

# Audit Fees: A Meta-analysis of the Effect of Supply and Demand Attributes\*

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## Abstract

We evaluate and summarize the large body of audit fee research and use meta-analysis to test the combined effect of the most commonly used independent variables. The perspective provided by the meta-analysis allows us to reconsider the anomalies, mixed results, and gaps in audit fee research. We find that, although many independent variables have consistent results, several show no clear pattern to the results and others only show significant results in certain periods or particular countries. These variables include a loss by the client and leverage, which have become significant in comparatively recent studies; internal auditing and governance, both of which have mixed results; auditor specialization, regarding which there is still some uncertainty; and the audit opinion, which was a significant variable before 1990 but not in more recent studies.

**Keywords** Audit fee research; Auditing; Meta-analysis; Supply and demand attributes

**JEL Descriptors** M40, M42

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## Les honoraires de vérification : une méta-analyse de l'incidence des attributs de l'offre et de la demande

### Condensé

Les auteurs ont pour but d'évaluer et de compiler les très nombreuses études qui ont porté sur les déterminants des honoraires de vérification, au cours des 25 dernières années. Les chercheurs précédents ont analysé quantité d'attributs des clients et des vérificateurs qui sont associés à des niveaux supérieurs ou inférieurs d'honoraires de vérification. Les auteurs procèdent ici à une méta-analyse afin de vérifier jusqu'à quel point l'utilisation de certains

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des inducteurs des honoraires de vérification relevés dans les études précédentes est répandue. Bien qu'une grande quantité de recensions narratives des études sur le sujet aient été effectuées, la méta-analyse permet aux auteurs de généraliser la nature des variables indépendantes incluses dans les études précédentes et d'évaluer si les résultats d'un ensemble d'études répercutent des phénomènes semblables. Plus encore, la méta-analyse conduit à des inférences plus valides dérivées de la connaissance d'un ensemble d'études que celles que l'on peut dériver d'une recension narrative des études existantes. Les auteurs constatent que de nombreux inducteurs d'honoraires présentent des résultats uniformes pour l'ensemble des études, des échantillons et des pays. Ils soulignent toutefois aussi certains secteurs dans lesquels les observations qui ont été consignées sont inattendues et dérogent à l'uniformité. Les auteurs analysent certains motifs théoriques et pratiques pouvant expliquer ces anomalies.

La méta-analyse est un instrument précieux, car les recensions narratives des études peuvent être trompeuses et, bien souvent, ne sont pas concluantes. Dans certains cas, les résultats de plusieurs études peuvent varier, et la taille des échantillons, la période étudiée et le contexte des études peuvent différer. Intégrer les conclusions d'un ensemble d'études est une tâche qui « en vient à dépasser les capacités de l'esprit humain ». C'est ce qui explique que différents chercheurs puissent parvenir à des conclusions différentes au sujet d'un ensemble donné d'études. En outre, toute étude prise isolément peut être trompeuse par suite d'une erreur d'échantillonnage. Il se peut donc que certaines études portant sur un vaste échantillon fassent état d'une conséquence particulière importante, alors que d'autres études portant sur un échantillon plus modeste ne signaleront d'aucune façon cette conséquence. Une recension narrative des études interprétera ces résultats comme étant apparemment incohérents et recommandera la poursuite des recherches, qui pourraient à leur tour produire des résultats incohérents et épaissir le brouillard. En revanche, la méta-analyse peut « élaguer le terrain et donner un sens » aux travaux de recherche grâce à l'évaluation de l'incidence globale des études existantes.

Les auteurs font appel à une technique de méta-analyse semblable aux techniques utilisées dans les travaux précédents en comptabilité et en vérification. Selon cette technique, ils convertissent les valeurs de  $p$  provenant des différentes analyses en notes  $Z$  et produisent ensuite une statistique  $Z$  qui peut être utilisée pour tester l'orientation et le degré de signification d'une conséquence dérivée de l'ensemble des études. Seules les études publiées sont recensées. Ce choix est une garantie de qualité, mais il peut présenter une lacune. Il se pourrait que les études non publiées relèvent des conséquences de moindre ampleur que les études publiées, s'il se trouve que les éditeurs préfèrent les études qui font état de résultats significatifs. En conséquence, une distorsion pourrait exister dans les études publiées si seules les études contenant des erreurs de type 1 vont sous presse. Ce problème, dit du « tiroir classeur », laisse soupçonner l'existence de nombreuses études légitimes non publiées qui languissent dans les classeurs et dont on ne dispose pas pour les intégrer à la méta-analyse. Le test du tiroir classeur consiste, pour les auteurs, à déterminer le nombre d'études supplémentaires donnant des résultats non significatifs qu'il faudrait pour conclure à un résultat non significatif dans le cadre de la méta-analyse, au niveau de 5 pour cent.

Les très nombreuses études sur les honoraires de vérification visaient différents objectifs, mais deux raisons principales semblent les avoir motivées : 1) évaluer la concurrence sur les marchés de la vérification, compte tenu en particulier du petit nombre de fournisseurs de services internationaux, et 2) examiner les questions touchant les contrats et l'indépendance

liées au processus de vérification (par exemple, les soumissions au rabais et les services autres que la vérification). Peu importe le but visé, cependant, une méthodologie commune s'est développée pour l'étude des déterminants des honoraires de vérification, méthodologie appliquée dans le cadre de bien au-delà de 100 articles parus dans des revues. Habituellement, un modèle d'estimation est élaboré grâce à la régression des honoraires de vérification sur diverses variables représentant des attributs qui, par hypothèse, sont liés aux honoraires de vérification, négativement ou positivement.

Les auteurs relèvent 186 variables indépendantes étudiées dans les 147 analyses qu'ils recensent. Ils classent ces variables en 18 catégories, qui sont ensuite classées à nouveau selon les attributs des clients, des vérificateurs et des missions, afin de faciliter l'analyse. Bien que le schéma de classification soit logique, et non empirique, il donne un précieux aperçu des variables qui sont le plus fréquemment traitées. Chaque catégorie regroupe diverses variables utilisées dans un nombre relativement important d'études et soumises à la méta-analyse de la présente étude. Il existe également de multiples variables qui n'apparaissent que dans une poignée d'études et se rattachent souvent à des caractéristiques exclusives à l'étude dans laquelle elles sont utilisées (par exemple, le pays, le contexte ou la culture). Ces variables sont exclues de la méta-analyse.

Les résultats dans le cas des attributs du client sont essentiellement conformes aux prévisions. Le principal déterminant des honoraires de vérification relevé dans presque toutes les études publiées est celui de la taille, qui est en relation positive avec les honoraires. Parmi les études recensées, 87 utilisent les actifs comme variable de contrôle de la taille, toutes ayant un coefficient positif significatif, à deux exceptions près. Les résultats de la méta-analyse sont donc positifs et fortement significatifs — il faudrait plus de 100 000 études non publiées dans les tiroirs classeurs pour renverser ce résultat.

Les relations de la complexité, du risque inhérent et de la rentabilité avec les honoraires de vérification sont également positives, comme prévu. Les résultats globaux relatifs à l'effet de levier sont positifs et significatifs. Toutefois, les études rapportent également un nombre relativement grand de résultats non significatifs. La classification de ces études par pays et par période donne à penser que l'effet de levier, même s'il a été important aux États-Unis et au Royaume-Uni dans le passé, était moins important, de façon générale, dans les autres pays et après 1990. Les résultats globaux de sept études réalisées à Hong Kong, par exemple, ne sont pas significatifs.

Les résultats au chapitre de la vérification interne sont assez partagés : un résultat négatif significatif, trois résultats positifs significatifs et sept résultats non significatifs. Le méta-résultat global n'est pas significatif. Seule une variable de gouvernance — les administrateurs externes — a été incluse dans suffisamment d'études pour figurer dans la méta-analyse. Les auteurs relèvent deux résultats positifs significatifs et trois résultats non significatifs, ainsi qu'une conséquence globale positive et significative, mais il suffirait de six études ayant des résultats non significatifs pour éliminer ce résultat. De nombreuses autres recherches sur la question s'imposent.

