

Non-audit Services and Auditor Independence Depending on Client Performance

Sun Min Kang , Chung-Ang University

In Tae Hwang, Chung-Ang University

Kang Sung Hur , Chung-Ang University

We posit that the effect of non-audit fees on auditor independence in Korea is based on audit client performance. Further, we suggest that an audit client with low performance has an incentive to purchase non-audit services (NAS) from an incumbent auditor to facilitate earnings management and steer accounting practices in a preferred direction. We find evidence that as non-audit fees in Korea increase, auditor independence is reduced only for low-performing audit clients. Thus, unconditional prohibition of NAS seems unnecessary. Regulators and policymakers should examine the motivation for purchasing NAS, particularly among audit clients with poor performance.

Whether the independence of an external auditor is undermined when it provides audit services and non-audit services (NAS) to the same company has long been a concern in the accounting field (Levitt 1998; Securities and Exchange Commission 2000; European Commission 2010; AICPA 2012; Ernst & Young 2014). The NAS of external auditors in Korea have become controversial following recent media reports of accounting fraud among *chaebols* (a South Korean form of business conglomerate) such as Dongyang, STX and Hyosung.¹ Daewoo Shipbuilding & Marine Engineering, which committed accounting fraud amounting to about 5 trillion won, purchased audits and NAS from the same firm. The accounting firm that overlooked the client's accounting fraud was suspended from doing business for one year as a penalty and has been seeking to separate its audit and management advisory services. This controversy has arisen because *chaebols* obtained NAS in addition to audit services from their incumbent auditors.

Despite the suspicion that providing NAS could compromise an external auditor's independence, prior studies have not consistently found this research result in Korea or overseas. Earlier studies argue that NAS have a negative effect on auditor independence and audit quality (Culvenor et al. 2002; Frankel et al. 2002; Kilgore et al. 2011; Krauss and Zulch 2013; Lim et al. 2013). However, research in Korea and overseas has failed to find a significant relationship between NAS and auditor independence (Kwon and Sohn 2002; Ashbaugh et al. 2003; Chung and Kallapur 2003; Park et al. 2003a, b; Kwon et al. 2004; Lim and Tan 2008).

The inconsistency of results in prior studies is the result of differences in the models and variables used

in the studies. First, extant literature that analyses the relationship between NAS and auditor independence and audit quality does not reflect the fact that there may be differences in the effect of NAS depending on the performance of the auditees or clients (Frankel et al. 2002; Kwon and Sohn 2002; Ashbaugh et al. 2003; Chung and Kallapur 2003; Park et al. 2003a, b; Kwon et al. 2004; Lim and Tan 2008; Svanstrom 2012; Krauss and Zulch 2013; Lim et al. 2013). In addition, as previous studies have used the absolute value of discretionary accruals as a proxy for audit quality or auditor independence, the confounding effects of the different directions of earnings management between low-performing clients that have incentives to manage earnings upward and clients that do not may cause problems with their analyses (Chung and Kallapur 2003; Lim and Tan 2008; Lim et al. 2013).

This study eliminates the potential cause of inconsistent analysis results in the existing literature arising from the problems inherent in their methodology. For this purpose, we designed a study model not adopted by previous studies that applies dependent variables that alter earnings, which are then used to analyse the relationship between NAS and auditor independence. Results of the analysis in this study are expected to explain why the results of extant literature are not consistent. Further, this study attempts to fill this gap in the literature.

Correspondence: Kang Sung Hur, College of Business Administration, Chung-Ang University, Seoul 156-756, Korea. email: hks522@naver.com

Accepted for publication 16 March 2018.

Although there are conflicting academic opinions about NAS and auditor independence, many countries regulate NAS. Like the US and the EU, Korea has a restriction against providing NAS and audit services simultaneously. Policymaking authorities have prohibited the provision of audit and NAS simultaneously to audit clients because of concerns that auditor independence could be jeopardised (Levitt 1998; Securities and Exchange Commission 2000; European Commission 2010; AICPA 2012; Ernst and Young 2014). The bankruptcy of Enron led to the US Sarbanes-Oxley Act (SOX) (2002), which prohibits the simultaneous provision of NAS with audit services because an excessive NAS fee could compromise auditor independence. Likewise, the EU adopted audit legislation in 2014 that limits the simultaneous provision of audit and NAS by auditors. Regulations on NAS applied in the US, EU and Korea uniformly limit the kinds and amounts of NAS provided by auditors without considering the interaction between clients' performance and the provision of NAS. Hence, existing regulations may restrict the NAS of well-performing companies with a low possibility of compromising auditor independence. The introduction of regulations that consider interactions between corporate performance and NAS based on the results of this study is expected to produce a more effective policy result in the long run.

Compared with the US and the EU, Korea introduced reform legislation in 2002 that placed comparatively weak restrictions on consulting services. Thus, some civic groups have insisted that the reform legislation may not be very effective. Therefore, this study reviews the effectiveness of the Korean Certified Public Accountant Act that was amended in 2002, which prohibits the offer of some aspects of NAS to clients by auditors, and analyses NAS and auditor independence in terms of incentives to purchase such services.² In this vein, we posit that the effect of a non-audit fee on auditor independence is based on client performance as a criterion. According to the economic theory of auditor independence (DeAngelo 1981; Watts and Zimmerman 1981), auditors' motives for compromising their independence are related to client-specific quasi-rents. Thus, we propose that the purchase of NAS by a manager with an earnings management incentive could compromise auditor independence because of the economic interest between the manager and auditor.

To analyse the effect of the provision of NAS on auditor independence and audit quality, we consider the situation and motivation of a manager of a company who wants to receive NAS (Simunic 1984). Additionally, regulators and researchers should analyse a company's motivation to purchase NAS from an incumbent auditor to investigate the possibility of managerial opportunism (Causholli et al. 2014). Management of a company that has achieved excellent performance should have no reason to manage earnings upward (Kapoor and Goel 2017).

Indeed, staff of some companies generating unexpectedly high performance may want to dilute their reported earnings to smooth income (Ronen and Sadan 1981; Trueman and Titman 1988; DeFond and Park 1997). Hence, not all companies that purchase NAS have an incentive to increase reported earnings.

However, managers of companies that have incurred losses or that show low performance compared with their competitors have an incentive to upgrade the appearance of their performance to maximise rewards or maintain their market position (DeGeorge et al. 1999). Iyengar and Zampelli (2008) found a significantly negative relationship between non-audit fees and the sensitivity of CEO pay to firm performance. Thus, companies with low performance typically have an interest in reducing every controllable expense, including NAS. Consequently, it is necessary to analyse what motivates companies with low performance to purchase NAS from an incumbent auditor.

To determine the interaction between NAS purchased by an audit client and auditor independence, it is necessary to itemise earnings management incentives. Accordingly, this study assumes that auditor independence is influenced by the interaction between earnings management incentives driven by the performance of audit clients and the economic incentives of the auditor providing NAS. Thus, we compare low-outcome companies that have a motive to manage earnings with high-outcome companies. Low- and high-outcome companies are identified according to return on assets (ROA) and operating cash flow (OCF) medians in the same industry. We measure auditor independence using discretionary accruals based on the modified Jones model (DeFond and Jiambalvo, 1991, 1993; Jones 1991; Kinney and Martin 1994; Dechow et al. 1995).

Prior Research and NAS Regulations

Prior research

An effective audit committee can maintain auditor independence, and the independence of an internal auditor can affect earnings management (Krishnamoorthy et al. 2002; Bajra and Cadez 2017). Prior studies that analyse the effect of NAS on auditor independence were thoroughly examined. Studies of NAS and auditor independence can be divided into studies that assert that NAS reduces auditor independence or are not associated with it, and studies that consider whether NAS could increase audit efficiency through knowledge spillovers.

Svanstrom (2012) observes the knowledge spillover phenomenon for NAS, yet his research sample consists of unlisted companies whose performance is not connected to stock price. Additionally, early studies interpret the relationship between NAS and accounting audit

fees as evidence of the knowledge spillover phenomenon (Simunic 1984; Palmrose 1986). Both studies found that audit fees are higher in companies that simultaneously receive NAS and interpret this as knowledge spillovers caused by the provision of NAS.

Ashbaugh et al. (2003) refute Frankel et al.'s (2002) study, which claims that the provision of NAS hinders auditor independence. Ashbaugh et al. (2003) argue that the ratio of the NAS fee to the audit fee does not reflect the scale of NAS. Consequently, both the level of the NAS fee and the ratio of the NAS fee to the audit fee have been shown to be unrelated to discretionary current accruals. However, when they conducted an analysis similar to that of Frankel et al. (2002), they reached a similar conclusion. Chung and Kallapur (2003) analysed the relationship between the importance of the client as an independent variable and the absolute value of discretionary accruals. The importance of an audit client is the ratio of its NAS fee to the auditor's total earnings. They could not, however, observe whether the importance of the client creates a close economic relationship between the audit client and the auditor. Zhou and Zhu (2012), who analysed the relationship between the economic importance of clients and auditor independence in Asian countries, assert that strict application of regulations after the Asian financial crisis reduced the possibility of compromising auditor independence. Lim and Tan (2008) analysed the relationship between the NAS fee and the absolute values of discretionary accruals when industry experts participate. In this instance, they could not find a statistically significant link between audit quality and the NAS fee. Kwon et al. (2004) investigated whether auditor independence is impaired when auditors in Korea provide NAS to their audit clients. For this purpose, they used discretionary accruals derived from the modified Jones model (Dechow et al. 1995). They found no evidence that auditors' provision of NAS or the amounts of the related fees are associated with discretionary accruals. Park et al. (2003b) divided companies into two groups in accordance with the NAS criteria, specifically whether external auditors provide NAS to their audit clients. The analysis found no significantly positive relationship between book accruals (total, current, discretionary and discretionary current accruals) and the joint provision of NAS to audit clients.

