РАЗДЕЛ 1
НАУЧНЫЕ ИССЛЕДОВАНИЯ И КОНЦЕПЦИИ

SECTION 1
ACADEMIC INVESTIGATIONS & CONCEPTS

FEE ENDOGENEITY, DISCRETIONARY ACCRUALS AND MANAGERIAL INCENTIVES

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Abstract

Our study examines linkages between discretionary accruals, management ownership and remuneration and non-audit service (NAS) fees. All findings for our study are based on an extensive analysis of 351 Singapore publicly listed firms for the 2001 fiscal year period. Inferential statistics results using OLS and 2SLS reveals three key findings. First, there is a negative association between discretionary accruals and NAS fees. Second, managerial ownership positively affects the negative association between discretionary accruals and NAS fees. Third, this positive affect is weaker amongst firms with high accounting-based management remuneration. Our study also documents that when using single-equation estimates audit committee effectiveness is found to have a significant positive (negative) influence on audit coverage (purchase NAS fees). After controlling for fee endogeneity, however, the evidence shows that audit committee effectiveness is not associated with purchase of either audit or NAS fees. Findings from single-equation models of audit and NAS fees confirm prior research showing a knowledge spillover effect. Consistent with emerging literature, however, we show that when using simultaneous-equations the association between audit and NASs fees suffers from simultaneous-equation bias. Thus, consistent with Whisenant et al., (2003) we conclude there is no knowledge spillover between the two fees. Another key feature of this paper is we expand the very limited literature investigating linkages between audit committee effectiveness and the two fees. We document a failure to control for the feedback relationship between the two fee types is likely to produce spurious findings and inferences.

Keywords: corporae governance, audit, committee, data, selection.

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1. Introduction

Gul, Chen and Tsui (hereafter GCT) (2003) are the first to document evidence linkages between discretionary accruals (hereafter *DACs*), managerial share ownership and compensation, and audit fees. Our study advances the work of GCT (2003) in three major ways. First, we adjust the single-equation audit fee pricing model employed by GCT (2003) to control for potential compounding effects of two additional factors – audit committee effectiveness and non-audit service (NAS) fees – recently found to be significant determinants of audit fees. Second, we improve on the analytical methodology GCT (2003) employ by conducting simultaneous-equation estimation analysis to control for potential endogeneity influences between audit and NAS fees. Recent empirical research (e.g., Whiseant et al., 2003) show coefficients and standard errors obtained from single-equation audit (and non-audit) fee models may suffer from significant simultaneous-equation bias. Finally, and potentially the most noteworthy contribution of our study, we extend beyond the analysis of GCT (2003) to investigate the linkages between *DACs*, managerial share ownership and compensation, and NAS fees.

Several motivations underlie our study. An initial motivation stems from the intense international interest and concern (particularly amongst regulators and corporate governance reformists) about the affect of NASs purchased from the incumbent auditor on the quality of the financial reporting process. Levitt (2000, p.1), for example, states NASs "shorten the distance between the auditor and management" such that "independence – if not in fact, then certainly in appearance – becomes a more elusive propostion".[1] Another primary extends from the expanding global attention with the oversight role of the audit committee. Various international corporate reform committees (e.g., Blue Ribbon Committee, 1999; Cadbury, 1992; King, 1994, 2002; Corporate Governance Committee (CGC), 2001) stress a primary responsibility of the audit committee is to formally and regularly review auditor independence. Increasingly many perceive the provision of NASs by the incumbent auditor to its client may inescapably impair auditor independence. The question of how (or even if) audit committees act to preserve auditor independence by balancing the provision of audit fees and NAS fees by the incumbent auditor essentially remains open and largely unexplored. A final motivation for our study is emerging evidence that documented evidence of knowledge spillovers between audit and NAS fees, and vice versa, found using single-equation model specifications may be overstated due to simultaneous-equation biases.

We test our hypotheses using data hand collected from a sample of 351 Singapore publicly listed firms from the 2001 financial year. Consistent with prior literature we include measures for firm size, business complexity and risk as control variables in our audit and NAS fee pricing models. Proxy measures for *DAC*, managerial ownership and remuneration GCT (2003), whilst we construct a composite measure of audit committee effectiveness based on the committee's level of independence, diligence and expertise (e.g., Abbott et al., 2003a; Beasley and Salterio, 2001). The natural logarithm of total audit and NAS fees proxy for the two dependent variables (e.g., Whisenant et al., 2003; Abbott et al., 2003b).

Our single-equation estimates of the audit fee pricing model support the linkages defined by GCT (2003) despite: (a) use of data from an alternative domestic setting and time period; and (b) inclusion of audit committee effectiveness and NAS fees as additional explanatory variables. However, estimates of the audit fee pricing model using simultaneous-equations indicate the associations identified by GCT (2003) are no longer substantiated. Findings from simultaneous-equation estimation, therefore, imply failure of GCT (2003) to control for the endogeneity problem between audit and NAS fees may have biased their (GCT, 2003) findings.

In the case of NAS fee pricing model, we find as expected a significant and negative association between *DAC* and NAS fees whether using single- or simultaneous-equation estimations. Also, we find a positive interaction between *DAC* and managerial from both single- and simultaneous-equation estimates. This infers the negative association between *DAC* and NAS fees is weaker in firms where managerial ownership is higher. Finally, single- and simultaneous-equation estimates of the NAS pricing model show a significant negative three way interaction between *DAC*, managerial ownership and remuneration. Thus, findings support our conjecture the positive interaction between *DAC* and managerial ownership declines in firms with high accounting-based managerial remuneration.

We also document evidence of a moderately significant positive association between audit committee effectiveness and audit fees from both single- and simultaneous-equation estimations. A significant negative association is found between audit committee effectiveness and NAS fees from single-equation but not simultaneous-equation estimations. This infers that ignoring the feedback relationship between NAS and audit fees may results in a spurious inverse association between audit committee effectiveness and NAS fees.

Finally, we document a positive significant association between audit and NAS fees from both

[1] CGC recommendations reflect the concerns about the level of non-audit service fees to audit fees, and the impairment of auditor independence. The recommendations of the CGC in the Code of Corporate Governance (*The Code*) (CGC, 2001) require a firm's board and audit committee actively ensure a proper balance between the two fees.

audit and NAS pricing models when using single-equation estimates. When modeled jointly (i.e., simultaneously) there is no evidence of a statistically significant association between the two fees; thus, implying no knowledge spillover between audit fees and NAS fees, and vice-versa.

Our study makes several key contributions. First, we contribute to both the audit and NAS pricing literature documenting further (initial) empirical evidence of association between audit (NAS) fees and *DAC*, managerial share ownership and compensation. Also, we add to these literatures by providing additional tests of linkages between audit committee effectiveness and audit, and NAS fees across an alternative domestic setting. Second, we detail additional empirical evidence of the joint determination between audit and NAS fees. Finally, we contribute further evidence supporting the view that a failure to control for the simultaneous determination of audit and NAS fees may lead to: (i) different inferences about knowledge spillovers between the two services; and (ii) possible spurious interpretations of direct influences from other potential determinants of each respective fee.

The remainder of this paper is arranged as follows. The next section discusses prior literature and develops the literature. This is followed by a discussion on the audit and NAS pricing models. The sample data, descriptive statistic and correlations are then outlined. We then document the major empirical findings from our analysis. Major findings are then discussed. Concluding remarks and future research ideas are then outlined in the final section.

2. Theory and Hypothesis Development

Jensen and Meckling (1976) argue the demand for auditing services stems from a desire of reduce shirking by corporate management (the auditee) that occurs when information asymmetries arise following separation of ownership and control. The auditee can, via bonding expenditures, reduce agency costs they would otherwise bear if they voluntarily elect increase the observability of their actions by hiring independent external auditors to monitor their behaviour (Jensen and Meckling, 1976; Abbott et al., 2003b).

