The Economic Determinants of Fees for Non-Audit Services Provided by the Incumbent Auditors: Evidence of Korean Listed Firms

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Abstract

This study examines the economic determinants of the magnitude of fees paid for non-audit services provided by the incumbent auditors among Korean listed firms over the period 1999-2002. Only 26% of the sample firm-years exhibit positive non-audit service fees, compared to 96% among U.S. listed firms, suggesting that recent regulatory concerns on potential lack of auditor independence due to provision of non-audit related services may not be as severe among Korean listed firms as in the U.S.

Unlike U.S. firms, Korean listed firms provide detailed descriptions of their incumbent auditors' non-audit services, allowing us to develop a rich taxanomy of non-audit activities including tax, routine management-related, information-technology, innovation, and valuation. A notable finding is that investments in innovation-related services occur the most often across industries, indicating increased demands for improving business efficiency among Korean firms.

In examining the economic determinant of the level of non-audit service fees, this study specifically controls for firms' decision to purchase non-audit services using a self-selection model. Based on a Heckman two-stage estimation, we posit that firms simultaneously determine whether to purchase non-audit services and the level of investments in non-audit services conditional upon the purchase of non-audit services. The evidence shows that the firms' decision to buy non-audit services is distinct from their decision on the level of investments in non-audit services. This evidence suggests that estimating a model for the economic determinants of non-audit fees without correcting for this self-selection bias can lead to an erroneous inference on the determining factors underlying non-audit services.

Key words: Non-audit services; Heckman two-stage estimation; survivorship bias.

The Economic Determinants of Fees for Non-Audit Services Provided by the Incumbent Auditors: Evidence of Korean Listed Firms

1. Introduction

This study examines the economic determinants of the magnitude of fees for non-audit services provided by the incumbent auditors among Korean listed firms over the period 1999-2002. In U.S., regulators and investors concern that non-audit services provided by the incumbent auditors can potentially impair the independence of the auditors. Out of this concern, the U.S. Securities and Exchange Commission (SEC) issued in November 2000 revised auditor independence rules. These rules require listed firms to disclose the amount and the types of non-audit fees, as well as audit fees, paid to the incumbent auditors. Furthermore, the U.S. Congress promulgated legislations in July 2002 that prohibit the incumbent auditors from providing certain types of non-audit services (Sarbanes-Oxley Act 2002).

Korea regulators and investors also express concerns about the potential adverse effects of provision of non-audit services on the incumbent auditors' independence. The Financial Supervisory Service (FSS), the Korean equivalent of SEC in the U.S., requires listed firms to disclose the detailed contents of the contracts with the auditors and the amount of audit and non-audit service fees paid to the incumbent auditor. Further, FSS currently considers restricting certain non-audit services provided by the incumbent auditors. However, audit firms argue that the provision of non-audit services does not impair their independence and that the restriction of certain non-audit services would prevent knowledge-spillovers between audit and non-audit services, consequently costing their client firms more.

To provide insights into the effect of the provision of non-audit services to the incumbent auditor's independence, this study examines the economic determinants of the level of fees paid for non-audit services provided by the incumbent auditors among Korean listed firms over the period 1999-2002. We find that only 26% of the sample firm-years purchase non-audit services from their auditors, compared to 96% among U.S. listed firms (Frankel, Johnson, and Nelson 2002). Thus, this finding suggests that recent concerns on potential adverse effects of provision of non-audit related services on auditor independence are not likely to be as severe among Korean listed firms as in the U.S. We also find that non-audit service fees constitute only 7% of total fees (i.e., the sum of audit and non-audit fees) paid to the incumbent auditors in our sample, compared to 49% among U.S. listed firms. This evidence indicates that provision of non-audit services by the incumbent auditors is not likely to be as material as in the U.S., and that it is premature argue for prohibition of non-audit services provided by the incumbent auditors.

We also find that unlike U.S. firms, Korean listed firms provide detailed descriptions of their incumbent auditors' non-audit services, allowing us to develop a rich taxanomy of non-audit activities including tax, routine management-related, information-technology, innovation, and valuation. A notable finding is that the client firms purchase investments in innovation-related services the most often regardless of industries, indicating increased demands for improving business efficiency.

In examining the economic determinant of the magnitude of non-audit service fees, we specifically control for firms' decision to purchase non-audit services using a self-selection model. Based on a Heckman two-stage estimation approach, we assume

that the client firms simultaneously determine whether to purchase non-audit services from their auditors and the level of investments in non-audit services conditional upon the purchase of non-audit services. We find that firms' decision to buy non-audit services from their auditor is distinct from their decision on the level of investments in non-audit services. This evidence suggests that estimating a model for the economic determinants of non-audit fees without correcting for this self-selection bias can lead to an erroneous inference on the determining factors underlying non-audit services.

This study makes the following contributions to the literature. First, the study provides initial evidence on the economic significance of the provision of non-audit services by the incumbent auditors. Relative to the listed firms in the U.S., Korean firms appear to purchase significantly lower levels of non-audit services from their auditors. Furthermore, investments in non-audit services provided by the incumbent auditors are concentrated in activities to improve the client firms' operations and business processes. These findings thus suggest that introducing the regulations prohibiting the provision of non-audit services by the incumbent auditors warrants a careful re-assessment of the extent of potential conflicts of interest between the client firms and their auditors. Furthermore, the findings of the study can provide useful policy recommendations on the potential adverse effects of economic dependence of the auditors on their independence. Second, this study develops the non-audit services pricing model and examines the determinants of non-audit services provided by incumbent auditors by simultaneously controlling for the client firms' decision to purchase non-audit services. Our finding is that the determinants of the client firms' decision to buy non-audit services are distinct from those of the level of investments in non-audit services. To the extent that the client firms attempt to minimize agency costs by purchasing non-audit services from their auditors (i.e., their decision to buy non-audit services is not random), a lack of control for this self-selection in non-audit fee pricing models would lead to an incorrect inference on the determining factors of non-audit services, especially in the case of low incident of non-audit services such as Korea.

The paper proceeds as follows. Section 2 discusses prior research on non-audit services and develops our research questions. Section 3 describes the model for the determinants of non-audit service fees and the sample. Section 4 presents the empirical results and section 5 concludes the study.

2. Prior studies on non-audit services by the incumbent auditors

This section first discusses select prior studies on the determinants of non-audit services and then the effect of non-audit services on auditor independent.

2.1. Economic determinants of non-audit services

Several prior studies examine potential economic determinants of the incumbent auditors' non-audit services. Scheiner and Kiger (1982) examine the amounts and types of non-audit services by the incumbent auditors and find that prohibiting the auditors from providing certain non-audit services to their clients does not appear to have a material impact on the client firms because these services represent only a small portion of total fees paid to the auditors.

Deberg, Kaplan, and Pany (1991) present the effects of performing non-audit services by the incumbent auditors on the auditor's relationship with the client firms. As the economic determinants of non-audit services, they examine industry membership,

the client size, accounting earnings, and leverage over a five-year period. These variables are likely related to the client firms' decision to purchase non-audit services.

Parkash and Vanable(1993) examine the effects of auditor incentives and knowledge spillovers in joint engagements for audit and non-audit services. They use managerial ownership and outside investment concentration as additional explanatory variables. They also include several variables to capture auditors' industry specializations. They find that agency costs and industry specializations have an effect on the decision to purchase recurring non-audit services.

Barkess and Simnett (1994) analyze the pricing of audit services and auditor independence issues associated with the provision of non-audit services by the incumbent auditors in Australia. In order to examine the incentive effects associated with the provision of non-audit services by the incumbent auditors, they examine firm size, auditor qualifications, industry membership and auditor type (e.g., big8 versus non-big8 auditors) as potential determinants of non-audit services. They find a positive relation between audit and non-audit fees. They also present that the level of non-audit services has no effect on auditor independence.

Firth (1997) develops a model to seek for the factors affecting the client firm's decision to purchase non-audit services from the incumbent auditors in U.K. They argue that the client firms that face potentially high agency costs purchase relatively smaller amounts of non-audit services from the incumbent auditors. Directors' ownership, ownership by the largest shareholder, and debt-to-assets ratio proxy for agency costs. The other determinants include return-on-equity, stock rate of return, firm growth and binary variables related to the incidence of losses, big-8 auditors, the incidence of acquisitions, issuance of new shares, installation of information systems, new external CEOs, and incidence of restructuring activities.