Frankel et al.'s (2002) study was the first to analyse the effect of close economic bonds between auditee and auditor on audit quality. The results show that the absolute value of discretionary accruals increases with the ratio of the NAS fee to the audit fee. Krauss and Zulch (2013) studied NAS and audit quality among German companies and found that the NAS fee has a negative relationship with audit quality. Lim et al. (2013) compared cases of high and low ratios of institutional investors and analysed the relationship between the log value of the NAS fee and the absolute value of discretionary current

accruals. Their results show that the NAS fee has a negative relationship with audit quality only when the ratio of institutional investors is low.

In summary, research on the effect of NAS on auditor independence or audit quality is contradictory. Yet, recent research has suggested that auditor independence is not compromised when industry experts participate (Lim and Tan 2008), when performance is monitored because the ratio of institutional investors is high (Lim et al. 2013) or when companies are unlisted (Svanstrom 2012). By contrast, Krauss and Zulch (2013) assert that NAS reduce audit quality. Further, Lim et al. (2013), who do not consider the ratio of institutional investors, found a negative relationship between NAS and audit quality. Causholli et al. (2014) found significant evidence that the purchase of future NAS is associated with impaired auditor independence in the current year. We examine whether auditor independence is compromised when audit clients with low performance have an income-increasing earnings management incentive.

NAS regulations

In 2002, Korea amended its Certified Public Accountant Act to prohibit the simultaneous provision of certain NAS with audit services. Additionally, since 2001, accounting firms in Korea have had to disclose in their business reports whether they provide consulting services to audit clients. The fairness of an audit may be compromised when an accounting firm provides additional work, such as consulting services, to an audit client. Articles 21 and 33 (job restrictions) in the amended Certified Public Accountant Act prohibit the provision of NAS to audit clients by public accountants and accounting firms. The restricted items are the preparation of accounting records and financial statements, the outsourcing of internal audit work, the establishment and operation of a financial information system, and the provision of an opinion on the feasibility of due diligence, financial reporting, valuation and transactions or contracts. NAS regulations require auditors to disclose NAS fees and their details in business reports in cases where they provide NAS other than the NAS prohibited above for their auditees or clients. Certified public accountants are required to document NAS they provide for their auditees or clients and preserve the records for eight years.

Compared with the US and the EU, Korea has comparatively weak restrictions on consulting services. In other words, the effectiveness of the reform legislation may be reduced because it only partially restricts consulting services. Some civic groups insist that the simultaneous provision of consulting services by accounting firms should be prohibited to improve auditor independence. The Korean National Assembly amended the Certified Public Accountant Act on February 18, 2016

and added new NAS to the prohibited list. Because of this new amendment, Korean law now resembles SOX.

Hypothesis Development

Hypothesis 1

One aspect used to enhance audit quality and observe auditor independence is examining whether the auditor provided NAS for the audit client (Culvenor et al. 2002; Kilgore et al. 2011). This study analyses whether auditor independence is compromised when an audit client purchases NAS from an incumbent auditor. We examine whether auditor independence is seriously compromised when companies with poor performance and a high incentive to pursue income-increasing earnings management purchase NAS from an auditor. First, we examine whether the purchase of NAS from an incumbent auditor compromises auditor independence. In addition, we analyse whether auditor independence is compromised with an increase in the ratio of NAS to total fees or NAS amount (Frankel et al. 2002; Ashbaugh et al. 2003). We use the same methods as Frankel et al. (2002) and Ashbaugh et al. (2003) because these studies return inconsistent results on the relationship between NAS and auditor independence. If an auditor provides NAS and audit services simultaneously, it could be increasingly difficult to suppress the client's preferred accounting practices as the auditor's economic dependence on the audit client increases. In addition, Jeong et al. (2005) argue that auditors that provide NAS to their audit clients are not highly paid for their audit fees. An economic bond between an auditor and an audit client could compromise the auditor's independence.

H1: The provision of NAS is associated with auditor independence.

Hypothesis 2

According to the Inspection Report of the Securities and Futures Commission, among companies sanctioned as a result of a violation of accounting and auditing standards, all companies provided with NAS showed poor management performance. However, prior research has analysed the relationship between NAS and auditor independence without considering the performance-based earnings management incentive of audit clients that purchase NAS. This study, therefore, empirically analyses whether auditor independence is compromised when low performers with high earnings management incentive purchase NAS from an incumbent auditor. Burgstahler and Dichev (1997) claim that 8–12% of companies that experience a reduction in net profit and 30–44% of companies that experience a minor net loss

report a net profit through earnings management. DeGeorge et al. (1999) explain earnings management as a psychological and behavioural phenomenon. Thus, we assume that managers have an incentive to manage earnings to maximise rewards and secure their positions. In addition, managers try to report a net profit rather than a net loss whenever possible, and a higher profit year after year. Therefore, managers may purchase NAS from incumbent auditors to engage in earnings management (Iyengar and Zampelli 2008). Managers may also use economic relationships to steer accounting practices in their preferred direction.

Typically, companies that purchase NAS have outstanding performance and many business opportunities, along with high demand for NAS. Because the earnings level of those companies is high, they have less incentive for earnings management than their less successful peers. Accordingly, they are less likely to influence an external auditor's independence by purchasing NAS. In fact, companies generating unexpectedly high performance may even try to soften their earnings (Ronen and Sadan 1981; Trueman and Titman 1988; DeFond and Park 1997). For this reason, it is unreasonable to argue that all companies that purchase NAS from their external auditors have an incentive to manage their earnings upward.

Hypothesis 2 was developed to analyse the interaction between auditor independence and client performance by dividing the sample into annual high-ranking (above the median in the same industry) and low-ranking (below the median in the same industry) categories (DeFond and Park 1997). Poorly performing firms typically minimise unnecessary expenses and reduce their purchase of NAS. Thus, poorly performing companies that purchase NAS have an incentive to manage their earnings and, if the incumbent auditor supplying the NAS can receive an additional benefit, non-audit fees increase the potential for compromising auditor independence.

H2: The effect of NAS on auditor independence varies according to client performance.

Data and Research Design

Sample selection

The data used in the empirical analysis were collected from the accounting information of KOSPI and KOSDAQ listed companies in the KIS-VALUE and the non-audit data of listed companies posted by the Korea Listed Companies Association. A total of 20 954 observations for KOSPI and KOSDAQ listed companies, excluding companies in the financial industry, were collected from 2002–16. Of these, we selected 15 837 company-year observations, including companies with administrative issues in KOSPI or KOSDAQ, and with 10 or

Table 1 Selection procedure for sample companies

Selection criteria	Observations
Listed companies 2002–16 (excluding financial institutions)	20 954
Less: Companies with impairment of capital or missing financial data	(671)
Companies with non–December fiscal year-end	(962)
Companies with qualified audit opinion	(172)
Companies whose number is below 10 by industry and year	(3312)
Full sample	15 837
Less: Companies that received only audit services from their auditors	(11 326)
NAS sample	4511

Companies are listed on the KSE and KOSDAQ; KSE: Korea Stock Exchange; KOSDAQ: Korea Securities Dealers Automated.

fewer industry-year observations, for the calculation of discretionary accruals. Data for NAS have been shown in proxy statements since 2002.

To enhance the reliability of the sample data, we excluded firms with missing financial data and firms with capital impairment. Companies with non-December fiscal year-ends were also excluded because of the need to prevent noise in the sample from timing differences, and because the comparability of their financial statements was low. As in similar studies, we excluded financial companies because of the significant differences in their accounting and tax rules compared to non-financial firms. In addition, to estimate discretionary accruals, we excluded companies with fewer than 10 observations by industry and year, after combining them into similar industries based on the medium classification criteria of the Korea Investors Service Inc. Finally, we excluded companies with an adverse audit opinion because their

accounting data were unreliable. Of the 15 837 company-year observations selected, 4511 received NAS from an incumbent auditor while 11 326 did not (see Table 1).

Descriptive statistics and correlation

Tables 2, 3, A1 and A2 provide the descriptive statistics and a correlation analysis of the variables used in the models of this study. Panel A in Table 2 shows the basic statistical values of audit fees and non-audit fees for the full sample ($n = 15\,837$), which were obtained by adding audit service purchases and NAS purchases simultaneously. As seen in Panel A, a large difference exists between the mean and median of total fees, as well as the minimum and maximum values.

Panel B in Table 2 shows the basic statistical values for audit and non-audit fees in the NAS sample ($n = 4511$). The maximum total fee value is 812 times the minimum value. Additionally, the maximum audit fee value is 1634 times the minimum value, and the maximum non-audit fee value is as large as 31 048 times the corresponding minimum value.

Panel B in Table 3 shows the basic statistics of the NAS sample ($n = 4511$) consisting of audit clients that purchased audit services and NAS from their auditors simultaneously. Among the entire sample in Panel A, the dummy variable of companies that received joint NAS (*NASdum*) was 29% on average. When we compare the full sample of Panel A ($n = 15\,837$) with the NAS sample ($n = 4511$), the joint NAS sample has greater values than the full sample ($n = 15\,837$) in the variables of discretionary accruals, excluding auditor change (*chAF*), Big 4 auditing (*Big4*), debt–equity ratio (*LEV*), asset size (*SIZE*), growth rate (*GRW*), new stock issuance (*ISSUE*),

Table 2 Audit fees and non-audit fees (2002–16)

Panel A: Full sample ($n = 15\,837$) (Unit: 1000 KRW)					
Variable	Mean	Standard dev.	Minimum	Median	Maximum
Total	118 666	334 356	2500	62 000	16 079 000
Audit	93 401	162 347	2350	60 000	5 300 000
Non-audit	25 265	215 240	0	0	12 419 000
Tax	3994	53 345	0	0	3 434 000
Others	21 270	192 483	0	0	12 419 000
Panel B: NAS sample ($n = 4511$) (Unit: 1000 KRW)					
Variable	Mean	Standard dev.	Minimum	Median	Maximum
Total	231 950	595 744	19 790	91 000	16 079 000
Audit	143 252	263 416	2350	68 250	3 840 000
Non-audit	88 698	396 288	400	13 000	12 419 000
Tax	14 024	99 254	0	4070	3 434 000
Others	74 675	355 111	0	3600	12 419 000

This table reports the sample distribution and descriptive statistics for audit fee and non-audit fee variables. Panel A comprises 15 837 firm-year observations from 2002–16. Panel B comprises 4511 firm-year observations from 2002–16.