Les attributs du vérificateur qui sont examinés englobent la qualité de son travail. L'on peut s'attendre à des honoraires de vérification supérieurs lorsque le vérificateur est reconnu pour la qualité supérieure de son travail. Les chercheurs précédents ont tenté d'utiliser un grand nombre de variables substituts représentant la qualité du travail du vérificateur, mais deux des plus couramment utilisées sont les suivantes : une variable nominale relative aux

cabinets qui se classent parmi les Huit, Six, Cinq ou Quatre Grands (85 études) et une mesure de la spécialisation sectorielle (9 études). Les résultats relatifs à la qualité du travail du vérificateur confirment de façon convaincante l'observation selon laquelle l'appartenance aux Huit, Six, Cinq ou Quatre Grands est associée à des honoraires de vérification supérieurs, 58 pour cent de la totalité des études rapportant un résultat positif significatif. Cet éloquent résultat se reflète dans la méta-analyse et un résultat de près de 14 000 au test du tiroir classeur. À l'exception de Price Waterhouse dans les années 1980, aucun cabinet important pris isolément n'a affiché de primes au titre des honoraires. La spécialisation du vérificateur, a-t-on constaté, est significative dans trois études (sur neuf) et le résultat global de la méta-analyse est significatif ; cette variable obtient cependant un résultat de 37 seulement au test du tiroir classeur, ce qui indique que la constatation n'est pas suffisamment claire.

Les attributs de la mission englobent l'existence de problèmes liés à la vérification, le substitut le plus courant étant une variable nominale indiquant l'expression par le vérificateur d'une opinion qui n'est pas une opinion sans réserve. Un lien positif avec les honoraires est prévu lorsque le rapport du vérificateur est assorti d'une réserve ou qu'il est modifié. Des 46 études qui comportent une variable substitut représentant l'opinion du vérificateur, 13 seulement rapportent la relation positive prévue avec les honoraires, tandis que 31 rapportent des résultats non significatifs et 2, une relation négative. Les résultats globaux indiquent que cette conséquence est positive, avec un résultat de 743 au test du tiroir classeur. Un examen plus approfondi révèle que tous les résultats significatifs à une exception près ont été obtenus avant 1990 et que le méta-résultat des études réalisées après 1990 n'est pas significatif. En conséquence, la nature de l'opinion du vérificateur pourrait être moins importante à titre d'inducteur d'honoraires de vérification. Ce changement est peut-être attribuable aux modifications de l'information publiée à l'égard des problèmes relatifs à la continuité de l'exploitation, survenues à la fin des années 1980 dans de nombreux pays.

La relation entre les honoraires de vérification et l'existence de services autres que la vérification a suscité beaucoup d'intérêt chez les chercheurs et les commentateurs. D'une part, l'on affirme que la prestation de services de vérification peut entraîner des honoraires inférieurs par suite de l'interfinancement des honoraires ou des synergies entre les services de vérification et les services autres que la vérification. D'autre part, les services autres que la vérification pourraient être associés à des honoraires de vérification supérieurs du fait qu'ils sont susceptibles de mener à des changements d'envergure, dans une organisation, qui requièrent un surplus de travail de vérification ou du fait que les sociétés clientes qui achètent des services de consultation peuvent éprouver des problèmes, de façon générale, ou du fait que le pouvoir monopolistique et l'efficacité des services sur le marché des services autres que la vérification permettent aux vérificateurs d'exiger une prime au titre des honoraires. Les services autres que la vérification ont une relation positive significative dans 16 études sur 19 qui englobent cette variable. La méta-analyse montre que les résultats globaux sont fortement positifs et significatifs. Cette constatation ne confirme pas la prévision selon laquelle les services autres que la vérification seront associés à une réduction des honoraires.

Les recherches existantes basées sur l'appréhension des honoraires de vérification sous la forme d'une fonction de production ont livré beaucoup de renseignements sur les déterminants des honoraires de vérification. Toutefois, l'analyse des auteurs met en relief certaines anomalies (dont la vérification interne), des résultats partagés (l'effet de levier par exemple) et des domaines dans lesquels il conviendrait d'intensifier les recherches (comme celui de la

gouvernance). Les anomalies et les résultats partagés peuvent être attribuables à la faible puissance des tests ou à des méthodologies de recherche incompatibles, ou peuvent aboutir à la remise en question des hypothèses sous-jacentes à l'appréhension des honoraires de vérification sous la forme d'une fonction de production. Ces conditions peuvent découler de problèmes liés au modèle empirique relativement aux honoraires de vérification, en particulier l'omission potentielle de certaines variables, de possibles problèmes touchant la spécification des variables de contrôle, et le caractère endogène des attributs de la demande ou leur omission.

La méta-analyse offre un moyen de comprendre l'ensemble des connaissances accumulées au fil de plus de vingt années de recherche sur les honoraires de vérification. Bien que la documentation sur le sujet continue d'évoluer, l'étude des auteurs confirme que les variables de contrôle solidement établies que sont la taille, la complexité et le risque sont liées aux honoraires de vérification. Les auteurs mettent en évidence plusieurs domaines dans lesquels des incertitudes subsistent dans la recherche sur les honoraires de vérification, et ils analysent les explications théoriques et pratiques de l'existence de ces incertitudes. Leurs observations relatives aux anomalies, aux incohérences et aux lacunes des études précédentes les portent à croire que la poursuite des recherches pourrait être particulièrement utile dans plusieurs domaines : 1) l'examen de la façon dont les différentes formes de propriété (notamment définies selon les actionnaires dominants — relation entre société mère et filiale ou entreprise familiale, par exemple) et les structures institutionnelles locales (par exemple, les dispositions de financement, les lois fiscales) influent sur les honoraires de vérification ; 2) l'élaboration de mesures plus perfectionnées du contrôle interne qui pourraient être utilisées dans la modélisation des honoraires de vérification ; 3) l'analyse de la façon dont la gouvernance d'une entreprise et l'environnement de réglementation dans lequel elle exerce ses activités influent sur le marché des services de vérification et sur les honoraires que réclame le vérificateur externe ; 4) l'étude de la qualité du travail de vérification et des circonstances dans lesquelles une qualité accrue est exigée par les parties prenantes qui en assument les coûts ; et 5) l'analyse de la relation entre les services autres que la vérification et les honoraires de vérification.

## 1. Introduction

The purpose of this paper is to evaluate and summarize the large body of research that has examined the determinants of audit fees over the past 25 years. Much of the research has followed from the original seminal work by Simunic 1980 and has investigated a number of client and auditor attributes associated with higher or lower levels of audit fees. In this paper, we use meta-analysis to test the pervasiveness of some of the drivers of audit fees identified in prior studies. Although there are a number of narrative literature reviews on this subject (e.g., Yardley, Kauffman, Cairney, and Albrecht 1992), the use of meta-analysis allows us to generalize the nature of the independent variables included in earlier studies and to evaluate whether the results of a set of studies represent similar phenomena. Further, meta-analysis "leads to more valid inferences about the knowledge of a set of studies" than can be derived from a narrative literature review (Trotman and Wood 1991, 181). We find that many fee drivers have consistent results across studies, samples, and countries. However, we also point out some areas where previous findings are

unexpected or inconsistent. We then discuss some theoretical and practical reasons why these anomalies may occur.

In his seminal paper, Simunic (1980) presented a production view of the audit process and hypothesized that certain drivers would be associated with variations in the level of audit fees because those drivers cause an auditor to perform more (or less) work during the course of the audit. Subsequent research has demonstrated convincingly that audit fees are associated with measures of client size, client risk, and client complexity. In general, these variables may be perceived as “supply” variables, in that they proxy for attributes of the audit process and the level of effort expended by the auditor. Size alone generally accounts for a large proportion of the variation in audit fees. However, prior research has generated mixed results regarding some potentially important explanatory variables (for example, the relationship between internal and external auditing). As is explained in detail later, these results may be due to inherent problems with the current production-based specification of the audit fee model including (1) inadequate control variable proxies, (2) omitted variables, and (3) endogeneity and missing demand factors.

The remainder of this paper is organized as follows. In section 2, we summarize the previous literature on audit fees and present a comprehensive list of client characteristics and auditor attributes that have been examined in prior studies. In section 3, we discuss meta-analysis in general. In section 4, we present the overall results for various classes of fee drivers. In section 5, we discuss potential problems with the typical specification of the audit fee model. In section 6, we present a summary and conclusion.