DeFond, Raghunandan, and Subramanyam (2002) recently examine the association between the incumbent auditor's fees (both audit and non-audit fees) and auditor independence by using the propensity of the auditors to issue going concern audit opinions as a proxy for auditor independence. They find no significant relation between audit (and non-audit) fees and auditor independence. They suggest that market-based motives, such as defamation of reputation and/or litigation risk, prevent auditors from impairing auditor independence.

Raghunandan, Read, and Whisenant (2003) examine the relation between restatement of previous financial statements and the fees paid to the incumbent auditors for audit and non-audit services. They compare the firms with restatements and the firms without restatements and find no statistically significant differences between two groups for three fee measures (i.e., non-audit fees, total fees, and fee ratios). They argue that non-audit fee or total fees paid to the auditor does not improperly affect the restatements of financial statements.

Whisenant, Sankaraguruswamy, and Raghunandan (2003) examine whether audit and non-audit fees are simultaneously determined. They group determinants of audit and non-audit fees into agency and contracting costs, performance, complexity, auditor type and the length of auditor-client firm relationship. They find a positive relation between audit fees and non-audit fees and suggest the existence of knowledge-spillover from conventional OLS single-equation estimations. But they show that these single-equation estimations suffer from a simultaneous equation bias, making single-equation results unreliable.

Choi, Jeon, and Park (2003) examine audit and non-audit fees of the incumbent auditors in Korea. They present that the provision of non-audit services by the incumbent auditor causes neither low balling of audit fees nor impairment of auditor independence.

2.2. Non-audit services and auditor independence

Frankel, Johnson, and Nelson (2002) examine the association between the client firms' discretionary accruals and the fees paid to the incumbent auditors to draw inferences on auditor independence. They suggest that auditor independence is compromised when the clients pay high non-audit fees relative to total fees.

Ashbaugh, LaFond and Mayhew (2003) examine the discretionary accruals similar to Frankel et al (2002)'s. They find no systematic evidence consistent with Frankel et al's claim that auditors impair their independence as a result of the clients purchasing non-audit services.

Choi, Jeon, and Park (2002) examine whether provision of non-audit service is related to auditor independence in Korea. They find that both the provision of non-audit service itself and the ratio of non-audit service fees to total fees are not positively related to auditor independence.

Chung and Kallapur (2003) test whether the auditor independence, proxied by abnormal accruals, is associated with the client's importance to the auditor. After controlling for industry and determinants of abnormal accruals based on previous studies, they fail to find a significant cross-sectional relation between the absolute value of abnormal accruals and the client importance.

The objective of these prior studies is to examine the determinants of non-audit services by the incumbent auditors and test for the effect of non-audit services on auditor independence using either single- or simultaneous-equations. Since prior studies fail to reach a consensus on the relation between non-audit services and auditor independence, this study first aims to provide the economic significance of non-audit services provided by the incumbent auditors and then examine the firm- and industry-factors that affect the firm's decision to purchase non-audit services. Specifically, we pay a close attention to potential bias that arises from lack of an adequate control over the client firms' simultaneous decision as to the purchase of non-audit services from their auditors and the level of investments in those services upon the purchase decision.

3. Research design and the sample

3.1. Basic regression model

Prior research examines various firm- and industry-characteristics as potential determinants of non-audit services (Scheiner and Kiger 1982; Deberg et al. 1991; Parkash and Vanable 1993; Barkess and Simnett 1994; Firth 1997; DeFond et al. 2002; Raghunandan et al. 2003; Whisenant et al. 2003). Consistent with these prior studies, we use non-audit fees as a proxy for the level of services and physical flow of knowledge provided by the incumbent auditors. The following equation examines the determinants of non-audit services, by incorporating most of the important determinants identified in prior studies. We classify the determinants into auditor-related factors (audit fee, auditor-the client firm relationship, auditor independence, auditor specialty) and the client firms related factors (firm size, complexity of the tasks, performance,

agency costs, risk).

$$
\begin{aligned}
LNNFEE = {} & \beta_0 + \beta_1 (LNFEE) + \beta_2 (FIRST) + \beta_3 (TENURE) + \beta_4 (OPINION) \\
& + \beta_5 (RESTATE) + \beta_6 (EXTRA) + \beta_7 (BIG5) + \beta_8 (LNTA) + \beta_9 (SQSEGS) \\
& + \beta_{10} (SQEMPS) + \beta_{11} (EXPORT) + \beta_{12} (LIQUIDITY) + \beta_{13} (INVREC) \\
& + \beta_{14} (ROA) + \beta_{15} (LOSS) + \beta_{16} (GROWTH) + \beta_{17} (NEWFIN) + \beta_{18} (DA) \\
& + \beta_{19} (INSTITUTION) + \beta_{20} (BIGGEST) + \beta_{21} (BETA) \\
& + \beta_{22} (VOLATILITY) + \beta_{23} (ALTMANZ) + \beta_{24} (Adummy) + \beta_{25} (Cdummy) \\
& + \beta_{26} (Fdummy) + \beta_{27} (Pdummy) + \beta_{28} (Rdummy) + \beta_{29} (Idummies) \\
& + \beta_{30} (Ydummies) + e, \qquad (1)
\end{aligned}
$$

where,

LNNFEE	=	the natural logarithm of non-audit fees paid to the incumbent auditor (in thousands won);
LNFEE	=	the natural logarithm of audit fees paid to the auditor;
FIRST	=	binary variable that takes the value of 1 for the first two years after the audit engagement, and 0 otherwise;
TENURE	=	The number of audit engagement year;
OPINION	=	binary variable set equal to 0 if the audit opinion in both the current and previous year is unqualified, and 1 otherwise;
RESTATE	=	dummy variable set equal to 1 if the client firm reports either gain or loss due to prior period's error correction, and 0 otherwise;
EXTRA	=	dummy variable set equal to 1 if the firm reports either extraordinary gains or losses, and 0 otherwise;
BIG5	=	dummy variable set equal to 1 if the auditor is one of big five audit firms, and 0 otherwise;
LNTA	=	the natural logarithm of total assets;
SQSEGS	=	the square root of the number of segments;
SQEMPS	=	the square root of the number of employees (measured in thousands);
EXPORT	=	dummy variable set equal to 1 if the firm's export sales are positive during the current fiscal year, and 0 otherwise;
LIQUIDITY	=	current assets divided by current liabilities;
INVREC	=	sum of inventory and accounts receivable, divided by total assets;
ROA	=	operating income divided by total assets;
LOSS	=	dummy variable set equal to 1 if the net income of the firm is negative in either one of the two previous fiscal years, and 0 otherwise;
GROWTH	=	percentage growth in sales over the previous fiscal year;
NEWFIN	=	dummy variable set equal to 1 if the firm reports new financing of either equity or long-term debt in the current year, and 0 otherwise;
DA	=	debt divided by total asset;
INSTITUTION	=	institutional ownership (in percentage);
BIGGEST	=	the level of ownership by the largest stockholder;
BETA	=	the firm's systematic risk estimated using monthly stock rates of

returns from the one-factor market model over the fiscal year;

VOLATILITY = the volatility of the residual using the market model over the fiscal year;

ALTMANZ = a score from Altman's (1968) bankruptcy prediction model;

Idummies = dummy variables for industries; and

Ydummies = dummy variables for the sample years.

We also add the following five binary variables to the regression equation above to examine the uniqueness in the characteristics of non-audit services among Korean listed firms.

Adummy = dummy variable set equal to 1 if non-audit services are related to consultation, investigation, and research, and 0 otherwise;

Cdummy = dummy variable set equal to 1 if non-audit services relate to the client firm as a whole, and 0 if non-audit services relate to specific divisions or departments of the client firm (e.g., computer product division);

Fdummy = dummy variable set equal to 1 if non-audit services are non-financial in nature, and 0 otherwise;

Pdummy = dummy variable set equal to 1 if non-audit services relate to the firm's overall operations or strategies, and 0 if non-audit services relate to specific functions within the firm (e.g., marketing-related tasks); and

Rdummy = dummy variable set equal to 2 if non-audit services represent non-routine works of auditor including non-financial jobs and information technology (IT) related works, 1 if non-audit services relate to innovation, valuation, and financial IT, and 0 if non-audit services relate to routine works including tax return filings.