The degree to which the auditee voluntarily increases observability of their actions by appointing independent external auditors still remains an open empirical question. Prior research identifies some factors influencing the auditee's decision on the extent of audit quality and coverage they are willing to purchase from the incumbent auditor. Findings, however, remain generally preliminary in nature, or are mixed and inconclusive. We concentrate on three potential aspects of influence (purchase of NASs; level of discretionary accruals; and presence of an effective audit committee) in developing testable hypotheses related to the auditee's pricing decision.

2.1. Influence of Discretionary Accruals, and Managerial Ownership and Remuneration

Whilst GCT (2003) utilized the audit risk model to develop a link with audit fees, we adapt the same model to hypothesize the potential influence of discretionary accruals on NAS fees. Consistent with GCT (2003) we presume a firm's inherent risk (as assessed by the auditor) is greater when discretionary accruals are higher. If the auditor determines the inherent risk of a client is higher there is likely to be a greater propensity to refrain from offering NASs. This is because by providing NASs to a high risk client the auditor faces more substantial financial losses (not only from reduction in audit and NAS fees but legal litigation[2]) if financial misstatements and fraud are undetected during the audit process. If the auditor is indeed willing to provide NASs to a high inherent risk client with sizeable discretionary accruals, the auditor is less likely to offer any discounts that may be afforded due to benefits arising from knowledge spillover from the audit process. Due to the higher charges offered by the incumbent auditor, the auditee may be more willing to purchase NASs from another auditor/service provider. The other auditor/service provider may be more willing to offer a discount for NASs provided as they are less financially exposed to the risks of financial misstatement or fraud being undetected. Another argument supporting a negative association between discretionary accruals and NAS fees stems from the perceptions and possible actions of shareholders and debtholders. Where discretionary accruals are deemed to be high shareholders and debtholders may subject the auditee to greater attention and calls for additional monitoring. In this event the auditee may place a higher reliance on the audit to attest to their actions and decisions. If, however, the auditee purchases NASs from the incumbent auditor, shareholders and debtholders may perceive this as impairing auditor independence. Consequently, shareholders and debtholders may discount the monitoring value of the audit diminishing any benefits corporate management had sought from it. Economic benefits of joint production from audit and NASs, therefore, are offset by higher agency costs. Thus, *ceteris paribus*, corporate management are likely to demand lower levels of NASs where discretionary accruals are high.

Surrogates for agency costs, such as managerial ownership, are likely to influence an auditee's

[2] Presuming the existence of a knowledge spillover effect from the provision of non-audit services, stakeholders may argue during legal litigation action that provision of such services would have given the auditor greater intimate knowledge of the auditee. Consequently, the auditor would have been better placed to detect financial misstatements and fraud. Failure on the part of the auditor to detect financial statements and fraud,, therefore, may be construed more significant than if only audit services were provided.

willingness to purchase NASs. Affording corporate management an equity stake in the firm is presumed to align their interests with those of external shareholders. Agency theorists, therefore, posit managerial ownership reduces agency conflicts. If agency conflicts are reduced the significance of monitoring mechanisms such as the audit is also likely to be diminished. In this light there is likely to be less questions about actions and activities that may be perceived as impairing auditor independence. The auditee, therefore, will have a higher propensity to take advantage of the joint production benefits of provision of audit and NASs by the incumbent auditor. That is, higher managerial ownership is likely to lead to the purchase of more NASs from the incumbent auditor. The proposed managerial ownership – NAS fee linkage is likely to hold even when discretionary accruals are high. As GCT (2003) argues managerial ownership will influence the likelihood reported accruals are subsequently realized. Specifically, when managerial ownership is high, corporate management are thought to be more inclined to use discretionary accruals with a greater likelihood of being realized in the future. GCT (2003, p.446) state auditors will "incrementally reduce the assessed level of inherent risk associated with DAs [*discretionary accruals*] when the level of managerial ownership in the firm is high." By reducing their assessment of inherent risk the external auditor is likely to be inclined to withhold NAS or charge them at a premium. Further, shareholders and debtholders are less likely to question actions and decisions that could impair auditor independence. Consequently, the auditee has greater incentive to purchase more NASs when managerial ownership is higher.

Greater accounting-based management remuneration is likely to have a negative impact on the interaction between discretionary accruals and managerial ownership. Higher levels of compensation related to accounting-based outcomes is likely to increase agency costs (e.g., Goldberg and Idson, 1995; Lambert and Larcker, 1987). Warfield et al., (1995, p.65) state, for example, the "presence of accounting-based provisions in compensation plans is inversely related to managerial ownership (i.e., increasing agency costs motivate use of accounting-based compensation plans)." GCT (2003) also argues managerial remuneration influences the type of accruals adopted by corporate management. Specifically, corporate management is more likely to select discretionary accruals most beneficial for maximizing their total compensations. Such discretionary accruals are likely to be those with a lower probability of realization. By selecting discretionary accruals with a lower likelihood of realization GCT (2003) propose auditors will perceive this as signaling the firm's increased inherent risk. Whether it be increased agency costs or high inherent risk, corporate management in firms with high accounting-based management compensation are likely to be in sub-optimal positions to take advantage of any joint production benefits from knowledge spillover effects of audit and NASs. Consequently, corporate management is likely to be less inclined to purchase NASs. Based on the above discussion we test the following hypotheses:

H1a: *Ceteris paribus*, there is a negative association between discretionary accruals and NASs purchased.

H1b: Ceteris paribus, the negative association between discretionary accruals and NASs purchased will be stronger for firms with high levels of managerial ownership.

H1c: *Ceteris paribus*, the positive interaction between discretionary accruals and managerial ownership will be stronger for firms with high accounting-based management compensation.

With regard to the impact of discretionary accruals, and management ownership and remuneration on audit fees we do not deviate – due to the nature of this study and empirical findings of GCT (2003) – directly from the original propositions forwarded by GCT (2003). In summary, therefore, we expect: (a) discretionary accruals to have a positive association with audit fees; (b) higher levels of managerial ownership will have a negative impact on the discretionary accrual – audit fee link; and (c) the moderating influence of higher managerial ownership on the discretionary accrual – audit fee link will be weaker if accounting-based management remuneration is high. Consequently, the following testable hypotheses are formed:

H2a: *Ceteris paribus*, there is a positive association between discretionary accruals and audit services purchased.

H2b: *Ceteris paribus*, the positive association between discretionary accruals and audit services purchased will be stronger for firms with high levels of managerial ownership.

H2c: *Ceteris paribus*, the negative interaction between discretionary accruals and managerial ownership will be weaker for firms with high accounting-based management compensation.

2.2. Association between Audit and NAS Fees

For more than a decade various groups (e.g., regulators, corporate governance reformists, stock exchanges) argued auditor independence is impaired when audit and NASs are provided jointly by the incumbent auditor. Agency theorists (e.g., Fama and Jensen, 1983; Jensen and Meckling, 1976; Watts and Zimmerman, 1986, 1990) conjecture the auditee is sensitive to perceptions of impaired independence since credible auditors are used to reduce principal-agent conflicts. Specifically, it is posited within the agency theory framework the demand for

independent audits occurs because the auditee wishes certification of their financial disclosures and verification for actions taken. In the absence of independent monitoring agency costs are imposed on the auditee. Any perceived impairment to auditor independence reduces the expected monitoring value of an audit and increases agency costs. There is motivation, therefore, for auditee to avoid audit devaluation and agency costs by managing the perceived level of economic bonding with the incumbent auditor by controlling the joint proportion of audit and NASs.

