Does Audit Tenure Impair Auditor Independence? Evidence from Option Backdating Scandals

Bo Ouyang
Management Division
Pennsylvania State University-Great Valley
Malvern, Pennsylvania 19355, USA

Huishan Wan
School of Accountancy
University of Nebraska-Lincoln
Lincoln, NE 68588, USA

Abstract

In 2011, U.S Public Company Accounting Oversight Board (PCAOB) voted to explore whether to propose mandating auditor rotation with a concept release to solicit public comment on this issue, which rekindled the debate of whether long audit tenure impairs audit quality. This study explores the relationship between audit tenure and likelihood of stock option backdating, a form of compensation fraud. The empirical evidence in this study suggests that firms with long audit tenure, particularly those with audit tenure longer than ten years, are more likely to backdate. However, the detrimental effect of long audit tenure on audit quality only exits in clients with small firm size. This study provides support to some, but not all, concerns of the regulator.

Keywords: Auditor independence, audit tenure, audit quality, stock option backdating

1.0 Introduction

"...key to concern over independence was the level of 'coziness' the firm had with the management of the company being audited...[m]any of the auditors of the large companies involved in the financial crisis ... had long running audit relationships with those companies." (PCAOB, 2011a)

Historically, authorities around the world have been very interested in implementing mandatory audit firm rotation to enhance auditor independence. In 2011, European Commission proposed a policy of six-year mandatory auditor rotation (European Commission, 2011) and in 2012, Netherland spearheaded by adopting an eight-year mandatory auditor rotation effective in 2016 (Lexology, 2013). In the U.S., Congress directed the General Accounting Office (GAO) to study the necessity of mandatory auditor rotation in 2002 and the report was issued by GAO in the following year. In the report, GAO did not recommend mandating the rotation, but cautioned "more experience needs to be gained" with this issue (GAO, 2003)[1]. Most recently, the working group of the Investor Advisory Group of Public Company Accounting Oversight Board (PCAOB) recommended that PCAOB undertake a project to implement periodic mandatory rotation of auditors. In response, PCAOB voted in 2011 to explore whether to propose mandating auditor rotation with a concept release to solicit public comment on this issue (PCAOB, 2011b). The proposed policy of mandatory audit firm rotation has rekindled a debate about the costs and benefits of the policy.

The controversy hinges on whether long audit tenure compromises audit quality. Proponents argue that long audit tenure negatively impacts audit quality because auditors may develop a cozy relationship with management so that auditors will lose their objectivity and independence and may not be willing to question or challenge management claims when necessary.

[1] In the report, GAO stated that : " it will take at least several years for the SEC and the PCAOB to gain sufficient experience with the effectiveness of the act in order to adequately evaluate whether further enhancements or revisions, including mandatory audit firm rotation, may be needed to further protect the public interest and to restore investor confidence" (GAO, 2003).

Also, as new auditors normally have a questioning mind that bringsa "fresh look" to detect problems in a client's financial reports (Lu and Sivaramakrishnan, 2009), mandatory auditor rotation may improve audit quality. Opponents, however, maintain that it takes years for new auditors to get familiar with a client's business and accounting practices, thus audit quality may suffer from mandatory audit firm rotation. Opponents also argue that requiring companies to rotate their auditors will not provide any incremental benefit as Sarbanes-Oxley Act of 2002 already requires having lead audit partners rotate every five years (CFO Magazine, 2012).

Results of academic studies are mixed as to whether long audit tenure lowers audit quality. Some studies find that quality is not affected by long tenure (e.g., Johnson et al. 2002; Gul et al. 2007); others find that quality improves with long tenure (e.g., Myers et al. 2003; Srinidhi et al. 2010); and still others find that quality diminishes with long tenure (e.g., Raghunathan 1994; Davis et al. 2009; Chu et al. 2012). Therefore, this is still an unanswered question.In this study, we investigate whether long audit tenure will impair auditor independence by examining the relationship between audit tenure and stock option backdatingscandal.

Stock option backdating refers to the practice of altering the grant date of a stock option to a date prior to the actual date that the company granted that option. Normally, the stock price of the altered date is lower than that of the actual grant date. Stock option backdating results in a lower exercise price and the granted option in-the-money and of higher value to the holder. Undisclosed or improperly-disclosed stock option backdatings are illegal. Arthur Levitt, former SEC chairman, describes option backdating as “stealing,” “ripping off shareholders,” and “the ultimate in greed” (Forelle and Bandler 2006).