## 2. Overview of prior research

Why study audit fees? While the large body of literature on audit fees has served different purposes, two major reasons are apparent: (1) to evaluate the competitiveness of audit markets, especially in light of the small number of international service providers, and (2) to examine issues of contracting and independence related to the audit process (for example, low-balling, nonaudit services). Regardless of the purpose, a common methodology has developed for examining the determinants of audit fees that has been used in well over 100 published journal articles. Typically, an estimation model is developed by regressing fees against a variety of measures surrogating for attributes that are hypothesized to relate to audit fees, either negatively or positively. The model typically takes the following form:

$$\ln f_i = b_0 + b_1 \ln A_i + \sum b_k g_{ik} + \sum b_e g_{ie} + e_i \quad (1),$$

where  $\ln f_i$  is the natural log of the audit fee,  $\ln A_i$  is the natural log of a size measure (usually total assets), and  $g_{ik}$  and  $g_{ie}$  are two groups of potential fee drivers. Most papers using this approach have addressed one (or a few) specific independent variable(s), so the resulting regression model is usually presented as a series of control variables ( $g_{ik}$ ) that have been shown to be significant in prior studies, plus the experimental variables ( $g_{ie}$ ) that are being added. If the coefficients on the experimental variables are significant, the hypothesized relationship with audit

fees is deemed to exist. In this way, the population of explanatory variables included in the empirical specification of audit fees has grown substantially since Simunic 1980.<sup>1</sup>

In order to summarize and analyze the extent of research on audit fees, a list of published audit fee studies was identified from a number of sources. We include papers that used audit fees as a dependent variable in an empirical model that fits the characterization of (1). We started with *Twenty Five Years of Audit Research* (Trotman, Gramling, Johnstone, Kaplan, Mayhew, Reimers, Schwartz, Tan, and Wright 2000), extended by a manual and electronic search of all journals likely to publish research on auditing and audit fees. The electronic search was conducted using ABI/Inform and EBSCO Host with keywords related to audit fees.<sup>2</sup> Our search included publications up to December 31, 2003. The set of papers we consider were published over 27 years (1977–2003) and include more than 20 countries. Panel A of Table 1 lists the papers included in the study. For our analysis, if a paper reported separate results for individual subsample analyses that were not also reported on a combined basis, we treated each set of results as a separate analysis.<sup>3</sup> Consequently, the papers we cite comprise 147 separate analyses. Panel B summarizes where the various papers have been published, and panel C summarizes the country and setting of the various studies.

Table 2 presents a list of 186 independent variables that have been examined in the 147 analyses that we reviewed. We have organized these variables into 18 categories. The categories are further grouped into client attributes, auditor attributes, and engagement attributes for ease of discussion. Although the classification scheme is logical, not empirical, it does provide a useful overview of the variables that are most frequently included in (1). Within each category are some variables that were used in a relatively large number of studies, and these are subject to meta-analysis in this paper. There are also a large number of variables that appear in only a handful of papers and often relate to unique aspects of the study in which they are used (for example, country, setting, or culture). These variables were not considered part of the meta-analysis. Table 2 also shows that we excluded some results from the analysis because the same underlying data were used in more than one study. Including multiple studies based on the same data violates the assumption of independence of observations required for meta-analysis.

### 3. Meta-analysis

According to Hunter and Schmidt 1990, narrative literature reviews can be misleading and often inconclusive. In some cases there may be several studies with varying results that are subject to variations in sample size, time period, and setting of the study. Integrating the findings across a set of studies is a task that “becomes too taxing for the human mind” (Hunter and Schmidt, 468). As a result, different researchers may reach different conclusions about a set of individual studies. Furthermore, any single study can be misleading due to sampling error, which “has been falsely interpreted as conflicting findings in almost every area of research in the social sciences” (Hunter and Schmidt, 44). This may lead to a pattern where some large sample studies report a significant effect while other studies with

TABLE 1  
Overview of separate studies included in this review

Authors	Date	Publication*	Subsample	Country	Period	Sample size
Abbott, Parker, Peters, and Raghunandan	2003	AJPT		U.S.	2001	492
Adams, Sherris, and Hossain	1997	JFMA		NZ	1988–93	193
Ahmed	2000	ARJ		NZ	1994–95	64
Anderson and Zéghal	1994	ABR	Small auditees	Canada	1980	158
Anderson and Zéghal	1994	ABR	Large auditees	Canada	1980	216
Ashbaugh, LaFond, and Mayhew	2003	AR		U.S.	Nov.–Dec. 2001	3,170
Baber, Brooks, and Ricks	1987	JAR		U.S.	1980–84	100
Balachandran and Simon	1993	JEMS		U.S.	1981–86	1,211
Beattie, Goodacre, Pratt, and Stevenson	2001	ABR		UK	1997	210
Beatty	1993	JAR		U.S.	1982–84	1,191
Behn, Carcello, Hermanson, and Hermanson	1999	CAR		U.S.	NS†	297
Bell, Landsman, and Shackelford	2001	JAR		U.S.	1989	422
Briinn, Peel, and Roberts	1994	BAR		UK	1988	150
Butterworth and Houghton	1995	JBFA		Australia	1987–88	268
Carcello, Hermanson, Neal, and Riley Jr.	2002	CAR		U.S.	1992–93	258
Chan, Ezzamel, and Gwilliam	1993	JBFA		UK	1989	280
Che-Ahmad and Houghton	1996	JIAAT		UK	1989	84
Chung and Lindsay‡	1988	CAR		Canada	1981	233
Chung and Narasimhan	2002	IJAu		12 countries	1989–93	6,198
Clatworthy, Mellett, and Peel	2002	JBFA		UK	1998	459
Collier and Gregory	1996	EAR		UK	1991	286

(The table is continued on the next page.)



TABLE 1 (Continued)

**Panel A (Continued)**

Authors	Date	Publication*	Subsample	Country	Period	Sample size
Colson, Maher, Broman, and Tiessen	1988	RAR	Year	U.S.	1977	89
Colson, Maher, Broman, and Tiessen	1988	RAR	Year	U.S.	1978	97
Colson, Maher, Broman, and Tiessen	1988	RAR	Year	U.S.	1981	109
Copley, Doucet, and Gaver	1994	AR		U.S.	1987	118
Copley, Gaver, and Gaver	1995	JAR		U.S.	1985	162
Craswell and Francis	1999	AR		Australia	1987	1,468
Craswell, Francis, and Taylor	1995	JAE		Australia	1987	513
Crittenden, Davis, Simon, and Trompeter	2003	JSM		UK	1982-88	728
Cullinan	1997	ABR		U.S.	1991	1,110
Cullinan	1998	AJPT		U.S.	1993	993
Davis and Simon	1992	AJPT		U.S.	1978-88	234
Davis, Ricchiute, and Trompeter <sup>§</sup>	1993	AR		U.S.	NS <sup>†</sup>	98
DeFond, Francis, and Wong	2000	AJPT		Hong Kong	1992	348
Deis and Giroux	1996	JAPP		U.S.	1983-84	232
Dugar, Ramanan, and Simon	1995	AIA		India	1984-86	167
Eichenseher	1995	ABR <sup>v</sup>		Malaysia	1989-90	185
Ezzamel, Gwilliam, and Holland	1996	ABR		UK	1992	294
Ezzamel, Gwilliam, and Holland	2002	IJAu		UK	1995	193
Fargher, Fields, and Wilkins	2000	AJPT		U.S.	1991-97	2,374
Fargher, Taylor, and Simon	2001	IJA		20 countries	1994	796
Felix, Gramling, and Maletta	2001	JAR		U.S.	1997	70
Ferguson and Stokes	2002	CAR	Year	Australia	1990	586

(The table is continued on the next page.)

TABLE 1 (Continued)

Authors	Date	Publication*	Subsample	Country	Period	Sample size
Ferguson and Stokes	2002	CAR	Year	Australia	1992	466
Ferguson and Stokes	2002	CAR	Year	Australia	1994	564
Ferguson and Stokes	2002	CAR	Year	Australia	1998	566
Ferguson, Francis, and Stokes	2003	AR		Australia	1998	681
Firth	1985	AJPT		NZ	1981, 1983	96
Firth	1993	IJMA		NZ	1981-86	600
Firth	1997	JBFA		Norway	1991-92	157
Firth	2002	JBFA		UK	1996	1,112
Francis	1984	JAЕ		Australia	1979	136
Francis and Simon	1987	AR		U.S.	1984-85	208
Francis and Stokes	1986	JAR	Small auditees	Australia	1983	96
Francis and Stokes	1986	JAR	Large auditees	Australia	1983	96
Gerrard, Houghton, and Woodliff	1994	MAJ		Australia	1980	232
Gist	1992	ABR		U.S.	1983-85	263
Gist	1994a	JAAF		U.S.	1983-85	139
Gist	1994b	AJPT		U.S.	1987	109
Gist	1995	JAAF		U.S.	1983-85	139
Glezen and Roberts	1990	RIGNA		Texas	1980-83	356
Goddard and Masters	2000	MAJ	Year	UK	1994	233
Goddard and Masters	2000	MAJ	Year	UK	1995	223
Gregory and Collier	1996	JBFA		UK	1987-91	399
Gul	1999	AJPT	Large	Hong Kong	1993	87

(The table is continued on the next page.)