Table 3 Descriptive statistics

Panel A: Full sample (n = 15 837)					
Variable	Mean	Standard dev.	Minimum	Median	Maximum
DA	-0.001	0.101	-0.350	0.001	0.317
Big 4	0.483	0.500	0	0	1
chAF	0.282	0.450	0	0	1
LEV	0.418	0.192	0.062	0.418	0.889
SIZE	25.585	1.391	23.188	25.323	30.249
GRW	0.107	0.242	-0.389	0.060	1.261
ISSUE	0.163	0.370	0	0	1
OCF	0.052	0.101	-0.258	0.050	0.369
ROA	0.036	0.115	-0.419	0.038	0.404
NAF _{dum}	0.285	0.451	0	0	1
NAF%	0.066	0.145	0	0	0.677
Tax%	0.017	0.043	0	0	0.234
Other%	0.048	0.135	0	0	0.643
InNAF	4.770	7.597	0	0	19.925

Panel B: NAS sample (n = 4511)					
Variable	Mean	Standard dev.	Minimum	Median	Maximum
DA	0.000	0.099	-0.350	0.000	0.317
Big 4	0.606	0.489	0	1	1
chAF	0.252	0.434	0	0	1
LEV	0.421	0.193	0.062	0.423	0.889
SIZE	26.020	1.707	23.188	25.626	30.249
GRW	0.116	0.243	-0.389	0.067	1.261
ISSUE	0.165	0.372	0	0	1
OCF	0.061	0.102	-0.258	0.058	0.369
ROA	0.044	0.113	-0.419	0.043	0.404
NAF%	0.233	0.188	0.002	0.143	0.677
Tax%	0.059	0.064	0	0	0.234
Other%	0.167	0.209	0	0.043	0.643
InNAF	16.746	1.442	12.899	16.380	19.925

This table reports the descriptive statistics for the key variables. The sample period is 2002–16. All variables are winsorised at 1% and 99%. See Table A3 for variable definitions.

cash flow (*OCF*) and ROA (*ROA*) variables. (Please refer to the Appendix for explanations of Tables A1 and A2.)

Measurement of discretionary accruals

Abnormal accruals are a typical indication of earnings management (Wilson 2011). In addition, numerous previous studies in the US (Frankel et al. 2002; Ashbaugh et al. 2003; Chung and Kallapur 2003), Australia (Gul et al. 2003) and Korea (Kwon and Sohn 2002; Park et al. 2003a, b; Kwon et al. 2004) have found that fees for audit and NAS are correlated with low audit quality. We estimated discretionary accruals using the modified Jones model (Dechow et al. 1995). Discretionary accruals, which correspond to the residuals derived in equation (1), were estimated using industry-year cross-sectional data from 2002–12. Using the industrial classification standard of KIS-VALUE as the industry

classification criteria, we selected industries with 10 or more companies available as targets. For discretionary accruals, we used residuals obtained by estimating according to industry-year cross-sections. The residuals, representing discretionary accruals, show the degree of the error of a specific company’s accruals compared to the average accruals of the total industry-year accruals by substituting the regression parameter calculated in equation (1) into equation (2).

$$TAC_{jt}/A_{jt-1} = a_0(1/A_{jt-1}) + a_1((\Delta REV_{jt} - \Delta AR_{jt})/A_{jt-1}) + a_2(PPE_{jt}/A_{jt-1}) + \varepsilon_{jt} \tag{1}$$

where TAC_{jt} is total accruals of company j in year t ; ΔREV_{jt} is the first difference of sales of company j in year t ; ΔAR_{jt} is the first difference of credit sales of company j in year t ; PPE_{jt} is property assets of company j in year t ; A_{jt-1} is total assets of company j in year $t-1$; and ε_{jt} is residuals of company j in year t .

$$DA_{it} = (TAC_{it}/A_{it-1}) - [\hat{a}_0(1/A_{it-1}) + \hat{a}_1((\Delta REV_{it} - \Delta AR_{it})/A_{it-1}) + \hat{a}_2(PPE_{it}/A_{it-1})] \tag{2}$$

where DA_{it} is discretionary accruals of company j in year t .

Methodology and definition of variables

To test the hypotheses, we used pooled OLS (ordinary least squares) regression in our estimations. Consistent with Frankel et al. (2002), Ashbaugh et al. (2003), and Lim and Tan (2008), we ran Models 1 to 3 and the ROA/OCF interaction Models 1 and 2 to test the association between non-audit fees and discretionary accruals. In this study, we investigate whether the firm performance of companies with income-increasing earnings management incentives affects the relationship between the provision of NAS and auditor independence. Further, we analyse whether auditor independence is compromised to a greater extent when low performers purchase audit services and NAS simultaneously from the incumbent auditor compared with when high performers do the same. Since it is difficult to identify auditor independence directly, we use the discretionary accruals of the audit client as a proxy for auditor independence following prior research (e.g., Frankel et al. 2002; Ashbaugh et al. 2003; Chung and Kallapur 2003). Auditor independence can be deemed compromised if the discretionary accruals of low performers increase significantly when audit services and NAS are simultaneously purchased from the incumbent auditor.

To test Hypothesis 1, we use Models 1 to 3. By targeting the full sample of 10 983 items of company data

and an auditor provision of NAS sample of 3071 items of company data, we control for those variables we expect to affect the dependent variables. Our study's models are designed to investigate the effect of the NAS purchase ratio, purchase amount and availability of purchases to discretionary accruals, which is the proxy for auditor independence. The variables of primary interest are $NAF\%$, $lnNAF$ and $NAFdum$. $NAF\%$ is the ratio of NAS to the total fee, $lnNAF$ is the natural log of the NAS fee, and $NAFdum$ is a dummy variable with a value of one for an audit client who purchased accounting audit services and NAS simultaneously from the same auditor and zero otherwise.

Model 1: NAS purchase ratio

$$DA_{it} = a_0 + b_1NAF\%_{it} + b_2Big4_{it} + b_3chAF_{it} + b_4GRW_{it} + b_5ISSUE_{it} + b_6SIZE_{i,t-1} + b_7OCF_{it} + b_8LEV_{it} + b_9ROA_{i,t-1} + b_{10}YD + b_{11}ID + \varepsilon_{it}$$

Model 2: NAS purchase amount

$$DA_{it} = a_0 + b_1lnNAF_{it} + b_2Big4_{it} + b_3chAF_{it} + b_4GRW_{it} + b_5ISSUE_{it} + b_6SIZE_{i,t-1} + b_7OCF_{it} + b_8LEV_{it} + b_9ROA_{i,t-1} + b_{10}YD + b_{11}ID + \varepsilon_{it}$$

Model 3: NAS purchase availability

$$DA_{it} = a_0 + b_1NAFdum_{it} + b_2Big4_{it} + b_3chAF_{it} + b_4GRW_{it} + b_5ISSUE_{it} + b_6SIZE_{i,t-1} + b_7OCF_{it} + b_8LEV_{it} + b_9ROA_{i,t-1} + b_{10}YD + b_{11}ID + \varepsilon_{it}$$

ROA Interaction Model 1: NAS purchase ratio

$$DA_{it} = a_0 + b_1NAF\%_{it} + b_2ROAdum_{i,t-1} + b_3ROAdum_{i,t-1} * NAF\%_{it} + b_4Big4_{it} + b_5chAF_{it} + b_6GRW_{it} + b_7ISSUE_{it} + b_8SIZE_{i,t-1} + b_9OCF_{it} + b_{10}LEV_{it} + b_{11}ROA_{i,t-1} + b_{12}YD + b_{13}ID + \varepsilon_{it}$$

ROA Interaction Model 2: NAS purchase amount

$$DA_{it} = a_0 + b_1lnNAF_{it} + b_2ROAdum_{i,t-1} + b_3ROAdum_{i,t-1} * lnNAF_{it} + b_4Big4_{it} + b_5chAF_{it} + b_6GRW_{it} + b_7ISSUE_{it}$$

$$+ b_8SIZE_{i,t-1} + b_9OCF_{it} + b_{10}LEV_{it} + b_{11}ROA_{i,t-1} + b_{12}YD + b_{13}ID + \varepsilon_{it}$$

OCF Interaction Model 1: NAS purchase ratio

$$DA_{it} = a_0 + b_1NAF\%_{it} + b_2OCFdum_{it} + b_3OCFdum_{it} * NAF\%_{it} + b_4Big4_{it} + b_5chAF_{it} + b_6GRW_{it} + b_7ISSUE_{it} + b_8SIZE_{i,t-1} + b_9OCF_{it} + b_{10}LEV_{it} + b_{11}ROA_{i,t-1} + b_{12}YD + b_{13}ID + \varepsilon_{it}$$

OCF Interaction Model 2: NAS purchase amount

$$DA_{it} = a_0 + b_1lnNAF_{it} + b_2OCFdum_{it} + b_3OCFdum_{it} * lnNAF_{it} + b_4Big4_{it} + b_5chAF_{it} + b_6GRW_{it} + b_7ISSUE_{it} + b_8SIZE_{i,t-1} + b_9OCF_{it} + b_{10}LEV_{it} + b_{11}ROA_{i,t-1} + b_{12}YD + b_{13}ID + \varepsilon_{it}$$

Both the ROA interaction model and the OCF interaction model are used to analyse whether independence among auditors that provide NAS to audit clients varies with respect to the firm performance of those audit clients with an earnings management incentive. The models separate companies into low performers and others, assign dummy variables and analyse the interactions. The value of the $ROAdum$ variable is one if the company's ROA is below the ROA median using the industry-year ROA median of the same industry and the same year, and zero otherwise. $ROAdum * NAF\%$, $ROAdum * lnNAF$, $OCFdum * NAF\%$ and $OCFdum * lnNAF$ are the interaction variables obtained by multiplying the NAS purchase ratio ($NAF\%$) by the NAS purchase amount ($lnNAF$). If the independence of an auditor for the low-performer group is compromised, the interaction variables show positive results with statistical significance.