Stock option backdatings have been standard business practice and gone largely unnoticed until they developed into a major accounting scandal in 2005 after Erik Lie, a finance professor at the University of Iowa, published a study (Lie 2005) that questioned some cases where a sharp increase in their stocks followed right after some firms granted stock options to their executives. The Wall Street Journal then began to examine individual companies and identified some firms in its investigative reporting.As of the end of 2006, the Wall Street Journal has identified suspicious option backdating patterns in more than 130 companies[2]. The SEC immediately lunched formal and an informal investigation of those firms identified in the WSJ’s investigative reporting and has formally charged some executives of accounting fraud[3]. Notable companies involved in this accounting scandal charged by the SEC include Broadcom Corp., UnitedHealth Group, and Comverse Technology. Since the SEC’s formal investigation, a significant number of firms have restated their prior financial reports to recognize more compensation expenses and quite a few executives and outside directors have lost their jobs and suffered from substantial reputational penalties (Efendi et al. 2013; Ertimur et al. 2012).

Prior studies attribute option backdating to an agency problem in which managers manipulate the grant dates of their option awards to increase their wealth opportunistically at the expense of the interests of shareholders or debt-holders. For example, Collins et al. (2009) and Narayanan et al. (2007) provide evidence that backdaters normally have weak corporate governance and strong managerial power. Further, the stock price of backdating firms drops significantly at the time of option backdating announcement (Bernile and Jarrell 2009) and the credibility of future earnings announcements is impaired (Cheng et al. 2009). Taken together, these studies suggest that option backdating possesses two basicfeatures of accounting fraud – incentive andopportunity.

Independent auditors have direct monitoring duty and assurance responsibility as compensation expenses need to be disclosed in the footnotes of financial reports and audited by independent external auditors. Backdated stock options will lower the compensation expense and overstate income and assets accordingly. After the breakout of the stock option backdating scandal, the PCAOB issued a formal guidance and alerted to auditors on the audit risk of stock option backdating. The PCAOB particularly emphasized that“auditors planning or performing an audit should be alert to the risk that the issuer may not have properly accounted for stock option grants and, as a result, may have materially misstated its financial statements or may have deficiencies in its [internal controls over financial reporting]. (PCAOB 2006)”Our sample of backdatings consists of 4,044 firm years that potentially have backdated their stock options between 1996 and 2005, as identified in Bebchuk, et al. (2010).

[2] Options Scorecard, the Wall Street Journal 2006, (http://online.wsj.com/public/resources/documents/info-optionsscore06-full.html)

[3]As of the end of 2011, the SEC and U.S. Attorney General’s Office has charged 67 executives with fraudulently backdating options. In the list of formal charged executives, there are 21 CEOs, 21 CFOs, 11 Board Chairmen, and 14 General Councels (SEC 2007, http://www.sec.gov/spotlight/optionsbackdating.htm).

Audit tenure is measured as the length of the auditor-client relationship as of the fiscal year-end in the financial statements. Our multivariate empirical evidences indicate that longer audit tenure is positively associated with the likelihood of option backdating and the positive effect is more pronounced when the audit tenure is longer than ten years. Our empirical evidence, however, does not support the claim of PCAOB that audit clients with a larger firm size may be particularly vulnerable to the negative effect of long audit tenure.Our study contributes to the ongoing debate of whether audit tenure impairs auditor independence by providing further evidence of the relationship between audit tenure and accounting scandal. Our study also has significant policy implication as the PCAOB is considering mandatory auditor rotation. Our evidence provides some support to the position of the PCAOB.

2.0 Method

2.1 Sample Selection

To investigate the relationship between audit tenure and stock option backdating scandals, we utilize a sample of firms that have backdated their stock options between 1996 and 2005, as identified in Bebchuk, et al. (2010)[4]. An option award is backdated or is a lucky grantif the stock price at the option grant date is the lowest of the month (Bebchuk et al., 2010). Data of stock return volatility, accounting data and data of board characteristics are obtained from CRSP, Compustat and Investor Responsibility Research Center (IRRC) respectively. We start with the sample of 15, 575 firm-year observations and merge with other databases. We lose 6,013 observations when the sample is merged with CRSP and Compustat for complete financial and accounting data. We lose another 5,116 observations to get corporate governance data from the database of IRRC. Finally, we delete 402 observations that belong to the industry of financial service (SIC code 60-69) as those firms have distinct corporate governance characteristics. Our final sample consists of 4,044 non-financial observations. Panel A of table 1 summarizes the derivation of the final sample.