TABLE 1 (Continued)

Panel A (Continued)						
Authors	Date	Publication*	Subsample	Country	Period	Sample size
Gul	1999	AJPT	Small	Hong Kong	1993	87
Gul and Tsui	1997	JAЕ		Hong Kong	1993	46
Gul, Chen, and Tsui	2003	CAR		Australia	1993	648
Hackenbrack, Jensen, and Payne	2000	JAR		U.S.	1992	414
Haskins and Williams	1988	ABR	Country	Australia	1979-81	67
Haskins and Williams	1988	ABR	Country	Ireland	1979-81	32
Haskins and Williams	1988	ABR	Country	NZ	1979-81	33
Haskins and Williams	1988	ABR	Country	UK	1979-81	170
Haskins and Williams	1988	ABR	Country	U.S.	1979-81	108
Hill, Ramsay, and Simon	1994	JAPP	Year	U.S.	1983	168
Hill, Ramsay, and Simon	1994	JAPP	Year	U.S.	1984	201
Hill, Ramsay, and Simon	1994	JAPP	Year	U.S.	1985	223
Hill, Ramsay, and Simon	1994	JAPP	Year	U.S.	1986	231
Hill, Ramsay, and Simon	1994	JAPP	Year	U.S.	1987	248
Hill, Ramsay, and Simon	1994	JAPP	Year	U.S.	1988	247
Ho and Ng	1996	ARA	Year	Hong Kong	1992	396
Ho and Ng	1996	ARA	Year	Hong Kong	1993	313
Houghton and Jubb	1999	JIAAT		Western Australia	1987-88	270
Ireland and Lennox	2002	JAАF		UK	1997-98	1,326
Iyer and Iyer	1996	AJPT		UK	1985, 1991	270
Johnson, Walker, and Westergaard	1995	AJPT		NZ	1989	179
Joshi and Al-Bastaki	2000	IJAu		Bahrain	1997	38

(The table is continued on the next page.)

TABLE 1 (Continued)

Authors	Date	Publication*	Subsample	Country	Period	Sample size
<b>Panel A (Continued)</b>						
Jubb, Houghton, and Butterworth	1996	MAJ		Western Australia	1988	229
Karim and Moizer	1996	IJA		Bangladesh	1991	157
Killough and Koh	1991	GAJ		Singapore	1988-89	41
Langendijk	1997	EAR	Trade, industry, and other	Netherlands	1990	303
Langendijk	1997	EAR	Financial services	Netherlands	1990	303
Lee	1996	ABR		Hong Kong	1990	224
Low, Tan, and Koh	1990	JBFA		Singapore	1986	291
Maher, Tiessen, Colson, and Broman <sup>#</sup>	1992	AR		U.S.	1977, 1981	78
Mathews and Peel	2003	ABR		UK	1900	121
Mayhew and Wilkins	2003	AJPT		U.S.	1991-97	2,294
Menon and Williams	2001	AJPT		U.S.	1980	85
Niemi	2002	IJAu		Finland	1996	61
O'Keefe, Simunic, and Stein	1994	JAR		U.S.	1989	249
O'Sullivan	1999	EAR		UK	1995	146
O'Sullivan	2000	BAR		UK	2000	313
O'Sullivan and Diacon	2002	IJAu		UK	1992	114
Palmrose	1986a	JAR		U.S.	1980-81	361
Palmrose	1986b	JAR		U.S.	1981	298
Palmrose	1989	AR		U.S.	1980-81	361
Pearson and Trompeter	1994	CAR		U.S.	1982-86	241

(The table is continued on the next page.)

TABLE 1 (Continued)

Panel A (Continued)						
Authors	Date	Publication*	Subsample	Country	Period	Sample size
Peel and Roberts	2003	ABR		UK	1997	708
Pong and Whittington	1994	JBFA		UK	1981-88	3,349
Raman and Wilson	1992	JAPP		U.S.	1984-87	722
Rose	1999	AIA	Hong Kong	Hong Kong	1995	168
Rose	1999	AIA	Malaysia	Malaysia	1995	225
Rubin	1988	AR		U.S.	1982	189
Sanders, Allen, and Korte	1995	AJPT	Year	U.S.	1985	159
Sanders, Allen, and Korte	1995	AJPT	Year	U.S.	1989	159
Seetharaman, Gul, and Lynn	2002	IAE		UK	1996-98	550
Simon <sup>‡</sup>	1985	AJPT		U.S.	1978-83	173
Simon	1995	IJA		South Africa	1991	144
Simon and Francis	1988	AR		U.S.	1984	440
Simon, Ramanan, and Dugar	1986	IJA		India	NS <sup>†</sup>	117
Simon and Taylor	1997	AIA		Pakistan	1993	205
Simon and Taylor	2002	IJAu		Ireland	1990-99	377
Simon, Teo, and Trompeter	1992	IJA	Hong Kong	Hong Kong	1987-88	99
Simon, Teo, and Trompeter	1992	IJA	Malaysia	Malaysia	1987-88	132
Simon, Teo, and Trompeter	1992	IJA	Singapore	Singapore	1987-88	126
Simunic <sup>‡</sup>	1980	JAR		U.S.	1977	397
Simunic <sup>‡</sup>	1984	JAR	Small firm	U.S.	1977	130
Simunic	1984	JAR	Large firm	U.S.	1977	133
Simunic and Stein	1996	AJPT		U.S.	1989	249

(The table is continued on the next page.)

TABLE 1 (Continued)

Authors	Date	Publication*	Subsample	Country	Period	Sample size
Taylor	1997	PAR		Japan	1996	52
Taylor and Baker	1981	ABR		UK	1976-77	126
Taylor and Simon	1999	IJA		20 countries	1991-95	2,333
Taylor and Simon	2003	RAEE		Nigeria	1990-96	157
Taylor, Simon, and Burton	1999	RAR		South Korea	1994-95	79
Tsui, Jaggi, and Gul	2001	JAAF		Hong Kong	1994-96	650
Turpen	1990	AJPT		U.S.	1982-84	146
Walker and Casterella	2000	AJPT		U.S.	1993	160
Wallace	1984a	FE		U.S.	1980	71
Wallace	1984b	HBR		U.S.	1981	32
Wallace	1989	AA		U.S.	1981	71
Ward, Elder, and Kattelus	1994	AR		U.S.	1988	171
Whisenant, Sankaraguruswamy, and Raghunandan	2003	JAR		U.S.	2001	2,666
Willekens and Achmadi	2003	IJA	Year	Belgium	1989	48
Willekens and Achmadi	2003	IJA	Year	Belgium	1997	71
Willenborg	1999	JAR	Development-stage enterprises	U.S.	1993-94	57
Willenborg	1999	JAR	Nondevelopment-stage enterprises	U.S.	1993-94	211
Zhang and Myrteza	1996	ARA		Australia	1990-92	243

(The table is continued on the next page.)

TABLE 1 (Continued)

<b>Panel B: Journals publishing articles included in the meta-analysis</b>		No. of publications
Abbreviation	Journal**	
AA	Advances in Accounting	1
ABR	Accounting and Business Research	10
ABRv	Accounting and Business Review	1
AIA	Advances in International Accounting	3
<i>AJPT</i>	<i>Auditing: A Journal of Practice &amp; Theory</i>	17
<i>AR</i>	<i>The Accounting Review</i>	11
ARA	Asian Review of Accounting	2
ARJ	Accounting Research Journal	1
BAR	British Accounting Review	2
<i>CAR</i>	<i>Contemporary Accounting Research</i>	6
EAR	European Accounting Review	3
FE	Financial Executive	1
GAJ	Government Accountants Journal	1
HBR	Harvard Business Review	1
IJA	International Journal of Accounting	7
IJAu	International Journal of Auditing	6
IJMA	International Journal of Research in Marketing	1
JAAPF	Journal of Accounting, Auditing and Finance	4
<i>JAE</i>	<i>Journal of Accounting and Economics</i>	4
JAPP	Journal of Accounting and Public Policy	3
<i>JAR</i>	<i>Journal of Accounting Research</i>	13
JBFA	Journal of Business Finance & Accounting	7
JEMS	Journal of Economics & Management Strategy	1
JIAAT	Journal of International Accounting Auditing and Taxation	2
JIFMA	Journal of International Financial Management & Accounting	1
JSM	Journal of Strategic Marketing	1
MAJ	Managerial Auditing Journal	3
PAR	Pacific Accounting Review	1
RAEE	Research in Accounting in Emerging Economies	1
RAR	Research in Accounting Regulation	2
RIGNA	Research in Governmental and Nonprofit Accounting	1

(The table is continued on the next page.)

