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경영학석사학위논문

Mandatory Auditor Designation
System and Audit Quality:
An Empirical Analysis of
Korean IPO Firms

(감사인 지정제도가 감사품질에 미치는 영향:
신규상장기업에 대한 실증연구)

2013년 2월

서울대학교 대학원
경영학과 회계학전공
김 태 윤

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Abstract

Mandatory Auditor Designation System and Audit Quality: An Empirical Analysis of Korean IPO Firms

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The purpose of this study is to empirically examine the impact of the mandatory auditor designation system on audit quality aimed at Initial Public Offering (IPO) firms in Korea. The mandatory auditor designation system has been enforced for IPO firms listed on the securities market since 2006. This study investigates the change of audit quality of the IPO firms as of 2006. I use absolute values of performance-matched discretionary accruals from the modified Jones model suggested by Kothari et al. (2005) as a proxy of audit quality.

I perform the univariate and multivariate analyses targeting the total firm-year samples listed on the securities market (which amount to 14,599 firm-year samples) and 621 IPO firms covering the periods from 2002 to 2010.

The empirical results of my study targeting IPO firms show that mandatory designation of auditors significantly lowers discretionary accruals compared to the IPO firms with free audit engagement system. This means that the mandatory auditor designation system is positively associated with audit quality.

Meanwhile, the empirical results of the total firm-year samples give the result that discretionary accruals have been significantly lowered for the firm-year samples since 2006. This signifies that reforms of various accounting systems other than the mandatory auditor designation system for IPO firms also contribute to improve audit quality in course of time.

Also, I find an incremental decrease in discretionary accruals for IPO firms compared to the total firm-year samples. It suggests that the improvement degrees of audit quality of IPO firms are significantly higher compared to overall listed companies.

In conclusion, this study gives more confidence in the mandatory auditor designation system; it positively influence on the improvement of audit quality.

This paper provides several contributions as follows: First, this research tries to increase the accuracy to prove effects of the mandatory auditor designation system on audit quality by

distinguishing IPO firms since 2006 from total firm-year samples.

Second, this study provides the updated results regarding the relationships between audit engagement system and the audit quality by analyzing recent firm-year data.

Lastly, this study is expected to contribute to regulators involved in accounting practices for their decision making when they make or revise various laws or practices related to the appointment of auditors.

Keywords : Initial Public Offering (IPO), Mandatory Auditor Designation System, Free Audit Engagement System, Audit Quality, Discretionary Accruals, Earnings Management.

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1. Introduction

Stakeholders including managers, investors, creditors, employees and analysts use target firms' accounting information when they make economic decision. In order to provide interested parties with suitable accounting information, it needs higher quality and more transparency. Through attestation processes, an external audit furnishes reliability and credibility on firms' financial statements; it makes accounting information more useful for stakeholders. As a result, it can be said that audit quality has a major impact on quality of accounting information.

However, audit quality has difficulties to observe and measure. DeAngelo (1981b) defines audit quality as the market-assessed joint probability that a given auditor will both detect material misstatements in the client's financial statements and report the material misstatements. That is, audit quality is a function of the auditor's ability to detect material misstatements (auditor competence) and reporting the errors (auditor independence).

A variety of proxies are suggested to estimate audit quality. For instance, prior studies propose accounting firm size, industry specialization, auditor reputation, outright audit failures, etc. In case of outright audit failures, there are litigation, business failures and audit failures, which occur when an auditor violates statutory provisions provided by Accounting and Auditing Enforcement Releases (AAERs); in this context, earnings restatement is naturally used to assess audit

quality. But there are limitations in these proxies as doubts have been expressed about the direct and reliable relationship between these proxies and audit quality. Along with this, there is a problem that they rarely occur in the real world. Thus, a degree of earnings management is practically used to assess audit quality, where many scholars consider discretionary accruals as a major measure to capture such earnings management.

Auditor appointment system is largely divided into the Free Audit Engagement System and the Mandatory Auditor Designation System. The free audit engagement system (FAES) is introduced to enhance the auditor's competence by accelerating competition with various auditors or accounting firms. On the other hand, the mandatory auditor designation system (MADS) is one of the distinct auditing institutions of Korea, which is intended to protect the auditor's independence. This system is expected to encourage auditors to provide their findings properly in the auditors' reports. In Korea, the FAES is mainly adopted at present, while the MADS is used for specific cases worrying audit risks.

In my research I use the performance-matched modified Jones model (Kothari et al., 2005) to detect audit quality of selected Initial Public Offering (IPO) firms on the Korean Stock Market or the Korea Securities Dealers Automated Quotations (KOSDAQ). I collect 621 firm-year observations of IPO covering the period from 2002 to 2010. In addition, I divide the samples into two distinct periods; one period is from 2002 to 2005, the period of the free audit engagement system,

and the other is from 2006 to 2010, the period of the mandatory auditor designation system for the firms. I verify my hypothesis that the mandatory auditor designation system for IPO firms significantly and positively influence on audit quality, supporting the most of prior literatures.

Furthermore, I also check audit quality of already listed companies during the selection periods in order to compare with audit quality of newly listed ones, i.e. IPO firms. This is thought to be helpful to increase the accuracy of capturing relationship between the mandatory auditor designation system and audit quality. This study provides the updated results regarding the relationships between audit engagement system and audit quality by analyzing recent firm-year data. This study is expected to contribute to regulators involved in accounting practices for their decision making when they make or revise various laws or practices related to the appointment of auditors.

This paper is composed of five sections: introduction, literature reviews and hypothesis development, research methods, empirical results and conclusion. In the next section, I briefly review precedent studies on the relationship between auditor appointment system and audit quality and provide my hypothesis. In section 3, I discuss the sample selection and my research designs. In section 4, I present the empirical results. In the final section, I conclude the results of this study and provide contribution and limitation of my research.

2. Literature Reviews and Hypothesis Development

2.1 Mandatory Auditor Designation System

The free audit engagement system (FAES) has been implemented in Korea since 1982, but this auditing system causes several worries on the possibility of infringement to the independence of external auditors since companies has authority to choose their external auditors. Auditees are considered to have tendency to abuse their appointment authorities under the FAES, which may result in weakened audit quality or outright audit failure. As a result, these concerns impose Financial Supervisory Service (FSS) to devise an alternative audit system mixing the free audit engagement system and the mandatory auditor designation system. That is, the mandatory auditor designation system has been adopted in specific cases after 1990 while the mainstream of audit still holds the free audit engagement system.

Precedent studies reported several reasons why auditees' selection of auditors may affect the independence of external auditors. First of all, if auditees select an external auditor for the purpose of opinion shopping, the auditor may be under pressure from their client (Chow and Rice, 1982). In this case, forced auditor change will help to increase audit quality. Second, several existing studies of Francis et al. (2010), Kallapur et al. (2011) and Newton et al. (2011) found

auditors in the face of increased competition are related to low audit quality. Fiolleau et al. (2009) argued that the bidding process affects behaviors of auditors which result in impaired independence of auditors. To win the bidding, each auditor tries hard to get on the good side of a client demonstrating that he/she will audit the client in a flexible way because the auditor thoroughly understands the client. Lastly, competitions among auditors can lead to 'low balling' (DeAngelo, 1981a) which is thought to impair the independence of external auditors, which is reported by Bandyopadhyay & Kao (2001), Hackenbrack et al. (2000) and Maher et al. (1992). According to the report by the Financial Supervisory Service (FSS) that analyzed the audit contract reports of 19,642 firms with December fiscal year as of 2011, Korean companies' audit fees of the firms with designated auditors are 54-118% higher than firms with non-designated auditors.

