-0.0187**	0.0196
Gender	-0.0816	0.14	-0.0123	0.2145
Age	-0.001	0.7929	-0.0001	0.8395
Time_to_Retirement	0.001	0.7909	0.0005	0.4509
Time_in_Role	-0.0034	0.137	-0.0001	0.7345
Time_on_Board	-0.0016	0.7714	0.0006	0.588
Time_in_Org	0.0015	0.3506	-0.0005*	0.0942
Avg_time_Other_Comp	0.004	0.4397	0.0004	0.7034
Num_Qualifications	0.0154	0.1967	0.0015	0.4786
Lev	0.1047**	0.0408		
MTB	-0.0003**	0.0126		
OPCYCLE	0.0000	0.7662		
CAPINT	-0.0175	0.9188		
Stdopca	-0.0003	0.9605		
Loss	-0.001	0.9689		
Size	-0.008	0.1476		
Industry fixed effects	Included		Included	
Year fixed effects	Included		Included	
Adjusted R ²	0.1065		0.7996	
N	5,691		8,536	

Table VII.
CEO accounting backgrounds, discretionary accrual and accounting conservatism after SOX

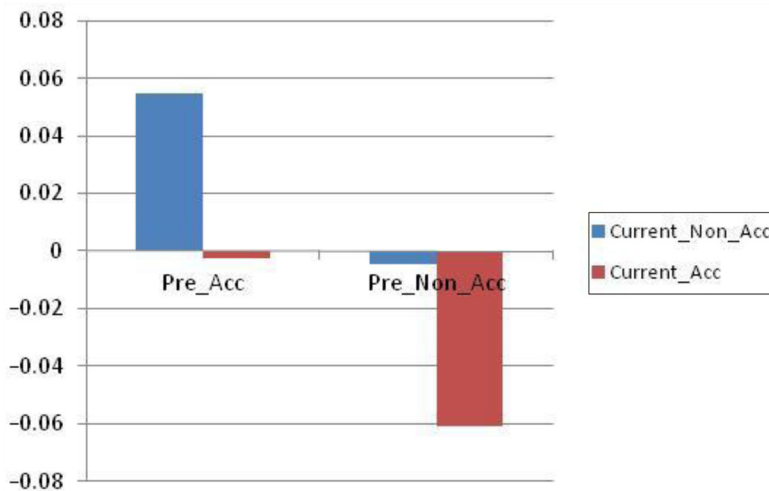
Notes: This table presents the results of estimating the association between accounting backgrounds and discretionary accruals, as well as C-score after 2002. We include year and industry (based on two-digit SIC code) fixed effects. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively, based on a two-tailed *t*-statistic

0.2165), indicating that CEO accounting backgrounds is not associated with earnings management behavior after the passage of SOX.

Column (2) of Table VII presents the results of estimating the impact of CEO accounting education backgrounds on the level of reporting conservatism in the post-SOX period. As before, the coefficient on the *ACC_Back* is negative and significant (coefficient = -0.0187 ; p -value = 0.0196), supporting *H2* that CEOs with accounting backgrounds are more likely to exhibit a lower level of accounting conservatism. Overall, our results show that after the passage of SOX, CEOs with accounting backgrounds remain less conservative.

4.3.2 Change in chief executive officers' accounting backgrounds. Previous analyses focus on continuing CEOs whose accounting backgrounds do not change. However, when a firm has experienced a CEO turnover, it is likely that the new CEO has different accounting backgrounds from the previous CEO. It is possible that a firm's conservatism changes after the CEO's background changes from accounting to non-accounting or from non-accounting to accounting, resulting from the CEO turnover. To provide evidence on the impact of such a change, we compare changes in the level of conservatism for firms that have experienced a CEO turnover, resulting in a shift in CEOs' educational backgrounds. In addition, the association between firms' accounting choices and CEOs' accounting backgrounds can be determined endogenously. CEOs are chosen because they have the right background to carry out actions intended by the board of directors. Such a change analysis can rule out this endogeneity issue.

Figure 1 shows that most firms do not hire a CEO with an accounting background different from his/her predecessor. There are 723 firm-year observations whose current CEO background and previous CEO background are all accounting; on average, their C-score only changes by -0.003 . There are 12,771 firm-year observations whose current CEO background and previous CEO background are all non-accounting; on average, their C-score



Notes: This figure presents the changes in conservatism and changes in accounting backgrounds for firms that have experienced a CEO turnover. Previous_CEO_Background is the accounting background of the preceding CEO. Current CEO Background is the accounting background of the current CEO

Figure 1.
Changes in C-Score
and changes in
accounting
backgrounds

only changes by -0.005 . There are 49 firms that hired a CEO with a non-accounting background, while their previous CEO has an accounting background. For such firms, their average C-score increases by 0.055, indicating an increased level of conservatism. There are 58 firms that hired a CEO with an accounting background, while their previous CEO has a non-accounting background. For such firms, their average C-score decreases by 0.061, indicating a decreased level of conservatism[5]. These results are consistent with our main finding that CEOs with accounting backgrounds are more likely to exhibit a lower level of accounting conservatism. Figure 6 further highlights changes in accounting backgrounds.

4.3.3 Robustness checks. To ensure the robustness of our results, we conduct a few additional analyses. First, to address the concern that our results may be driven by differences in our samples, we construct a constant sample which only includes firm-year observations with non-missing values for variables used in both models. This is because the variables we used for accounting conservatism and earnings management are not exactly the same and the sample-firms we used are not exactly the same across the two models. The constant sample includes 6,911 observations. We re-estimate our accounting conservatism and earnings management models and find qualitatively similar results as before.