TABLE 1 (Continued)

<b>Panel C: Number of studies by country and setting</b>		No. of studies
Country	Setting	
Australia	Listed companies	17
Bahrain	Listed companies	1
Bangladesh	Public and nonpublic firms	1
Belgium	Private companies	2
Canada	Listed companies	3
Finland	Large companies	1
Hong Kong	Listed companies	10
India	Government and nongovernment firms	2
Ireland	Listed companies	2
Japan	Listed companies	1
Malaysia	Listed companies	3
Netherlands	Listed companies	2
Norway	Listed companies	1
Nigeria	Listed companies	1
New Zealand	Listed companies	4
	Insurance companies	1
	Municipal	1
Pakistan	Listed companies	1
Singapore	Listed companies	1
	Government departments	1
South Africa	Listed companies	1
South Korea	Listed companies	1
United Kingdom	Listed companies	20
	Insurance companies	1
	Micro-firms	1
	Charities	1
	National health service trusts	1
United States	Listed companies	42
	Insurance companies	1
	Savings and loans	6
	Entities receiving federal financial assistance	1
	Municipal	8
	Pension plans	2
	School districts	2
Multicountry	Listed companies	3

(The table is continued on the next page.)



TABLE 1 (Continued)

**Notes:**

- \* Journal names are shown in panel B.
- † NS: not stated.
- ‡ Dependent variable, audit fee divided by total assets.
- § Dependent variable, audit hours.
- # Dependent variable, change in audit fee.
- \*\* Journals shown in boldface italics are considered to be high-quality journals used in the subsequent analysis (see Table 3).

smaller samples find no effect. A narrative literature review will report these as apparently inconsistent results and call for further research, which may also produce inconsistent results and further cloud the issue. By contrast, meta-analysis can clean up and make sense of research literatures by assessing the overall effect of the existing studies.

We use meta-analysis techniques that are similar to those used in prior accounting and auditing papers, including Christie 1990, Trotman and Wood 1991, Kinney and Martin 1994, and Ahmed and Courtis 1999. First, we carry out the Stouffer combined test, which converts  $p$ -values from separate analyses to  $z$ -scores, adds them, and divides by the square root of the number of tests. It also produces a  $Z$ -statistic that can be used to test the direction and significance of an effect. This test was used by Kinney and Martin. In addition, we compute a weighted Stouffer test, which gives greater weight to studies with a larger sample size (Wolf 1986, 40). Because both tests generate the same basic results, we report only the Stouffer combined test in this paper.<sup>4</sup>

Including only published studies ensures quality, but has a potential weakness. Unpublished studies might have smaller effects than published papers if editors do not like “no results” papers. Consequently, there may be a bias present in published papers because only studies with type one errors appear in print (Hunter and Schmidt 1990, 83). This is referred to as the “file drawer problem”, which reflects the possibility that there may be many legitimate but unpublished studies languishing in file drawers that are not available for accumulation in the meta-analysis. Meta-analysis includes a technique to estimate the number of missing studies that would be required to bring the  $p$ -value of the meta-analysis down to an insignificant level. Using the results of the Stouffer combined test, we calculate the “file drawer test” as the number of additional studies with a  $Z$ -statistic of zero that would be needed to yield an insignificant result for the meta-analysis at the 5 percent level (Wolf 1986, 38). We further tested the sensitivity of this test by removing the most significant test result for each variable and recomputing the file drawer test to determine whether one outlier study dominates the results.<sup>5</sup>

A usual principle of meta-analysis is to include as many studies as possible. Errors made in lower-quality studies can be expected to cancel each other out, and

TABLE 2

Summary of independent variables used in audit fee research (total number of analyses = 147)

Category	Variable*	Total number of analyses	Results excluded for lack of independence
<i>Client attributes</i>			
Size	<i>Assets</i>	<b>105</b>	<b>18</b>
	<i>Sales</i>	<b>24</b>	
	<i>City population</i>	<b>7</b>	
	Expenditure	<b>2</b>	
	Cash flow	<b>1</b>	
Complexity	Size other	<b>8</b>	
	<i>Complexity</i>	<b>9</b>	
	<i>Number of subsidiaries</i>	<b>94</b>	<b>12</b>
	<i>Standard Industrial Classification (SIC)</i>	<b>14</b>	
	Diversification	<b>4</b>	
	Disclosure	<b>3</b>	
	Current cost accounting	<b>2</b>	
	Contingent liabilities	<b>1</b>	
	<i>Foreign subsidiaries</i>	<b>49</b>	<b>10</b>
	U.S. subsidiaries	<b>1</b>	
	<i>Number of business segments</i>	<b>10</b>	<b>3</b>
	Number of trading outlets	<b>1</b>	
	Grants	<b>2</b>	
	Multiple languages	<b>1</b>	
	English used in report	<b>1</b>	
	Number of journal entries	<b>1</b>	
	Number of activities	<b>5</b>	
	Assets in place	<b>2</b>	
	Pension plan	<b>1</b>	
	Pension plan contribution	<b>2</b>	
	Pension plan participants	<b>2</b>	
	Amendment	<b>2</b>	
	Unionized plan	<b>2</b>	
	Extraordinary items or discontinued operations	<b>2</b>	
	Restatement	<b>1</b>	
	Book to market	<b>2</b>	
	Pension plan	<b>1</b>	
Number of employees	<b>1</b>		
Change in superintendent	<b>1</b>		
Foreign sales	<b>1</b>		

(The table is continued on the next page.)

TABLE 2 (Continued)

Category	Variable*	Total number of analyses	Results excluded for lack of independence
	<b><i>Foreign assets</i></b>	<b>12</b>	<b>1</b>
Inherent risk	Number of audit locations	10	3
	<b><i>Inventory</i></b>	<b>22</b>	<b>3</b>
	<b><i>Receivables</i></b>	<b>20</b>	<b>3</b>
	<b><i>Inventory and receivables</i></b>	<b>50</b>	<b>7</b>
	<b><i>Current assets</i></b>	<b>7</b>	<b>1</b>
	Litigation propensity	2	
	Profit variance	2	1
	Inherent risk	4	1
	Business risk	1	
	Merger	1	
	Financing	1	
	Proceeds of issue	4	
	Volatility	3	
	Unseasoned issue	2	
Growth in sales	2		
	<b><i>Systematic risk</i></b>	<b>6</b>	<b>1</b>
Profitability	Unsystematic risk	2	1
	<b><i>Profitability ratio</i></b>	<b>43</b>	<b>6</b>
	<b><i>Loss</i></b>	<b>46</b>	<b>7</b>
	<b><i>Stock return</i></b>	<b>1</b>	
Leverage	High debt	2	
	Debt/expenditure	1	
	<b><i>Current ratio</i></b>	<b>6</b>	<b>3</b>
	Current liabilities	1	
	<b><i>Leverage</i></b>	<b>45</b>	<b>6</b>
	<b><i>Bond rating</i></b>	<b>7</b>	
	<b><i>Quick ratio</i></b>	<b>20</b>	<b>4</b>
	<b><i>Equity/debt ratio</i></b>	<b>5</b>	
	z-score	1	
	<b><i>Debt per capita</i></b>	<b>5</b>	
	Deficit in equity	1	
Commercial bank underwriter	2		
Previous relationship with underwriter	2		
Prestige of underwriter	1		
	<b><i>Probability of failure</i></b>	<b>7</b>	

(The table is continued on the next page.)

TABLE 2 (Continued)

Category	Variable*	Total number of analyses	Results excluded for lack of independence
Form of ownership	<i>Stock versus mutual</i>	9	1
	<i>Public or private</i>	15	3
	<i>Major shareholding</i>	9	1
	Executive director shareholding	1	
	Nonexecutive director shareholding	1	
	Financial institution shareholding	1	
	Other major shareholding	1	
	Government ownership	2	
	Subsidiary	1	
	Subsidiary of a multinational	1	
	Joint ventures	2	
	Market listed (non-U.S.)	1	
	Market listed (over the counter)	1	
Internal control	<i>Internal audit</i>	13	2
	Organization structure	3	
	Qualified accountants	1	
	Chief financial officer tenure	2	
	Reliance on internal controls	3	
	Material weaknesses	2	
Governance	Regulation	5	2
	<i>Outside directors</i>	5	
	CEO/chair combined	4	
	Audit committee	3	
	Number of audit committee members	1	
	Executive on audit committee	2	
	Audit committee expertise	1	
	Other directorships	1	
	Tenure of nonexecutive directors	1	
	Number of board meetings	2	
	Number of audit committee meetings	1	
	Other directorships held by outside directors	3	
	Inside director remuneration	1	
	Inside director shareholding	1	
	Cadbury Code	2	
Actively traded	1		
Governing body turnover	3		

(The table is continued on the next page.)