Panel B of table 1 demonstrates the distribution of sample firms by focus industry and the comparison with the Compustat population. 29 percent of the firms in our sample are manufacturing firms and 23 percent are in consumer products and food while Compustat population has 23 percent and 20 percent respectively. Overall, there is no discernible difference between our sample and the Compustat population in terms of industry member distribution. In regressions, industry dummies are included to control any industry effect. Panel D of table 1 displays the comparison between the original sample of Bebchuk et al., 2010 (hereafter, original sample) and the sample in this study (hereafter, our sample). In the original sample, approximately 14.3% of the firm-years in the sample backdated the stock options and most of the backdatings occurred between 1996 and 2000. In our sample, 11.33% of the observations backdated the stock options and the percentages of backdated stock options are higher between 1997 and 2002.

2.2 Measurement of Audit Tenure

Audit tenure is measured as the length of the auditor-client relationship as of the fiscal year-end in the financial statements. In addition to a continuous variable of audit tenure, we also include a categorical variable and specifically test the claim of PCAOB that audit tenure higher than ten years may impair audit quality and thus requires mandatory rotation (PCAOB, 2011). Consistent with prior literature, we collect audit tenure information from Compustat database that started the coverage of auditor in 1976. The initiation date of the audit tenure is inevitably censored on the left. The sample in Bebchuk, et al. (2010) ends in 2005. Thus the longest audit tenure for most firms is 30 years[5]. Panel C of table 1 presents the distribution of audit tenure data. In the sample of this study, common audit tenures include 1-3 years and 7-13 years. Tenures of 23 and 24 years are also relatively popular.

2.3 Regression Model and Variable Definitions

Following prior research, our logistic regression models are as follows:

$$\text{Backdating}=b_0+b_1*\text{Tenure} + b_2*\text{Size}+b_3*\text{Hightech}+b_4*\text{Duality}+b_5*\text{PID}+b_6*\text{Bsize}+b_7*\text{Volatility}+b_8*\text{SOX}+b_9*\text{Firmage}+b_{10}*\text{Big4} \quad (a)$$

[4] Data are available for download at Professor Bebchuk's website: http://www.law.harvard.edu/faculty/bebchuk/data.shtml

[5]Auditor data are available in Compustat for some firms as early as 1974. The longest audit tenure in the sample of this study is 32 years therefore.

Backdating=b_0+b_1*Tenure10+
b_2*Size+b_3*Hightech+b_4*Duality+b_5*PID+b_6*Bsize+b_7*Volatility+b_8*SOX+b_9*Firmage+b_{10}*Big4(b)
Variable definitions are summarized in Table 2.

Our dependent variable (Backdating) is a dummy variable which is equal to one if a firm backdated its stock option in a year as identified by Bebchuk et al. (2010). Our primary test variables are audit tenure (Tenure) in regression model (a) and a dummy variable indicating if a firm's audit tenure is higher than or equal to 10 years (Tenure10) in regression model (b).

Control variables in the regression models are based on prior studies of backdating. Collins et al. (2009) suggest that weaker corporate governance is positively associated with the incidence stock option backdating. Particularly, they indicate that boards with lower percentage of independent directors and CEO duality structure are more likely to award backdated stock options to their executives. Therefore, we include three variables of board characteristics to control the effect of corporate governance: percentage of independent variables (PID); CEO and board chair being the same individual (Duality) and the size of the board (Bsize). Heron and Lie (2006) provide evidence that smaller firms may have less effective monitoring system and may get less attention from the public and thus are more likely to award backdated stock options. We include a control variable of market value (Size) in regression models. Following Heron and Lie (2006) and Collins et al. (2009), we also include variables to control stock return volatility (Volatility), high-tech industries (Hightech) and auditor type (Big4) in regression models.