The control variables are whether the auditor is one of the Big 4 ($Big4$) and whether the client has changed auditors ($chAF$), as well as the total asset growth rate (GRW), sales cash flow (OCF), increase in capital ($ISSUE$), debt ratio (LEV), company size ($SIZE$) and $YEAR$ and IND dummy variables.

The $Big4$ variable is one if the auditor has business ties with the US Big 4 and zero otherwise. Becker et al. (1998) and Francis and Krishnan (1999) report that the discretionary accruals of companies audited by non-Big 4 firms are higher than those audited by the Big 4. The $chAF$ variable is a dummy variable with a value of one for companies that changed auditors and zero otherwise. A change of auditor may affect audit quality (Lee et al. 2013; Arthur et al. 2017). DeFond and Subramanyam (1998)

argue that managers of companies that change auditors may negotiate with the auditor, and the discretionary accruals of companies that change auditors are higher than those of companies that do not.

LEV is related to earnings management. DeFond and Jiambalvo (1994) claim that companies with a higher debt ratio have an incentive to manage their discretionary accruals upward. Using the same method as the models of Frankel et al. (2002) and Chung and Kallapur (2003), we use the *LEV* variable to control for debt ratio. *SIZE* is a proxy for various omitted variables (Becker et al. 1998). Ashbaugh et al. (2003) and Dee et al. (2002) used a company size variable as a control variable. The larger the company, the larger the NAS amount is likely to be. Accordingly, we set up a *SIZE* variable by using the natural log of basic total assets as a control variable.

The *GRW* variable is the growth rate of total assets. Dee et al. (2002) argue that companies with growth possibilities are more likely to have an upward earnings management incentive. The *ROA* variable is obtained by dividing the prior year's income by total assets at the end of the year before the prior year. The managers' motive to purchase NAS in the current year depends on prior firm performance. Thus, we use the prior year *ROA* variable as a control variable. Another reason for not using the current year *ROA* is that, as Chung and Kallapur (2003) report, in the current year *ROA*, earnings management obtained using any method affects abnormal accruals in the current year. *OCF* is the cash flow from sales activities compared with total assets. Based on prior studies (Dechow et al. 1995; Becker et al. 1998; DeFond and Subramanyam 1998) that indicate that cash flow and discretionary accruals have a negative relationship, we add *OCF* as a control variable. Frankel et al. (2002) and Ashbaugh et al. (2003) also used an *OCF* variable as a control variable.

The value of the *ISSUE* variable is one if capital increased 10% or more compared with the prior year and zero otherwise. Rangan (1998) and Teoh et al. (1998) report that companies with paid-in capital increases have an upward earnings management incentive to make the companies' future look positive to investors. *YEAR* is a dummy variable to control for the yearly differences caused by economic conditions, and *IND* is a dummy variable to control for the difference in industries.

We believe that if auditor independence is reduced by an increase in the ratio of NAS purchased by an audit client from the auditor or by an increase in the purchase amount, discretionary accruals increase. Additionally, when NAS and audits are purchased simultaneously, if an NAS purchasing company's auditor's independence is reduced compared with a non-purchasing company's, discretionary accruals increase. Thus, the regression parameters (*b1*) of *NAF%*, *lnNAF* and *NAFdum* in Models 1 to 3 will have statistically significant positive values. If the

simultaneous purchase of NAS does not affect independence, the regression parameters of *NAF%*, *lnNAF* and *NAFdum* will not have statistically significant values. If auditor independence is strengthened by simultaneous purchase, the regression parameters of *NAF%*, *lnNAF* and *NAFdum* will have statistically significant negative values.

Hypothesis 2 can be tested by dividing the sample group based on the medians of *ROA* and *OCF* and using the *ROA* interaction model and the *OCF* interaction model. We predict that if auditor independence is reduced in terms of low performers, the interaction variables of *ROAdum*NAF%*, *ROAdum*lnNAF*, *OCFdum*NAF%* and *OCFdum*lnNAF* will have statistically significant positive values. Additionally, if auditor independence is unrelated to the audit client's performance, the interaction variables will not have statistically significant values. However, if auditor independence is strengthened in terms of low performers, the interaction variables will have statistically significant negative values.

Results

Auditor independence and purchase of NAS

Table 4 shows the analysis of the effect of the NAS purchase ratio, purchase amount and purchase availability on discretionary accruals, which is the proxy for auditor independence. For the full sample ($n = 15,837$), the purchase ratio of NAS (*NAF%*) shows a significant result at the 1% level, and the purchase amount for NAS (*lnNAF*) shows significance at the 10% level; however, purchase availability (*NAFdum*) is insignificant. For the NAS sample ($n = 4,511$), both *NAF%* and *lnNAF* are statistically significant.³ Thus, when the purchase ratio of NAS (*NAF%*) to the total fee increases or the purchase amount for NAS (*lnNAF*) is large, auditor independence is reduced.⁴ For the NAS sample, we do not present purchase availability (*NAFdum*) because all audit clients in that sample purchased NAS.

In Park et al. (2003b) and Ashbaugh et al., who analysed Korean data, provision of NAS (*NAFdum*) shows an insignificant result. In addition, applying the ratio of NAS to total fees (*NAF%*) and the NAS amount variable (*lnNAF*) to the analysis in the same period, Frankel et al. (2002) and Ashbaugh et al. (2003), who used American data, produce divergent results. In a model that does not classify clients' performance, analysis results may be inconsistent and mixed as the model includes confounding incentives for managing earnings by purchasing NAS from their auditors. Thus, Hypothesis 2 is supported, as the analysis reflects classification of clients' performance.

The control variables in Table 4 that show consistently significant relationships with the dependent

Table 4 Regression results

Variable	Full sample (n = 15 837)						NAS (n = 4511)			
	Model 1		Model 2		Model 3		Model 1		Model 2	
	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value
Intercept	-0.010	(-0.68)	-0.012	(-0.85)	-0.013	(-0.92)	-0.001	(-0.05)	-0.013	(-0.57)
NAF%	0.014	(2.95)***					0.018	(2.83)**		
lnNAF			0.000	(1.68)*					0.002	(1.87)*
NAFdum					0.002	(1.63)				
Big4	0.001	(0.48)	0.001	(0.62)	0.001	(0.64)	-0.001	(-0.51)	-0.001	(-0.44)
chAF	0.001	(0.66)	0.001	(0.64)	0.001	(0.63)	0.004	(1.17)	0.004	(1.19)
GRW	0.111	(36.75)***	0.111	(36.83)***	0.111	(36.85)***	0.114	(20.63)***	0.114	(20.56)***
ISSUE	-0.033	(-16.97)***	-0.033	(-16.9)***	-0.033	(-16.89)***	-0.027	(-7.74)***	-0.027	(-7.7)***
SIZE	0.001	(1.58)	0.001	(1.74)	0.001	(1.81)	0.000	(0.46)	0.000	(-0.23)
OCF	-0.586	(-83.33)***	-0.586	(-83.28)***	-0.586	(-83.28)***	-0.612	(-48.86)***	-0.612	(-48.82)***
LEV	0.003	(0.79)	0.003	(0.8)	0.003	(0.8)	0.002	(0.22)	0.001	(0.21)
ROA	0.279	(42.54)***	0.279	(42.55)***	0.279	(42.54)***	0.285	(23.63)***	0.286	(23.69)***
YD	Included		Included		Included		Included		Included	
ID	Included		Included		Included		Included		Included	
Adj. R ²	0.357		0.356		0.356		0.398		0.397	

This table reports the regression results on the relationship between DA and NAF%, lnNAF and NAFdum. The table reports the regression coefficients and adjusted t-statistics in parentheses based on the sample from 2002–16. See Table A3 for variable definitions. ***, ** and * denote significance at the 1%, 5% and 10% (two-tailed) levels, respectively.

variable (*DA*) are *GRW*, *ISSUE*, *OCF* and *ROA*. Regarding the *GRW* variable, *DA* rises significantly as the company's growth rate of total assets increases (Dee et al. 2002). The *OCF* variable has a statistically significant negative relationship with *DA*, indicating that companies with larger sales cash flows try to suppress earnings (Dechow et al. 1995). The *ISSUE* variable shows a statistically significant negative relationship with *DA*. We believe that the reason for the difference is that a company that can raise a large amount of capital in a short time is sound, has future growth potential and may have less earnings management incentive than other companies. The higher the *ROA* of the prior year, the larger the *DA* at a significant level. The *Big4*, *chAF*, *SIZE* and *LEV* variables do not show significant relationships with *DA*.

NAS and auditor independence depending on audit client performance

Table 5 shows the analysis for Hypothesis 2. We analyse the effect of the non-audit purchase ratio (*NAF%*) and purchase amount (*lnNAF*) on the proxy for auditor independence (*DA*) depending on audit client performance. The low- and high-performing groups are calculated according to the *ROA* and *OCF* medians in the same industry and year (DeFond and Park 1997). For the performance separation criteria, we use the medians of *ROA* and *OCF* for the same year and industry because managers of companies with lower *ROA* or *OCF* than similar competing companies in the same year are assumed to have an earnings management incentive.