According to the Article 4.3 of the Act on External Audit of Stock Companies and the Article 4 of the Enforcement Decree of the Act on External Audit of Stock Companies, the Securities and Futures Commission (SFC) may nominate an auditor of a company when the company requests the nomination to the SFC after obtaining approval from the statutory auditor or the auditor selection and appointment commission, or request any company depicted on the Article 4.3 of the Act on External Audit of Stock Companies¹⁾ to

1) [Article 4.3 Designation of Auditors by Securities and Futures Commission (SFC)]

(1) Any company failing to appoint an auditor within four months from the date of commencement of each business year;

(2) Any company deemed to replace an auditor on unjustifiable grounds

or any company which appoints an auditor in violation of the statutory auditor appointment process;

(3) Any company pointed out by the SFC to have prepared and published financial statements or consolidated financial statements in violation of the accounting standards like Generally Accepted Accounting Principle (GAAP);

(4) Any company where the large shareholder and the person under a special relationship jointly hold more than 50/100* (25/100**) of the total issued and outstanding shares, and the large shareholder or the person under a special relationship is the representative director;

* A condition for 50/100 shall be applied among the companies whose total amount of assets is more than 100 billion won, which indicates a company jointly held more than 50/100 of the total issued and outstanding shares;

** A condition for 25/100 shall be applied among the listed companies on the Korean Stock Market or the KOSDAQ Market, which indicates a company jointly held more than 25/100 of the total issued and outstanding shares;

(5) From among listed companies on the Korean Stock Market, any company recognized and designated as requiring a fair audit by the SFC, as prescribed by Presidential Decree as follows:

(a) Any listed company whose issues of stock have been designated as administrative issues;

(b) Any listed company where loans to the largest shareholder and the person under a special relationship is more than 30/100 of its total equities, or a securities listed company where the total amount of loans to the largest shareholder and the person under a special relationship and guarantee deposits for them is more than 10/100 of its total equities;

(c) Any company for which fair audit is necessary because of its violation of the Act or the Financial Investment Services and Capital Markets Act;

(6) Any company whose main creditor bank requests the SFC to nominate auditors;

(7) Other acts like the Mutual Saving Banks Act request firms with the relevant conditions for hiring designated auditors; or

(8) Other companies recognized and designated by Presidential Decree that they are especially in need of a fair audit as follows:

(a) A stock company that intends to have its stocks listed during the pertinent or next business year excluding a corporation listed on the Korean Stock Market, which intends to become a corporation listed on the KOSDAQ Market, a corporation listed on the KOSDAQ Market, which

appoint an auditor or replace with the person designated by the Securities and Futures Commission (SFC) within three business years. In such cases, the SFC shall nominate an auditor from among accounting corporations.

The numbers of corporations with designated auditors and the causes of auditor designation from 2002 to 2010 announced by the FSS are as follows:

Table 1. Numbers and Major Causes of Auditor Designation

Item \ Year	Year								
	2002	2003	2004	2005	2006	2007	2008	2009	2010
Violation of Statutory Regulations Regarding Auditor Appointment and Change	14	9	10	10	8	19	20	6	12
Enforcement Results of Surveillance	43	54	47	54	56	41	48	41	31
Designated as Administrative Issues	68	57	91	73	27	54	55	72	53
IPO Firms	-	-	-	300	198	192	142	125	172
Others	37	33	43	36	18	33	36	26	27

intends to become a corporation listed on the Korean Stock Market, or a stock company that intends to become a corporation listed on the Korean Stock Market and that has its stocks listed on a foreign stock exchange designated by the Securities and Futures Commission (limited to stock exchanges that permit only companies whose accounting information is reliable to list their securities);

(b) A corporation listed on the KOSDAQ Market, whose issues have been designated as administrative issues under the listing regulations established separately for the KOSDAQ Market pursuant to the Financial Investment Services and Capital Markets Act: Provided that those designated as administrative issues due to low trading volume of stocks shall be excluded herefrom; or

(c) Any other company for which fair auditing is deemed particularly necessary due to any reason similar to those under subparagraphs (a) through (b).

Item \ Year	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total	162	153	191	473	307	339	301	270	295

(Source: The Financial Supervisory Service, <http://www.fss.or.kr/>)

In the table above, it is observed that 300 firms which intend to list on the securities market including the Korean Stock Market and the KOSDAQ Market had designated auditors in 2005. The Fictitious Auditor Designation System had been adopted from 2001 to 2005. According to this system, if a firm, which had an intention of listing on the securities market in the next business year, chose an auditor who fulfilled the certain necessary requirements, the Securities and Futures Commission could approve the appointed auditor considered as a designated auditor. So it can be said the free audit engagement system were actually adopted during the period. But in 2004, legislators amended several articles of Act on External Audit of Stock Companies, concerning auditor appointments and its changes in order to protect investors, and this amendment began to take effect in 2005 to the companies which intended to list on the securities market in the next business year. Consequently, the mandatory auditor designation system has been applied to all the IPO firms listed on the securities market since 2006.

There are somewhat considerable literature on the mandatory auditor designation system in Korea. Generally, a good deal of prior studies find that the auditor designated firms have a statically significant relation to lowered discretionary accruals (DA), and their

results support an argument that the mandatory auditor designation system is helpful to audit quality.

According to Kim and Yi (2009), discretionary accruals are lowered for auditor designated firms compared to a control group consisting of firms which have rights to select or appoint their own external auditors. Mayhew and Pike (2004) conclude that auditors' independence increases when investors select external auditors regardless of managers' influence. They suggest that the proportion of independence violations significantly decreases for the firm which transfers the right to appoint and change an auditor from managers to investors. That leads to improved audit quality.

Kwon et al. (2004) analyzed a sample of 811 auditor designated firms from 1991 to 2000. The result of discretionary accruals for the sample shows that discretionary accruals of firms with mandatory auditor designation system are significantly more income-decreasing than those with free audit engagement system. They also show that there is a tendency of more income-decreasing discretionary accruals for the firms which have designated auditors for longer periods. They argue that the auditor designation regulation per se provides incentives for auditors to audit their clients on a base of the conservative accounting principle. Indeed, they support the mandatory auditor retention system from their finding that auditors become more conservative with their clients as a period of the relationship between an auditor and a firm lengthens.

Kang and Hwang (2007) suggest that the mandatory auditor

designation system improves accounting transparency by guaranteeing independence of a firm's auditor. They divide periods of 1,528 firm-year observations into the auditor pre-designation periods, the auditor ongoing designation periods and the auditor post-designation periods on 308 corporations with designated auditors from 1998 to 2004. They perform paired t-tests and regression analysis of discretionary accruals measured by the modified Jones model. They find that discretionary accruals decrease during the auditor designation periods. They also find discretionary accruals before the auditor designation periods are significantly bigger than those after the designation periods. Meanwhile, they show that discretionary accruals have also continued to decrease for two years prior to the auditor designation, which means the improvement in auditor independence is not the only factor sufficient to explain the decrease in discretionary accruals. As a result, they argue that the improvement in accounting transparency is caused by the mixed efforts of the improvement of a designated auditor's independence and the exertion of a corporation to achieve better accounting transparency.

On the contrary, Kim and Jeong (2009) argue that the mandatory auditor designation system applied to IPO companies does not improve transparency of accounting information through enhancement of auditors' independence. They investigate whether there are any differences in earnings management of IPO companies, to which the mandatory auditor designation system applied in 2006

and 2007 while the free audit engagement system is applied in 2004 and 2005. From the univariate test, they show that earnings management has no difference in IPO companies regardless of the engagement of statutory auditors. In addition, the multivariate test shows that earnings management measured by performance-matched discretionary accruals when statutory auditors were engaged surpasses earnings management when companies had the right to choose their own auditors.

According to Bae et al. (2010), it is impossible to find an evidence on their suggestion that audit quality measured by an absolute value of discretionary accruals increases when audited by a designated auditor. They suggest that when non-designated periods of the control group is included, the result is changed to be insignificant unlike the findings by Kim and Yi (2009). They oppose the well-known perception that the free audit engagement by clients may be a significant threat to auditor independence.

2.2 Estimation of Audit Quality

The purpose of audit is to reduce information risk. Firms provide financial information like financial statements and footnotes for information users including stakeholders. But there is information risk in the information that firms provide. Four major reasons for information risk are reported as follows (Lee et al., 2007): First, there are conflicts between information providers and information users.