We measure the dependent and independent variables at the end of fiscal year, otherwise stated. Using the natural logarithm of non-audit fees paid to the incumbent auditor helps to address potential non-linear relation between non-audit fees and the client firm's size (Francis and Simon 1987). LNFEE is the natural logarithm of audit fees paid to the auditor, and it proxies for the knowledge spillovers between audit and non-audit services; a significant positive coefficient would indicate the knowledge spillovers. TENURE and FIRST attempt to capture the number of the audit engagement years; as the auditor accumulates knowledge of the client firms, the experiences that the auditor obtains by providing non-audit services can extract rents from their clients. The coefficients on TENURE and FIRST are expected to be positive and negative, respectively. RESTATE, EXTRA, and OPINION are empirical proxies for auditor independence; if auditor independence is impaired due to provision of non-audit services, the coefficients on RESTATE and EXTRA are predicted to be positive and the coefficient on OPINION is expected to be negative. We include BIG5 because large auditors likely have superior audit quality; the positive coefficient is predicted.

LNTA, SQSEGS, SQEMPS, and EXPORT are proxies for firm size and complexity of the client firms' operations; larger size and increased complexity of the firms increase the demand for non-audit services and hence the positive coefficients are predicted for these variables.

LIQUIDITY, ROA, GROWTH, RETURN, INVREC and LOSS are proxies for

the client firms' performance; as the firms with better performance and firms in sound financial condition are likely to have reduced need for non-audit services, the negative coefficients are predicted for all the variables, except for INVREC and LOSS. NEWFIN is a proxy for the firm's demand for non-audit services that would support new financing activities; a positive coefficient is predicted. INSTITUTION, BIGGEST, and DA are proxies for agency costs; when the level of institutional ownership and the largest shareholder's ownership are high, they likely have decreased demand for the auditor's monitoring. Thus, positive coefficients are predicted for these ownership variables. A high ratio of debt increases the demand for audited financial statements (Chow 1982), thus predicting a negative coefficient.

BETA, VOLATILITY, and ALTMANZ are proxies for risk; because the clients facing high risks are likely to demand improved efficiency in their operations, the positive coefficients are predicted for BETA and VOLATILITY, and a negative coefficient is predicted for ALTMANZ.

3.2. The sample

From 2001 fiscal year, Korean listed firms are required to disclose the types and the amounts of audit and non-audit service fees paid to the incumbent auditors for the current and prior two years. The data on audit and non-audit service fees over the 1999-2002 periods come from the electronic data filing system maintained by FSS. We obtain financial statement data from the KIS-FAS (Korea Investors Services - Financial Analysis System) database and business division data from the TS2000 database.

Table 1, panel A shows that the initial data includes 2,792 firm-year observations from the KIS-FAS database. We exclude 286 observations from financial firms (industry codes of 65000-67999), because the financial statements data are not comparable between financial and non-financial firms. We also exclude 97 observations due to missing data on audit fees. We exclude 199 observations due to lack of financial statement data for the explanatory variables. The final sample has 2,210 firm-year observations.

4. Empirical evidence

4.1. Descriptive Statistics

We are first interested in the extent and the level of non-audit service fees paid to the incumbent auditors in Korean listed firms, since the extent of economic significance or materiality of non-audit service fees can provide insights into the ongoing debate on the potential adverse effects of non-audit service related economic dependence on audit quality.

Table 1, Panel B shows the distribution of the sample firms by industry. The sample firms appear to be concentrated in four industries, that is, chemicals, extractive industries, durable goods manufacturers and utilities. To mitigate concerns on an industry clustering of the sample, the regression analysis below includes industry dummies. One notable finding is that the percentage of the firm-years with positive non-audit service fees in this sample is significantly lower than that of the U.S. listed firms, indicating that Korean listed firms appear to purchase significantly lower levels of non-audit services from their auditors. While more than nine of ten U.S. listed firms buy non-audit services from their auditors, only 26% of Korean listed firms purchase non-audit services. Only in four industries, the percentage of firm-year observations

with positive non-audit services is greater than 30%; mining and construction (39.7%), transportation (37.5%), business services (41.0%), and computers (54.1%). The significantly reduced propensity for Korean listed firms to buy non-audit services from their auditors suggests that the recent regulatory concerns on potential lack of auditor independence due to provision of non-audit related services are not likely to as severe among Korean listed firms as in the U.S. firms.

Table 2 reports descriptive statistics of audit and non-audit service fees by the types of services. Panel A shows that the average ratio of non-audit fees to total fees (the sum of audit and non-audit fees) is 6.7% in this sample, compared to approximately 50% among U.S. firms. This finding is not surprising, since only 26% of Korean listed firms buy non-audit services from their auditors, compared to 96% among the U.S. firms. Panel B shows that for only those observations with positive non-audit service fees, the mean ratio of non-audit fees to total fees is 26.3%, still significantly lower than in the U.S. Panel C and D show the descriptive statistics of audit and non-audit fees by year. In panel D, the ratio of non-audit service fees to total fees is between 26% and 27% for each of the four sample years, indicating a stable pattern the clients' policies on the level of investments in non-audit services. This evidence overall suggests that non-audit service fees are not as material in Korea and that it is probably premature to argue for the promulgation of statutory regulations prohibiting the provision of non-audit services to the client in Korea.

To provide additional insights into the types of non-audit services, Table 3, panel A classifies non-audit services in great detail. Unlike U.S. firms, Korean listed firms provide detailed descriptions of their incumbent auditors' non-audit services, allowing us to develop detailed classifications. First, we classify non-audit activities according to the types of the services; (a) financial statement related tasks (e.g., internal audit, financial reporting and compliance with regulations), (b) tax (tax returns and tax litigations), (c) corporate finance (issuances of stocks and bonds and disposal of fixed assets), (d) information-technology (installation and maintenance of accounting and financial systems, enterprise-resource-planning (ERP) and control systems), (e) innovation (business analysis and improvement, risk and crisis management, merger and acquisitions, and restructuring), and (f) valuation services (business and asset valuations, shareholder and brand valuation). Financial statements, IT, and innovation related tasks constitute 15.6%, 19.5%, and 35.4% of total non-audit service fees, respectively, suggesting that investments in information technology and business improvements receive a high priority in the client firms' decision to buy non-audit services.

The mean level of investments in information technology-related non-audit services the highest, reflecting the large amounts of initial and maintenance expenditures related to installation and management for the information systems. The mean value of tax service fees is relatively low, probably reflecting the recurring nature of tax related services. Non-audit services most relate to the client firm as a whole (81%) rather than a department or operational division. We also classify non-audit services by the primary functions of the auditor. Auditors most often directly perform non-audit services (76%), while they provide consultation (21%) or research/investigation (2.5%) less frequently. In the classification by the regularity of auditors' activity, only 23% of non-audit service fees are related to 'regular' activities of the auditor such as financial statements and tax services. Finally, most of the non-audit

services are related to financial activities (97%).

Table 3, Panel B reports non-audit service fees by the types of activities across industries. A notable finding is that investments in innovation-related services occur most often regardless of industries, indicating increased demands for improving business efficiency among Korean firms. However, significant differences exist in the types of non-audit services across industries, and hence the regressions specifically control for industry fixed effects.

Table 4 presents descriptive statistics on audit and non-audit fees and the economic determinants identified in equation (1) above. Substantial cross-sectional variation exists in most variables. The mean (median) value of the audit tenure (TENURE) is 4.31 (3.00). An unqualified opinion (OPINION) is issued to 92% of firm-year observations. Large auditors (BIG5) conduct audits for 64% of the firm-years in the sample, a figure significantly lower than that in the U.S. where large auditors audit more than 90% of the listed firms. 41% of the sample firm-years exhibit losses in either one of the two previous fiscal years. The mean values of institutional ownership (INSTITUTION) and the largest shareholder's ownership (BIGGEST) are 8.1% and 28.7%.

Unreported correlation coefficients between the variables in the regressions are all within reasonable ranges except for a correlation between audit fee (LNFEE) and firm size (LNTA), suggesting that a multi-collinearity problem does not cause a serious concern.