The results show that in both the *ROA* interaction model and the *OCF* interaction model, all the interaction variables (*ROAdum*NAF%*, *ROAdum*lnNAF*, *OCFdum*NAF%* and *OCFdum*lnNAF*) have a significantly positive relationship with discretionary accruals at the 5% level. Thus, when the purchase ratio of NAS (*NAF%*) or purchase amount (*lnNAF*) is large in the low-performance group, auditor independence is reduced. Audit clients with low performance can purchase NAS to manage their earnings upward, raising the possibility of compromising the independence of an auditor who obtains additional income.⁵

The control variables in Table 5 that show consistently significant relationships with *DA* are *GRW*, *ISSUE*, *OCF* and *ROA*. For the *GRW* variable, discretionary accruals significantly increase with the company's growth rate of total assets. The *OCF* variable shows a significantly negative relationship with discretionary accruals. Companies with larger sales cash flows use earnings management to suppress earnings. When the prior year's *ROA* is high, discretionary accruals are also large and statistically significant. The *ISSUE* variable shows a significantly negative relationship, which suggests that companies raising capital have low earnings management incentives. The *Big4*, *chAF*, *SIZE* and *LEV* variables do not show a significant relationship with *DA*.

Additional analysis

In this study, among companies provided with NAS, those with poor performance were able to pursue earnings management by using discretionary accruals

Table 5 Regression results: Client performance

Variable	ROA Interaction model (n = 4511)				OCF Interaction model (n = 4511)			
	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value
Intercept	0.014	(0.62)	0.02899	(1.15)	-0.004	(-0.18)	0.008	(0.31)
NAF%	0.004	(0.54)			0.006	(0.69)		
lnNAF			0.000	(-0.06)			0.000	(0.26)
ROAdum	-0.026	(-6.33)***	-0.084	(-3.15)***				
OCFdum					-0.002	(-0.35)	-0.058	(-2.14)**
ROAdum*NAF%	0.029	(2.41)**						
ROAdum*lnNAF			0.004	(2.44)**				
OCFdum*NAF%					0.030	(2.52)**		
OCFdum*lnNAF							0.004	(2.36)**
Big4	-0.002	(-0.62)	-0.002	(-0.57)	-0.001	(-0.5)	-0.001	(-0.44)
chAF	0.003	(1.06)	0.003	(1.07)	0.004	(1.21)	0.004	(1.23)
GRW	0.114	(20.7)***	0.114	(20.65)***	0.114	(20.61)***	0.114	(20.55)***
ISSUE	-0.028	(-7.88)***	-0.028	(-7.88)***	-0.027	(-7.70)***	-0.027	(-7.67)***
SIZE	0.000	(0.32)	-0.000	(-0.25)	0.000	(0.58)	0.000	(-0.11)
OCF	-0.618	(-49.46)***	-0.618	(-49.44)***	-0.592	(-34.94)***	-0.595	(-35.05)***
LEV	0.007	(1.05)	0.007	(0.95)	0.001	(0.12)	0.000	(0.03)
ROA	0.237	(16.55)***	0.234	(16.31)***	0.285	(23.68)***	0.286	(23.69)***
YD		Included		Included		Included		Included
ID		Included		Included		Included		Included
Adj. R ²		0.403		0.403		0.398		0.398

This table presents the regression results on audit client performance. The table reports the regression coefficients and adjusted *t*-statistics in parentheses based on the sample from 2002–16. See Table A3 for variable definitions. ***, ** and * denote significance at the 1%, 5% and 10% (two-tailed) levels, respectively.

because of the undermined independence of the auditors. In the foregoing study model, Hypothesis 2 was verified using the size of discretionary accruals. To verify the hypothesis more directly, however, this study analysed whether the companies that had committed accounting fraud and had also obtained NAS showed poor management performance.⁶ That is, companies that were subject to disciplinary actions imposed as the result of an inspection by the Securities and Futures Commission are considered to have proven use of earnings management. Markelevich and Rosner (2013) found a significantly positive relationship between auditor fee variables and SEC-sanctioned fraud firms.

Thus, this study identified the companies that had disciplinary actions imposed for accounting fraud as the result of an inspection by the Securities and Futures Commission. The management performance of these companies was then compared to the median of their respective industry. If the management performance of the companies was above the median of the industry or evenly distributed in the upper and lower levels, this result is interpreted as not supporting Hypothesis 2. By contrast, if a company sanctioned by the supervisory authority for having committed accounting fraud had weaker management performance and was provided with NAS in the same fiscal year, the result is interpreted as supporting Hypothesis 2.

Table 6 shows the management performance of the companies provided with NAS from external auditors that also had disciplinary actions imposed because of

accounting fraud. Among the sample companies disciplined for committed accounting fraud, 16 were simultaneously provided with both audit services and NAS, with the highest frequency in 2011 (four samples).⁷ For this study, ROA and OCF were used to measure the management performance of individual companies for the year of their accounting fraud and compared with the industry medians of ROA and OCF. For reference, the auditors, audit fees and non-audit fees are presented in the years during which the accounting fraud was committed, along with the details of the disciplinary measures imposed on CPAs and accounting firms.

This study shows that among the 16 companies subjected to disciplinary actions, a considerable proportion of the sample had ROA and/or OCF values below the industry median. Specifically, the ROAs of 13 companies (81.25%) that were disciplined were below the industry median, excluding only Daewoo (2012), Wooyang (2012) and Hansolseen-tech (2009). Similarly, the OCFs of 10 companies (62.5%) were below the industry median, with the exception of Hyosung (2005, 2006, 2007), Pacificbio (2011), Samwha (2010) and IDS (2010).

Since this study used the industry median values of ROA and OCF as the standard for management performance to test Hypothesis 2, the management performance of the companies announced to have committed accounting fraud and provided with NAS shown in Table 6 should be distributed with a probability of 50% as compared with the industry median. However, the findings are that, among the companies that committed

Table 6 Performance and NAS fee of companies with fraudulent accounting (unit: one million KRW)

Name	Year	$ROA_i \geq ROA_{ind}$	$OCF_i \geq OCF_{ind}$	Auditor	TF	AF	NAF	NAF%	Discipline on CPAs or audit firms
Daewoo E&C	2012	2.5% > -0.4%	-13.5% < -1.1%	PWC	1 176	530	646	55%	Two-year limited audit of certain companies
Gumsung Tech	2011	-40.2% < 2.3%	-13.9% < 0.0%	DFK	201	161	40	20%	Additional compensation for damages; Four-year limited audit of certain companies
Hansolseen-tech	2009	9.4% > 6.9%	-4.4% < 9.6%	PWC	133	73	60	45%	Three-year limited audit of certain companies
Heshbon	2008	4.1% < 6.5%	-12.7% < 2.4%	EY	54	48	6	11%	Two-year limited audit of certain companies
Hyosung	2005	2.1% < 5.2%	9.8% > 6.5%	KPMG	734	270	464	63%	Two-year limited audit of certain companies
Hyosung	2006	-1.4% < 5.7%	8.6% > 5.8%	KPMG	706	295	411	58%	Two-year limited audit of certain companies
Hyosung	2007	2.1% < 5.0%	8.4% > 6.0%	KPMG	817	300	517	63%	Two-year limited audit of certain companies
IDS	2010	2.3% < 5.0%	6.2% > 6.1%	BDO	120	80	40	33%	Two-year limited audit of certain companies
Keystone Global	2006	-4.1% < 1.5%	-25.5% < 3.0%	RSM	69	45	24	35%	Warning actions on three CPAs; one-year limited audit of certain companies
Pacificbio	2011	-7.7% < -1.8%	8.9% > 4.9%	Jungil	64	58	6	9%	One-year limited audit of certain companies
PARU	2010	5.3% < 7.1%	-19.2% < 4.0%	IAPA	151	85	66	44%	Two-year limited audit of certain companies; one-year limited audit for listed company
PSMC	2011	3.8% < 5.9%	2.6% < 4.6%	Morison	65	30	35	54%	Two-year limited audit of certain companies; 40-point disadvantage imposed
Samwha	2010	-16.7% < 5.0%	7.2% > 6.1%	Nexia	95	60	35	37%	20-point disadvantage imposed
Ssangyoung-cement	2009	-6.8% < 1.4%	5.4% < 5.6%	EY	625	270	355	57%	One-year limited audit of certain companies
Taihan	2011	-21.0% < 4.6%	0.0% < 4.5%	Deloitte	550	450	100	18%	One-year suspension for three CPAs; three-year limited audit of certain companies
Wooyang	2012	3.4% > 3.0%	-4.2% < 5.3%	RSM	85	75	10	12%	Suspension of director for two years; five-year limited audit of certain companies

Name: company names with earnings manipulation or fraudulent accounting that were noted in audit review; Year: fiscal year with earnings manipulation or fraudulent accounting that were noted in audit review; ROA: net income of year $t-1$ divided by total assets of year $t-2$; OCF: cash from operations deflated by total assets at the beginning of the year; ROA_{ind} : annual ROA median of the same industry; OCF_{ind} : annual OCF median of the same industry; TF: total fee = audit fee + non-audit fee; AF: audit fee; NAF: non-audit fee; NAF%: Non-audit fee divided by total fee.

accounting fraud through earnings management, when ROA and OCF are used as the measures of performance, the actual results were that 81.25% and 62.5% were provided with NAS.⁸

The introduction and footnote 1 note that Hyosung frequently replaced its auditors (PwC, KPMG and Deloitte) and that its non-audit fees were 108% of audit fees. However, the same company reappears in Table 6

for accounting fraud (in 2005, 2006 and 2007) in the additional analysis. As a result, the Securities and Futures Commission imposed a ban (restriction) on the external audit of Hyosung for two years by KPMG, its external auditor. Despite this, it was not possible to verify the disciplinary measures placed on the company, as there was no record of the ban in the business reports on which this study is based. Therefore, the result of the additional

analysis, that most of the companies provided with NAS among those that committed accounting fraud had poor management performance, supports Hypothesis 2. Additionally, only those companies with poor management performance among those provided with NAS engaged in earnings management.