Firms, information providers, can pervert financial information based on their tastes and interests. Second, financial information has an important effect upon its information users. Biased or incomplete information may lead to serious harm to the users who make an economic decision. Third, the complexity of financial information contributes to information risk. Information users are lack of professional knowledge to discern the truth although the complexity of information increases as time advanced. Lastly, information users are located remotely from the source of a firm's financial information. Due to temporal, economic and institutional constraints, information users cannot access and test the sources for information. As a result, an audit conducted by objective third parties is needed to reduce information risk, and people pay attention to increase the quality of an audit. Then, it is natural to recognize the importance of applying a proper proxy of audit quality.

Audit quality defined by DeAngelo (1981b) is the joint probability of discovering and reporting a breach in regard to auditing a given company, which is perceived by market participants. To estimate audit quality in this connection, precedent literatures suggest some proxies including accounting firm size, industry specialization, auditor reputation and outright audit failures.

DeAngelo (1981b) provides accounting firm size as a proxy for audit quality as he believes that information users trust major accounting firms. Francis and Wilson (1988) as well as Jonson and Lys (1990) also use that proxy for estimating audit quality. Big

accounting firms generally have more clients than small size ones. As a result, they argue that if big size firms do not report their findings of fraud and errors of clients, or misreport financial reporting, then they will lose much more reputation comparing to small size firms, resulting in economic losses which it is hard for the big accounting firms to afford. By contrast, small accounting firms have less clients, thus a single client occupies more shares in profits. Small firms will easily understand and go along with their clients' stance in terms of importance.

Shockley and Holt (1983) and Palmrose (1984) use industry specialization as a proxy for perceived audit quality. An auditor of a given industry specialist has an ability to provide more talented audit service, along with high reputation to be more damaged if his/her audit results in failure.

Watts and Zimmerman (1983) use auditor's reputation because they argue that market participants perceive the reputation as an important proxy for auditor independence. According to their studies, when auditors establish high reputations, they are forced to increase audit quality to maintain their reputations because high reputations are considered to guarantee increases in audit demands as well as audit fees.

Meanwhile, Francis (2004) summarizes that outright audit failures consist of Generally Accepted Accounting Principles (GAAP) failures and audit report failures. The GAAP failure means a case of an auditor's failure to enforce GAAP, and the audit report failure

means a case of an auditor's failure to modify an audit report. It is believed that outright audit failures are quite apparent in case of auditor litigation, business failures and earnings restatements. Audit failure rates can be measured by the number of lawsuits against auditors, bankruptcies of auditees in spite of modified or qualified audit opinions, which include issuing an audit report mentioning going concern uncertainty, and ex post facto modifications of audit reports. But outright audit failure rates measured by these factors are relatively very small. As a result, those are not the good proxies to capture audit quality.

Becker et al. (1998) and Frankel et al. (2002) argue that audit quality is related to implied earnings management behavior of clients, which is estimated by the amount of discretionary accruals. Discretionary accruals are one of the most preferred proxies to capture audit quality, and they are examined or tested for the explanation power in various studies. As a fairly typical case, the Jones model (Jones, 1991) including the adjusted Jones model (Dechow et al., 1995) is mainly adopted. Afterward, Kothari et al. (2005) argue that performance-matched discretionary accruals are superior to the ordinary discretionary accruals for they show enhanced powers to capture a firm's earnings management well.

Following previous literatures, I also use this proxy in my research when figuring out the relationship between the mandatory auditor designation system and audit quality. I use performance-matched discretionary accruals which Kothari et al.

(2005) suggests; in a concrete form, I analyze an absolute value of performance-matched discretionary accruals for it is reported that negative values bear a close relation to decreased audit quality, along with positive values of the discretionary accruals.

2.3 Research Hypothesis

Characteristics of auditors may have significant influence on differences in accounting quality. The mandatory auditor designation system was introduced to protect the interested parties and to improve audit quality, which results in fair audit, by guaranteeing independence of auditors which is one of key characteristics of auditors. However, there is a risk in this case for the Financial Supervisory Service (FSS), which involves the Securities and Futures Commission (SFC), to appoint an auditor who is lack of competence. To deal with this, the FSS prepares requirements for auditors according to their characteristics when selecting and appointing an auditor for a particular firm by announcing the Regulation of External Audit and Accounting. According to this regulation, when total assets of a firm assigned for the audit designation get larger, the Big 4 accounting firms (Samil PricewaterhouseCoopers, Deloitte Anjin LLC, Samjong KPMG Inc. and Ernst & Young Advisory, Inc.) have more chances to be appointed. In this way, the FSS intends to cope with apprehension of a falling-off in audit quality, which is more likely to arise in the random selection system of a designated auditor. The

conditions for auditor designation according to characteristics of auditor are introduced in Appendix 3 of the Regulation of External Audit and Accounting. In accordance with this appendix, the Big 4 accounting firms which operate their business on a large scale are apt to be appointed for large size corporations. The conditions are shown in Table 2 as follows:

Table 2. Conditions for Auditor Designation According to Characteristics of Auditors²⁾

Category	Total Asset of Company	Conditions of Auditors					Accounting Firm Designation
		No. of CPAs Belonging to an Accounting Firm	No. Years of Establishment	Revenue	Capacity for Damages	Status of Cooperation with Foreign Firms	
I	Over 800 billion won	Over 100	Over 10 years	Over 30 billion won	Over 5 billion won	Actual cooperation	Satisfying 4 conditions
II	300 billion ~ 800 billion won	Over 50	Over 7 years	Over 10 billion won	Over 1.5 billion won	Actual cooperation	Satisfying 4 conditions

2) (1) The Number of CPAs Belonging to an Accounting Firm is calculated according to the statutory auditor point formula.

(2) Capacity for Damages is calculated by the sum of accumulated amount of joint fund for damages, reserves for damage compensation and liability insurance for compensation premium.

(3) In the category of Status of Cooperation with Foreign Firms, Actual Cooperation means having entered into an audit quality agreement and Simple Cooperation means any cooperation other than the aforementioned cooperation.

(4) An accounting firm with the capacity to audit companies with over 800 billion won in assets cannot be designated as auditor to the companies with less than 50 billion won in assets. However, this does not apply to the designation of prospective stock listed corporations.

Category	Total Asset of Company	Conditions of Auditors					Accounting Firm Designation
		No. of CPAs Belonging to an Accounting Firm	No. Years of Establishment	Revenue	Capacity for Damages	Status of Cooperation with Foreign Firms	
III	50 billion ~ 300 billion won	Over 20	Over 3 years	3 billion won	500 million won	Simple cooperation	Satisfying 3 conditions
IV	Less than 50						All accounting firms

(Source: Appendix 3 of the Regulation on External Audit and Accounting)

In summary, the mandatory auditor designation system in current operation in Korea is considered an improvement of independence of an auditor along with complementation of competence. I think it is important to research whether the mandatory auditor designation system achieves this purpose in terms of academic significance or not. This study will also contribute to policy makers revising and implementing the related regulations or practices in the future.

I hypothesize that the implementation of the mandatory auditor designation system contributes to an improvement of audit quality. I test the following hypothesis using absolute values of performance-matched discretionary accruals from the modified Jones model suggested by Kothari et al. (2005) as a proxy of audit quality.

Hypothesis 1: IPO firms with designated auditors are significantly

associated with lower absolute values of discretionary accruals comparing to IPO firms with free audit engagement system.

Meanwhile it is possible to expect overall quality of financial reporting increases as time passes by modifying related accounting systems. As the periods of the free audit engagement system for IPO firms precede those of the mandatory auditor designation system, it is required a comparative analysis of the transition of average audit quality for already stock listed companies during the research periods. We need to calculate the differences in discretionary accruals for already stock listed companies making a comparison between the periods of the free audit engagement system (from 2002 to 2005) and those of the mandatory auditor designation system (from 2006 to 2010). And it is necessary to determine whether the level of differences between the already stock listed companies and IPO firms calculated according to the above hypothesis are statically significant. Therefore, I propose an additional hypothesis as follows:

Hypothesis 2: For already stock listed companies other than IPO firms, the differences in absolute values of discretionary accruals during the periods between the free audit engagement system and the mandatory auditor designation system are significantly lower than those for IPO firms.