4.2. Regression results

The ordinary least squares (OLS) regression results are provided in Table 5. In Korea, audit fees were determined in proportion to the firm size until 1998. Although after 1999, audit fees are determined according to market forces including a negotiation between the auditor and client, the relation between audit fee (LNFEE) and firm size (LNTA) is very close (correlation of 0.85). As a result, the multi-collinearity problem can occur when audit fee and firm size are used in the regression. Hence we exclude either audit fee or firm size from the regression and find that basic results remain unchanged.

From column 1 to column 3, the coefficients on LNFEE are significantly positively associated with non-audit service fees, consistent with knowledge spillovers. TENURE and BIG5 have positive and significant coefficients, consistent with large non-audit service fees for the client firms with a long audit tenure auditor and the clients of large auditors. EXTRA has a positive and significant coefficient, suggesting that the clients with high extra-ordinary gains or losses pay large non-audit service fees to their clients. The coefficients on LNTA and SQEMPS are positive and significant, indicating that as firm size and complexity of the client's operations increase, non-audit service fees increase. The coefficient on BIGGEST is negative and significant, suggesting that as the level of ownership by the largest shareholders increases, non-audit service fees lessen. This evidence implies that monitoring by the largest shareholders reduces the need for the auditor's monitoring activities. The coefficient on BETA is significantly positive and the coefficient on ALTMANZ is significantly negative, indicating that as the client firms' risk increases, their non-audit fees also increase.

4.3. Heckman two-stage regression results

In our sample, only 26% of firm-year observations exhibit positive non-audit service fees and hence 74% of the sample observations have the value of zero for the dependent variable in the OLS regression. The zero non-audit service suggests that the client firms decide not to purchase non-audit services from their auditors. It firms optimally decide to purchase non-audit services (i.e, the decision to buy or not to buy non-audit services is not random across the sample firms), a correlated-omitted-variables-problem can arise unless this self-selection is properly controlled for.

To address this omitted-variables-problem, we introduce a Heckman two-stage model. Specifically, we posit that the audit clients decide simultaneously whether to purchase non-audit services from their auditors and the level of investments in those non-audit services upon their decision to buy non-audit services. In implementing a Heckman two-stage approach, we first estimate a Probit model for the clients' choice to purchase non-audit services and then estimate a OLS model to examine the level of non-audit fees with a self-selection correction variable from the first stage Probit model as an additional explanatory variable.

$$O^* = \chi_1\beta_1 + \varepsilon_1, \quad (2)$$
$$\ln(\text{Non-audit fee} + 1) = \chi_2\beta_2 + \varepsilon, \quad (3)$$
if non-audit services from the incumbent auditor are purchased, and 0 otherwise.

χ_1 denotes the vector of the firm- and industry-specific factors affecting the firm's decision to buy non-audit service, and χ_2 represents the vector of the economics factors affecting the amount of non-audit service fees upon the firm's decision to buy non-audit services. In equation (2), the client firms decide to purchase non-audit services from their auditors when the latent variable O^*, representing the incremental benefits from non-audit services, is positive. Conditional upon the decision to buy non-audit services, we posit that the clients then decide the amount of investments in non-audit fees according to the economic determinants in equation (3).

In a Heckman model, if χ_1 is equal to χ_2 and β_1 is limited to β_2, the result of the Heckman estimation is the same as a Tobit model estimation. However, if this condition is not descriptively correct, the result of the Heckman model is no longer the same as a Tobit model. It is therefore an empirical issue whether the Heckman estimation is more valid than a Tobit estimation.

On the assumption that χ_1 is equal to χ_2 and β_1 is limited to β_2, we first estimate the Tobit model and then relax this restriction by examining the Heckman model. A Tobit model examines two effects of a Heckman model, equations (2) and (3), in a single regression.

$$Y_i = Y_i^* = \alpha + \beta X_i + \upsilon_i \quad \text{if } Y_i^* > 0$$
$$Y_i = 0 \quad \text{if } Y_i^* \leq 0 \quad (4)$$

Column 4 of Table 5 presents the result of Tobit model. We note a few notable differences between OLS and Tobit model results. In the Tobit model, LNTA, TENURE, BIG5, SQEMPS are no longer significant. Only LNFEE, EXTRA, BETA, and SQSEGS are positive and significant, BIGGEST and ALTMANZ are negatively significant. This evidence suggests that it is important to adequately control for the

preponderance of zero values in non-audit service fees in examining the economic determinants of non-audit service fees.

In Table 6, column 2 to 4, we present the results of the two-stage estimation model. As noted above, the client firms are assumed to simultaneously determine whether to purchase non-audit services and the level of investments in non-audit services upon the purchase of non-audit services. In column 2, the first-stage Probit model presents similar results as the Tobit model. LNFEE, EXTRA, BIGGEST and BETA have significantly positive coefficients and ALTMANZ has significantly negative coefficients. This evidence suggests that the client firms consider the level of audit fees, auditor independence, and firm risk in determining whether to purchase non-audit services. The largest shareholder variable is positive and significant, suggesting that unlike the OLS and Tobit evidence of a negative relation between the largest ownership and non-audit service fees, the largest ownership encourages the decision to purchase non-audit services. As discussed below, however, the relation between the largest ownership and the amounts of non-audit services is negative in the OLS regression with a correction for self-selection bias. This evidence suggests that it is important to properly control for the self-section bias in examining the economic determinants of non-audit services. SQSEGS, a proxy for the client firm's complexity, is no longer significant in the Probit model.

The second-stage OLS regression determines the level of investments in non-audit services. TENURE, BIG5, LNTA, SQSEGS, and VOLATILITY variables are significantly positive in their expected signs and these findings are different from those of the Probit model. While the audit tenure, auditor specialty, size and complexity of the client, and volatility are not significantly associated with the decision to purchase non-audit services, they are important factors determining the level of investments in purchased non-audit services. The coefficient on BETA becomes insignificant, suggesting that systematic risk of the client no longer has a significant impact on the level of non-audit services after correcting for self-selection bias. The independent variables related to client performance have no significant effects on both the purchasing choice and the level of non-audit services.

The evidence on the largest ownership is noteworthy. As the largest ownership increases, the client firm tends to purchase non-audit services. However, upon purchasing non-audit services from the auditors, the level of investments in those non-audit services tends to decrease in the largest ownership. These seemingly conflicting results likely reflect the corporate strategies of Korean listed firms with significant ownership by the largest shareholders that consider the purchase of non-audit services from the incumbent auditors as an instrument for improving firm value.

Compared with the Tobit estimation, the Heckman two-stage model distinguishes the client's decision to buy non-audit services from the decision for the level of investments in those services. The differences in the results between the Tobit and Heckman two-stage estimations suggest that it is empirically important to consider these two decisions as distinct ones, rather assuming that the economic determinants of two decisions are identical.

In Table 6, column 4, we examine the second-stage equation with binary variables for the types of non-audit services provided by the incumbent auditors in order to provide additional insights into the determinants of non-audit service fees. The coefficient on Adummy that represents consultation, investigation, and research types of

non-audit services is positive and significant. This evidence suggests that non-audit services purchased in an attempt to improve the core knowledge base of the client are more material than those associated with recurring business maintenance performances. The coefficients on, Pdummy (to reflect the incidence of non-audit services related to the firm's overall operations or strategies versus non-audit services related to specific functions within the firm) and Rdummy (to reflect incidence of non-audit services representing auditor's non-routine services on innovation, valuation, and information technology) are positive and significant, and the coefficient on Cdummy (to denote non-audit services related to the client firm as a whole) is negative and significant. This evidence suggests that non-audit services related to firm's overall operations or strategies, tasks outside of auditors' normal specialization and those services associated with specialized core knowledge of specific department within the client firms tend to increase. Furthermore, non-audit fees related to non-recurring consultation, investigation, and research are higher than those related to recurring business maintenance performances. This observation is consistent with the evidence above that investments in innovation-related services occur most often regardless of industries (Table 3, Panel B). Thus this evidence implies that unlike some arguments in prior studies that non-audit service fees are a cause of potential deterioration of auditor independence, non-audit services purchased from the incumbent auditors likely attempt to enhance efficiency of the client firms. The coefficient on Fdummy (to capture non-audit services that are financial in nature) is insignificant, probably due to little variation in this variable (less than 3% of non-audit service fees are non-financial).