Prior research of the joint provision of audit and NASs generally finds a positive association between the two fee categories. Simunic (1984, p.698) argues this finding is "consistent with the hypothesis that the cost function for MAS and auditing are significantly interdependent. Specifically…the observed relationship would arise if the production of auditing generates knowledge useful in MAS production and/or the production of MAS reduces the marginal cost of auditing and audit demand is relatively elastic." Recent studies using U.S., Australian and U.K. data (e.g., Davis et al., 1993; Bell et al., 2001; Butterworth and Houghton, 1995; Craswell and Francis, 1999; Ezzamel et al., 1996) provide additional evidence of a significant positive association supporting the proposition of beneficial knowledge spillover from NASs to audit fees. Prior research also documents a significant and positive influence of audit fees on NAS fees (e.g., DeBerg et al., 1991; Craswell, 1999). These studies conclude there is the presence of a knowledge flow from audit to NASs.

Findings supporting knowledge spillover effects from audit fees to NAS fees, and vice-versa, rely on single-equation models. Emerging empirical research casts doubt on prior findings based on single-equation models. Whisenant et al., (2003), for example, argue audit and NAS fees are jointly determined. Thus, findings using equation estimates may suffer from significant simultaneous-equation bias with the significance of all estimated coefficients (and associated standard errors) overstated (understated) (Maddala, 1991). In support of their argument of joint determination affects Whisenant et al., (2003, p.742) document evidence showing "inferences about knowledge spillovers from non-audit services to audit services, as well as audit to non-audit services, are different using single-equation and simultaneous-equation specifications."

We wish to further document evidence of the association between audit and NAS fees (with consideration for the possible endogeneity concern between the two fees) in relation to the impact of findings GCT's (2003) findings. Given the conflicting prior empirical findings we do not develop a directional hypothesis *a priori*. Thus, we test the following (in the null form):

H3: Ceteris paribus, there is no association between audit service and NASs purchased from the incumbent auditor.

2.3. Audit Committee Effectiveness

Previous studies have examined the relationship between audit committees and other corporate reporting/auditing issues. These include auditor dismissals following going concern reports (Carcello and Neal, 2003), discretionary accruals (Klein, 2002), financial misstatements (Abbott et al., 2003a) and auditor resignations (Lee et al., 2003). There exists little research, however, of the association between audit committee characteristics and respective fees (audit and NAS) paid to the incumbent auditor. Whilst several definitions exist audit committee effectiveness is broadly described as being a function of independence, diligence and expertise. It is generally posited by regulators, corporate governance reformists and scholars alike that a more effective audit committee demands greater audit quality, thereby, requiring increased effort on the part of the incumbent auditor. Consequently, audit fees are higher. Conversely, an effective audit committee is likely to display a heightened sensitivity toward perceptions of impaired auditor independence. As a result an effective audit committee is likely to seek to decrease the perceived level of economic bonding between the incumbent auditor and firm leading to lower fees paid to the incumbent auditor for NASs.

Findings from prior research of the association between audit committee effectiveness and audit fees are generally mixed and inconclusive. Drawing on U.S. data Abbott et al., (2003b) show audit committee independence and expertise are positively statistically associated with audit fees. However, diligence and audit fee were not statistically associated. Based on their findings Abbott et al., (2003b) conclude an effective audit committee is associated with higher audit fees. Conversely, based on a study of Australian firms Sharma (2003) finds audit committee diligence, rather than independence and expertise, is positively associated with audit fees. A three-way interaction variable comprising the three major characteristics of audit committee effectiveness, however, indicates audit fees are generally higher in firms with more effective audit committees. Finally, Goddard and Master (2000), using a sample of 223 U.K. publicly listed firms, fail to find any association between audit committee effectiveness and audit fees.

To our best knowledge there are only two studies investigating the association between audit committee effectiveness and NAS fees. Again, empirical findings are mixed. Consistent with expectations Abbott et al., (2003b) find a negative and significant. They (Abbott et al., 2003 b) use a

composite measure based on independence and diligence to measure audit committee effectiveness whilst defining NAS fees as the ratio between NASs paid to total audit services purchased. Based on their findings, Abbott et al., (2003b) conclude an effective audit committee reduces NASs purchased from the incumbent auditor. Like Abbott et al., (2003), Antle et al., (2002) find, when using a single-equation model and a composite proxy, audit committee effectiveness is inversely related to NAS fees. Antle et al., (2002) also test for the moderating influence of joint determination of audit and NAS fees on the audit committee effectiveness – NAS fee linkage using a simultaneous-equation model. They (Antle et al., 2002) find when using simultaneous-equation estimation no significant association. Consequently, Antle et al., (2002) argue the negative association documented using single-equation estimates are spurious, occurring because the joint determination of fees is not accounted for. Overall, Antle et al., (2002) conclude effective audit committees *do not* regard NASs as compromising auditor independence. This conclusion is consistent with other related work by Chung and Kallapur (2003) and Ashbaugh et al., (2003).

Despite mixed empirical findings we construct our hypotheses based on the general presumption of a positive (negative) influence of audit committee effectiveness on audit (NAS) fees. Thus, we test the following:

H4a: Ceteris paribus, there is a positive association between audit committee effectiveness and audit services purchased from the incumbent auditor.

H4b: Ceteris paribus, there is a negative association between audit committee effectiveness and NASs purchased from the incumbent auditor.

3. Specifications: Audit and Non-Audit Fees Pricing Models

Prior research of the determinants of audit and NAS fees rely on observable data as proxies for the demand- and supply-side factors generating outcomes of audit and NASs evident in fees paid. For consistency we generally follow GCT (2003) in developing our audit and NAS fee pricing models. Control variables included in the audit and NAS fee pricing models monitor the compounding effects of firm size, operating performance, business complexity and risks, and auditor type. Prior research strongly supports their inclusion (e.g., Simunic, 1980; Palmrose, 1986; Craswell et al., 1995; Parkash and Venable, 1993; Firth, 1997; Frankel et al., 2002).The audit fee pricing model is as follows:

$$LogTAudFee_i = a_i + \alpha_{i1}FSize_i + \alpha_{i2}\ Busy_i + \alpha_{i3}ForSub_i + \alpha_{i4}Leverage_i + \alpha_{i5}LogSub_i + \alpha_{i6}ROA_i + \alpha_{i7}Big\text{-}5_i + \alpha_{i8}CurR_i + \alpha_{i9}ARec_i + \alpha_{i10}InvR_i + \alpha_{i11}Loss_i + \alpha_{i12}Delay_i + + \alpha_{i13}DAC\ Ind_i + \alpha_{i14}Dac\ Ind_i{*}DAC_i + \alpha_{i15}Own\%_i + \alpha_{i16}Remun_i{*}Own\%_i + \alpha_{i17}Remun_i + \alpha_{i18}Remun_i{*}Dac\ Ind_i + \gamma_{i1}DAC_i + \gamma_{i2}Own\%_i{*}DAC_i + \gamma_{i3}Own\%_i{*}Remun_i{*}DAC_i + \lambda_{i1}AudEff_i + \omega_{i1}LogNAudFee_i + \varepsilon_i \quad (1)$$

And the NAS fee pricing model as:

$$LogNAudFee_i = a_i + \alpha_{i1}FSize_i + \alpha_{i2}\ Busy_i + \alpha_{i3}ForSub_i + \alpha_{i4}Leverage_i + \alpha_{i5}LogSub_i + \alpha_{i6}ROA_i + \alpha_{i7}Big\text{-}5_i + \alpha_{i8}CurR_i + \alpha_{i9}ARec_i + \alpha_{i10}InvR_i + \alpha_{i11}Loss_i + \alpha_{i12}Issue_i + \alpha_{i13}DAC\ Ind_i + \alpha_{i14}Dac\ Ind_i{*}DAC_i + \alpha_{i15}Own\%_i + \alpha_{i16}Remun_i{*}Own\%_i + \alpha_{i17}Remun_i + \alpha_{i18}Remun_i{*}Dac\ Ind_i + \gamma_{i1}DAC_i + \gamma_{i2}Own\%_i{*}DAC_i + \gamma_{i3}Own\%_i{*}Remun_i{*}DAC_i + \lambda_{i1}AudEff_i + \omega_{i1}LogTAudFee_i + \varepsilon_i \quad (2)$$

Apart from *LogNAudFee*, *Delay*, *Issue* and *AudEff*, all other variables defined in *Equations 1* and *2* are replicated from GCT (2003). For further consistency the proxy measures used to operationalize imported variables also follow GCT (2003). We adopt this approach in an effort to enhance comparability of findings.