3. Research Methods

3.1 Data Collection

The data of IPO firms during the research periods are obtained from Korea Exchange (KRX) and the Korea Investors Service (KIS) Value of NICE Information Service Co., Ltd. The data of external auditors and financial reporting for the selected sample firms are collected from the KIS Value. I use the research periods from 2002 to 2010, which are divided into two groups as of 2006 when all the newly securities listed companies should have their designated auditors. The free audit engagement system was adopted from 2002 to 2005; the mandatory auditor designation system was applied from 2006 to 2010. The specific standards of sample selection are as follows:

- (1) Firms with December fiscal year, newly or continuously listed on the securities market during the research periods (from 2002 to 2010)
- (2) Excluding banking firms
- (3) Excluding firm-year data after delisting if any listed companies are delisted from the securities market during the research periods
- (4) Firms whose data of external auditors and financial reporting are available

The first condition is introduced for the comparison with other prior studies and the convenience of analysis. I select samples from firms with December fiscal year to match the sample with the identical feature. The second condition is used because banking firms are very different from firms which run other businesses like manufacturing industry, and so on. In other words, it can be said that the business environment or the regulation degree of the banking business is unique when compared with other businesses. It is considered that financial reporting data of the banking business have no relation with those of other businesses because of the differences in components and meanings of accounts in financial statements. The third condition is introduced to remove unusual factors for the research. Firms delisted from the securities market during the research periods are apt to result in higher probabilities of abnormal financial reporting in comparison with common firms. So, if a given firm is delisted from the securities market during the research periods, I exclude certain firm-year data after the date of delisting. The last condition is added to enhance availability of sample data and accuracy of the analysis for an empirical research.

I extract and analyze the samples which meet the above conditions. The data of newly IPO firms are provided by the KRX during the research periods from 2002 to 2010 amount to 905 as a whole. To settle the research sample, I remove 30 firms that accounts for relocated listings on the other securities market, which sometimes occur when already listed firms move from the KOSDAQ Market to

the Korean Stock Market. I also exclude firms with the incompleteness of financial data in case that I cannot obtain the data of external auditors as well as financial reporting for the sample from the KIS Value database. Finally, I have IPO firm samples amounting to 621 for this research.

The details of IPO firm samples are as follows:

Table 3. Sample Compositions of IPO Firms

Panel A. Composition of the total IPO firm samples	
	905
IPO Firms from 2002 to 2010	
IPO Firms with Relocated Listings on the Other Securities Market (From KOSDAQ Market to Korean Stock Market)	(30)
Banking Firms	(35)
Firms without December Fiscal Year	(40)
Firms Infeasible to Measure Discretionary Accruals Due to Lack of Data, etc.	(179)
Total	621
Panel B. Composition of IPO Firms	
	342
IPO from 2002 to 2005	279
IPO from 2006 to 2010	63
Total	621

3.2 Research Design

3.2.1 Estimation of Audit Quality from Discretionary Accruals

I use absolute values of discretionary accruals as a proxy of accrual-based earnings management. It is well known that absolute values of discretionary accruals provide better information on audit quality comparing to the original values of discretionary accruals (Bartov et al., 2000). Discretionary accruals are estimated from a cross-sectional analysis of variables as Subramanyam (1996) suggests that cross-sectional regression analysis using the Jones model shows more stable result than that of time-series analysis. To measure discretionary accruals, I use the performance-matched measure of abnormal accruals following Kothari et al. (2005), who provided a modified version of the adjusted Jones model (1995), frequently used in various recent studies. The performance-matched modified Jones model (Kothari et al., 2005) is as follows:

$$TA_{it}/A_{i,t-1} = a_0[1/A_{i,t-1}] + b_1[(\Delta REV_{it} - \Delta REC_{it})/A_{i,t-1}] + b_2[PPE_{it}/A_{i,t-1}] + b_3ROA_{it} + \varepsilon_{it} \quad (1)$$

Where i and t mean an individual firm and a specific year, respectively;

TA_{it} = total accruals of firm i in year t ;

ΔREV_{it} = change in sales of firm i in year t , as compared from year $t-1$;

ΔREC_{it} = change in account receivables from trade of firm i in year of t , as compared from year $t-1$;

PPE_{it} = gross property, plant and equipment of firm i in year t ;

ROA_{it} = return on assets of firm i in year t ;

$A_{i,t-1}$ = total assets of firm i in year $t-1$, and;

ε_{it} = the error term.

Total accruals (TA) are computed from net income (NI) minus cash flows from operating activities (CFO). And discretionary accruals are calculated by subtracting non-discretionary accruals from total accruals, which is offered as the error term.

The above Equation (1) is calculated separately according to each set of the two-digit Korea Standard Industry Classification (KSIC) codes and a calendar year, following precedent studies. I exclude firms belonging to certain sets of industry and year which have less than 10 firms. Then I calculate coefficients of each variable for every set using a regression analysis. Finally I compute discretionary accruals of every firm for each industry code and calendar year, which is not excluded from the research sample.

3.2.2 Research Model

I assume that the implementation of the mandatory auditor designation system for IPO firms is negatively associated with absolute values of discretionary accruals in my hypothesis. To test Hypothesis 1, I use a multivariate regression model as follows:

$$\begin{aligned} ABDA_{it} = & a_0 + b_1DESIG_{it} + b_2BIG4_{it} + b_3SIZE_{it} + b_4LEV_{it} + b_5CFO_{it} + \\ & b_6GROWTH_{it} + b_7LOSS_{it} + b_8ROA_{it} + \text{Year dummies} + \\ & \text{Industry dummies} + \varepsilon_{it} \quad (2) \end{aligned}$$

Where i and t mean an individual firm and a specific year, respectively;

$ABDA_{it}$ = the absolute value of discretionary accruals;

$DESIG_{it}$ = 1 if an auditor of an IPO firm during the research periods from 2002 to 2010 is designated and 0 otherwise, which is divided into two groups as of 2006, following the revision of related regulations;

$BIG4_{it}$ = 1 if a firm is audited by the Big 4 major accounting firms and 0 otherwise;

$SIZE_{it}$ = natural logarithm of the book value of total assets;

LEV_{it} = leverage of liabilities that is measured by the ratio of total liabilities to total equities;

CFO_{it} = cash flows from operations scaled by lagged total assets;

$GROWTH_{it}$ = growth rate of sales, which is sales scaled by lagged

sales;

$LOSS_{it}$ = 1 if a firm's net income is negative and 0 otherwise;

ROA_{it} = net income deflated by lagged total assets;

Year dummies = dummy variables intended to control for year differences during the research periods;

Industry dummies = dummy variables intended to control for industry differences using the two-digit KSIC codes;

ε_{it} = the error term.

The independent variable of the above model is an indicator variable that takes 1 when the mandatory auditor designation system is applied to an IPO firm, or takes 0 otherwise. The independent variable is the absolute value of performance-matched discretionary accruals that is a proxy of audit quality.

In the above mentioned equation, control variables include the Big 4 major accounting firms (BIG4), assets size of a firm (SIZE), the leverage of liabilities (LEV), cash flows from operations (CFO), the growth rate of total assets (GROWTH), profit or loss of a firm (LOSS), and return on assets (ROA), which all are expected to affect abnormal earnings of a firm, i.e. the absolute value of discretionary accruals. In the multivariate regression model, I control those variables.

I use a control variable of BIG4 following Francis et al. (1999) who argue that the size of an accounting firm is negatively associated with earnings management of its client. It is generally

expected that BIG4 have more financial resources, better industry expertise and higher auditor reputations, all of which lead to increased audit quality. In other words, the existence of audit by the Big 4 accounting firms has the possibility to restrain managers from adjusting their earnings.