5. Conclusions

This paper provides the economic determinants of the magnitude of fees for non-audit services provided by the incumbent auditors among Korean listed firms over the 1999-2002 periods. We focus on the economic significance or materiality of non-audit services by the incumbent auditors and the determinants of non-audit service fees. We find that the incidence, amount, and ratio of non-audit fees to total fees (audit and non-audit fees) among Korean listed firms are significantly smaller than those in the U.S. listed firms. Thus, it is likely too premature to regulate non-audit services that can be provided by the incumbent auditors in Korea.

We estimate a Heckman two-stage estimation, because only 26% of the sample firms exhibit positive non-audit services fees in Korea and thus a potential omitted-variables-problem can arise. In estimating a Heckman two-stage equation, we assume that firms simultaneously determine whether to purchase non-audit services and the level of investments in non-audit services upon the purchase decision. We find that the firms' decision to buy non-audit services is distinct from their decision on the level of investments in non-audit services. This evidence suggests that estimating a model for the economic determinants of non-audit fees without correcting for this self-selection bias can lead to an erroneous inference on the determining factors underlying non-audit services.

Regarding the types of non-audit services, we find that the non-audit fees related to consultation, investigation, and research are higher than non-audit services associated with recurring business maintenance performances. Furthermore, non audit fees targeted for tasks outside of auditors' normal specialization and for specific divisions' expertise are expensive. This evidence suggests that non-audit services are purchased from the

incumbent auditors to enhance firm value, rather than serve as a cause of auditor independence defamation.

This study attempts to provide detailed characteristics of non-audit services and the client firms' decisions to purchase non-audit services. Future studies can examine the competitiveness and operational efficiency of the client firms that decide to purchase non-audit services from their auditors to provide insights to the effect of non-audit services on firm value.

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TABLE 1
Sample Description

Panel A: Selection Procedure for Sample of Firms

Selection Criteria	*Observations*
Definitive proxies of fiscal year between 1999 and 2002	2,792
Less : Financial institutions (industry code 65000-67999)	(286)
Missing Audit fee data	(97)
Observations with audit fee data	2,409
Less : Observations not available on KIS-FAS[a] and TS2000[b]	(199)
Sample observations with audit fee data	2,210
Less : No non-audit fee service	(1,623)
Sample observations with audit and non-audit fee data	587

[a]Korea Investors services - Financial Analysis System
[b]Database of Korea Listed Companies Association (KLCA)

TABLE 1 (Continued)

Panel B: Distribution of Observations by Industry

	Total Sample		*KIS-FAS*	*Positive non-audit sample*		*No non-audit sample*	
Industry Description	*n*	*%*	*%*	*n*	*%*	*n*	*%*
Agriculture	20	0.83	0.80	0	0	20	100.00
Mining and construction	171	7.10	7.50	68	39.77	103	60.23
Food	170	7.06	6.98	33	19.41	137	80.59
Textiles and printing/publishing	179	7.43	7.50	38	21.23	141	78.77
Chemicals	271	11.25	11.05	76	28.04	195	71.96
Pharmaceuticals	134	5.56	5.39	24	17.91	110	82.09
Extractive	327	13.57	13.81	70	21.41	257	78.59
Durable manufacturers	484	20.09	20.19	119	24.59	365	75.41
Transportation	64	2.66	2.55	24	37.50	40	62.50
Utilities	303	12.58	12.13	81	26.73	222	73.27
Retail	167	6.93	7.22	46	27.54	121	72.46
Services	95	3.94	3.75	39	41.05	56	58.95
Computers	24	1.00	1.12	13	54.17	11	45.83
Total	2,409	100.00	100.00	631	26.19	1,778	73.81

Industry membership is determined by Industrial Code of KNSO (Korea National Statistical Office) as follows: Agriculture (01000-09999), Mining and construction (10000-12999, 45000-46999), Food (15000-16999), Textiles and printing/publishing (17000-17999, 21000-22999), Chemicals (24000-24999, excluding 24200-24299), Pharmaceuticals (24200-24299), Extractive (23000-23999, 25000-27999), Durable manufacturers (28000-33999, excluding 30000-30999), Transportation (60000-63999), Utilities (18000-20999, 34000-37999), Retail (50000-52999), Services (40000-41999, 55000-55999, 64000-99999, excluding 64000-67999), and Computers (30000-30999).

TABLE 2
Descriptive Statistics of Auditor Fees Disclosed in the Statements of Fiscal Year between 1999 and 2002[a]

Panel A: Mandatory Disclosures of Fee Data in total sample (n = 2,409)

Variable	*Mean*	*FJN's Mean[b]*	*Standard Deviation*	*First Quartile*	*Median*	*Third Quartile*	*Minimum*	*Maximum*	*% > 0*
Audit	68,872	511	82,164	34,000	45,500	70,000	5,000	1,400,000	100.00
Audit/Total	0.93	0.51	0.16	0.95	1.00	1.00	0.03	1.00	
IS	5,704	209	133,342	0	0	0	0	5,131,000	0.79
IS/Total	0.00	0.02	0.04	0.00	0.00	0.00	0.00	0.90	
Other	23,978	1,050	141,573	0	0	2,500	0	3,760,000	26.07
Other/total	0.07	0.47	0.15	0.00	0.00	0.04	0.00	0.97	
Nonaudit	29,682	1,258	208,820	0	0	2,760	0	5,397,000	26.19
Nonaudit/Total	0.07	0.49	0.16	0.00	0.00	0.05	0.00	0.97	
Total	98,555	1,769	256,806	35,000	47,082	77,000	5,000	5,682,000	

Panel B: Mandatory Disclosures of Fee Data in positive non-audit services sample (n = 631)

Variable	*Mean*	*FJN's Mean[b]*	*Standard Deviation*	*First Quartile*	*Median*	*Third Quartile*	*Minimum*	*Maximum*	*% > 0*
Audit	112,578	511	137,588	41,000	64,900	130,000	5,000	1,400,000	100.00
Audit/Total	0.74	0.51	0.22	0.62	0.82	0.90	0.03	0.99	
IS	21,778	209	260,017	0	0	0	0	5,131,000	3.01
IS/Total	0.01	0.02	0.08	0.00	0.00	0.00	0.00	0.90	
Other	91,542	1,050	265,355	5,330	15,000	68,000	0	3,760,000	99.52
Other/total	0.25	0.47	0.21	0.10	0.17	0.37	0.00	0.97	
Nonaudit	113,320	1,258	396,457	5,460	15,000	70,000	300	5,397,000	100.00
Nonaudit/Total	0.26	0.49	0.22	0.10	0.18	0.38	0.01	0.97	
Total	225,898	1,769	475,169	49,105	83,790	215,500	15,505	5,682,000	

Table 2 (Continued)

Panel C : Mandatory Disclosures of Fee Data by year (n =2,409)

	1999 (n=580)				*2000 (n=606)*				*2001 (n=613)*				*2002 (n=610)*			
Variable	*N(>0)*	*Mean*	*Median*	*% > 0*	*N(>0)*	*Mean*	*Median*	*% > 0*	*N(>0)*	*Mean*	*Median*	*% > 0*	*N(>0)*	*Mean*	*Median*	*% > 0*
Audit	580	56,712	39,980	100.00	606	63,353	42,620	100.00	613	73,301	48,000	100.00	610	81,467	51,840	100.00
Audit/Total		0.95	1.00			0.93	1.00			0.92	1.00			0.93	1.00	
IS	1	207	0	0.17	7	6,190	0	1.16	4	14,447	0	0.65	7	1,662	0	1.15
IS/Total		0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	
Other	121	21,202	0	20.86	166	22,406	0	27.39	179	24,271	0	29.20	162	27,845	0	26.56
Other/total		0.05	0.00			0.07	0.00			0.07	0.00			0.07	0.00	
Nonaudit	121	21,409	0	20.86	167	28,596	0	27.56	180	38,718	0	29.36	163	29,547	0	26.72
Nonaudit/Total		0.05	0.00			0.07	0.00			0.08	0.00			0.07	0.00	
Total		78,121	41,000			91,949	44,334			112,020	51,314			111,014	54,622	