In sum, while poorly performing companies have more incentives for accounting fraud, not all poorly performing companies commit accounting fraud. It can thus be inferred from the results of this study that poorly performing companies that purchase NAS from incumbent auditors are highly likely to commit accounting fraud. Therefore, more meticulous inspections are required of poorly performing companies that purchase NAS from their incumbent auditors, as these companies are highly likely to compromise the independence of the auditors who acquire additional quasi-rents from them.

Conclusion

We focused on audit clients that have an incentive to carry out earnings management through the simultaneous purchase of audit services and NAS from an incumbent auditor. Although many studies have examined the effect of NAS on auditor independence, a lack of consensus exists. Further, prior research has overlooked the opportunistic purchase of NAS by audit clients with low performance. Thus, to analyse the effect of NAS on auditor independence and audit quality, we considered the situation and motives of an audit client for purchasing NAS. In addition, we investigated the reason for purchasing NAS from the incumbent auditor by considering the opportunistic earnings management incentive of the manager. We also conducted an empirical analysis using audit clients with an income-increasing earnings management incentive to investigate whether this condition changes the interaction between NAS and auditor independence.

We found that when audit clients with an income-increasing earnings management incentive purchase NAS, auditors compromise their independence by not suppressing the accounting practices that the client manager prefers because of the quasi-rents the auditor receives for the additional services provided. To verify the results of this study, the companies that purchased both audit services and NAS were compared with companies that received disciplinary action from the Securities and Futures Commission. These companies were included in the group of those with poor management performance.

Our results show that the earnings management incentive of audit clients (based on their performance) changes the effect of simultaneously providing audit services and NAS on auditor independence. Moreover, this explains why the results of prior research are inconsistent: prior research does not consider the earnings

management incentive of audit clients. The results of this study suggest the following policy implications. Regulations on NAS currently applied in the US, EU and Korea uniformly limit the kinds and amount of NAS provided by auditors without considering the interactions between clients' performance and the provision of NAS. However, restrictions on NAS without considering the management performance of clients may limit the normal management activities of those companies with no incentive to earnings management. Hence, to obtain an effective policy for restricting NAS, it is desirable to implement a policy that will restrict NAS provided to poorly performing companies that are motivated to manage earnings upward rather than placing uniform restrictions on all companies on an unconditional basis.

Although businesses need NAS from experts, if a low-performing audit client with an income-increasing earnings management incentive purchases NAS and thereby compromises auditor independence, the effect on the transparency and reliability of accounting information, as well as the effect on users of such information and the whole economy, can be serious. The findings of our study could thus help stakeholders of companies understand accounting information and help policymakers and regulators form appropriate rules. Our research, however, has a limitation because our empirical analysis relies on Korean data. Thus, future research could apply our research model to data from other countries.

Notes

- 1 The Hyosung Group has 45 affiliated companies with a *chaebol* ranking of 32 (Fair Trade Commission 2016a, b). From 2002 to 2016, its auditors (PwC, KPMG and Deloitte) received NAS fees of approximately 4.9 billion won, equivalent to 97% of the audit fees for the same period.
- 2 While SOX prohibits nine NAS, Korean law prohibits four, considering local circumstances. The Korean National Assembly, however, amended the Certified Public Accountant Act on 18 February 2016 and added new NAS to the prohibited list. Because of the new amendment, Korean law has become similar to SOX.
- 3 Although not presented in the table, we also analysed discretionary accruals using performance-matched discretionary accruals that were estimated by including ROA as the dependent variable in a regression analysis to estimate DA (Kothari et al. 2005). For the full sample ($n = 15,837$), $NAF\%$ showed a significant result at the 5% level; however, $lnNAF$ and $NAFdum$ were insignificant. For the NAS sample ($n = 4511$), $NAF\%$ was statistically significant at the 5% level; however, $lnNAF$ was insignificant.
- 4 To determine whether the proof of Hypothesis 1 is robust, for companies that purchased NAS at least once during the 15-year period, we compared the period in which the purchases were made and the period in which no purchases were made. The number of company-year samples in which NAS were purchased from the same auditor at least once was 12,625. For the sample ($n = 12,625$), $NAF\%$ showed a significant result at the 1% level; $lnNAF$ and $NAFdum$ were statistically significant at the 5% level.
- 5 NAS include tax-related services. However, tax services have traditionally been considered part of accounting activities. Thus, we

performed an additional analysis and found that auditor independence does not reduce if tax services are purchased simultaneously with an accounting audit by the same auditor, even for the low-performing group. However, excluding all non-tax services, NAS has a significantly positive relationship with DA. For SOX, tax services are not on the list of prohibited NAS items, suggesting that US policy authorities do not consider that the simultaneous provision of an accounting audit and tax services compromises auditor independence.

- 6 The Supervisory Authority (the Securities and Futures Commission) of Korea operates an audit review system (audit review, audit for audit, inspection, oversight of the audit), which reviews whether external auditors' audit reports have been independently and appropriately prepared in accordance with the auditing standards. The accounting firms and CPAs that violate auditing standards are subject to sanctions, such as cancellation of registration, and suspension of their operations and audit business, and companies that violate the accounting standards are subject to sanctions, such as recommendations for dismissal of executives and restrictions on issuance of securities and appointment of auditors. Companies that have been sanctioned by the Securities and Futures Commission (supervision) are those formally recognised as having adjusted their financial positions and profits in violation of accounting standards or as not having had independent auditing. In the US, the Public Company Accounting Oversight Board oversees the auditing of listed companies to protect investors' interests and make sure that audit reports are prepared in a way that meets public interests.
- 7 According to reported materials from the Financial Services Commission, only 4% of listed companies were selected for audit inspection. In addition, even when they were selected as a target, not all of them were subject to disciplinary measures. In 2011, with the largest number of firms out of the 16 targets, 11 listed companies (0.71%) had disciplinary measures imposed on them out of (a total of) 1547 companies. Table 6 shows that of the 11 listed companies subject to disciplinary actions for accounting fraud in 2011, four companies that were provided with NAS by their auditors had lower ROA or OCF than the median ROA or OCF of their industries. Meanwhile, among the listed companies, an average of 25–35% of companies were provided with NAS from the same auditors. Specifically, out of the total of 1547 listed companies in 2011, 25.40% of the companies or 393 companies were provided with NAS. Considering that an extremely small number of companies (0.71%) had disciplinary measures imposed on them for accounting fraud, the fact that all 16 firms that had disciplinary measures for accounting fraud imposed on them and that were provided with NAS had poor management performance is significant. This result strongly suggests that, among the 393 companies provided with NAS by the same auditors in 2011, companies with weaker management performance than the industry average engaged in earnings management.
- 8 The ROAs of Daewoo E&C (2012), Wooyang (2012) and Hansolseen-tech (2009), which were higher than their industry median, were lower than the industry median if based on the OCF standard. Thus, all 16 sample companies had at least one smaller value than the industry average in either the ROA or OCF standard.

References

- Arthur, N., Endrawes, M. and Ho, S. 2017, 'Impact of Partner Change on Audit Quality: An Analysis of Partner and Firm Specialisation Effects', *Australian Accounting Review*, 27 (4): 368–81.
- American Institute of Certified Public Accountants (AICPA) 2012, *2011 Yellow Book, Independence: Nonaudit Services Documentation Practice Aid*, American Institute of Certified Public Accountants, New York.
- Ashbaugh, H., LaFond, R. and Mayhew, B. 2003, 'Do Non-audit Services Compromise Auditor Independence? Further Evidence', *The Accounting Review*, 78 (July): 611–39.
- Bajra, U. and Cadez, S. 2017, 'The Impact of Corporate Governance Quality on Earnings Management: Evidence from European Companies Cross-listed in the US', *Australian Accounting Review*, <http://doi.org/10.1111/auar.12176>.
- Becker, C.L., DeFond, M.L., Jiambalvo, J. and Subramanyam, K.R. 1998, 'The Effect of Audit Quality on Earnings Management', *Contemporary Accounting Research*, 15: 1–24, <https://doi.org/10.1111/j.1911-3846.1998.tb00547.x>.
- Burgstahler, D. and Dichev, I. 1997, 'Earnings Management to Avoid Earnings Decreases and Losses', *Journal of Accounting and Economics*, 24: 99–126, [https://doi.org/10.1016/S0165-4101\(97\)00017-7](https://doi.org/10.1016/S0165-4101(97)00017-7).
- Causholli, M., Chambers, D.J. and Payne, J.L. 2014, 'Future Nonaudit Service Fees and Audit Quality', *Contemporary Accounting Research*, 31: 681–712, <https://doi.org/10.1111/1911-3846.12042>.
- Chung, H. and Kallapur, S. 2003, 'Client Importance, Non-audit Services, and Abnormal Accruals', *The Accounting Review*, 78 (July): 931–55.
- Culvenor, J., Stokes, D. and Taylor, S. 2002, 'A Review of the Proposals for Reform of Independence of Australian Company Auditors', *Australian Accounting Review*, 12 (27): 12–23.
- DeAngelo, L. 1981, 'Auditor Size and Audit Quality', *Journal of Accounting and Economics*, 3: 183–99, [https://doi.org/10.1016/0165-4101\(81\)90002-1](https://doi.org/10.1016/0165-4101(81)90002-1).
- Dechow, P., Sloan, R. and Sweeney, A. 1995, 'Detecting Earnings Management', *The Accounting Review*, 70 (2): 193–225.
- Dee, C., Lulseged, A. and Nowlin, T. 2002, 'Earnings Quality and Auditor Independence: An Examination using Non-audit Fee Data'. Available at: <http://ssrn.com/abstract=304185>, accessed 17 April 2017.
- DeFond, M.L. and Jiambalvo, L. 1991, 'Incidence and Circumstances of Accounting Errors', *The Accounting Review*, 66 (3): 643–55.
- DeFond, M.L. and Jiambalvo, J. 1993, 'Factors Related to Auditor–Client Disagreements over Income-increasing Accounting Methods', *Contemporary Accounting Research*, 9 (2): 411–31, <https://doi.org/10.1111/j.1911-3846.1993.tb00889.x>.
- DeFond, M.L. and Jiambalvo, J. 1994, 'Debt Covenant Violation and Manipulation of Accruals', *Journal of Accounting and Economics*, 17 (1–2): 145–76, [https://doi.org/10.1016/0165-4101\(94\)90008-6](https://doi.org/10.1016/0165-4101(94)90008-6).
- DeFond, M.L. and Park, C. 1997, 'Smoothing Income in Anticipation of Future Earnings', *Journal of Accounting and*