SIZE is included to control political costs of a firm. According to Watts and Zimmerman (1978), if the size of a firm is bigger, its probability to be a political target will also be increasing through the growth of interested parties; increase of political costs provide managers with incentives to report accounting incomes less than the actual. Larger firms are more likely to show higher quality of earnings, which is negatively associated with discretionary accruals (Becker et al., 1998).

LEV is used to control firms with higher leverage. DeFond and Jiambalvo (1994) suggest that managers of such firms have incentives to report optimistic earnings to avoid violation of debt covenants by using earnings management. As a result, when a firm's level of leverage gets higher, the amount of discretionary accruals has more possibilities to grow.

CFO is included to control for cross-sectional variations in cash flows from operations, which may affect the level of discretionary accruals. Dechow et al. (1995) and Becker et al. (1998) report its negative association with discretionary accruals.

GROWTH is selected to control the difference in earnings management according to the growth levels of firms. As high

growing firms need more money to keep up their paces, they have more incentives to manage earnings aggressively (Mizik and Jacobson, 2008). It is expected that positive relationship between a firm's growth measured by growth rates of sales and discretionary accruals.

LOSS is chosen to control the effect of firms that report negative earnings. These firms have incentives to make their business performances better. Thus, Roychowdhury (2006) argues firms with negative earnings will use discretionary accruals more, and audit quality will become worse. However, according to Healy (1985), when a firm reports heavy losses, they may not manage earnings aggressively with the purpose of Big Bath³). Consequently, there are two conflicting opinions about the effect of LOSS.

ROA is included to control the effect of firm performance on accruals estimating discretionary accruals, following Butler et al. (2004). Butler et al. (2004) and Kothari et al. (2005) argue that discretionary accruals are positively associated with earnings performance of a firm in the way that firms with high earnings have tendency to show positive accruals that lead to positive discretionary accruals. Thus, ROA may be positively correlated with earnings management.

3) Big Bath means an earnings management technique by which an one-time charge is taken against income, which results in lower expenses in the future. The write-off reduces net assets or net income from the financial reports and cause lower net income for that fiscal year. The objective is to 'take one big bath' in a single year, thus the company will report increased net income in the future.

Likewise, I suggest the second multivariate model to verify Hypothesis 2. In the below model, a coefficient of IPO×POST variable means the incremental change of discretionary accruals for IPO firms compared with that of the total sample including already listed companies as well as IPO firms, which amount to 14,599 firm-years. This coefficient is expected to capture the actual effect on audit quality improvement by enforcing the mandatory auditor designation system for IPO firms. A concrete form of the model is as follows:

$$\begin{aligned}
 ABDA_{it} = & a_0 + b_1IPO_{it} + b_2POST_{it} + b_3IPO_{it} \times POST_{it} + b_4BIG4_{it} + \\
 & b_5SIZE_{it} + b_6LEV_{it} + b_7CFO_{it} + b_8GROWTH_{it} + b_9LOSS_{it} + \\
 & b_{10}ROA_{it} + \text{Year dummies} + \text{Industry dummies} + \varepsilon_{it} \quad (3)
 \end{aligned}$$

Where *i* and *t* mean an individual firm and a specific year, respectively;

$ABDA_{it}$ = the absolute value of discretionary accruals;

IPO_{it} = 1 if a firm is newly listed on the securities market during the research periods from 2002 to 2010 and 0 otherwise;

$POST_{it}$ = 1 if a firm-year sample belongs to the periods from 2006 to 2010 when the mandatory auditor designation system became effective for IPO firms, and 0 otherwise when the free audit engagement system was enforced on them;

$BIG4_{it}$ = 1 if a firm is audited by the Big 4 major accounting firms and 0 otherwise;

$SIZE_{it}$ = natural logarithm of the book value of total assets;

LEV_{it} = leverage of liabilities that is measured by the ratio of total liabilities to total equities;

CFO_{it} = cash flows from operations scaled by lagged total assets;

$GROWTH_{it}$ = growth rate of sales, which is sales scaled by lagged sales;

$LOSS_{it}$ = 1 if a firm's net income is negative and 0 otherwise;

ROA_{it} = net income deflated by lagged total assets;

Year dummies = dummy variables intended to control for year differences during the research periods;

Industry dummies = dummy variables intended to control for industry differences using the two-digit KSIC codes;

ε_{it} = the error term.

The independent variables are IPO and POST that are indicator variables. IPO takes 1 if a firm is newly listed on the securities market during the research periods, or takes 0 otherwise. POST takes 1 if a firm-year sample belongs to the periods of the mandatory auditor designation system for IPO firms (from 2002 to 2005), or takes 0 otherwise. The dependent variable is the absolute value of performance-matched discretionary accruals following Kothari et al. (2005), which is a proxy of audit quality.

To draw more reliable results, I also winsorize outliers of all the variables used in this study except for the indicator variables like DESIG, IPO, POST, BIG4 and LOSS to the 1 and 99 percentile values.

4. Empirical Results

4.1 Descriptive Statistics

I finally have 621 IPO firm-year observations among the total sample of 14,599 firm-years, which are listed on the securities market that consists of the Korean Stock Market and the KOSDAQ Market, during the research periods. I summarize descriptive statistics of my research variables. The minimums, the first quartiles, the means, the medians, the third quartiles, the maximums and the standard deviations of variables including independent variables, control variables and dependent variables are shown in Table 4 and Table 5.

When I compare IPO firm samples with the total sample, I find that the mean DA of IPO firms is 0.025588 which is bigger than -0.00133 for the total firm-year samples. It is expected that earnings management in the first listed years for IPO firms is a generally higher level. As a result, I analyze the degree of improvement of audit quality from adoption of the mandatory auditor designation system, which will be described in the following analyses.

And I find the mean ratio (0.634461) of BIG4 for IPO firms is bigger than the entire firms (0.551408). When enforcing the auditor designation on IPO firms, possibilities of hiring Big 4 auditors become higher because the statutory methods of auditor engagement are favorable for them.

Tables of the above-mentioned descriptive statistics are as follows:

Table 4. Descriptive Statistics for IPO Firm-year Observations

Variable	N	Minimum	First Quartile	Mean	Median	Third Quartile	Maximum	Standard Deviation
DA	621	-0.36366	-0.05984	0.025588	0.020001	0.106686	0.388889	0.14643
ABDA	621	0.00105	0.035926	0.113702	0.083824	0.153751	0.455206	0.103416
DESIG	621	0	0	0.449275	0	1	1	0.497821
BIG4	621	0	0	0.634461	1	1	1	0.481969
SIZE	621	22.35468	23.85161	24.52092	24.33366	24.95625	29.84805	0.974122
LEV	621	0.026105	0.218026	0.614671	0.426599	0.777163	10.74015	0.728994
CFO	621	-0.50667	-0.00598	0.098031	0.09293	0.197684	0.611992	0.203688
GROWTH	621	-1.46229	0.007096	0.16432	0.150011	0.306672	1.655737	0.364252
LOSS	621	0	0	0.085346	0	0	1	0.279621
ROA	621	-0.68637	0.059763	0.143619	0.129078	0.216978	0.572871	0.160697

Variables are defined as follows:

DA = discretionary accruals measured by the modified version of adjusted Jones model (Kothari et al., 2005);

ABDA = the absolute value of above measured discretionary accruals;

DESIG = 1 if an auditor of an IPO firm during the research periods from 2002 to 2010 is designated and 0 otherwise, which is divided into two groups as of 2006, following the revision of related regulations;

BIG4 = 1 if a firm is audited by the Big 4 major accounting firms and 0 otherwise;

SIZE = natural logarithm of the book value of total assets;

LEV = leverage of liabilities that is measured by the ratio of total liabilities to total equities;

CFO = cash flows from operations scaled by lagged total assets;

GROWTH = growth rate of sales, which is sales scaled by lagged sales;

LOSS = 1 if a firm's net income is negative and 0 otherwise;

ROA = net income deflated by lagged total assets.