Panel D: Mandatory Disclosures of Fee Data in positive non-audit services sample by year (n = 631)

	1999 (n=121)				*2000 (n=167)*				*2001 (n=180)*				*2002 (n=163)*			
Variable	*N(>0)*	*Mean*	*Median*	*% > 0*	*N(>0)*	*Mean*	*Median*	*% > 0*	*N(>0)*	*Mean*	*Median*	*% > 0*	*N(>0)*	*Mean*	*Median*	*% > 0*
Audit	121	91,370	53,475	100.00	167	121,238	108,009	100.00	180	112,585	65,000	100.00	163	139,932	70,000	100.00
Audit/Total		0.74	0.85			0.74	0.83			0.74	0.79			0.73	0.82	
IS	1	1,000	0	0.83	7	22,463	0	4.19	4	49,202	0	2.22	7	6,221	0	4.29
IS/Total		0.00	0.00			0.02	0.00			0.01	0.00			0.01	0.00	
Other	121	10,164	8,400	100.00	166	81,306	11,000	99.40	179	82,656	15,632	99.44	162	104,354	20,000	99.39
Other/total		0.26	0.15			0.24	0.16			0.25	0.19			0.26	0.18	
Nonaudit	121	102,622	8,400	100.00	167	103,769	12,000	100.00	180	131,858	16,000	100.00	163	110,574	20,000	100.00
Nonaudit/Total		0.26	0.15			0.26	0.17			0.26	0.21			0.27	0.18	
Total		193,993	70,000			205,007	73,020			244,443	85,500			250,507	101,000	

Table 2 (Continued)

[a]The data on audit and non-audit service fees over the 1999-2002 period come from the electronic data filing system (DART : Data Analysis, Retrieval and Transfer System) maintained by FSS.

[b]Mean of auditor fees disclosed in proxy statements, Frankel, Johnson, and Nelson (2002). All levels are in thousands of dollars.

A classificatory criterion of auditor fees follows Frankel, Johnson, and Nelson (2002) for the comparative analysis.

Audit = aggregate fees billed for professional services render for the audit of the annual financial statements and the reviews of the biannual and quarterly financial statements;

IS = aggregate fees billed for financial information systems design and implementation;

Other = aggregate fees billed for all services rendered other than the services covered by Audit and IS;

Non-audit = sum of IS and Other; and,

Total = total fees billed.

The components of Other fees are as follows: Audit-Related, e.g., regulatory audits, and preparation of registration statements; Tax, e.g., preparation and filing of tax forms, and tax-related consulting; Combined Audit-Related and Tax, consisting of fees from both of the previous categories; and Other Advisory, e.g., general consulting services, and information technology consulting for systems not associated with the financial statements.

All levels are in thousands of Korean won except for FJN's Mean.

Table 3
Classification of Non-audit services and Comparison across Industries.

Panel A. Classification of Non-audit services

By the Types of the Service				
Variable	*Sum*	*%*	*n*	*Means*
Financial Statement	11,180,516	15.64	155	72,132
Tax	5,217,541	7.30	345	15,123
Corporate Finance	7,809,622	10.92	101	77,323
IT	13,933,706	19.49	20	696,685
Innovation	25,316,848	35.41	182	139,104
Valuation	4,949,704	6.92	87	56,893
Other Services	3,096,786	4.33	25	123,871
Total	71,504,723	100.00		
By the Primary Function of the Auditor				
Direct Performance	54,498,566	76.22	564	96,629
Consultation	15,246,976	21.32	120	127,058
Research/Investigation	1,759,181	2.46	60	29,320
Total	71,504,723	100.00		
By the regularity of the Auditor's Activity				
Regular	16,398,057	22.93	447	36,685
Non-regular	55,106,666	77.07	317	173,838
Total	71,504,723	100.00		
by the Object of the Non-audit Service				
Firm	58,582,421	81.93	592	98,957
Division/Department	12,922,302	18.07	118	109,511
Total	71,504,723	100.00		
By the Range of the Non-audit Service				
Overall Operations/Strategies	64,467,105	90.16	606	106,381
Specific Function	7,037,618	9.84	96	73,309
Total	71,504,723	100.00		
By the Financial Character of the Non-audit Service				
Financial	69,614,366	97.36	625	111,382
Non-financial	1,890,357	2.64	30	63,012
Total	71,504,723	100.00		

Table 3 (Continued)

Panel B. Comparison across Industries of Non-audit Services across Industries.

	Financial Statement				*Tax*				*Corporate Finance*				*IT*			
Industry Description	*Sum*	*%*	*n*	*Means*	*Sum*	*%*	*n*	*Means*	*Sum*	*%*	*n*	*Means*	*Sum*	*%*	*n*	*Means*
Agriculture	0	0.00	0	0	0	0.00	0	0	0	0	0	0	0	0.00	0	0
Mining/construction	781,632	25.00	22	35,529	280,997	8.99	27	10,407	718,413	22.97	21	34,210	0	0.00	0	0
Food	805,350	9.47	9	89,483	83,369	0.98	15	5,558	1,165,640	13.70	7	166,520	5,652,000	66.43	4	1,413,000
Textiles and printing/publishing	379,300	37.45	8	47,413	177,581	17.54	24	7,399	2,000	0.20	1	2,000	15,000	1.48	1	15,000
Chemicals	749,105	9.09	12	62,425	1,452,853	17.64	55	26,416	490,265	5.95	10	49,027	3,388,599	41.14	2	1,694,300
Pharmaceuticals	2,800	1.24	1	2,800	60,066	26.69	13	4,620	82,250	36.55	4	20,563	0	0.00	0	0
Extractive	340,147	6.56	16	21,259	518,901	10.00	39	13,305	728,500	14.04	7	104,071	0	0.00	0	0
Durable manufacturers	5,838,317	22.19	35	166,809	768,946	2.92	62	12,402	1,975,467	7.51	11	179,588	4,065,384	15.45	8	508,173
Transportation	32,941	4.26	2	16,471	164,232	21.24	16	10,265	414,000	53.55	3	138,000	0	0.00	0	0
Utilities	737,858	12.59	23	32,081	925,100	15.79	48	19,273	666,130	11.37	10	66,613	252,723	4.31	3	84,241
Retail	369,598	6.78	10	36,960	261,850	4.81	23	11,385	735,700	13.50	14	52,550	30,000	0.55	1	0
Services	1,120,468	20.60	16	70,029	207,646	3.82	15	13,843	831,257	15.28	13	63,943	0	0.00	0	0
Computers	23,000	1.67	1	23,000	316,000	22.92	8	39,500	0	0	0	0	530,000	38.43	1	530,000

	Innovation				*Valuation*				*Others*				*Total*			
Industry Description	*Sum*	*%*	*n*	*Means*	*Sum*	*%*	*n*	*Means*	*Sum*	*%*	*n*	*Means*	*Sum*	*%*	*n*	*Means*
Agriculture	0	0.00	0	0	0	0.00	0	0	0	0.00	0	0	0	0	0	0
Mining/construction	1,141,143	36.49	28	40,755	204,868	6.55	14	14,633	0	0.00	0	0	3,127,053	100	68	45,986
Food	449,500	5.28	8	56,188	264,000	3.10	6	44,000	88,000	1.03	3	29,333	8,507,859	100	33	257,814
Textiles and printing/publishing	337,471	33.32	9	37,497	79,142	7.81	1	79,142	22,200	2.19	2	11,100	1,012,694	100	38	26,650
Chemicals	1,764,025	21.42	23	76,697	294,805	3.58	9	32,756	97,000	1.18	2	48,500	8,236,652	100	76	108,377
Pharmaceuticals	67,500	29.99	6	11,250	12,442	5.53	3	4,147	0	0.00	0	0	225,058	100	24	9,377
Extractive	1,968,150	37.94	14	140,582	1,031,307	19.88	11	93,755	600,375	11.57	4	150,094	5,187,380	100	70	74,105
Durable manufacturers	11,044,854	41.98	35	315,567	674,420	2.56	14	48,173	1,942,211	7.38	8	242,776	26,309,599	100	119	221,089
Transportation	45,000	5.82	2	22,500	117,000	15.13	4	29,250	0	0.00	0	0	773,173	100	24	32,216
Utilities	1,926,798	32.89	26	74,108	1,350,300	23.05	9	150,033	0	0.00	0	0	5,858,909	100	81	72,332
Retail	3,382,837	62.09	13	260,218	335,288	6.15	10	33,529	333,000	6.11	4	83,250	5,448,273	100	46	118,441
Services	2,679,570	49.27	15	178,638	586,132	10.78	6	97,689	14,000	0.26	2	7,000	5,439,073	100	39	139,463
Computers	510,000	36.98	3	170,000	0	0.00	0	0	0	0.00	0	0	1,379,000	100	13	106,077