Consistent with other studies (e.g., Francis and Simon, 1987; Whisenant et al., 2003) we operationalize the dependent variables (i.e., *LogTAudFee* and *LogNAudFee*) in *Equations 1* and *2* as the natural logarithm of audit and NAS fees respectively (expressed actual $SGD) so as to linearize their relationship with the measure of client size.

Drawing on related audit committee research (e.g., Abbott et al., 2003b; Beasley and Salterio, 2001), we proxy audit committee effectiveness (i.e., *AudEff*) by constructing a composite score based on three audit committee features: (1) independence; (2) diligence; and (3) expertise. We award an audit committee a score of one when meeting each of the following conditions: (1) audit committee comprises only independent directors; (2) audit committee met at least three times during firm's 2001 fiscal year; and (3) at least one serving independent director possesses educational qualifications or professional certifications in accounting or law. Firm with an audit committee meeting all conditions receive a score of three; two of three a score of two; one of three a score of one; and zero if meeting none.

To avoid creating a singular covariance matrix in the second stage of 2LS estimation, it is necessary we specify based on prior research explanatory variables that are conjectured to be unique in their direct influence on audit and NAS fees (Whisenant et al., 2003). Reporting lag (*Delay*) – defined as the number of days between the end of the fiscal-year end and earnings announcement date – is found to affect only audit fees. Conversely, recent issuances (defined as occurring in years *t*- and *t*-1) of new finances (*Issue*) is found to only influence NAS fees (Whiseant et al., 2003). We include an indicator

variable whereby firms issuing new finances in either 2000 or 2001 are scored one and all remaining firms zero. In analytical tests with *LogTAudFee* as the dependent variable *Issue* is excluded, whilst *Delay* is excluded for all tests with *LogNAudFee* as the dependent variable.

Table I formally summarizes the proxy measures for each dependent, independent and control variables, and interaction terms included in *Equations 1* and *2. [See appendices, table I].*

A positive (negative) coefficient, γ_{i1}, in regressions based on *Equation1* (*Equation 2*) would support the suggestion higher discretionary accruals leads to greater (lower) audit (NAS) fees. If the level of ownership moderates discretionary accruals – audit (NAS) fee linkages as predicted then the coefficient, γ_{i2}, will be negative (positive). Conversely, the coefficient, γ_{i3}, will be positive (negative) if the level of accounting-based management compensation offsets the influence of higher managerial ownership. If audit committee effectiveness positively influences the quality and coverage of the audit we expect the coefficient, λ_{i1}, will be positively significant regressions based on *Equation 1*. Conversely, if more effective audit committees perceive NASs increase economic bonding between corporate management and the incumbent auditor we expect the coefficient, λ_{i1}, to be negatively significant in regressions based *Equation 2*. Finally, a positive coefficient, ω_{i1}, in regressions based on *Equations 1* and *2* will support the proposition of knowledge spillovers between non-audit and audit services, and vice-versa.

4. Sample Data and Descriptive Statistics

4.1. Sample Selection

Our initial sample comprises 492 firms representing all publicly traded entities listed on the Singapore Stock Exchange (SGX) as at December 31, 2001. Consistent with prior research firms we exclude 111 firms as they were either: (a) from the financial sector; (b) incorporated in a foreign nation; and (c) only listed on the SGX during 2001. Data needed to calculate proxy measures for the dependent, experimental and control variables is hand collected from 2001 fiscal year annual reports. Twenty-one firms were excluded from the analysis as the complete source documentation sought could not be obtained. A further 35 firms were excluded as there is insufficient corporate governance and financial data provided in their 2001 fiscal year report to calculate corresponding proxy measures. Finally, we exclude a further fifteen outliers (>4 standard deviations from the dependent variable's mean). Reported analysis reported is based on a final useable sample of 351 firms. Table II Panel A summarizes the sample selection process. *[See appendices, table II].*

Table II Panel B reports the industry breakdown of the final useable sample. For comparative purposes Table II Panel B also details distribution by industry of firms listed on the SGX as at the end of December 31, 2001. Generally, industry distribution patterns of the final useable the sample and SGX are relatively similar. For instance, consistent with Singapore's general economic base our final useable sample comprised a large proportion of manufacturing firms (39.68% final useable sample) with a strong representation from the commerce and construction sectors (18.06% and 11.29% respectively). One contrast to the sample used by GCT (2003) is our final useable sample does not comprise any natural resource firms. Singapore's lack of natural resources, and insufficient expertise of this industry, likely accounts for non-representation of natural resource industry firms in our final useable sample.

4.2. Descriptive Statistics

Table III reports the composition of total (audit and NAS) fees paid to audit firms by industry. Data indicates some industry variations[3] in the relative levels of audit and NASs provided by the incumbent auditor. Firms in the *Manufacturing – Electrical* and *Manufacturing – Metal Products*, for example, purchase the lowest relative levels of NASs to total fees (13.34% and 14.37% respectively). Comparatively, firms in the *Manufacturing – Machinery and* Equipment, *Other – General Services* and *Commerce – Retail* sectors purchase the highest (55.29%, 46.14% and 41.43% respectively). *[See appendices, table III*].

Descriptive statistics for dependent, experimental and control variables for the full final useable sample are presented in Table IV. Relative to other developed nations, such as Australia, U.K. and U.S., the actual value of audit and NAS fees paid by Singapore firms is generally lower (e.g., Sharma, 2003; Whisenant et al., 2003; Abbott et al., 2003a). Further, the ratio of NAS fees to audit fees is in general lower (e.g., Abbott et al., 2003b). Our final useable is relatively comparable to that used by GCT (2003) across a number of variables such as the level of managerial ownership and remuneration. However, the samples differ in other aspects. For example, mean *ROA* (percentage of firms reporting a loss) is higher (lower) for our final useable sample relative to the GCT (2003) sample. Firms in both samples were the subject of trying economic conditions. The firms in our sample, however, appear not have been hard pressed as those in the GCT (2003) sample. A small geographical size, closer proximity to neighbouring nations and more intense

[3] Due to these differences we include industry intercepts in the regression analysis to control for the cross-section variations in the level of audit and non-audit service fees between industry sectors.

globalization pressures likely accounts for the higher percentage of foreign subsidiaries owned by firms in our sample relative to those in the GCT (2003) sample. Our sample's current ratio mean is lower than the GCT (2003) sample, whilst the means for accounts receivable and inventory ratios are higher. Differences in industry sector representation levels may, in part, explain these variations. Finally, the mean *DACs* to total assets as at *t*-1 for our sample are greater than that reported by GCT (2003)(-3.20% compared to -2.40%). This finding is not completely unexpected as Leuz et al., (2003) reports discretionary accrual levels in Singapore are generally higher than Australia. *[See appendices, table IV].*

4.3. Correlations

Table V presents a correlation matrix between the dependent and experimental variables.[4] The upper half reports Pearson pairwise correlation coefficients (cr_p), whilst the lower half Spearman correlation coefficients (cr_s). *DACs* ($p<0.05$ in both cr_p and cr_s), *Own%* and *Remun* ($p<0.01$ in both cr_p and cr_s) are negatively significantly correlated with *LogTAudFee*. Conversely, *LogTAudFee* is positively correlated with *AudEff* ($p<0.01$ in both cr_p and cr_s) and *LogNAudFee* ($p<0.01$ in both cr_p and cr_s). Meanwhile, *LogNAudFee* is negatively significantly associated with *DACs* ($p<0.05$ in cr_p and 0.01 in cr_s), *Own%* ($p<0.01$ in both cr_p and cr_s), *Remun* ($p<0.01$ in both cr_p and cr_s) and *AudEff* ($p<0.01$ in both cr_p and cr_s). Correlations outlined above provide initial general support for *H1b*, *H4a* and *H4b*, whereas *H3* and *H1a* are not supported. Whilst correlations between *LogTAudFee* and *DACs* are contrary to expectations, they are consistent with GCT (2003). They (GCT, p.453) state that despite the negative correlation this "results does not necessarily contradict our hypothesized relationship between audit fees and DAs [*discretionary accruals*], because it is obtained from a univariate test that does not control for the effects of other variables." Correlations between experimental variables are consistent with prior empirical research (e.g., GCT, 2003). *[See appendices, table V].*