Those studies suggest that firms with larger stock return volatility are more likely to backdate their stock options, firms in high-tech industries rely more on stock options compensating their executives and dominant audit suppliers have higher incentives and capability to detect stock option backdating. Two additional control variables are included to control the effects of firm age (Firmage) and intensified regulatory environment after the passage of Sarbanes-Oxley Act in 2002 (SOX)[6]. Younger firms heavily use stock options to compensate and retain executives. Thus, we expect a negative relationship between firm age and likelihood to backdate and include a variable to control that effect in regressions.SOX requires that public firms file a Form 4 with the SEC within two days of an option grant to executives, significantly crippling a firm's ability to backdate its stock options. The additional control variable takes into consideration of the changed regulatory environment.

3.0 Results

3.1 Descriptive Statistics

Table 3provides the descriptive statistics for the general sample. Approximately 11 percent of the observations in the sample backdated their stock options between 1996 and 2005 and mean (median) audit tenure is 13.76 (12) years. Approximately 62 percent of the observations have an audit tenure equal to or longer than 10 years. The mean (median) total assets is $4.18 billion ($1.23 billion), mean (median) volatility is 0.13 (0.12) and the mean (median) firm age is 25.42 years (22 years). Approximately 6 percent are in high-tech industries and the average size of the board of directors is 9.12. Average percentage of independent directors is 65 percent and about 58 percent observations have the structure of CEO duality in the board of directors. Most of the observations in the sample, or 98 percent, are audited by one of the four big international auditors.

3.2 Univariate Results

Table 4 reports the result of the univariate correlations[7]. The upperpanel of panel A summarizes the result of Pearson correlation while the result of Spearman correlation is presented in the lower panel. The panel indicates that the two primary variables of audit tenure (Tenure and Tenure10) are not significantly correlated with the likelihood to backdate. The result also suggests that firms in high-tech industries, with a lower percentage of independent directors and a smaller board size are more likely to backdate stock options awarded to executives. Observations with higher stock return volatility or smaller firm age are also more likely to be backdaters. The table also suggests that SOX can limit opportunistic timing of stock option grants. Panel B of table 4 compares some firm characteristics between samples split by audit tenure.

[6]Although SOX has significantly constrained backdating activities after 2002, Bebchuk et al.(2010) indicate that the passage of SOX in 2002 diminished, but not eliminated backdating.

[7] Most of the correlation coefficients are below 0.20. The regression diagnostics indicate that multicollinearity is not an issue (all VIF scores are below 2).

Observations with audit tenure shorter than 10 years, or the sample of short tenure, are significantly smaller in terms of firm size (mean total assets of $3.7 billion for the short-tenure sample vs. $4.5 billion for the long-tenure sample), significantly younger (mean firm age of 22.05 years of the short-tenure sample vs. 27.51 years of the long-tenure sample), more likely in the high-tech industries (8 percent in the high-tech industries of the short-tenure sample vs. 5 percent of the long-tenure sample), less likely to be audited by one of the big four international accounting firms (97 percent of the short-tenure sample audited by big 4 vs. 99 percent of the long-tenure sample) and more likely to have a smaller size of board of directors (mean size of 8.72 for short-tenure sample vs. 9.37 for long-tenure sample).

Panel C of table 4 summarizes the comparison of firm characteristics between samples divided by the median total assets of the general sample. Observations with total assets less than the median total assets of the general sample, or the sample of small firms, have significantly shorter audit tenure: average audit tenure of the sample of small firm size is 12.3 years vs. 15.23 years for the sample of big firm size; 57 percent observations in the sample of small firm size have an audit tenure longer than 10 years while 66 percent in the sample of big firm size do. Observations in small-firm-size sample are also significantly younger (mean firm age of 20.38 years vs. 30.45 years of the big-firm-size sample), more likely in the high-tech industries (9 percent vs. 3 percent of the big-firm-size sample), less likely to be audited by one of the big four international accounting firms (97 percent audited by big 4 vs. 99 percent of the big-firm-size sample) and have more volatile stock returns (mean stock return volatility of 0.15 vs. 0.11 of the big-firm-size sample). There are also significant differences in some dimensions of corporate governance. Firms with less total assets are less likely to have the structure of CEO duality (51 percent vs. 65 percent of big-firm-size sample), have a smaller percentage of independent directors (mean percentage of 64% vs. 67% of the big-firm-size sample) and have a smaller board (mean board size of 7.99 vs. 10.24 of the big-firm-size sample).