Second, we exclude firms in the utilities and regulated industries (SIC codes from 4900 to 4949), because these firms are subject to specific regulatory constraints. We also exclude firms in the financial services industry (SIC codes from 6000 to 6999), because accruals in the financial services industry are defined differently from accruals in other industries. Our results are qualitatively the same as before using this reduced sample.

Finally, we use the market-to-book ratio as an alternative accounting conservatism measures. A high market-to-book ratio suggests a high level of conservatism. Our results are qualitatively the same as before after we replace the accounting conservatism measures with the market-to-book ratio.

5. Conclusion

Experimental accounting research has documented that accounting education and backgrounds tend to lead to lower ethical behavior. Building upon this finding, this paper examines whether CEOs' accounting backgrounds affect firms' earnings management behavior and the reported accounting conservatism. We show that firms with CEOs who have accounting backgrounds exhibit lower levels of accounting conservatism. However, we do not find evidence that these firms show higher levels of income-increasing discretionary accruals.

This paper makes several contributions to the literature and suggests future research opportunities in several ways. First, our paper is the first study that investigates the impact of CEOs' accounting backgrounds on firms' financial reporting policy. Future studies can examine the impact of CEOs' accounting backgrounds on various firm decisions such as financing, investing, mergers and acquisitions, etc. Second, our findings may have some policy implications. If accounting backgrounds of CEOs can make a significant difference on firms' behavior, it is reasonable to make CEOs accountable for the quality of financial reporting. Third, this paper is one of the first to empirically test inferences drawn by experimental accounting research. There has been a gap between archival and experimental accounting studies. We propose that interesting research questions can be addressed by filling in such a gap. Fourth, our paper also has important implications for practice. The evidence presented in this paper can help auditing firms improve their audit quality by investigating CEOs' educational backgrounds. It may help SEC detect accounting malpractice or fraud. Future research can further explore the three-way association among CEO background, personal characteristics and corporate decisions.

Notes

1. Our paper differs from [Matsunaga and Yeung \(2008\)](#) in the following ways: we focus on CEOs' accounting educational backgrounds, rather than their prior working experience (CFOs or not); and the samples are different (our sample has 2,457 firms compared with 200 firms in [Matsunaga and Yeung \(2008\)](#)).
2. www.boardex.com/. See the Appendix in [Fracassi and Tate \(2012\)](#) for a detailed description of the BoardEx database.
3. [Dyreg et al. \(2010\)](#) used either the ExecuComp database or internet to obtain the biographical information about each of the executives (e.g. age, educational background and gender) between 1992 and 2006, while we used BoardEx to identify such information. In addition, the two samples are different. Hence, our summary statistics (e.g., the percentage of executives with accounting backgrounds) are different from theirs.
4. For detailed descriptions of this method, please refer to [Khan and Watts \(2009\)](#).
5. We do not conduct a regression analysis because of the infrequency of CEO turnover in which the CEO's accounting background changes from the previous CEO (from accounting to non-accounting backgrounds and vice versa).

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Acc_Back	A dummy variable equal to 1 for CEOs with accounting certifications or degree
DA	Discretionary Accrual measured based on the Jones (1991) model
DA_Adjust	Discretionary Accrual measured based on a modified Jones (1991) model
DA_ROA	Discretionary Accrual measured based on matched firm performance (based on ROA)
C_score	Incremental bad news timeliness as in Khan and Watts (2009)
Total_score	Total bad news timeliness as in Khan and Watts (2009)
Gender	A dummy variable equal to 1 for male and 0 for female
Age	The age of CEOs
Time To Retire	Time to retirement
Time in Role	Time in their current roles
Time on Board	Time on board activities
Time in Org	Time in their current organization
Avg_Time_Other_Com	Average time spent in other companies
Num_Qualification	Number of qualifications
LEV	Leverage, Long-term debt (DLTT) w.r.t to total assets (AT)
MTB	Market value of equity to book value of equity. Defined as market value of equity (CSHO x PRCC_F) scaled by (CEQ)
OPCYCLE	Natural log of the firm's operating cycle measured in days. Define as $\text{Log}(180 * ((AR_t + AR_{t-1}) / \text{SALES}_t + (\text{INV}_t + \text{INV}_{t-1}) / \text{COGS}_t))$, where AR is the accounts receivable (RECT), SALES is sales revenue (SALE), INV is inventory (INVT), and COGS is cost of goods sold (COGS)
CAPINT	Capital intensity. Defined as net property, plant and equipment (CAPX) divided by total assets (AT)
Stdopca	Standard deviation of cash flows (OANCF) deflated by average total assets (AT) based on the prior 9 years, including the current year
LOSS	A dummy variable. If Net Income (NI) is negative, then 1; 0, otherwise
SIZE	Natural log of total sales (SALE)
ROA	Returns on assets, measured as income before extraordinary items (IB) divided by total assets (AT)
CEO Over-Confidence	CEOs who hold stock options that are more than 67% in the money (i.e., the stock price exceeds the exercise price by more than 67%)
SUSPECT_NI	Firm-years that have net income scaled by total assets that is greater than or equal to zero but less than 0.005

Table AI.
Variable definitions

Corresponding author

Rong Huang can be contacted at: rong.huang@baruch.cuny.edu

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