[4] For brevity Pearson and Spearman pairwise correlations for control factors are not tabulated. In short, correlations for the majority of control variables are significant and in the predicted directions. Importantly, though, correlations between control variables do not exceed 0.400. Farrar and Glauber (1967) argue bivariate correlation values above 0.8 indicate harmful levels of mulitcollinearity (also see Hair et al., 1995). Nonetheless, we further test for multicollinearity calculating variance inflation factor (VIF) values (not tabulated) for single-equation estimates. VIF values do not exceed 2.00. This is substantially below the critical value of 10.00 (Netter et al. 1989). Overall, multicollinearity is deemed not to be a serious concern.

5. Results: Single- and Simultaneous-Equation Analysis

Our first objective is to determine the robustness of the findings from the audit fee pricing model employed by GCT (2003): (a) using data from an alternative domestic setting; and (b) the inclusion of NAS fees and audit committee effectiveness. We are then interested in determining if findings of GCT (2003) are artifacts of simultaneous-equations bias rather than signals of casual relations. Table V reports results of three regression estimates: (a) OLS regression based on the original audit fee pricing model of GCT (2003) (Panel A); (b) OLS regression based on *Equation 1* (Panel B); and (c) 2LS regression based on *Equation 1* (Panel C). Findings reported in Table V Panel A generally support the findings of GCT (2003). These results infer the findings of GCT (2003) hold when using sample drawn from an alternative domestic setting. The results of GCT (2003) continue to hold after including NAS fees and audit committee effectiveness into the audit fee pricing model (see Table VI Panel B). The only difference of any reasonable note between our findings and those of GCT (2003) is the coefficient on *Own%*DAC* is negatively significant at the 1% confidence level in our tests rather than 5% for GCT (2003). Simultaneous-equation estimates of *Equation 1*, however, yield conflicting results. Specifically, 2LS regression results reported in Table VI Panel C show the coefficients on *DAC*, *Own%*DAC* and *Own%*Remun*DAC* are insignificant from zero. These findings imply coefficients and standard errors based on single-equation estimates suffer significant simultaneous-equation bias. *[See appendices, table VI].*

The second major objective of our study is to advance the work of GCT (2003) by investigating the association between NAS fees and discretionary accruals, and management ownership and remuneration. Results from three regressions (non-audit pricing fee model based on the GCT (2003) model; OLS regression based on *Equation 2*; and 2LS regression based on *Equation 2*) are reported in Table VII Panels A, B and C respectively. Coefficients on *DAC* are negative and significant in all regressions reported in Table VIII ($p<0.05$ Panel A and C; and $p<0.01$ Panel B). Results imply that when discretionary accruals are higher corporate management are less willing or unable to purchase NASs from the incumbent auditor. The coefficients on the interaction term *Own%*DAC* are positive and significant ($p<0.10$ Panel A; $p<0.01$ Panel B; and $p<0.05$ Panel C). Findings are consistent with the contention higher managerial ownership reduces the sensitivity toward the perceived level of economic bonding between the firm and incumbent auditor from the purchase of NASs. The coefficient on the three-way interaction term *Remun*Own%*DAC* is

not significant from zero in the OLS regression based on the GCT (2003) model (Table VIIPanel A). However, the coefficient is negative and significant in the OLS and 2LS regression tests based on *Equation 2* ($p<0.01$ Table VII Panel B and $p<0.05$ Table VII Panel C). Findings, therefore, partially support the inference the influence of managerial ownership in moderating the link between discretionary accruals and NAS fees is offset by higher management remuneration. *[See appendices, table VII]*.

Another key focus of our study is to provide further evidence of knowledge spillovers between audit services and NASs, and vice versa. Findings from single-equation estimates of *Equation 1* reported in Table VI Panel show the coefficient on *LogNAudFee* to be positively significantly associated with *LogTAudFee* ($p<0.01$). After controlling for endogeneity between the two fees, however, the association is insignificant from zero (see Table VI Panel C). OLS regression results reported in Table VII Panel B show the coefficient on *LogTAudFee* is positive and significant ($p <0.001$). Results reported in Table VII Panel C, however, show that when we perform simultaneous-equation estimation of *Equation 2* the coefficient on *LogTAudFee* is not significantly different from zero.

Finally, we are interested in documenting further empirical evidence of the association between audit and NAS fees, and audit committee effectiveness. Results of single- and simultaneous-equation estimates of *Equation 1* reported in Table VII Panels B and C indicate audit committee effectiveness is moderately positively associated with audit fees ($p<0.10$). Consistent with prior empirical findings, we find a significant and negative coefficient on *AudEff* for the single-equation estimation of *Equation 2* (Table VII Panel B p-value <0.05). Conversely, for simultaneous-equation estimates the coefficient on *AudEff* is insignificant from zero.

6. Discussion

A number of key conclusions are drawn from our findings. Results of single-equation estimates of the audit fee pricing model of GCT (2003) and *Equation 2* support the findings and interpretations of GCT (2003). These findings are of significance for two important reasons. First, consistent findings using the GCT (2003) audit fee pricing model whilst using data from an alternative domestic setting and time period infers the results of GCT (2003) can be applied across national boundaries and were not time specific. Second, findings based on our audit fee pricing model suggest that employed by GCT (2003) is not subject to misspecification despite omission of two key determinants of audit fees as defined by prior literature. Estimates based on simultaneous-equations, however, provide a contrasting picture. Whilst single-equation estimates support acceptance of *H2a*, *H2b* and *H2c*, simultaneous-equation estimates call for their rejection. That is, simultaneous-equation estimate results infer there is a lack of a: (a) positive association *DAC* and audit fees; (b) moderating influence on the *DAC* – audit fee linkage from managerial ownership; and (c) reduction in the negative interaction between *DAC* and managerial ownership when accounting-based management remuneration is higher. Overall, our findings from simultaneous-equation estimates suggest the failure by GCT (2003) to control for the joint determination of audit and NASs results spurious and misleading findings.

Single-equation estimates of the non-audit pricing model indicate a negative association between the level of discretionary accruals and non-audit fees. This implies when discretionary accruals are higher the auditee purchases less NASs from the incumbent auditor. This could be due to the auditee's: (a) heightened sensitivity toward the perceive existence of economic bonding between the firm and incumbent auditor: and/or (b) greater unwillingness to purchase NASs priced higher by the external audit due to more extensive inherent risk extending from greater potential discretionary accruals will not be realized in the future. The significant positive interaction between discretionary accruals and managerial ownership from single-equation estimates, meanwhile, infer in firms with higher managerial ownership there is less sensitivity toward the perceived level of economic bonding between the incumbent auditor and the firm. Consequently, these firms are more willing to purchase more NASs from the incumbent auditor. Finally, the significant and positive three-way interaction between *DAC*, managerial ownership and remuneration suggests interaction between discretionary accruals and managerial ownership declines in firms where accounting-based management remuneration is high. Hence, single-equation estimates of discretionary accruals, management ownership and remuneration within the non-audit pricing model do not appear to be influenced by simultaneous bias. Findings related to NAS fee found from single-equation estimates continue to hold when simultaneous-equation estimation is performed. Based on the findings of OLS and 2LS regression analysis Hypotheses *H1a*, *H1b* and *H1c* are accepted.