Table 5. Descriptive Statistics for Total Sample Firm-years

Variable	N	Minimum	First Quartile	Mean	Median	Third Quartile	Maximum	Standard Deviation
DA	14,599	-0.36366	-0.05795	-0.00133	-0.00069	0.05621	0.388889	0.114399
ABDA	14,599	0.00105	0.025321	0.082444	0.057036	0.107573	0.455206	0.084838
IPO	14,599	0	0	0.042537	0	0	1	0.201818
POST	14,599	0	0	0.550106	1	1	1	0.4975
BIG4	14,599	0	0	0.551408	1	1	1	0.497367
SIZE	14,599	22.23562	24.10429	25.08838	24.88166	25.83525	29.84805	1.476372
LEV	14,599	-1.71782	0.367612	1.168626	0.769183	1.410618	10.74015	1.545675
CFO	14,599	-0.50667	-0.01736	0.056305	0.052593	0.128444	0.611992	0.162079
GROWTH	14,599	-1.46229	-0.04502	0.103785	0.092383	0.253498	1.655737	0.415219
LOSS	14,599	0	0	0.259949	0	1	1	0.438622
ROA	14,599	-0.85117	-0.00805	0.018537	0.042403	0.101052	0.572871	0.201572

Variables are defined as follows:

DA = discretionary accruals measured by the modified version of adjusted Jones model (Kothari et al., 2005);

ABDA = the absolute value of above measured discretionary accruals;

IPO = 1 if a firm is newly listed on the securities market during the research periods from 2002 to 2010 and 0 otherwise;

POST = 1 if a firm-year sample belongs to the periods from 2006 to 2010 when the mandatory auditor designation system became effective for IPO firms, and 0 otherwise when the free audit engagement system was enforced on them;

BIG4 = 1 if a firm is audited by the Big 4 major accounting firms and 0 otherwise;

SIZE = natural logarithm of the book value of total assets;

LEV = leverage of liabilities that is measured by the ratio of total liabilities to total equities;

CFO = cash flows from operations scaled by lagged total assets;

GROWTH = growth rate of sales, which is sales scaled by lagged sales;

LOSS = 1 if a firm's net income is negative and 0 otherwise;

ROA = net income deflated by lagged total assets.

4.2 Correlation Analysis of Variables

I provide an analysis of the pairwise relations between variables selected as independent, dependent and control variables in my models.

I find that there are significant correlations between some variables in certain cases. In cases that correlations between independent variables and control variables, or among independent variables are particularly significant, it is suspected that some variables seem to have high level of multicollinearity. Thus, the multicollinearity test is needed. According to my analysis, the maximum value of the Variance Inflation Factors (VIF) from Regression Model (2) is 5.01546, and the maximum value of the VIF from Regression Model (3) is 4.71897. I consider that significant multicollinearity problems are not seriously influential in my research models. Chatterjee and Price (1977) argue that if a regression model has independent or control variables among which a value of the VIF is found more than 10, there is high probability of significant multicollinearity problems.

The Pearson correlation coefficients are reported in Table 6 and Table 7 as follows:

Table 6. Pearson Correlation Matrix for IPO Firm-year Observations

	ABDA	DESIG	BIG4	SIZE	LEV	CFO	GROWTH	LOSS	ROA
ABDA	1	-0.09947**	-0.03079	0.02938	0.18592***	-0.20196***	0.17201**	0.09069**	0.09431**
DESIG	-0.09947**	1	0.08729**	0.25241**	-0.08522**	0.08732**	0.01895	-0.12527**	0.11342**
BIG4	-0.03079	0.08729**	1	0.15718**	-0.03888	0.03708	0.0421	-0.01946	0.07058*
SIZE	0.02938	0.25241**	0.15718**	1	0.10255**	0.103**	0.13807**	-0.15448*	0.12279**
LEV	0.18592***	-0.08522**	-0.03888	0.10255**	1	-0.33181**	0.08714**	0.25116**	-0.40143**
CFO	-0.20196***	0.08732**	0.03708	0.103**	-0.33181**	1	0.30635**	-0.33922**	0.64345**
GROWTH	0.17201**	0.01895	0.0421	0.13807**	0.08714**	0.30635**	1	-0.29082**	0.5074**
LOSS	0.09069**	-0.12527**	-0.01946	-0.15448*	0.25116**	-0.33922**	-0.29082**	1	-0.57917**
ROA	0.09431**	0.11342**	0.07058*	0.12279**	-0.40143**	0.64345**	0.5074**	-0.57917**	1

***, ** and * denote that correlation coefficients of two indicated pairs of variables are statistically significant at the

level of 1%, 5% and 10%, respectively.

Variables are defined as follows:

ABDA = the absolute value of discretionary accruals measured by the modified version of adjusted Jones model (Kothari et al., 2005);

DESIG = 1 if an auditor of an IPO firm during the research periods from 2002 to 2010 is designated and 0 otherwise, which is divided into two groups as of 2006, following the revision of related regulations;

BIG4 = 1 if a firm is audited by the Big 4 major accounting firms and 0 otherwise;

SIZE = natural logarithm of the book value of total assets;

LEV = leverage of liabilities that is measured by the ratio of total liabilities to total equities;

CFO = cash flows from operations scaled by lagged total assets;

GROWTH = growth rate of sales, which is sales scaled by lagged sales;

LOSS = 1 if a firm's net income is negative and 0 otherwise;

ROA = net income deflated by lagged total assets.

Table 7. Pearson Correlation Matrix for Total Sample Firm-years

	ABDA	IPO	POST	BIG4	SIZE	LEV	CFO	GROWTH	LOSS	ROA
ABDA	1	*** 0.07766	*** -0.02652	*** -0.05574	*** -0.21906	*** 0.06448	*** -0.04936	*** 0.12437	*** 0.07592	*** -0.05028
IPO	*** 0.07766	1	*** -0.04272	*** 0.0352	*** -0.08102	*** -0.07554	*** 0.05426	*** 0.03073	*** -0.08391	*** 0.1308
POST	*** -0.02652	*** -0.04272	1	** -0.01671	*** 0.17294	*** -0.05629	*** -0.04587	* -0.01426	*** 0.03621	*** -0.04456

	ABDA	IPO	POST	BIG4	SIZE	LEV	CFO	GROWTH	LOSS	ROA
BIG4	*** -0.05574	*** 0.0352	** -0.01671	1	*** 0.29939	*** -0.00276	*** 0.1121	*** 0.02317	*** -0.11134	*** 0.14043
SIZE	*** -0.21906	*** -0.08102	*** 0.17294	*** 0.29939	1	*** 0.05941	*** 0.04837	*** -0.0301	*** -0.17514	*** 0.11358
LEV	*** 0.06448	*** -0.07554	*** -0.05629	*** -0.00276	*** 0.05941	1	*** -0.13674	*** -0.00088	*** 0.20793	*** -0.22658
CFO	*** -0.04936	*** 0.05426	*** -0.04587	*** 0.1121	*** 0.04837	*** -0.13674	1	*** 0.24735	*** -0.41967	*** 0.61922
GROWTH	*** 0.12437	*** 0.03073	* -0.01426	*** 0.02317	*** -0.0301	*** -0.00088	*** 0.24735	1	*** -0.25052	*** 0.35678
LOSS	*** 0.07592	*** -0.08391	*** 0.03621	*** -0.11134	*** -0.17514	*** 0.20793	*** -0.41967	*** -0.25052	1	*** -0.68653
ROA	*** -0.05028	*** 0.1308	*** -0.04456	*** 0.14043	*** 0.11358	*** -0.22658	*** 0.61922	*** 0.35678	*** -0.68653	1

***, ** and * denote that correlation coefficients of two indicated pairs of variables are statistically significant at the level of 1%, 5% and 10%, respectively.