3.3 Regression Results

Multiple regression results are presented in Table 4. The result of regressions on the general sample is first reported in panel A. We find that there is a significantly positive relationship between audit tenure and the likelihood of backdating. (p-value = .02 for the variable of Tenure) and the positive relationship still persists when a dummy variable is adopted of whether the audit tenure is equal to or longer than 10 years (p-value=.04 for the variable ofTenure10). Consistent with prior literature (Heron and Lie, 2006; Collins et al. 2009), most of the control variables are significant and have the expected directions of signs. The coefficient estimates on SOX, Big4, Firmage, and PID are negative and significant, suggesting observations audited by one of the big four international accounting firms, after the passage of SOX, with a larger firm age and a higher percentage of independent directors in the board are less likely to backdate their stock options grants to executives. Firms with the structure of CEO duality in the board are more likely to be backdaters.

We also address the concern of the PCAOB that audit clients with a larger firm size may be particularly vulnerable to the negative effect of long audit tenure. Panel B of table 5 provides the result of logistic regressions on samples split by the median total assets of the general population. The result does not support the claim of PCAOB in that the positive relationship between audit tenure and the likelihood to backdate stock option grants exists only in the sample of firms with small firm size (p-value=.05 and .03 for the variables of Tenure and Tenure10 respectively).

Taken together, our empirical evidences indicate that longer audit tenure is positively associated with the likelihood of option backdating and the positive effect is more pronounced when the audit tenure is longer than ten years. Our empirical evidence, however, does not support the claim of PCAOB that audit clients with a larger firm size may be particularly vulnerable to the negative effect of long audit tenure.

4.0 Conclusion

Auditor independence is essential to unbiased assurance service provided by auditors to information users. Critics have argued that long audit tenure may impair auditor independence and audit quality. Our evidence indicates that long audit tenure is positively associated with the likelihood of stock option backdating, a form of accounting fraud. Our evidence further suggests that the detrimental effect of long audit tenure is more pronounced in larger audit clients. Overall, our study provides support of mandatory auditor rotation proposed by PCAOB.

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Table 1:Sample Derivation and Distribution of Data

Panel A:Sample Derivation

Sample of Bebchuk et al.(2010)	15,575
Merge with CRSP & Compustat	(6,013)
Merge with IRRC	(5,116)
Delete financial service firms	(402)
Final sample*	4,044

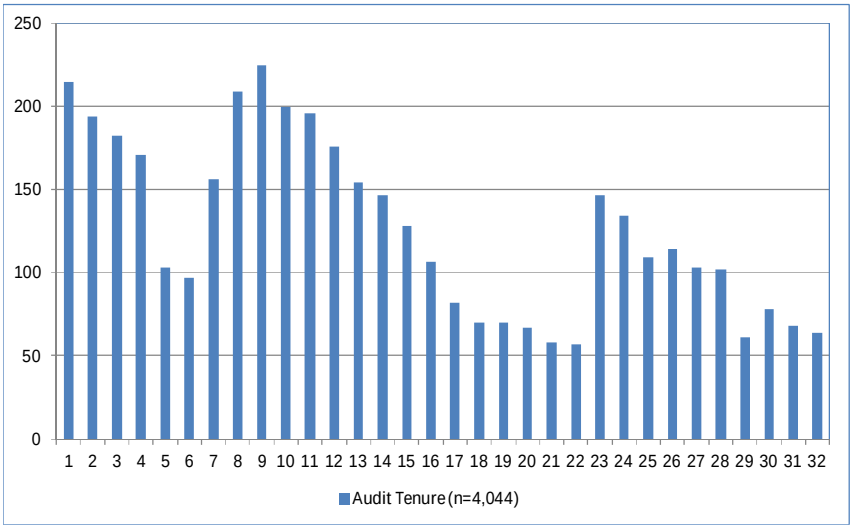
*: An option award is backdated if the stock price at the option grant date is the lowest of the month (Bebchuk et al., 2010).