TABLE 2 (Continued)

Category	Variable*	Total number of analyses	Results excluded for lack of independence
Industry	<i>Financial institutions</i>	<b>16</b>	
	<i>Utilities</i>	<b>18</b>	<b>2</b>
	<i>Manufacturers</i>	<b>7</b>	<b>1</b>
	Shipping	1	
	Service and distribution	4	
	Mining	5	
	Consolidated firm	3	
	Agriculture and energy	3	
	General insurance	1	
	Reinsurance	1	
	Other	7	
	Growth industry	1	
<i>Auditor attributes</i>			
Auditor quality	<b>Big 4, Big 5, Big 6, or Big 8</b>	<b>94</b>	<b>9</b>
	Non-Big 8 national auditor	4	
	<b>Price Waterhouse</b>	<b>10</b>	
	Arthur Andersen	3	
	Coopers & Lybrand	3	
	Deloitte & Touche/Deloitte Haskins & Sells	3	
	Ernst & Young/Ernst & Whinney	3	
	KPMG	3	
	Arthur Young	1	
	Touche Ross	1	
	Number of auditor offices	1	
	Mid-tier auditor	2	
	Official auditor	1	
	Joint audit (professional)	1	
	Joint audit (professional-amateur)	1	
	Small city, big auditor	1	
	Audit quality	2	
	Contract type	1	
	Merger	1	
	Multinational auditor	1	
	Audit firm market share	4	
	No competing specialists	1	
	<b>Auditor specialist</b>	<b>13</b>	<b>4</b>

(The table is continued on the next page.)

TABLE 2 (Continued)

Category	Variable*	Total number of analyses	Results excluded for lack of independence
	Second largest auditor in industry	1	
	Auditor industry concentration	1	
Auditor tenure	<b>Auditor tenure</b>	<b>13</b>	
	<b>Change of auditor</b>	<b>27</b>	<b>4</b>
	2nd year audit	3	
	3rd year audit	3	
	4th year audit	2	
	5th year audit	1	
Auditor location	<b>Auditor location</b>	<b>11</b>	
<i>Engagement attributes</i>			
Report lag	<b>Audit report lag</b>	<b>12</b>	
Busy season	<b>Busy season</b>	<b>35</b>	<b>3</b>
Audit problems	Material weaknesses	1	
	Material instances of noncompliance	1	
	Client participation	6	2
	SEC criticized	1	
	Bankruptcy	1	
	Lawsuit	2	
	Legal costs	8	
	<b>Audit opinion</b>	<b>57</b>	<b>11</b>
	Audit opinion (lagged)	1	
	First time audited	1	
Nonaudit services reporting	<b>Nonaudit services by auditor</b>	<b>24</b>	<b>5</b>
	Nonaudit services by others	2	
	<b>Number of audit reports</b>	<b>10</b>	<b>2</b>
	Comprehensive annual financial report	4	
	Six-monthly reporting	1	
	Audit scope	2	
	Second auditor	2	
	Audit on fund basis	1	
<i>Miscellaneous attributes</i>			
Other	Acquisition or disposal	2	
	Research and development	1	
	Delist	1	
	Cost weight	1	

(The table is continued on the next page.)

TABLE 2 (Continued)

Category	Variable*	Total number of analyses	Results excluded for lack of independence
	Party membership	1	
	Free cash flows	1	
	Property tax rate	1	
	Revenue/property tax	1	
	Product mix	1	
	Tax	2	
	Year <sup>†</sup>	3	
	Income per capita	1	
	Board composition, Malay	1	
	Board composition, foreign	1	
	First day, initial public offering return	1	

**Notes:**

\* Variables in boldface italics are part of the meta-analysis reported in Table 3.

<sup>†</sup> One study used variables for Year = 1993, Year = 1994, Year = 1995, Year = 1996, and Year = 1997.

the advantage of having more data is considered to outweigh the disadvantages of including studies with limitations. However, whether articles in higher-quality journals provide similar results to those in all journals is a relevant issue. It can be expected that these journals publish higher-quality studies with more robust findings; but there is also a greater possibility of bias, as it is possible that editors are more likely to reject findings that are not interesting because they are not significant. It is also possible that the differences are merely a matter of timing; the first study on a particular topic may be considered interesting, even with some methodological limitations, and might be accepted by a top-level journal. Later studies, with the same limitations, are less novel, and so they may be consigned to lower-level journals. Weighing both perspectives, we report separate results for five high-quality journals for comparative purposes.

#### 4. Results

Each attribute in Table 3 is discussed in detail in the following sections. For each category, we discuss the nature of the attribute, the types of proxies used in prior studies, and the results from the meta-analysis for the most common variable specifications. In general, the results for the high-quality journals are similar to those of the full study, with a few exceptions mentioned below. In a few cases, excluding other journals results in insufficient studies to carry out a meta-analysis.

TABLE 3

Summary of results from meta-analysis of selected independent variables (high-quality journals — AJPT, AR, CAR, JAE, JAR — in parentheses: 66 studies)

Attribute	Independent variable	Number of sets of results		Number of significant results			Stouffer test		File drawer studies at $p = 0.05$
		Pos.	Neg.	Not significant	Sign.	Sign			
<i>Client attributes</i>	Size	Assets	87 (47)	0	2	0.0000 (0.0000)	pos. (pos.)	111,146 (34,397)	
		Sales	24 (9)	0	2	0.0000 (0.0000)	pos. (pos.)	7,072 (631)	
	Complexity	City population	7 (5)	0	0	0.0000 (0.0000)	pos. (pos.)	924 (452)	
		Complexity	9 (3)	0	1	0.0000 (0.0000)	pos. (pos.)	559 (70)	
	Number of subsidiaries	Number of subsidiaries	82 (44)	0	14	0.0000 (0.0000)	pos. (pos.)	42,835 (11,501)	
		Number of SIC codes	14 (5)	0	3	0.0000 (0.0000)	pos. (pos.)	607 (88)	
	Foreign subsidiaries	Foreign subsidiaries	39 (26)	1	9	0.0000 (0.0000)	pos. (pos.)	4,967 (1,463)	
		Number of business segments	7 (5)	1	1	0.0000 (0.0000)	pos. (pos.)	87 (78)	
	Number of audit locations	Number of audit locations	7 (6)	0	1	0.0000 (0.0000)	pos. (pos.)	350 (78)	

(The table is continued on the next page.)



TABLE 3 (Continued)

Attribute	Independent variable	Number of sets of results			Number of significant results			Stouffer test		File drawer studies at $p = 0.05$
		Pos.	Neg.	Not significant	Pos.	Neg.	Sig.	Sign		
Inherent risk	Foreign assets	11 (7)	0 (0)	1 (1)	10 (6)	0 (0)	1 (1)	0.0000 (0.0000)	pos. (pos.)	739 (381)
	Inventory	19 (9)	1 (0)	9 (4)	9 (5)	1 (0)	9 (4)	0.0000 (0.0000)	pos. (pos.)	495 (266)
	Receivables	17 (10)	1 (1)	5 (3)	11 (6)	1 (1)	5 (3)	0.0000 (0.0000)	pos. (pos.)	418 (266)
Profitability	Inventory and receivables	43 (30)	0 (0)	7 (7)	36 (23)	0 (0)	7 (7)	0.0000 (0.0000)	pos. (pos.)	10,153 (3,518)
	Current assets	6 (4)	0 (0)	0 (0)	6 (4)	0 (0)	0 (0)	0.0000 (not tested)	pos. (not tested)	159 (27)
	Systematic risk	5 (0)	0 (0)	2 (0)	3 (0)	0 (0)	2 (0)	0.0000 (not tested)	pos. (not tested)	27 (304)
Leverage	Profitability ratio*	37 (20)	13 (10)	18 (6)	6 (4)	13 (10)	18 (6)	0.0000 (0.0000)	neg. (neg.)	304 (215)
	Loss*	39 (23)	3 (3)	27 (15)	9 (5)	3 (3)	27 (15)	0.0000 (0.0019)	pos. (pos.)	219 (48)
	Leverage ratio*	39 (24)	1 (1)	19 (9)	19 (14)	1 (1)	19 (9)	0.0000 (0.0000)	pos. (pos.)	1,027 (340)
Quick ratio	Quick ratio	16 (14)	8 (8)	7 (5)	1 (1)	8 (8)	7 (5)	0.0000 (0.0000)	neg. (neg.)	184 (207)

(The table is continued on the next page.)