- Economics*, 23 (2): 115–39, [https://doi.org/10.1016/S0165-4101\(97\)00004-9](https://doi.org/10.1016/S0165-4101(97)00004-9).
- DeFond, M.L. and Subramanyam, K. 1998, 'Auditor Changes and Discretionary Accruals', *Journal of Accounting and Economics*, 25 (1): 35–68, [https://doi.org/10.1016/S0165-4101\(98\)00018-4](https://doi.org/10.1016/S0165-4101(98)00018-4).
- DeGeorge, F., Patel, J. and Zeckhauser, R. 1999, 'Earnings Management to Exceed Thresholds', *The Journal of Business*, 72 (1): 1–33, <https://doi.org/10.1086/209601>.
- Ernst & Young 2014, 'Point of View: Our Perspective on Issues of Concern', European Union Audit Legislation. Available at: [http://www.ey.com/Publication/vwLUAssets/EY_-_European_Union_audit_legislation/\\$FILE/EY-pov-european-union-audit-legislation-april-2014.pdf](http://www.ey.com/Publication/vwLUAssets/EY_-_European_Union_audit_legislation/$FILE/EY-pov-european-union-audit-legislation-april-2014.pdf), accessed 17 April 2017.
- European Commission 2010, *Audit Policy: Lessons from the Crisis*, Green paper, European Commission, Brussels.
- Fair Trade Commission 2014, 'Data Analysis, Retrieval and Transfer System of the Financial Supervisory Service'. Available at: <http://dart.fss.or.kr>, accessed 17 April 2017.
- Fair Trade Commission 2016a, 'FTC designates 65 "Cross Shareholding Limits Business Group"'. Available at: <http://www.ftc.go.kr/www/selectReportUserView.do?key=47&rptype=>, accessed 9 April 2018.
- Fair Trade Commission 2016b, '2016 Cross Shareholding and Debt Guarantee Restricted Business Group Designations'. Available at: <http://www.ftc.go.kr/www/selectReportUserView.do?key=47&rptype=>, accessed 9 April 2018.
- Francis, J.R. and Krishnan, J. 1999, 'Accounting Accruals and Auditor Reporting Conservatism', *Contemporary Accounting Research*, 16 (1): 135–65, <https://doi.org/10.1111/j.1911-3846.1999.tb00577.x>.
- Frankel, R., Johnson, M. and Nelson, K. 2002, 'The Relation Between Auditors' Fees for Non-audit Services and Earnings Quality', *The Accounting Review*, 77 (Supplement): 71–105, <https://doi.org/10.2308/accr.2002.77.s-1.71>.
- Gul, F.A., Chen, C.J. and Tsui, J.S. 2003, 'Discretionary Accounting Accruals, Managers' Incentives, and Audit Fees', *Contemporary Accounting Research*, 20 (3): 441–64.
- Iyengar, R.J. and Zampelli, E.M. 2008, 'Auditor Independence, Executive Pay and Firm Performance', *Accounting & Finance*, 48 (2): 259–78, <https://doi.org/10.1111/j.1467-629X.2007.00226.x>.
- Jeong, S.W., Jung, K.E. and Lee, S.J. 2005, 'The Effect of Mandatory Auditor Assignment and Non-audit Service on Audit Fees: Evidence from Korea', *International Journal of Accounting*, 40 (3): 233–48.
- Jones, J.J. 1991, 'Earnings Management During Import Relief Investigations', *Journal of Accounting Research*, 29 (2): 193–228, <https://doi.org/10.2307/2491047>.
- Kapoor, N. and Goel, S. 2017, 'Board Characteristics, Firm Profitability and Earnings Management: Evidence from India', *Australian Accounting Review*, 27 (2): 180–94.
- Kilgore, A., Radich, R. and Harrison, G. 2011, 'The Relative Importance of Audit Quality Attributes', *Australian Accounting Review*, 21 (3): 253–65.
- Kinney Jr., W.R. and Martin, R.D. 1994, 'Does Auditing Reduce Bias in Financial Reporting? A Review of Audit-related Adjustment Studies', *Auditing*, 13 (1): 151–56.
- Kothari, S.P., Leone, A.J. and Wasley, C.E. 2005, 'Performance Matched Discretionary Accrual Measures', *Journal of Accounting and Economics*, 39 (1): 163–97, <https://doi.org/10.1016/j.jacceco.2004.11.002>.
- Krauss, P. and Zulch, H. 2013, 'Non-audit Service and Audit Quality: Blessing or Curse?', *Journal of Applied Business Research*, 29 (2): 305–25.
- Krishnamoorthy, G., Wright, A. and Cohen, J. 2002, 'Audit Committee Effectiveness and Financial Reporting Quality: Implications for Auditor Independence', *Australian Accounting Review*, 12 (28): 3–13.
- Kwon, S. and Sohn, S. 2002, 'Analysis of the Effect of the Non-audit Service on the Independence of Audit and Enhancing Audit Independence', *Korean Accounting Journal*, 11: 209–52.
- Kwon, S., Sohn, S. and Lee, E. 2004, 'Effect of Non-audit Service on the Auditor's Independence', *Korean Accounting Review*, 29: 249–80.
- Lee, D.H., Kim, S.M., Oh, K.W. and Yoo, S.W. 2013, 'New Auditors' Decisions for Released Firms from the Mandatory Auditor Designation Rule: Evidence from South Korea', *Australian Accounting Review*, 23 (4): 341–56.
- Levitt, A. 1998, 'The "Numbers Game"', Remarks from SEC Chairman A. Levitt at the New York University Center for Law and Business, New York.
- Lim, C.-Y., Ding, D.K. and Charoenwong, C. 2013, 'Non-audit Fees, Institutional Monitoring, and Audit Quality', *Review of Quantitative Finance and Accounting*, 41 (2): 343–84, <https://doi.org/10.1007/s11156-012-0312-1>.
- Lim, C.-Y. and Tan, H.-T. 2008, 'Non-audit Service Fees and Audit Quality: The Impact of Auditor Specialization', *Journal of Accounting Research*, 46 (1): 199–246, <https://doi.org/10.1111/j.1475-679X.2007.00266.x>.
- Markelevich, A. and Rosner, R.L. 2013, 'Auditor Fees and Fraud Firms', *Contemporary Accounting Research*, 30 (4): 1590–625, <http://onlinelibrary.wiley.com/doi/10.1111/1911-3846.12013/full>.
- Palmrose, Z.-V. 1986, 'The Effect of Non-audit Services on the Pricing of Audit Services: Further Evidence', *Journal of Accounting Research*, 24 (2): 405–11, <https://doi.org/10.2307/2491144>.
- Park, J.I., Jeon, K.A. and Choi, J.H. 2003a, 'Descriptive Analyses on the Relationship Between Non-audit Fee and Audit Fee', *Korean Accounting Journal*, 12: 29–65.
- Park, J.I., Jeon, K.A. and Choi, J.H. 2003b, 'Does Non-audit Service Compromise Auditor Independence?' *Korean Accounting Review*, 28: 141–76.

Rangan, S. 1998, 'Earnings Management and the Performance of Seasoned Equity Offerings', *Journal of Financial Economics*, 50 (1): 101–22, [https://doi.org/10.1016/S0304-405X\(98\)00033-6](https://doi.org/10.1016/S0304-405X(98)00033-6).

Ronen, J. and Sadan, S. 1981, *Smoothing Income Numbers: Objectives, Means, and Implications*, Addison-Wesley, Reading, Massachusetts.

Securities and Exchange Commission 2000, *Final Rule: Revision of the Commission's Auditor Independence Requirement, 17 CFR Parts 210 and 240*, Securities and Exchange Commission, Washington, DC.

Simunic, D.A. 1984, 'Auditing, Consulting and Auditor Independence', *Journal of Accounting Research*, 22 (2): 679–702, <https://doi.org/10.2307/2490671>.

Svanstrom, T. 2012, 'Non-audit Services and Audit Quality: Evidence from Private Firms', *European Accounting*

Review, 22 (2): 337–66, <https://doi.org/10.1080/09638180.2012.706398>.

Teoh, S.H., Welch, I. and Wong, T.J. 1998, 'Earnings Management and the Long-run Market Performance of Initial Public Offerings', *Journal of Finance*, 53 (6): 1935–74.

Trueman, B. and Titman, S. 1988, 'An Explanation for Accounting Income Smoothing', *Journal of Accounting Research*, 26 (Supplement): 127–39, <https://doi.org/10.2307/2491184>.