Panel B: Distribution of Observations by Focus Industry

Focus Industry	Corresponding Two-Digit SIC codes	Number of Observations (%)	Compustat Population (%)*
Construction	15-17	64 (1.59%)	1.34%
Consumer Products and Food	20-33	929 (23.02%)	19.93%
Energy	10-14, 46, 49	390 (9.66%)	15.52%
Information and Communication	48, 73, 78, 79, 84	528 (13.08%)	18.87%
Manufacturing	34-39	1,197 (29.16%)	22.88%
Personal Services, Healthcare	72, 80, 83	102 (2.53%)	2.31%
Commercial Services, Education	75, 76, 82, 87, 89	78 (1.93%)	2.60%
Retail and Wholesale	50-59	608 (15.36%)	11.41%
Transportation	40-42, 44, 45, 47	129 (3.02%)	2.90%
All other	1, 2, 7, 8, 99	19 (0.37%)	2.20%
Total		4,044	100%(rounded)

*: Calculated based upon all firms in the active Compustat database, excluding financial firms

Panel C: Distribution of Observations by Audit Tenure



Panel D: Distribution of Firm Years(Comparison with the original backdating data from Bebchuk, et al. 2010)

	Sample of Bebchuk et al. (2010)				Sample of This Study			
Year	N (a)	Percentage	Backdating (b)*	Percentage (b/a)	N (a)	Percentage	Backdating (b)*	Percentage (b/a)
1996	1,147	7.36%	211	18.40%	276	6.77%	24	8.70%
1997	1,372	8.81%	248	18.08%	318	7.86%	41	12.89%
1998	1,389	8.92%	217	15.62%	321	7.96%	40	12.46%
1999	1,284	8.24%	228	17.76%	325	8.01%	41	12.62%
2000	1,509	9.69%	265	17.56%	382	9.43%	47	12.30%
2001	1,821	11.69%	326	8.81%	474	11.73%	78	16.46%
2002	1,682	10.80%	207	12.31%	445	11.01%	55	12.36%
2003	1,766	11.34%	197	11.16%	482	11.96%	45	9.34%
2004	1,853	11.90%	164	8.85%	521	12.88%	45	8.64%
2005	1,752	11.25%	165	9.42%	500	12.38%	42	8.40%
Total	15,575	100%	2,228	14.30%	4,044	100%	458	11.33%

*: Firms that have backdated stock options, identified in Bebchuk et al. (2010)

Table 2: Variable Definitions

Variables	Definition
Backdating	dummy variable equal to one if the firm backdated stock options; zero otherwise
Tenure	audit tenure from Compustat
Tenure10	dummy variable equal to one if audit tenure is greater than or equal to 10; zero otherwise
Size	natural log of the market value
Hightech	dummy variable equal to one if sic code is between 7370 and 7379
Duality	dummy variable equal to one if the CEO and the board chairman are the same individual
PID	percentage of independent directors in the board of directors
Bsize	the size of the board of directors
Volatility	stock return volatility of the past 60 months
SOX	dummy variable equal to one if the year is after 2002
Firmage	Firm age calculated from Compustat
Big4	dummy variable equal to one if the auditor is one of the big four international auditors
Ta	total assets in $ millions

Table 3: Descriptive Statistics

Descriptive Statistics of the General Sample (n=4,044)

Variable*	Mean	Median	Std Dev	Minimum	Maximum
Backdating	0.11	0	0.32	0	1
Tenure	13.76	12	8.95	1	32
Tenure10	0.62	1	0.49	0	1
Size	7.33	7.25	1.47	2.44	12.52
Hightech	0.06	0	0.24	0	1
Duality	0.58	1	0.49	0	1
PID	0.65	0.67	0.17	0.09	0.94
Bsize	9.12	9	2.47	4	28
Volatility	0.13	0.12	0.06	0.03	0.49
SOX	0.48	0	0.50	0	1
Firmage	25.42	22	14.69	3	56
Big4	0.98	1	0.13	0	1
Ta	4,181.15	1,230.71	11,256.66	17.50	262,867.00

*: Variablesare defined in table 2.