TABLE 3 (Continued)

Attribute	Independent variable	Number of sets of results		Number of significant results		Stouffer test		File drawer studies at $p = 0.05$
		Pos.	Neg.	Pos.	Neg. significant	Sig.	Sign	
	Equity-to-debt ratio	5 (5)	2 (2)	0 (0)	3 (3)	0.0163 (0.0163)	neg. (neg.)	3 (3)
	Bond rating	7 (5)	0 (0)	6 (4)	1 (1)	0.0000 (0.0000)	pos. (pos.)	146 (45)
	Debt per capita	5 (3)	0 (0)	2 (1)	3 (2)	0.0008 (not tested)	pos. (not tested)	13
	Probability of failure	7 (1)	0 (0)	6 (0)	1 (1)	0.0000 —	pos. (not tested)	50
Form of ownership	Stock versus mutual	8 (0)	0 (0)	1 (0)	7 (0)	0.0001 (not tested)	pos. (not tested)	35
	Public or private	12 (8)	0 (0)	8 (6)	4 (2)	0.0000 (0.0000)	pos. (pos.)	403 (264)
	Major shareholding*	8 (2)	4 (0)	1 (1)	3 (1)	0.0090 (not tested)	neg. (not tested)	9
Internal control	Internal audit*	11 (4)	1 (1)	3 (0)	7 (3)	0.0544 (not tested)	not significant (not tested)	
Governance	Outside directors	5 (1)	0 (0)	2 (1)	3 (0)	0.0083 (not tested)	pos. (not tested)	6
Industry	Financial institutions	16 (7)	10 (5)	1 (0)	5 (2)	0.0000 (0.0000)	neg. (neg.)	91 (353)

(The table is continued on the next page.)

TABLE 3 (Continued)

Attribute	Independent variable	Number of sets of results			Number of significant results			Stouffer test		File drawer studies at $p = 0.05$
		Pos.	Neg.	Not significant	Pos.	Neg.	Sig.	Sign		
<i>Auditor attributes</i>	Utilities	16 (6)	0 (0)	9 (4)	7 (2)	0.0000 (0.0000)	neg. (neg.)		599 (95)	
	Manufacturing	6 (3)	3 (0)	1 (1)	2 (2)	0.0032 (not tested)	pos.		10	
	Big 5/Big 6/Big 8	85 (40)	49 (23)	3 (1)	33 (16)	0.0000 (0.0000)	pos.		13,922 (3,015)	
	Price Waterhouse	10 (3)	3 (1)	2 (0)	5 (2)	0.0075 (0.0014)	pos. (pos.)		12 (7)	
Audit tenure	Auditor specialist	9 (7)	3 (3)	0 (0)	6 (4)	0.0001 (0.0000)	pos. (pos.)		37 (61)	
	Audit tenure*	13	4	2	7	0.0507	not significant			
	Change of auditor	(7)	(4)	(0)	(3)	(0.0000)	(pos.)		(35)	
Auditor location	Change of auditor	23 (11)	4 (2)	8 (3)	11 (6)	0.0002 (0.0132)	neg. (neg.)		86 (9)	
	Auditor location	11	8	0	3	0.0000	pos.		338	
		(0)	(0)	(0)	(0)	(not tested)				

(The table is continued on the next page.)

TABLE 3 (Continued)

Attribute	Independent variable	Number of sets of results	Number of significant results		Stouffer test		File drawer studies at $p = 0.05$	
			Pos.	Neg.	Sig.	Sign		
<i>Engagement attributes</i>								
Report lag	Audit report lag*	12 (4)	6 (3)	0 (0)	6 (1)	0.0000 (0.0000)	pos. (pos.)	187 (54)
Busy season	Busy season*	32 (19)	5 (1)	2 (2)	25 (16)	0.0005 (0.1701)	pos. (not significant)	95
Audit problems	Audit opinion*	46 (31)	13 (11)	2 (2)	31 (18)	0.0000 (0.0000)	pos. (pos.)	743 (625)
Nonaudit services	Nonaudit services	19 (8)	16 (6)	2 (1)	1 (1)	0.0000 (0.0000)	pos. (pos.)	1,014 (132)
Reporting	Number of audit reports	8 (8)	6 (6)	0 (0)	2 (2)	0.0000 (0.0000)	pos. (pos.)	240 (240)

**Note:**

\* See Table 4 for a further breakdown of these variables.

### *Client attributes*

#### *Size*

The most dominant determinant of audit fees found across virtually all published studies is size, which is expected to have a positive relationship with fees (Simunic 1980). Size is typically measured as total assets, with some studies using revenues. The size measure is usually transformed by taking the natural logarithm of the raw data in order to improve the linear relationship with audit fees.<sup>6</sup> The amount of variation explained by size is generally in excess of 70 percent; however, this percentage may be significantly lower in smaller firms (Bell, Knechel, and Willingham 1994). The results for size measures are overwhelmingly positive and significant. There are 87 studies that include assets as a control variable for size, with all but 2 having a significant positive coefficient. Consequently, the results of the meta-analysis reported in Table 3 are positive and strongly significant — there would have to be more than 100,000 unpublished studies in file drawers to overturn this result. There are 24 studies in which sales is the size variable, with 22 showing positive and significant results. Again, the meta-analysis results confirm the positive association with fees. Although not a surprise, these results taken together indicate that size is an extremely critical explanatory variable for any model of audit fees.<sup>7</sup>

#### *Complexity*

Researchers typically expect that the more complex a client, the harder it is to audit and the more time-consuming the audit is likely to be (Simunic 1980; Hackenbrack and Knechel 1997). However, the general concept of complexity has been measured in many different ways by researchers and we identify 33 specific metrics that may proxy for complexity in an audit fee model. The most typical indicators of complexity include the number of subsidiaries (82 studies), the number of foreign subsidiaries (39), the proportion of foreign assets (11), the number of Standard Industrial Classification (SIC) codes that make up the client (14), the number of business segments (7),<sup>8</sup> the number of audit locations (7), and a subjective rating of complexity provided by the audit team (9).

The meta-analysis results for the seven commonly used complexity variables reported in Table 3 leave little doubt that the relationship between fees and complexity is positive and significant. Of the 169 results included in previous studies, only 2 are significantly negative and 30 are insignificant. That is, a measure of complexity is positive and significant in 81 percent of the reported results. The strongest results are seen for the number of subsidiaries with a file drawer value of over 40,000. The weakest result is seen for the number of business segments where one study reports a negative association and the file drawer result is 87. Overall, while the definition of complexity has varied a great deal across studies, the empirical evidence strongly supports a positive relationship between complexity and audit fees.

*Inherent risk*

A number of researchers have suggested that audit fees are positively associated with inherent risk in an engagement because certain parts of the audit may have a higher risk of error and require specialized audit procedures (Simunic 1980; Stice 1991). The two areas most frequently cited as being difficult to audit are inventory and receivables (Simunic 1980; Newton and Ashton 1989). The three metrics that are commonly used to represent inherent risk are inventory divided by total assets (19 studies), receivables divided by total assets (17), and the combination of inventory and receivables divided by total assets (43). For these three proxies, 71 percent of prior studies (56 out of 79) reported a significant positive relationship between inherent risk and audit fees. The results are strongest for inventory and receivables combined where 84 percent of the studies report significant positive results and the file drawer result is 10,153. The association between fees and inventory or receivables separately is weaker, with only 47 percent of studies using inventory and 65 percent of studies using receivables reporting a positive association. Taken together, these results suggest that inherent risk is an important driver of audit fees but the combination of inventory and receivables may be a better proxy than considering these accounts separately. Other measures of inherent risk used in audit fee research are current assets and systematic risk. All 6 studies that used current assets found it to be significant and positive, which may be an artifact of the inventory and receivables components of current assets. Also, systematic risk has been found to be significant and positive in 3 of 5 studies.<sup>9</sup>

*Profitability*

Client profitability is often considered another measure of risk because it reflects the extent to which the auditor may be exposed to loss in the event that a client is not financially viable (Simunic 1980). In general, the worse the performance of the organization, the more risk to the auditor and the higher the audit fee is expected to be. The two variables that are typically used to measure performance are a profitability ratio (usually net income divided by total assets, 37 studies) and a dummy variable for the existence of a loss (39). It is expected that the relationship between audit fee and return on assets (ROA) will be negative and the relationship with loss will be positive. The results for the profitability ratio measure are mixed, but the meta-analysis shows a significant negative overall result. We found 6 studies that reported a significant positive result for return on assets and 13 that reported a negative association (18 are insignificant). The meta-analysis is also negative with a file drawer result of 304. The alternative measure of profitability, a dummy variable for loss, was reported to be significant and positive in 23 percent of the papers reviewed with a positive meta-result and file drawer test of 219. The mixed results indicate that auditors may not be as finely calibrated to differences in the profitability metrics as the fee model suggests. The relationship between return on assets and fees may be nonlinear because a reduction of ROA when a company is already losing money may not have the same impact as a reduction when the company is just barely making a profit. Similarly, while the loss dummy is a cruder metric and

requires less calibration by auditors, it may not reflect the threshold at which auditors actually begin to perceive increased risk.