Watts, R. and Zimmerman, J. 1981, *The Markets for Independence and Independent Auditors*, Unpublished manuscript, University of Rochester.

Wilson, M. 2011, 'Earnings Management in Australian Corporations', *Australian Accounting Review*, 21 (3): 205–21.

Zhou, G.S. and Zhu, X.K. 2012, 'Client Importance and Auditor Independence: The Effect of the Asian Financial Crisis', *Australian Accounting Review*, 22 (4): 371–83.

Appendix

Table A1 NAS purchase ratio by management performance

Panel A: NAS purchase ratio by ROA performance (n = 15 837)				Panel B: NAS purchase ratio by OCF performance (n = 15 837)			
	High ROA	Low ROA	Total		High OCF	Low OCF	Total
NAS	2438	2073	4511	NAS	2456	2055	4511
Ratio	30.43%	26.49%	28.48%	Ratio	30.65%	26.26%	28.48%
No NAS	5574	5752	11 326	No NAS	5556	5770	11 326
Ratio	69.57%	73.51%	71.52%	Ratio	69.35%	73.74%	71.52%
Total	8012	7825	15 837	Total	8012	7825	15 837
Ratio	100%	100%	100%	Ratio	100%	100%	100%

Panel C: NAS purchase ratio by ROA performance (n = 12 625)				Panel D: NAS purchase ratio by OCF performance (n = 12 625)			
	High ROA	Low ROA	Total		High OCF	Low OCF	Total
NAS	2438	2073	4511	NAS	2456	2055	4511
Ratio	37.76%	33.60%	35.73%	Ratio	37.90%	33.45%	35.73%
No NAS	4018	4 096	8 114	No NAS	4025	4089	8 114
Ratio	62.24%	66.40%	64.27%	Ratio	62.10%	66.55%	64.27%
Total	6456	6169	12 625	Total	6481	6144	12 625
Ratio	100%	100%	100%	Ratio	100%	100%	100%

NAS = sample of companies that purchased non-audit services; No NAS = sample of companies that did not purchase non-audit services; Panels A and B represent NAS purchase ratio by management performance for the full sample (n = 15 837); Panels C and D represent NAS purchase ratio by management performance for company-year samples in which NAS were purchased from the same auditor at least once during the 15-year period (n = 12 625).

Panels A and B show the ratio of companies that purchased NAS in accordance with their performance among the total sample (n = 15 837). In the sample above (below), ROA median in the same year in the same industry (n = 8012, 7825), the number of clients that purchased NAS was 2438 (2073) and the ratio was 30.43% (26.49%). In the sample above (below) OCF median (n = 8012, 7825), the number of clients that purchased NAS was 2456 (2055) and the ratio was 30.65% (26.26%). The samples above ROA and OCF medians have a larger number and higher ratio of companies that purchased NAS than those below the ROA and OCF medians. In sum, as a result of the analysis of the purchase ratio of NAS after classifying the total sample by ROA and OCF performance of the companies, we found that companies with low performance do not necessarily need more NAS.

Of the total sample (n = 15 837), there are companies that have never purchased NAS during the 15 years from 2002–16. As these companies have different characteristics from those that purchased NAS more than once, it is necessary to analyse the NAS purchase ratio after excluding such companies. Panels C and D show the purchase ratio of NAS for company-year observations that purchased NAS more than once during the 15-year period (n = 12 625) in accordance with their management performance. Of this sample (n = 12 625), among the samples above (below), ROA median in the same year and the same industry (n = 6456, 6169), the number of clients that purchased NAS was 2438 (2073) and the ratio was 37.76% (33.60%). In the samples above (below) the OCF median (n = 6481, 6144), the number of clients that purchased NAS was 2456 (2055) and the ratio was 37.90% (33.45%).

(Continued)

Table A1 Continued

As with the results in Panels A and B, the samples in Panels C and D above the ROA and OCF medians are larger and have a higher ratio of companies that purchased NAS than those below the ROA and OCF medians. In sum, among the sample of companies that purchased NAS more than once ($n = 12\,625$), companies with low performance do not necessarily need more NAS.

Table A2 Correlation matrix by client performance

Panel A: High ROA ($n = 2438$)						Panel B: Low ROA ($n = 2073$)					
Variable	DA	OCF	ROA	NAF%	lnNAF	Variable	DA	OCF	ROA	NAF%	lnNAF
DA	1.000	-0.592 <.0001	0.160 <.0001	0.016 0.423	-0.036 0.073	DA	1.000	-0.394 <.0001	0.099 <.0001	0.041 0.060	0.020 0.364
OCF		1.000	0.273 <.0001	0.050 0.013	0.036 0.080	OCF		1.000	0.266 <.0001	0.038 0.085	0.080 0.000
ROA			1.000	0.064 0.002	-0.059 0.004	ROA			1.000	-0.001 0.973	0.071 0.001
NAF%				1.000	0.818 <.0001	NAF%				1.000	0.818 <.0001
lnNAF					1.000	lnNAF					1.000
Panel C: High OCF ($n = 2\,456$)						Panel D: Low OCF ($n = 2\,055$)					
Variable	DA	OCF	ROA	NAF%	lnNAF	Variable	DA	OCF	ROA	NAF%	lnNAF
DA	1.000	-0.319 <.0001	0.274 <.0001	0.028 0.159	0.011 0.597	DA	1.000	-0.296 <.0001	0.317 <.0001	0.083 0.000	0.034 0.120
OCF		1.000	0.351 <.0001	0.056 0.006	-0.016 0.433	OCF		1.000	0.191 <.0001	0.000 0.997	0.070 0.002
ROA			1.000	0.059 0.003	-0.004 0.824	ROA			1.000	0.034 0.122	0.033 0.135
NAF%				1.000	0.819 <.0001	NAF%				1.000	0.817 <.0001
lnNAF					1.000	lnNAF					1.000

This table reports the Pearson correlation coefficients with two-tailed p -values. See Table A3 for variable definitions.

We classify poorly performing and well-performing companies that purchased NAS and analyse the correlation between the level of NAS ($NAF\%$ and $lnNAF$) and discretionary accruals (DA). An increase in discretionary accruals in accordance with an increase in the level of NAS ($NAF\%$ and $lnNAF$) can be translated as a greater incentive for earnings management. To investigate this, we classify the sample into companies above ROA and OCF medians and those below ROA and OCF medians in the same industry and the same year, and analyse the correlation between discretionary accruals (DA) and NAS variables ($NAF\%$ and $lnNAF$).

Panels A, B, C and D show the correlation between the samples above the ROA and OCF medians ($n = 2438$, $n = 2456$) and those below the ROA and OCF medians ($n = 2073$, 2055) in the same industry and the same year. In Panels A, B, C and D, discretionary accruals (DA) as the measure of earnings management has a significantly negative relationship with OCF, while it has a significantly positive relationship with ROA. On the other hand, in Panel A (Panel B), companies with high (low) ROA performance have an insignificant (significantly positive) relationship between discretionary accruals (DA) and NAS to total fees ($NAF\%$), while their NAS fee amount ($lnNAF$) has a significantly negative (insignificant) relationship. To sum up, companies with low ROA performance ($n = 2073$) in Panel B show a significantly positive relationship between discretionary accruals (DA) and the NAS variable ($NAF\%$).

Likewise, while companies with high OCF performance ($n = 2456$) in Panel C have an insignificant relationship with discretionary accruals and the NAS variables ($NAF\%$ and $lnNAF$), companies with low OCF performance ($n = 2\,055$) in Panel D have a significantly positive relationship with discretionary accruals and the NAS variable ($NAF\%$). In sum, companies with low ROA and OCF performance show a significantly positive relationship between discretionary accruals and the NAS variable ($NAF\%$). Discretionary accruals (DA) show a significantly negative relationship with ROA performance and a significantly positive relationship with OCF performance. However, only poorly performing companies show a significantly positive relationship between discretionary accruals (DA) and the NAS variable ($NAF\%$). In sum, as the relationship between discretionary accruals (DA) and management performance measured by ROA contradicts the relationship between discretionary accruals (DA) and management performance measured by OCF, it is difficult to judge whether poorly performing companies have a greater incentive for earnings management through manipulation of discretionary accruals (DA). Only poorly performing companies show a significantly positive relationship between discretionary accruals (DA) as the earnings management variable and the NAS variable $NAF\%$. This study uses discretionary accruals (DA) as a proxy to verify whether auditor independence is compromised in cases where poorly performing companies purchase NAS from their incumbent auditors.

Table A3 Definition of variables

Variable	Definition
<i>DA</i>	Discretionary accruals computed using the modified Jones model
<i>NAF%</i>	Non-audit services fee divided by total fee
<i>lnNAF</i>	Natural log of the non-audit services fee
<i>NAFdum</i>	One if the audit client purchased NAS from the firm's auditor and zero otherwise
<i>Tax%</i>	Tax services fee divided by total fee
<i>Other%</i>	NAS fee (excluded tax services fee) divided by total fee
<i>Big4</i>	One if the firm's auditor is a Big 4 firm and zero otherwise
<i>chAF</i>	One if the firm's auditor changed and zero otherwise
<i>LEV</i>	Total liabilities divided by total assets
<i>SIZE</i>	Natural log of beginning of the year total assets
<i>GRW</i>	The firm's total assets divided by the beginning of the year total assets
<i>ISSUE</i>	One if the number of shares outstanding increased by at least 10% and zero otherwise
<i>OCF</i>	Cash from operations deflated by the beginning of the year total assets
<i>ROA</i>	Net income in year $t-1$ divided by total assets in year $t-2$
<i>ROAdum</i>	One if $ROA < ROA$ median by industry and year and zero otherwise
<i>OCFdum</i>	One if $OCF < OCF$ median by industry and year and zero otherwise
<i>YD</i>	Year fixed effect
<i>ID</i>	Industry fixed effect