Table 4:Univariate analysis

Panel A: Correlations

Variables*	Backdating	Tenure	Tenure10	Size	Hightech	Duality	PID	Bsize	Volatility	Sox	Firmage	Big4
Backdating		-0.01	0.01	-0.02	0.04	0.02	-0.07	-0.03	0.06	-0.05	-0.07	-0.02
		0.60	0.43	0.27	0.01	0.15	<.0001	0.03	0.00	0.00	<.0001	0.24
Tenure	0.00		0.78	0.15	-0.12	0.05	0.05	0.21	-0.23	-0.10	0.42	0.06
	0.99		<.0001	<.0001	<.0001	0.00	0.00	<.0001	<.0001	<.0001	<.0001	<.0001
Tenure10	0.01	0.84		0.09	-0.08	0.01	-0.01	0.13	-0.14	-0.07	0.18	0.05
	0.43	<.0001		<.0001	<.0001	0.63	0.40	<.0001	<.0001	<.0001	<.0001	0.00
Size	-0.02	0.13	0.08		-0.01	0.11	0.10	0.44	-0.27	0.08	0.22	0.06
	0.16	<.0001	<.0001		0.43	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.00
Hightech	0.04	-0.12	-0.08	-0.02		-0.03	-0.02	-0.16	0.24	0.04	-0.19	0.02
	0.01	<.0001	<.0001	0.29		0.12	0.26	<.0001	<.0001	0.01	<.0001	0.26
Duality	0.02	0.04	0.01	0.12	-0.03		0.14	0.09	-0.12	-0.05	0.14	0.01
	0.15	0.02	0.63	<.0001	0.12		<.0001	<.0001	<.0001	0.00	<.0001	0.58
PID	-0.07	0.03	-0.02	0.10	-0.03	0.14		0.05	-0.07	0.23	0.22	0.04
	<.0001	0.06	0.33	<.0001	0.06	<.0001		0.00	<.0001	<.0001	<.0001	0.02
Bsize	-0.05	0.21	0.13	0.42	-0.17	0.09	0.09		-0.43	-0.10	0.41	0.04
	0.00	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001	0.00
Volatility	0.06	-0.22	-0.13	-0.29	0.23	-0.14	-0.09	-0.49		0.20	-0.46	0.00
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001	0.95
SOX	-0.05	-0.11	-0.07	0.08	0.04	-0.05	0.22	-0.09	0.22		-0.04	0.00
	0.00	<.0001	<.0001	<.0001	0.01	0.00	<.0001	<.0001	<.0001		0.01	0.76
Firmage	-0.07	0.40	0.25	0.22	-0.20	0.13	0.21	0.44	-0.51	-0.04		0.03
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.01		0.04
Big4	-0.02	0.07	0.05	0.06	0.02	0.01	0.04	0.04	-0.01	0.00	0.03	
	0.24	<.0001	0.00	0.00	0.26	0.58	0.01	0.00	0.67	0.76	0.09	

Upper panel: Pearson correlation; Lower panel: Spearman correlation.

*: Variables are defined in table 2.

Panel B: Descriptive Statistics of the Samples Divided by Audit Tenure

	Sample of Short Tenure (n=1,552)*		Sample of Long Tenure (n=2,492)*		Test of the Differences	
Variable**	Mean	Median	Mean	Median	Chi-square	t-test
Backdating	0.11	0	0.12	0	0.43	
Tenure	4.97	5	19.24	18		<.0001
Tenure10						
Size	7.16	7.10	7.43	7.34		<.0001
Hightech	0.08	0	0.05	0	<.0001	
Duality	0.58	1	0.59	1	0.63	
PID	0.66	0.67	0.65	0.67		0.40
Bsize	8.72	8	9.37	9		<.0001
Volatility	0.14	0.13	0.12	0.11		<.0001
SOX	0.52	1	0.46	0	<.0001	
Firmage	22.05	15	27.51	26		<.0001
Big4	0.97	1	0.99	1	0.00	
Ta	3,703.47	998.53	4,478.64	1,417.49		0.03

*: Samples are further divided into two sub-samples: sample of long audit tenure includes those with an audit tenure longer than nine years while sample of short audit tenure include those with an audit tenure shorter than ten years. **: variables are defined in table 2.