Variables are defined as follows:

ABDA = the absolute value of discretionary accruals measured by the modified version of adjusted Jones model (Kothari et al., 2005);

IPO = 1 if a firm is newly listed on the securities market during the research periods from 2002 to 2010 and 0 otherwise;

POST = 1 if a firm-year sample belongs to the periods from 2006 to 2010 when the mandatory auditor designation

system became effective for IPO firms, and 0 otherwise when the free audit engagement system was enforced on them;

BIG4 = 1 if a firm is audited by the Big 4 major accounting firms and 0 otherwise;

SIZE = natural logarithm of the book value of total assets;

LEV = leverage of liabilities that is measured by the ratio of total liabilities to total equities;

CFO = cash flows from operations scaled by lagged total assets;

GROWTH = growth rate of sales, which is sales scaled by lagged sales;

LOSS = 1 if a firm's net income is negative and 0 otherwise;

ROA = net income deflated by lagged total assets.

4.3 Univariate Analysis

For the univariate analysis, I divide the full IPO observations into 2 groups. The criterion of classification is whether the DESIG variable takes 0 or 1. IPO firms newly listed on the securities market from 2002 to 2005 (where DESIG is 0), when the mandatory auditor designation system for IPO firms was not implemented, amount to 342 firms, while the others from 2006 to 2010 (where DESIG is 1), when revised regulations on the mandatory auditor designation system were enforced, amount to 279 firms.

I compare the average absolute values of discretionary accruals in case that DESIG is 1, to that where DESIG is 0. The difference between two groups is 0.0207, which is significant at the level of 5%. The average ABDA for IPO firms whose DESIG is 0 surpasses meaningfully that for IPO firms whose DESIG is 1. This means that audit quality for IPO firms audited by designated auditors is higher than the others.

The result from univariate analysis of IPO firms is represented in Table 8 as follows:

Table 8. T-test for IPO Firms

DESIG	N	Average ABDA	Std. Dev.
0	342	0.123	0.1122
1	279	0.1023	0.0904
Diff.		0.0207	0.103
T-value		2.54** (p=0.0113)	

***, ** and * denote statistical significance at the levels of 1%, 5% and 10%, respectively.

Variables are defined as follows:

ABDA = the absolute value of discretionary accruals measured by the modified version of adjusted Jones model (Kothari et al., 2005).

4.4 Multivariate Analysis

The results of multivariate analysis using Regression Model (2) and Regression Model (3) are provided in Table 9 and Table 10. Samples for Model (2) are aimed at IPO firms during the research periods from 2002 to 2010. On the other hand, Model (3) targets total listed firm samples as this model is used to distinguish the degree of audit quality improvement for IPO firms from that for the total sample.

I find that the coefficient of DESIG is -0.047 with the t-value of -2.86 , which means DESIG is negatively associated with absolute values of discretionary accruals with significance of the 1% level. In other words, the mandatory auditor designation system for IPO firms is highly associated with improvement of audit quality.

I also find that BIG4 and SIZE have no significant effects on absolute values of discretionary accruals in the observed IPO firms. Although the coefficient of BIG4 is below zero, it is especially worthy of notice that significantly actual relationship between BIG4 and audit quality is not found in Korea. Also, I cannot find that relationship between the two in Regression Model (3), which will appear hereafter.

Other coefficients of control variables and their t-values are shown as expected. In case of LOSS, it is suggested that the tendency of IPO firms that report losses is using discretionary accruals more, according to this analysis.

Table 9. Multivariate Regression Analysis for IPO Firms

Variable	Coefficient Estimate	Standard Error	T-value	Pr > t
INTERCEPT	-0.09907	0.11536	-0.86	0.3908
DESIG	-0.047***	0.01643	-2.86	0.0044
BIG4	-0.00864	0.00814	-1.06	0.2888
SIZE	0.00581	0.00441	1.32	0.1881
LEV	0.02435***	0.00624	3.9	0.0001
CFO	-0.22974***	0.02467	-9.31	<.0001
GROWTH	0.0233*	0.01297	1.8	0.0729
LOSS	0.07378***	0.01685	4.38	<.0001
ROA	0.33059***	0.04159	7.95	<.0001
Year dummies	Included			
Industry dummies	Included			
Observations	621			
F Value	5.03***		Pr > F	<.0001
R-Square	0.2826		Adj. R-Sq.	0.2265

***, ** and * denote that an indicated coefficient of variables are statistically significant at the levels of 1%, 5% and 10%, respectively.

Variables are defined as follows:

DESIG = 1 if an auditor of an IPO firm during the research periods from 2002 to 2010 is designated and 0 otherwise, which is divided into two groups as of 2006, following the revision of related regulations;

BIG4 = 1 if a firm is audited by the Big 4 major accounting firms and 0 otherwise;

SIZE = natural logarithm of the book value of total assets;

LEV = leverage of liabilities that is measured by the ratio of total liabilities

to total equities;

CFO = cash flows from operations scaled by lagged total assets;

GROWTH = growth rate of sales, which is sales scaled by lagged sales;

LOSS = 1 if a firm's net income is negative and 0 otherwise;

ROA = net income deflated by lagged total assets.

In analysis of Regression Model (3), the coefficient of IPO×POST represents the degree of incremental audit quality improvement for IPO firms compared with the total sample. Before checking that variable, it is needed to look into variables of IPO and POST. The coefficient of IPO is 0.0309061 and the t-value is 5.26, which means significantly negative association with audit quality, equal to the arguments of Friedlan (1994) and Teoh et al. (1994, 1998). They show that earnings management of IPO firms has a tendency of occurring more aggressively and more frequently. In case of POST, the coefficient is -0.017921 which is significant at the 1% level. Thus, it is assumed that overall audit quality improves along with the quality of financial reporting in course of time, due to the reform of various accounting systems.

IPO×POST presents a coefficient of -0.014497 which is statically significant at the 10% level. It suggests that the degrees of audit quality improvement for IPO firms are significantly higher and greater, compared to overall listed companies.

When looking into BIG4, it has no significance with audit quality although its coefficient has negative value, which is same as the result of Regression Model (2). Unlike precedent literatures in the United States, which finds a negative relationship between the size of

an auditor and discretionary accruals (Becker et al., 1998; Francis et al., 1999), prior researches targeting Korean firms provide controversial conclusions whether audits by big accounting firms in Korea result in decreasing discretionary accruals. According to the analysis in this paper, there is no evidence of a significant relationship between the size of an accounting firm and absolute values of discretionary accruals of its clients, which is similar to the result of Park and Lee (2003) and Choi (2005). It is considered that disparities in the business environments and accounting systems bring about the differences between discretionary accruals in respect of the size of an auditor in the United States and those in Korea.

In the case of SIZE, LEV, CFO and GROWTH, estimated coefficients of these variables come up as expected, following prior studies. But I cannot find meaningful outcomes regarding LOSS and ROA in this analysis.

The detailed result of Multivariate Regression Model (3) is as follows:

Table 10. Multivariate Regression Analysis for Total Sample Firm-years

Variable	Coefficient Estimate	Standard Error	T-value	Pr > t
INTERCEPT	0.2866051***	0.01684876	17.01	<.0001
IPO	0.0309061***	0.00587903	5.26	<.0001
POST	-0.017921***	0.0026434	-6.78	<.0001
IPO×POST	-0.014497*	0.00796	-1.82	0.0687
BIG4	-0.000328	0.00175188	-0.19	0.8513

Variable	Coefficient Estimate	Standard Error	T-value	Pr > t
	-0.00875***	0.00066944	-13.07	<.0001
SIZE	0.0031591***	0.00059948	5.27	<.0001
LEV	-0.025873**	0.01313041	-1.97	0.0489
CFO	0.0283283***	0.00234579	12.08	<.0001
GROWTH	0.0024336	0.00253805	0.96	0.3378
LOSS	-0.009551	0.0105657	-0.9	0.3661
ROA				
Year dummies	Included			
Industry dummies	Included			
Observations	14,599			
F Value	27.65***		Pr > F	<.0001
R-Square	0.1208		No. of Clusters	1,878

***, ** and * denote that an indicated coefficient of variables are statistically significant at the levels of 1%, 5% and 10%, respectively.