Table 4
Descriptive Statistics on Auditor Fees and the Economic Determinants and Correlation[a]
(1999 - 2002)

Panel A. Descriptive Statistics on Auditor Fees and the Economic Determinants

Variable[b]	*Mean*	*Std. Dev.*	*Median*	*10th percentile*	*90th percentile*	*Correlation with LNNFEE*
LNNFEE	2.62	4.43	0.00	0.00	10.18	-
LNFEE	10.88	0.64	10.74	10.25	11.76	0.414***
FIRST	0.41	0.49	0.00	0.00	1.00	-0.086***
TENURE	4.31	3.96	3.00	1.00	9.00	0.150***
OPINION	0.08	0.27	0.00	0.00	0.00	-0.036*
RESTATE	0.02	0.15	0.00	0.00	0.00	-0.038*
EXTRA	0.31	0.46	0.00	0.00	1.00	0.054***
BIG5	0.64	0.48	1.00	0.00	1.00	0.141***
LNTA	19.18	1.43	19.01	17.57	21.16	0.375***
SQSEGS	1.95	0.34	2.00	1.41	2.24	0.060***
SQEMPS	27.62	24.72	21.08	11.22	48.53	0.330***
EXPORT	0.81	0.39	1.00	0.00	1.00	0.002
LIQUIDITY	1.59	1.25	1.28	0.60	2.87	-0.089***
INVREC	0.28	0.14	0.26	0.10	0.48	-0.111***
ROA	0.04	0.11	0.05	-0.03	0.12	0.011
LOSS	0.41	0.49	0.00	0.00	1.00	-0.017
GROWTH	0.14	1.11	0.06	-0.20	0.36	-0.020
NEWFIN	0.44	0.50	0.00	0.00	1.00	0.147***
DA	0.63	0.90	0.55	0.27	0.91	0.002
INSTITUTION	8.07	12.95	2.96	0.00	22.19	0.065***
BIGGEST	28.65	18.76	27.25	2.35	52.37	-0.088***
BETA	0.85	0.42	0.84	0.42	1.28	0.135***
VOLATILITY	0.09	0.40	0.04	0.02	0.13	-0.037*
ALTMANZ	0.96	1.60	0.80	0.44	1.37	-0.012

[a]The Samples are composed of Korean listed firms over the period 1999-2002, after excluding samples of financial firms, missing data on audit fees and financial statement data. The final sample has 2,210 firm-year samples.
[b]Dependent and independent variables are measured at the end of fiscal year, otherwise stated.

LNNFEE = the natural logarithm of non-audit fees paid to the incumbent auditor (in thousands won);
LNFEE = the natural logarithm of audit fees paid to the auditor;
FIRST = binary variable that takes the value of 1 for the first two years after the audit engagement, and 0 otherwise (Korea Investors Services (KIS));
TENURE = The number of audit engagement year (KIS);
OPINION = binary variable set equal to 0 if the audit opinion (KIS Code 600101) in both the current and previous year is unqualified, and 1 otherwise;
RESTATE = dummy variable set equal to 1 if the client firm reports either gain (KIS Code 127136) or loss (KIS Code 127252) due to prior periods' error correction, and 0 otherwise;
EXTRA = dummy variable set equal to 1 if the firm reports either extraordinary gains (KIS Code 127100) or losses (KIS Code 127200), and 0 otherwise;
BIG5 = dummy variable set equal to 1 if the auditor is one of big five audit firms, and 0 otherwise (KIS);
LNTA = the natural logarithm of total assets (KIS Code 115000);
SQSEGS = the square root of the number of segments (Korea Listed Companies Association (KLCA));
SQEMPS = the square root of the number of employees (KIS Code 105000, measured in thousands);
EXPORT = dummy variable set equal to 1 if the firm's export sales (KIS Code 502001) are positive during the current fiscal year, and 0 otherwise;
LIQUIDITY = current assets (KIS Code 112000) divided by current liabilities (KIS Code 116000);

TABLE 4 (continued)

INVREC	=	sum of inventory (KIS Code 111400) and accounts receivable (KIS Code 111150), divided by total assets;
ROA	=	operating income (KIS Code 125000) divided by total assets;
LOSS	=	dummy variable set equal to 1 if the net income of the firm (KIS Code 129000) is negative in either one of the two previous fiscal years, and 0 otherwise;
GROWTH	=	percentage growth in sales (KIS Code 121100) over the previous fiscal year;
NEWFIN	=	dummy variable set equal to 1 if the firm reports new financing of either equity (KIS Code 163171) or long-term debt (KIS Code 163141-163144) in the current year, and 0 otherwise;
DA	=	debt divided by total asset;
INSTITUTION	=	institutional ownership (KIS Code 500303-500305, in percentage);
BIGGEST	=	the level of ownership by the largest stockholder (KIS Code 500404);
BETA	=	the firm's systematic risk estimated using monthly stock rates of returns from the one-factor market model over the fiscal year (Korea Investors Service - Stock Market Analysis Tool (KIS-SMAT));
VOLATILITY	=	the volatility of the residual using the market model over the fiscal year (KIS-SMAT); and
ALTMANZ	=	a score from Altman's (1968) bankruptcy prediction model.

***, **, *Significant at the .01, .05, and .10 levels.

TABLE 5
Single Equation Estimation of the Determinants of Non-audit Fee

$$LNNFEE = \beta_0 + \beta_1 (LNFEE) + \beta_2 (FIRST) + \beta_3 (TENURE) + \beta_4 (OPINION) + \beta_5 (RESTATE) + \beta_6 (EXTRA) + \beta_7 (BIG5) + \beta_8 (LNTA) + \beta_9 (SQSEGS) + \beta_{10} (SQEMPS) + \beta_{11} (EXPORT) + \beta_{12} (LIQUIDITY) + \beta_{13} (INVREC) + \beta_{14} (ROA) + \beta_{15} (LOSS) + \beta_{16} (GROWTH) + \beta_{17} (NEWFIN) + \beta_{18} (DA) + \beta_{19} (INSTITUTION) + \beta_{20} (BIGGEST) + \beta_{21} (BETA) + \beta_{22} (VOLATILITY) + \beta_{23} (ALTMANZ) + \beta_{24} (Idummies) + \beta_{25} (Ydummies) + e,$$