Panel C: Descriptive Statistics of the Samples Divided by Firm Size

	Sample of Small Firm Size (n=2,022)*		Sample of Big Firm Size (n=2,022)		Test of the Differences	
Variable**	Mean	Median	Mean	Median	Chi-square	t-test
Backdating	0.13	0	0.10	0	0.01	
Tenure	12.30	11	15.23	14		<.0001
Tenure10	0.57	1	0.66	1		<.0001
Size	6.34	6.38	8.32	8.19		<.0001
Hightech	0.09	0	0.03	0	<.0001	
Duality	0.51	1	0.65	1	<.0001	
PID	0.64	0.67	0.67	0.69		<.0001
Bsize	7.99	8	10.24	10		<.0001
Volatility	0.15	0.14	0.11	0.10		<.0001
SOX	0.47	0	0.49	0	0.35	
Firmage	20.38	16	30.45	31		<.0001
Big4	0.97	1	0.99	1	<.0001	
Ta	572.49	536.52	7,789.80	3,247.91		<.0001

*: Samples are further divided into two sub-samples: sample of large firm size includes those with total assets higher than the median of the total assets of the general sample while sample of small firm size includes those with total assets less than the median of the total assets of the general sample.

**: variables are defined in table 2.

Table 5: Regression analysis

Panel A: Regressions of General Sample

Model (a):

Backdating=b_0+b_1*Tenure + b_2*Size+b_3*Hightech+b_4*Duality+b_5*PID+b_6*Bsize+b_7*Volatility+b_8*SOX+b_9*Firmage+b_{10}*Big4

Model (b):

Backdating=b_0+b_1*Tenure10+ b_2*Size+b_3*Hightech+b_4*Duality+b_5*PID+b_6*Bsize+b_7*Volatility+b_8*SOX+b_9*Firmage+b_{10}*Big4

		Model (a)		Model (b)	
Variables*	Predicted Sign (?)	Estimate	p-value	Estimate	p-value
Intercept	(?)	0.67	0.61	0.54	0.68
Tenure	(?)	0.02	**0.02**		
Tenure10	(?)			0.25	**0.04**
Size	(?)	0.00	0.96	0.00	0.96
Hightech	+	0.08	0.79	0.07	0.81
Duality	+	0.26	0.02	0.26	0.02
PID	-	-0.61	0.07	-0.61	0.07
Bsize	(?)	0.01	0.85	0.00	0.87
Volatility	+	1.02	0.39	1.06	0.37
SOX	-	-0.68	0.00	-0.69	0.00
Firmage	(?)	-0.02	0.00	-0.01	0.01
Big4	-	-0.59	0.10	-0.58	0.11

*: variables are defined in table 2.

Panel B: Regressions by Firm Size

Model (a):

Backdating=b_0+b_1*Tenure + b_2*Size+b_3*Hightech+b_4*Duality+b_5*PID+b_6*Bsize+b_7*Volatility+b_8*SOX+b_9*Firmage+b_{10}*Big4

Model (b):

Backdating=b_0+b_1*Tenure10+b_2*Size+b_3*Hightech+b_4*Duality+b_5*PID+b_6*Bsize+b_7*Volatility+b_8*SOX+b_9*Firmage+b_{10}*Big4

		Sample of Small Firm Size (n=2,022)*				Sample of Large Firm Size (n=2,022)*			
		Model (a)		Model (b)		Model (a)		Model (b)	
Variables**	Predicted Sign (?)	Estimate	p-value	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	(?)	-2.07	0.14	-2.13	0.12	-11.51	0.98	-11.55	0.98
Tenure	(?)	0.02	**0.05**			0.01	0.46		
Tenure10	(?)			0.36	**0.03**			0.07	0.69
Size	(?)	0.02	0.81	0.03	0.73	0.02	0.81	0.02	0.79
Hightech	+	0.33	0.40	0.34	0.39	-0.38	0.44	-0.41	0.41
Duality	+	0.15	0.30	0.16	0.28	0.49	0.01	0.49	0.01
PID	-	-0.53	0.25	-0.52	0.26	-0.74	0.17	-0.76	0.16
Bsize	(?)	-0.01	0.81	-0.01	0.80	0.03	0.42	0.03	0.43
Volatility	+	0.97	0.53	1.09	0.48	1.06	0.61	1.05	0.61
SOX	-	-1.11	0.00	-1.11	0.00	-0.29	0.34	-0.30	0.34
Firmage	(?)	-0.02	0.07	-0.01	0.14	-0.01	0.04	-0.01	0.05
Big4	-	-0.16	0.74	-0.15	0.76	-1.31	0.03	-1.29	0.04

*: Samples are further divided into two sub-samples: sample of large firm size includes those with total assets higher than the median of the total assets of the general sample while sample of small firm size includes those with total assets lower than the median of the total assets of the general sample.

**: variables are defined in table 2.