Variables are defined as follows:

IPO = 1 if a firm is newly listed on the securities market during the research periods from 2002 to 2010 and 0 otherwise;

POST = 1 if a firm-year sample belongs to the periods from 2006 to 2010 when the mandatory auditor designation system became effective for IPO firms, and 0 otherwise when the free audit engagement system was enforced on them;

IPO × POST = 1 if both variables of IPO and POST are 1 and 0 otherwise;

BIG4 = 1 if a firm is audited by the Big 4 major accounting firms and 0 otherwise;

SIZE = natural logarithm of the book value of total assets;

LEV = leverage of liabilities that is measured by the ratio of total liabilities to total equities;

CFO = cash flows from operations scaled by lagged total assets;

GROWTH = growth rate of sales, which is sales scaled by lagged sales;

LOSS = 1 if a firm's net income is negative and 0 otherwise;

ROA = net income deflated by lagged total assets.

When summarizing those findings in this paper, it is suggested that the mandatory auditor designation system has a

positive relationship with audit quality. A designated auditor provides high quality of audit services in case of IPO firms at the 1% significance level. Furthermore, the above-stated finding is still valid for the total firm-year samples despite the lower significance of 10%. This gives more confidence about the mandatory auditor designation system that will contribute to a significant improvement of audit quality. In this sense, independence of auditors may play a more important role in the improvement of audit quality, even though auditor competence has a crucial influence as well.

5. Conclusion

I analyze the relationship between the mandatory auditor designation system and audit quality, particularly aimed at IPO firms from 2002 to 2010. Audit quality is measured by the absolute value of performance-matched discretionary accruals (Kothari et al., 2005). From 621 IPO firm samples, I find that the mandatory auditor designation system has a negative association with discretionary accruals at the 1% level of significance. This finding is consistent with my hypothesis of the mandatory auditor designation system that has been enforced on firms listed on the securities market since 2006.

Furthermore, I strengthen my hypothesis by the entire firm-years analysis. I find the incremental effect of audit quality improvement focusing on the IPO firms that have been listed since 2006, when compared with the total firm-year samples amounting to 14,599. Although the significance level is lowered to 10%, this finding gives a more meaningful insight in regard to the literature on audit quality. This result is interpreted as a suggestion that auditor independence plays an important role in improving audit quality.

However, this study has several limitations as well. First of all, I divide the IPO samples into two groups as of 2006. There may be other factors to determine audit quality other than the reform of regulations on auditor engagement. This is obvious in the way that the adjusted R-squared value is under 30% for both regression models from hypotheses of this paper. These models need to be

improved for a better explanation power.

Second, I use the absolute value of discretionary accruals as a proxy of audit quality. When I use the original value of discretionary accruals, I do not find a significant relationship between the mandatory auditor designation system and discretionary accruals. This consequence may be due to negative values of discretionary accruals in the way that negative values impact on the statistical analysis. Plenty of firm-year samples with negative values are thought to contribute the dilution of meaningful results, as negative values reduce the statistical effects from positive values of discretionary accruals.

In this paper, I use the absolute values for it is the size of discretionary accruals that matters. It is difficult to say that audit quality regarding firms with the large negative values of discretionary accruals is desirable. That can be interpreted as auditors fail to control earnings management of firms in case of the increase in absolute degrees of discretionary accruals, regardless of positive numbers or negative numbers. Nevertheless, it is unavoidable to say that explanatory powers of this study are restricted by the fact that I cannot find a significant relationship between independent variables and original values of discretionary accruals.

Third, the appropriacy of using proxies related to discretionary accruals is not guaranteed in all cases. Ball and Shivakumar (2008) bring discretionary accruals into question as they argue that estimates of discretionary accruals are biased upward in

various related studies on earnings management in many cases including IPO. It is possible to use various alternative proxies of audit quality to strengthen the robustness of regression models that I provide.

In conclusion, it is believed that this paper provides several contributions as follows: First, this research contributes to increase the accuracy to prove effects of the mandatory auditor designation system on audit quality by distinguishing IPO firms since 2006 from total firm-year samples.

Second, this study provides the updated results regarding the relationships between audit engagement systems and audit quality by analyzing recent firm-year data. This research contributes to the literature on searching a relationship between the auditor engagement system and audit quality through those recent data, as the recent reform of regulations on audits provides optimal opportunities for researches on audit quality.

Lastly, this study is expected to contribute to regulators involved in accounting practices for their decision making when they make or revise various laws or practices related to the appointment of auditors.

Empirical results from this study reconfirm the suggestions that majority of precedent studies provide. I find that giving a guarantee of auditors' independence helps improve audit quality. Of course, it is captured that overall degrees of audit quality have been improved with the course of time. This shows a fact that reforms of

various accounting systems other than the mandatory auditor designation system for IPO firms also contribute to audit quality improvements. Nevertheless, I suggest that the mandatory auditor designation system provides higher degrees of improvements from the findings of this study. The findings of this study propose that there are considerable needs to consider whether this system is to be expanded to the other cases, in which the mandatory auditor designation system is not applied at present.

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요약(국문초록)

본 연구의 목적은 신규상장기업을 대상으로 감사인지정제도가 감사품질에 미치는 영향을 실증하는데 있다. 감사인지정제도는 2006년 이후 신규상장하는 기업에 대해 의무화되었다. 이에 해당 연도를 기준으로 신규상장기업들의 감사품질의 변화를 연구하였다. 감사품질은 Kothari et al. (2005)이 제시한 수정된 Jones 모형에서 기업성과를 통제한 모형을 통해 산출한 재량적 발생액의 절대값을 통해 측정하였다.

이를 위해 2002년부터 2010년까지 한국거래소에 상장되어 있는 기업(14,599개 표본 기업-연도) 및 연구대상기간에 기업공개가 이루어진 621개 표본 기업을 대상으로 일변량 및 다변량 분석을 진행하였다.

우선 신규상장기업 표본에 대한 분석 결과, 기업공개 시 감사인지정이 이루어진 기업이 그렇지 않은 기업에 비해서 유의적으로 낮은 재량적 발생액을 보였다. 이는 감사인지정제도가 감사품질에 긍정적인 영향을 미치고 있는 것으로 해석할 수 있다.

한편, 전체 표본을 대상으로 한 결과, 감사인지정 관련 제도가 정비된 2006년을 기준으로 재량적 발생액이 유의적으로 감소하였음이 확인되었다. 이는 시간 경과에 따라 회계제도의 정비 등이 이루어지면서 기업들의 전반적인 감사품질이 개선된 것으로 볼 수 있다.

여기에 연구대상기간 동안 기업공개가 이루어진 기업들에 있어서 유의적인 수준에서 추가적인 재량적 발생액의 감소효과가 있음을 확인하였다. 이는 전반적인 감사품질의 개선되는 수준에 비해서 상장예정기업의 감사품질 개선효과가 더 크다는 사실을 의미한다.

이상을 종합하면 본 연구를 통해 감사인지정제도가 감사품질개선에 긍정적인 영향을 미치고 있다는 사실에 대해 보다 높은 수준의 확신을 부여할 수 있다.

본 연구의 공헌점은 다음과 같다.

첫째, 상장예정기업에 대한 감사인지정제도가 본격적으로 시행된 2006년 이후의 자료를 통하여 전체 표본 기업 대비 신규상장기업에 대한 감사품질 개선효과를 보다 정밀하게 담아내었다.

둘째, 최근의 상장기업 자료를 이용하여 감사인지정제도가 감사품질에 미치는 영향을 분석하였다. 보다 최근 자료의 분석을 통해 관련 연구 진척에 도움이 될 수 있다.

마지막으로, 본 연구가 규제기관 담당자들이 향후 감사인 선임과 관련된 여러 제도를 개선하는데 일정 수준 기여할 수 있을 것으로 판단된다.

주요어 : 기업공개, 감사인지정제도, 자유수입제도, 감사품질, 재량적 발생액, 이익조정

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