Prior empirical research of audit and NAS fee pricing models using single-equation generally support the existence of client-specific knowledge spillovers between audit fees and NAS fees, and vice-versa (e.g., Simunic, 1984; Davis et al., 1993; Deberg et al., 1991; Craswell, 1999). Our findings from from single-equation estimates are consistent with the prior research. We show, however, that consistent with Whisenant et al., (2003) and Antle et al., (2002) the audit and NAS fees are endogenously

determined. Consequently, when modeled jointly in simultaneous-equation tests audit and NAS fees are found to be unrelated. These findings provide further evidence to support recent emerging suggestions that contrary to prior research using single-equation model estimations there is no knowledge spillovers from audit fees to NAS fees, and vice-versa. On the back of findings from simultaneous-equation estimation we conclude our findings support acceptance of the null hypothesis *H3*. One immediate and important implication follows this conclusion. Specifically, findings imply less justification for excluding the incumbent auditor from completing NASs. There would have been greater justification if we had documented joint-supply benefits.

Finally, findings show a positive association between audit committee effectiveness and audit fees when using both single- and simultaneous-equation estimations. These results support the contention that a more effective audit committee is likely to demand more extensive audit coverage from the incumbent auditor. Findings are consistent with prior empirical work (e.g., Abbott et al., 2003a; Antle et al., 2002). Based on these empirical tests *H4a* is accepted. Also, our findings from single-equation estimates confirm prior the findings of Abbott et al., (2003b) who show a composite proxy for audit committee effectiveness is inversely related to non-audit fees. Our findings provide additional evidence supporting the proposition an effective audit committee is likely to reduce the purchase of NASs from the incumbent auditor. An effective audit committee may reduce such purchased due to a heightened sensitivity toward the perceived compromise of auditor independence. Conclusions based on single-equation estimates, however, may be premature. Simultaneous-equation model estimates show that when audit and NAS fees are modeled jointly the composite proxy measure for audit committee effectiveness is no longer statistically significantly related to NAS fees. Based on these latter findings the negative association documented from single-equation estimations are considered spurious, being the result of fee simultaneity not being accounted for. Consequently, we conclude that contrary to *H4b* expectations there is no support for the view an effective audit committee regards NASs as compromising auditor independence. This view is consistent with recent studies (e.g., Chung and Kallapur, 2003; Ashbaugh et al., 2003).

7. Concluding Remarks and Future Research Ideas

Our study provides a number of important contributions to the audit and NAS fee literatures. First, we document evidence showing the inclusion of NAS fees and audit committee effectiveness as additional explanatory variables in the audit pricing model of GCT (2003) did not distract from their conclusion when employing a single-equation estimation approach. However, their (GCT, 2003) do not hold after controlling for endogeneity between audit and NAS fees using simultaneous-equation estimations. These latter results, therefore, challenge the findings of GCT (2003) inferring significant simultaneous-equation bias produced spurious and misleading conclusions from their (GCT, 2003) study. Second, our study extends the analysis of GCT providing empirical evidence of the linkages between NAS fees and discretionary ownership, and managerial ownership and remuneration. Third, we document further evidence the failure to control for the simultaneous determination of audit and NAS fees leads to alternative inferences about knowledge spillovers between the two service types. Finally, we expand the very limited literature investigating linkages between audit committee effectiveness and audit fees, and NAS fees. An important contribution is we provide further evidence the failure to control for the feedback relationship between the two fee types is likely to lead to spurious findings and inferences regarding influence of audit committee effectiveness.

Despite the comprehensive coverage of our study a variety of additional issues emerge as worthy areas of future investigation. For example, future research may seek to determine if relationships between audit/NAS fees and certain financial and corporate governance variables previously identified using single-equation estimates are also significantly influenced by the endogenous nature of the two fee types. Another area of fruitful research may involve the operationalization of discretionary accruals using alternative proxy measures. We used the cross-sectional modified Jones (1991) to be consistent with GCT (2003) and other related research. Future research may seek to focus on specific components of accruals such as the provision of doubtful debts or amortization of intangible assets (DeFond and Subramanyam, 1998). Consistent with GCT (2003), we only examined relationships within a single fiscal timeframe. Future research may attempt to determine if the endogenous nature of the two fee types, and the resulting impact of factors such as discretionary accruals and audit committee effectiveness, hold across an expanded timeframe. Finally, future research should examine the influence of other variables (e.g., separation of CEO and chairperson positions) firms may use to offset agency costs of low managerial ownership. This line of scrutiny can also examine for complementary or substitution effects of using alternative corporate governance mechanisms, and the resulting impact on purchase of audit and NASs from the incumbent auditor.

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Appendices

Table I. Variable Definition

Variable Description	Variable Title
Dependent (Experimental) Variables	
Natural logarithm of total reported audit fees for firm i for their fiscal year 2001.	*LogTAudFee*
Natural logarithm of total reported NAS fees for firm i for their fiscal year t-.	*LogNAudFee*
Control Variables	
Natural logarithm of the total book reported assets of firm i for their fiscal year t-1.	*FSize*
Indicator variable with firm i scored one (1) if their fiscal year end is December 31; otherwise scored zero (0).	*Busy*
Percentage of subsidiaries of firm i incorporated outside of Singapore.	*ForSub*
Ratio of book value long-term debt of firm i for year t- to book value total assets of firm i for year t-1.	*Leverage*
Natural logarithm of the total number of firm i for their fiscal year t-.	*LogSub*
Ratio of earnings before extraordinary items of firm i for year t- to book value total assets of firm i for year t-1.	*ROA*
Indicator variable with firm i scored one (1) if their incumbent auditor in fiscal year t- is a Big-5 firm; otherwise scored zero (0).	*Big-5*
Ratio of book value total current assets of firm i for year t- to book value total current liabilities of firm i for year t-.	*CurR*
Ratio of book value total accounts receivable of firm i for year t- to book value total assets of firm i for year t-.	*ARec*
Ratio of book value total inventory of firm i for year t- to book value total assets of firm i for year t-.	*InvR*
Indicator variable with firm i scored one (1) if it has occurred a financial loss at least once in the three prior fiscal years; otherwise scored zero (0).	*Loss*
Indicator variable with firm i scored one (1) if it received a qualified audit report; otherwise scored zero (0).	*Opinion*
Indicator variable with firm i scored one (1) if it has issued any equity or long-term debt during the prior two fiscal years; otherwise scored zero (0).	*Issue*
Square root of the number of days between the end of year for firm i and earnings announcement date.	*Delay*
Indicator variable with firm i scored one (1) if the percentage of outstanding common shares held by executive directors in firm i at the end of the fiscal year is greater than 5%; otherwise scored zero (0).	*Own%*
Indicator variable with firm i scored one (1) if the inside directors' remuneration divided by total assets is within the top quartile for the full sample;; otherwise scored zero (0).	*Remun*
Indicator variable with firm i scored one (1) if discretionary accruals are positive; otherwise scored zero (0).	*Dac Ind*
Interaction variable between DAC Ind (as defined above) and DAC (as defined below).	*Dac Ind*DAC*
Interaction variable between Remun (as defined above) and DAC (as defined below).	*Remun*DAC*
Interaction variable between Remun and Exe_Own_5% (both defined above).	*Remun*Own%*
Experimental Variables	
Absolute discretionary accruals firm i for year t- measured by modified-Jones (1991) model.	*DAC*
Interaction variable between DAC (as defined above) and Own% (as defined above).	*Own%*DAC*
Interaction variable between DAC (as defined above), Remun (as defined above) and Own% (as defined above).	*Own%*Remun*DA*
Composite score of audit committee effective with firm awarded a point for meeting each of the following conditions: (1) audit committee comprises all independent directors; (b) audit committee met three or more times during fiscal year; and (c) at least one independent director on audit committee had suitable financial and/or legal qualifications.	*AudEff*