		OLS (1)[a]		*OLS (2)*[a]		*OLS (3)*[a]		*Tobit*	
Variable[b]	*Predicted Sign*	*Parameter Estimate*	*t-statistics*	*Parameter Estimate*	*t-statistics*	*Parameter Estimate*	*t-statistics*	*Parameter Estimate*	*Chi-Square*
Intercept		-21.38	-8.16***	-12.15	-5.28***	-20.72	-8.25***	-79.15	68.95***
LNFEE	+	2.07	7.07***			2.23	9.74***	5.45	25.22***
FIRST	-	-0.18	-0.79	-0.09	-0.39	-0.18	-0.80	-1.07	1.69
TENURE	+	0.06	2.15**	0.08	2.90***	0.06	2.16**	0.07	0.57
OPINION	-	-0.45	-1.30	-0.36	-1.04	-0.46	-1.34	-2.05	2.37
RESTATE	+	-0.29	-0.49	-0.15	-0.25	-0.32	-0.54	-1.53	0.42
EXTRA	+	0.53	2.54***	0.50	2.36**	0.54	2.58***	2.18	8.40***
BIG5	+	0.34	1.83*	0.53	2.83***	0.34	1.81*	0.88	1.51
LNTA	+	0.13	0.88	0.76	6.68***			0.75	2.07
SQSEGS	+	0.32	1.22	0.42	1.59	0.32	1.20	1.61	2.75***
SQEMPS	+	0.01	2.08**	0.02	3.74***	0.01	2.63***	-0.01	0.19
EXPORT	+	0.14	0.55	0.23	0.87	0.16	0.62	0.69	0.49
LIQUIDITY	-	0.08	1.04	0.03	0.37	0.08	1.05	0.21	0.51
INVREC	+	0.33	0.47	0.42	0.59	0.23	0.33	1.30	0.25
ROA	-	-0.77	-0.84	-1.24	-1.33	-0.66	-0.72	-3.34	1.00
LOSS	+	0.19	0.99	0.20	1.02	0.18	0.93	0.33	0.21
GROWTH	-	-0.05	-0.61	-0.04	-0.57	-0.05	-0.66	-0.19	0.32
NEWFIN	+	-0.04	-0.23	0.11	0.57	-0.03	-0.13	-0.16	0.05
DA	-	0.04	0.42	0.10	0.94	0.03	0.33	0.20	0.27
INSTITUTION	+	-0.01	-1.52	-0.01	-1.36	-0.01	-1.42	-0.03	1.28
BIGGEST	+	-0.01	-2.14**	-0.01	-2.46***	-0.01	-2.10**	-0.03	2.81*
BETA	+	0.46	2.03**	0.51	2.24**	0.48	2.14**	1.76	4.06**
VOLATILITY	+	-0.27	-1.20	-0.24	-1.07	-0.29	-1.29	-1.86	2.17
ALTMANZ	-	-0.14	-2.55***	-0.12	-2.08**	-0.15	-2.56***	-0.54	3.86**
Adj. R^2		0.20		0.18		0.20			
Obs.		2210		2210		2210		2210	

TABLE 5 (continued)

[a]OLS (1) includes both of audit fee (LNFEE) and firm size (LNTA); OLS (2) excludes LNFEE; and OLS (3) excludes LNTA in the regression.
[b]The definitions of variables are presented in Table 4, Panel A.
Industry dummies and Year dummies don't show.
***, **, *Significant at the .01, .05, and .10 levels.

Table 6
Heckman Two-stage Estimation of the Determinants of Non-audit Fee

$$LNNFEE = \beta_0 + \beta_1 (LNFEE) + \beta_2 (FIRST) + \beta_3 (TENURE) + \beta_4 (OPINION) + \beta_5 (RESTATE) + \beta_6 (EXTRA) + \beta_7 (BIG5) + \beta_8 (LNTA) + \beta_9 (SQSEGS) + \beta_{10} (SQEMPS) + \beta_{11} (EXPORT) + \beta_{12} (LIQUIDITY) + \beta_{13} (INVREC) + \beta_{14} (ROA) + \beta_{15} (LOSS) + \beta_{16} (GROWTH) + \beta_{17} (NEWFIN) + \beta_{18} (DA) + \beta_{19} (INSTITUTION) + \beta_{20} (BIGGEST) + \beta_{21} (BETA) + \beta_{22} (VOLATILITY) + \beta_{23} (ALTMANZ) + \beta_{24} (Adummy) + \beta_{25} (Cdummy) + \beta_{26} (Fdummy) + \beta_{27} (Pdummy) + \beta_{28} (Rdummy) + \beta_{29} (Idummies) + \beta_{30} (Ydummies) + e,$$

		Tobit		*Probit*		*Heckman (1)*[a]		*Heckman (2)*[a]	
Variable[b]	*Predicted Sign*	*Parameter Estimate*	*Chi-Square*	*Parameter Estimate*	*Chi-Square*	*Parameter Estimate*	*t-statistics*	*Parameter Estimate*	*t-statistics*
Intercept		-79.15	68.95***	-7.15	56.77***	-14.04	-2.03**	-8.09	-1.20
LNFEE	+	5.45	25.22***	0.52	23.16***	1.60	3.78***	1.15	2.79***
FIRST	-	-1.07	1.69	-0.10	1.48	-0.01	-0.08	0.04	0.27
TENURE	+	0.07	0.57	0.01	0.65	0.04	3.13***	0.04	2.65***
OPINION	-	-2.05	2.37	-0.21	2.52	0.04	0.14	0.03	0.12
RESTATE	+	-1.53	0.42	-0.14	0.38	-0.26	-0.63	-0.27	-0.70
EXTRA	+	2.18	8.40***	0.21	7.90***	0.29	1.48	0.21	1.15
BIG5	+	0.88	1.51	0.08	1.19	0.35	2.51***	0.29	2.15**
LNTA	+	0.75	2.07	0.05	0.98	0.22	2.20**	0.19	1.98**
SQSEGS	+	1.61	2.75***	0.14	2.23	0.42	2.09**	0.34	1.81*
SQEMPS	+	-0.01	0.19	0.00	0.12	0.00	-0.68	0.00	-0.24
EXPORT	+	0.69	0.49	0.07	0.53	-0.04	-0.22	0.03	0.16
LIQUIDITY	-	0.21	0.51	0.02	0.72	-0.06	-1.15	-0.05	-0.96
INVREC	+	1.30	0.25	0.17	0.43	-0.61	-1.30	-0.65	-1.45
ROA	-	-3.34	1.00	-0.31	0.93	-0.48	-0.69	-0.09	-0.14
LOSS	+	0.33	0.21	0.03	0.20	0.06	0.51	0.14	1.25
GROWTH	-	-0.19	0.32	-0.02	0.37	0.02	0.40	0.03	0.57
NEWFIN	+	-0.16	0.05	-0.02	0.07	-0.06	-0.56	-0.14	-1.26
DA	-	0.20	0.27	0.02	0.30	-0.04	-0.47	-0.03	-0.33
INSTITUTION	+	-0.03	1.28	0.00	1.76	0.00	1.06	0.00	0.39
BIGGEST	+	-0.03	2.81*	0.00	2.86*	-0.01	-2.13**	-0.01	-1.58
BETA	+	1.76	4.06**	0.18	4.51**	0.01	0.07	-0.06	-0.31
VOLATILITY	+	-1.86	2.17	-0.20	2.43	0.84	2.75***	0.82	2.84***
ALTMANZ	-	-0.54	3.86**	-0.05	3.33**	-0.14	-1.90*	-0.11	-1.59
Lambda						1.78	1.58	1.14	1.04

TABLE 6 (continued)

	Tobit		*Probit*		*Heckman (1)*[a]		*Heckman (2)*[a]	
Variable[b]	*Parameter Estimate*	*Chi-Square*	*Parameter Estimate*	*Chi-Square*	*Parameter Estimate*	*t-statistics*	*Parameter Estimate*	*t-statistics*
Adummy							0.28	2.36**
Cdummy							-0.38	-2.86***
Fdummy							-0.12	-0.50
Pdummy							0.28	1.90*
Rdummy							0.48	5.93***
Pseudo-R^2			0.13					
Adj. R^2					0.51		0.56	
Obs.	2210		2210		587		587	

[a]The composition of independent variables in Heckman (1) is same as OLS regressions in Table 5, Heckman (2) regression includes binary variables for the types of non-audit services provided by the incumbent auditors.

Lambda represents the fact that the non-audit service observations are expectable.

Adummy = dummy variable set equal to 1 if non-audit services are related to consultation, investigation, and research, and 0 otherwise;

Cdummy = dummy variable set equal to 1 if non-audit services relate to the client firm as a whole, and 0 if non-audit services relate to specific divisions or departments of the client firm;

Fdummy = dummy variable set equal to 1 if non-audit services are financial in nature, and (0) otherwise;

Pdummy = dummy variable set equal to 1 if non-audit services relate to the firm's overall operations or strategies, and 0 if non-audit services relate to specific functions within the firm (e.g., marketing-related tasks); and

Rdummy = dummy variable set equal to 2 if non-audit services represent non-routine works of auditors which include non-financial jobs and information technology (IT) related works, 1 if non-audit services relate to innovation, valuation, and financial IT, and 0 if non-audit services relate to routine managerial works including tax return filings.

[b]The definitions of other variables are presented in Table 4, Panel A.

Industry dummies and Year dummies don't show.

***, **, *Significant at the .01, .05, and .10 levels.