Table II. Sample used in analysis and industry breakdown. **Panel A**. Sample selection process

Description	*Number*
# Firms listed on SGX at end of year t	492
# Firms listing on SGX during year t	37
# Foreign firms listed on SGX during year t	40
# Finance sector firms list on SGX during year t	24
# Firms providing incomplete annual reports in year t	12
# Firms with insufficient corporate governance and financial data in year t	16
# Firms excluded for being outliers (>5 standard deviations from dependent variable's mean)	12
Final sample used	351

Panel B. Industry breakdown of final sample

	Sample		*SGX*$^{\lambda}$	
Industry Description:	*No.*	*Ptge*	*No.*	*Ptge*
Commerce – Retail	19	5.41%	22	5.63%
Commerce – Wholesale	39	11.11%	42	10.74%
Construction	35	9.97%	38	9.72%
Hotels and Restaurants	15	4.27%	15	3.84%
Information Technology – Services	24	6.84%	26	6.65%
Manufacturing – Chemical Products$^{\phi}$	3	0.85%	3	0.77%
Manufacturing – Electrical	8	2.28%	9	2.30%
Manufacturing – Electrical Products	28	7.98%	32	8.18%
Manufacturing – Food and Beverage	16	4.56%	19	4.86%
Manufacturing – Machinery and Equipment	11	3.13%	12	3.07%
Manufacturing – Metal Products	20	5.70%	22	5.63%
Manufacturing – Other Manufacturing	19	5.41%	21	5.37%
Manufacturing – Petroleum Products$^{\phi}$	1	0.28%	1	0.26%
Manufacturing – Printing and Publishing	15	4.27%	17	4.35%
Manufacturing – Rubber and Plastic	10	2.85%	12	3.07%
Manufacturing – Transport Equipment$^{\phi}$	6	1.71%	6	1.53%
Multi-Industry	19	5.41%	21	5.37%
Other – General Services	21	5.98%	22	5.63%
Other – Healthcare$^{\phi}$	5	1.42%	5	1.28%
Other – Plantations$^{\phi}$	0	0.00%	1	0.26%
Properties	16	4.56%	21	5.37%
Transport/Storage/Comm. – Postage and Comm.$^{\phi}$	0	0.00%	1	0.26%
Transport/Storage/Comm. – Storage$^{\phi}$	4	1.14%	4	1.02%
Transport/Storage/Comm. – Transport	17	4.84%	19	4.86%
Total:	351	100.00%	391	100.00%

Where: ϕ = Firms in the final useable sample from these industry sectors are all grouped into "Miscellaneous Industries" when calculating the expected accruals. This procedure is consistent with GCT (2003). For estimating the expected accruals we require at least eight firms in each industry sector. This cut-off is consistent with prior research (e.g., Klein, 2002). λ = We exclude financial service industry sector firms from the analysis which is consistent with much of the prior audit/NAS fee and discretionary accrual research (e.g., Kim et al., 2003; Whisenant et al., 2003).

Table III. Relative amounts of audit and NAS fees paid to audit firms

Industry Description:	*Number*	*Total Fees*	*Audit Fees*		*NAS Fees*	
		Mean	*Mean*	*% Total Fees*	*Mean*	*% Total Fees*
Commerce – Retail	19	$205,633.65	$120,429.47	58.57%	$85,204.18	41.43%
Commerce – Wholesale	39	$153,589.92	$108,775.00	70.82%	$44,814.92	29.18%
Construction	35	$153,803.71	$110,449.17	71.81%	$43,354.54	28.19%
Hotels and Restaurants	15	$155,722.73	$116,971.00	75.11%	$38,751.73	24.89%
Information Technology – Services	24	$132,201.17	$103,894.92	78.59%	$28,306.25	21.41%
Manufacturing – Chemical Products	3	$85,250.00	$59,750.00	70.09%	$25,500.00	29.91%
Manufacturing – Electrical	8	$100,175.00	$86,812.50	86.66%	$13,362.50	13.34%
Manufacturing – Electrical Products	28	$133,582.33	$95,015.74	71.13%	$38,566.59	28.87%
Manufacturing – Food and Beverage	16	$311,000.00	$215,727.27	69.37%	$95,272.73	30.63%
Manufacturing – Machinery and Equipment	11	$159,516.73	$71,321.55	44.71%	$88,195.18	55.29%
Manufacturing – Metal Products	20	$97,637.53	$83,603.53	85.63%	$14,034.00	14.37%
Manufacturing – Other Manufacturing	19	$120,961.56	$85,536.56	70.71%	$35,425.00	29.29%
Manufacturing – Petroleum Products	1	$180,000.00	$180,000.00	100.00%	$0.00	0.00%
Manufacturing – Printing and Publishing	15	$206,239.14	$137,991.43	66.91%	$68,247.71	33.09%
Manufacturing – Rubber and Plastic	10	$110,847.90	$85,208.30	76.87%	$25,639.60	23.13%
Manufacturing – Transport Equipment	6	$387,230.00	$268,047.00	69.22%	$119,183.00	30.78%
Multi-Industry	19	$506,967.08	$357,863.08	70.59%	$149,104.00	29.41%
Other – Healthcare	5	$185,025.00	$135,150.00	73.04%	$49,875.00	26.96%
Other – General Services	21	$133,867.94	$72,095.63	53.86%	$61,772.31	46.14%
Properties	16	$178,086.50	$111,086.50	62.38%	$67,000.00	37.62%
Transport/Storage/Comm. – Storage	4	$195,666.67	$165,666.67	84.67%	$30,000.00	15.33%
Transport/Storage/Comm. – Transport	17	$485,156.59	$305,243.12	62.92%	$179,913.47	37.08%

Where: Total Fees = Audit Fees plus NAS Fees (actual) paid to the incumbent auditor in the firm's 2001 fiscal year. Audit Fees = fees ($ actual) billed for the audit of the firm's financial reports. NAS Fees = aggregate fees ($ actual) billed to the firm for work not related toaudit of the firm's financial reports

Table IV. Descriptive Statistics

Variable: $^{\phi}$	*Mean*	*Std Deviation*	*Percentile 25*	*Median*	*Percentile 75*
Total Audit Fees	$191,115.75	$294,633.12	$67,750.00	$112,968.00	$190,500.00
Log TAudFee	11.7191	0.8380	11.1236	11.6349	12.1574
NAS Fee	$59,570.04	$126,624.71	$5,000.00	$21,738.00	$59,599.50
Log NAudFee	6.4473	8.4438	8.5172	9.9867	10.9954
NAudFee/TAudFee	0.2348	0.1849	0.0711	0.2242	0.3464
Total Assets	$421,513,003.23	$1,483,559,657.78	$44,484,250.00	$97,211,500.00	$255,989,250.00
FSize	18.5403	1.4157	17.6106	18.3924	19.3606
Busy	60.968%	N/A	N/A	N/A	N/A
ForSub	42.318%	30.512%	17.402%	40.000%	66.667%
Leverage	9.461%	12.034%	0.166%	4.791%	14.957%
Total No. Subsidiaries	13.8806	28.9390	5.0000	8.0000	14.0000
Subs	2.0019	1.5581	1.6094	2.0794	2.6391
ROA	-0.985%	16.763%	-3.508%	1.702%	4.976%
Big-5	86.129%	N/A	N/A	N/A	N/A
CurR	1.9685	1.6635	1.0689	1.5220	2.2699
ARec	0.1711	0.1254	0.0727	0.1504	0.2498
InvR	0.1460	0.1582	0.0302	0.0989	0.2212
Loss	35.484%	N/A	N/A	N/A	N/A
Opinion	6.129%	N/A	N/A	N/A	N/A
Delay	92.0677	39.7545	73.0000	90.0000	107.2500
Issue	27.097%	N/A	N/A	N/A	N/A
Own%	15.1396	20.7231	0.1674	5.2264	24.1311
Total Remuneration	$1,322,741.92	$1,509,884.44	$499,250.00	$985,092.50	$1,762,400.00
Remun	$0.02	$0.02	$0.00	$0.01	$0.02
Dac Ind	51.613%	N/A	N/A	N/A	N/A
Non-Absolute DAC	-0.0320	0.0785	-0.0774	-0.0393	0.0029
DAC	0.0642	0.0552	0.0284	0.0539	0.0859
AudEff	1.5484	0.9257	1.0000	1.0000	2.0000
Adjusted R^2	35.458%	27.912%	15.956%	36.287%	57.341%

Where: ϕ = All dependent, experimental and control variables, as defined in Table I, are in italics. Descriptive statistics provided for specific firm attributes provided in normal text supplement details for the related dependent, experimental and control variable

Table V. Pearson/Spearman Correlation Matrix between Dependent and Experimental Variables

Variable Name	*LogTAudFee*	*DAC*	*Own%*	*Remun*	*AudEff*	*LogNAudFee*
LogTAudFee		-0.1399Ψ	-0.2917*	-0.2681*	0.2311*	0.3416*
DAC	-0.1355Ψ		0.0652	0.1408*	-0.0109	-0.0984Ψ
Own%	-0.3257*	0.0870*		0.0606	-0.0431	-0.2755*
Remun	-0.3595*	0.2057*	0.1005Ψ		0.0409	-0.2409*
AudEff	0.2178*	0.0272	-0.0494	0.0475		-0.1267*
LogNAudFee	0.7070*	-0.1831*	-0.2071*	-0.2433*	-0.1475*	

Where: * = coefficient significant at the $p \leq 0.01$, two-sided; Ψ = coefficient significant at the $p \leq 0.05$, two-sided.

Table VI. Multivariate results – Audit Fee Model (Full Sample: n = 351)

		Dependent Variable: LogTAudFee					
		Panel A		***Panel B***		***Panel C***	
		Original GCT Model Specification		***Single-equation Specification***		***Simultaneous-equation Specification***	
Variable	***Predicted Sign***	***OLS Est.***	***t-stat.***	***OLS Est.***	***t-stat.***	***2SLS Est.***	***t-stat.***
Intercept	?	3.551	5.948*	4.044	7.145*	4.551	5.678*
FSize	+	0.421	13.691*	0.387	13.348*	0.341	7.005*
Busy	-	-0.068	-1.087	-0.148	-2.486*	-0.264	-2.401*
ForSub	+	0.344	3.457*	0.369	4.047*	0.419	3.452*
Leverage	+	0.155	0.575	0.053	0.251	-0.170	-0.480
LogSub	+	0.083	4.058*	0.088	4.663*	0.094	3.840*
ROA	-	-0.875	-3.483*	-0.797	-3.438*	-0.636	-2.013
Big-5	+	0.468	5.276*	0.482	5.912*	0.530	4.857*
CurR	-	-0.019	-0.976	-0.028	-1.603Θ	-0.041	-1.707Ψ
ARec	+	0.403	1.504Θ	0.379	1.543Θ	0.433	1.371Θ
InvR	+	0.091	0.471	0.014	0.078	-0.172	-0.664
Loss	+	0.017	0.210	0.035	0.482	0.045	0.483

Opinion	+	0.127	0.987	0.029	0.240	0.120	0.656
Delay	+			0.001	1.068	0.001	0.139
Dac Ind	+	-0.124	-1.372Θ	-0.072	-0.823	-0.027	-0.229
*Dac*DAC*	+	0.716	0.687	-0.134	-0.124	-1.053	-0.694
Remun	?	0.212	1.129	0.154	0.881	0.070	0.305
*Remun*DAC*	?	-0.237	-0.115	-0.998	-0.522	-2.479	-0.938
Own%	-	-0.093	-0.915	-0.048	-0.478	0.001	0.012
*Remun*Own%*	?	-0.299	-1.327Θ	-0.194	-0.917	-0.043	-0.149
DAC	+	0.540	1.792Ψ	0.610	1.880Ψ	0.270	0.184
*Own%*DAC*	-	-0.569	-2.257Ψ	-0.690	-2.843*	-0.071	-0.904
*Remun*Own%*DAC*	+	1.291	1.468Θ	1.441	1.592Θ	0.790	0.726
AudEff	+			0.044	1.359Θ	0.055	1.509Θ
LogNAudFee	?			0.171	7.485*	0.052	1.155
Model Summary		*Adj. R^2 = 0.626*		*Adj. R^2 = 0.687*		*Adj. R^2 = 0.550*	

Where: * = coefficient significant at the $p \leq 0.01$, one-sided, except for the intercept at two-sided; Ψ = coefficient significant at the $p \leq 0.05$,one-sided; Θ = coefficient significant at the $p \leq 0.10$, one-sided. See Table I for formal definitions of the dependent, experimental and control variables.

Table VII. Multivariate results – NAS Fee Model (Full Sample: n = 351)

		Dependent Variable: LogNAudFee					
		Panel A		*Panel B*		*Panel C*	
		Original GCT Model Specification		*Single-equation Specification*		*Simultaneous-equation Specification*	
Variable	*Predicted Sign*	*OLS Est.*	*t-stat.*	*OLS Est.*	*t-stat.*	*2SLS Est.*	*t-stat.*
Intercept	?	-1.021	-1.453Θ	-3.854	-3.891*	-5.592	-7.249*
FSize	+	1.061	2.133Ψ	-1.590	-2.691*	-4.029	-0.756
Busy	+	2.540	2.525*	3.071	3.210*	3.599	2.338*
ForSub	+	0.774	0.481	3.305	2.201Ψ	5.309	3.145*
Leverage	-	4.674	1.072	4.563	1.118	2.994	0.540
LogSub	+	-0.174	-0.526	-0.690	-2.219Ψ	-1.167	-1.072
ROA	-	-3.031	-0.746	2.835	0.746	7.425	0.690
Big-5	+	-0.901	-0.628	-3.957	2.883*	-6.661	-1.102
CurR	?	0.292	0.940	0.463	1.624Θ	0.556	1.813Ψ
ARec	?	-0.820	-0.189	-3.064	-0.771	-5.425	-0.814
InvR	+	3.781	1.211	3.204	1.123	2.679	0.819
Loss	+	-0.158	-0.121	-0.211	-0.176	-0.524	-0.360
Opinion	+	-3.241	-1.555Θ	-2.653	-1.383Θ	-1.965	-0.773
Issue	+			1.471	1.430Θ	0.373	0.143
Dac Ind	+	-0.403	-0.275	-0.681	-0.479	0.122	0.053
Dac*DAC	+	1.036	0.477	2.877	1.246	1.733	0.763
Remun	?	1.729	0.569	0.547	0.194	-0.595	-0.152
Remun*DAC	?	3.512	0.917	3.291	1.047	3.784	1.036
Own%	-	-0.486	-0.295	-0.567	-0.350	-0.161	-0.083
Remun*Own%	?	-4.077	-1.118	-1.696	-0.497	0.035	0.007
DAC	-	-3.346	-1.967Ψ	-4.453	-2.604*	-4.208	-2.455*
Own%*DAC	+	5.659	1.548Θ	5.383	2.502*	5.726	2.220Ψ
Remun*Own%*DAC	-	-6.021	-1.104	-6.643	-1.734Ψ	-7.195	1.632Θ
AudEff	-			-0.553	-1.771Ψ	-0.727	-1.283
LogTAudFee	?			0.403	7.254*	0.264	0.962
Model Summary		Adj. R^2 = 0.404		Adj. R^2 = 0.497		Adj. R^2 = 0.357	

Where:* = coefficient significant at the $p \leq 0.01$, one-sided, except for the intercept at two-sided; Ψ = coefficient significant at the $p \leq 0.05$, one-sided; Θ = coefficient significant at the $p \leq 0.10$, one-sided. See Table I for formal definitions of the dependent, experimental and control variables.