In order to examine these results in more detail, we classified the various studies that incorporated measures of profitability and those that used a dummy variable for financial losses by country and time period (see Table 4). In general, a significant relationship between losses and fees is observed post-1990 and for countries other than Canada and Australia. Pre-1990 studies had insignificant results overall for profitability and typically had insignificant results for the loss measure. Although we are not sure why, the most recent results suggest that the existence of a loss for a client has become an increasingly important driver of audit fees.

### *Leverage*

Leverage also measures the risk of a client failing, which potentially exposes the auditor to loss (Simunic 1980). Consequently, researchers generally expect to find an association between the leverage of a company and its audit fees (e.g., Gist 1994b). The two most common proxies for leverage have been the ratio of debt to total assets (leverage ratio, 39 studies) and the quick ratio (16). The expected association between fees and leverage ratio is positive, while the relationship with the quick ratio is expected to be negative. About half of the prior studies confirm these expectations and the meta-results are highly significant, although the file drawer result is better for the leverage ratio (1,027 versus 184). Leverage can also be measured by the equity-debt ratio, which is a transformation of the leverage ratio and yields consistent results (albeit with a low file drawer statistic). Other studies have used bond ratings, debt per capita (in governmental studies), and the probability of failure. The combined meta-results support the expected relationship between leverage and audit fees. However, there are a relatively large number of insignificant results reported in prior studies. Classifying these studies by country and time period suggests that leverage may have been important in the United States and United Kingdom in the past. For example, six of the nine studies conducted in the United States in the 1980s reported a significant relationship between fees and leverage, but generally were less important in other countries and post-1990 (see Table 4). For example, overall results for seven Hong Kong studies are not significant.

### *Form of ownership*

Several studies have included the form of ownership of the client as a potential driver of audit fees because it might affect the agency costs or risk of the organization or its auditor. In general, some forms of ownership are considered to increase the auditor's potential exposure to liability and lead to higher audit fees. The three most common metrics used to proxy for ownership are dummy variables for public versus private companies (12 studies), stock versus mutual companies (8), and the existence of a major shareholder (8). In the latter case, the existence of a dominant shareholder could either indicate higher agency costs or stronger control, with potentially conflicting effects on audit fees. The strongest results are obtained for the public versus private dummy, with 8 of 12 studies reporting a significant positive

TABLE 4  
Subsample results for selected categories of selected variables\*

Independent variable	Subgroup	Number of studies		Number of significant results			Stouffer test		File drawer studies at $p = 0.05$
		Pos.	Neg.	Not significant	Sign.	Sign			
<b>Profitability ratio</b>		37	6	13	18	0.0000	neg.	304	
	Pre-1990	17	3	3	11	0.9879			
	Post-1990	19	3	10	6	0.0000	neg.	353	
<b>Loss</b>		39	9	3	27	0.0000	pos.	219	
	Pre-1990	16	3	1	12	0.0262	pos.	6	
	Post-1990	20	5	2	13	0.0004	pos.	62	
	Canada and Australia	12	0	2	10	0.8654			
	Other	27	9	1	17	0.0000	pos.	312	
<b>Leverage ratio</b>		39	19	1	19	0.0000	pos.	1,027	
	Pre-1990	10	5	0	5	0.0004	pos.	31	
	Post-1990	27	12	1	14	0.0000	pos.	449	
	U.S.	10	8	0	2	0.0000	pos.	107	
	UK	9	4	0	5	0.0000	pos.	123	
	Hong Kong	7	1	0	6	0.3177			
<b>Major shareholding</b>		8	1	4	3	0.0090	neg.	9	
	U.S.	2	1	0	1	not tested			
	UK	5	0	4	1	0.0000	neg.	34	

(The table is continued on the next page.)



TABLE 4 (Continued)

Independent variable	Subgroup	Number of studies	Number of significant results			Stouffer test		File drawer studies at $p = 0.05$
			Pos.	Neg.	Not significant	Sig.	Sign	
<b>Internal audit</b>		<b>11</b>	<b>3</b>	<b>1</b>	<b>7</b>	<b>0.0544</b>		
	Pre-1990	7	3	1	3	0.0065	pos.	9
	Post-1990	3	0	0	3	not tested		
	U.S.	3	2	1	0	not tested		
	Other countries	8	1	0	7	0.0322	pos.	2
<b>Audit tenure</b>		<b>13</b>	<b>4</b>	<b>2</b>	<b>7</b>	<b>0.0507</b>		
	Pre-1990	10	3	1	6	0.0251	neg.	41
	Post-1990	3	1	1	1	not tested		
	Public sector	4	2	2	0	not tested		
	Private sector	8	1	0	7	0.1269		
<b>Report lag</b>		<b>12</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>0.0000</b>	<b>pos.</b>	<b>187</b>
	Pre-1990	1	1	0	0	not tested		
	Post-1990	11	5	0	6	0.0000	pos.	147
	UK	6	2	0	4	0.0004	pos.	19
	Hong Kong	4	2	0	2	not tested		

(The table is continued on the next page.)

TABLE 4 (Continued)

Independent variable	Subgroup	Number of studies		Number of significant results			Stouffer test		File drawer studies at $p = 0.05$
		Pos.	Neg.	Not significant	Sign.	Sign			
<b>Busy season</b>		<b>32</b>							<b>95</b>
	Pre-1990	12	2	25	<b>0.0005</b>	<i>pos.</i>			44
	Post-1990	19	0	10	0.0002	<i>pos.</i>			1
	U.S. municipal	6	2	14	0.0446	<i>pos.</i>			39
	U.S. nonmunicipal	N/A	0	4	0.0000	<i>pos.</i>			
	UK	7	N/A	N/A	not tested				8
	Australia	9	1	6	0.0081	<i>pos.</i>			
<b>Audit opinion</b>	Australia	9	1	8	0.6332				
	Hong Kong	6	1	4	0.2489				
		<b>46</b>	<b>13</b>	<b>31</b>	<b>0.0000</b>	<i>pos.</i>			<b>743</b>
	Pre-1990	27	9	18	0.0000	<i>pos.</i>			507
	Post-1990	17	4	11	0.0198	<i>pos.</i>			10
	Australia	10	3	7	0.0000	<i>pos.</i>			49
	U.S.	25	8	15	0.0000	<i>pos.</i>			336

**Note:**

\* Lines in boldface italic represent category totals as reported in Table 3; lines below these represent further analysis of these totals.

relationship with fees and a file drawer result of 403.<sup>10</sup> Similar results are obtained for stock versus mutual companies, with a file drawer result of 35. The major shareholding variable reveals mixed results — one positive, four negative, and three insignificant — with a significant negative meta-result but a file drawer result of only 9. This may be a case where national institutional environments are particularly important, as the positive result is for the United States and the four negative results are for the United Kingdom. Studies in Hong Kong and Norway reported insignificant results.

### *Internal control*

Internal control is expected to affect audit fees because the audit process should be sensitive to differences in the control environment of an organization (Knechel 2001). Few researchers have had access to data about internal control, but 11 studies have been able to look at the relationship between internal auditing and audit fees. Internal audit has been measured variously as internal audit expenditures, internal audit assistance, ratio of internal audit costs to total assets, internal audit payroll, and number of internal auditors. The results for internal audit are quite mixed with one significant negative result, three significant positive results, and seven insignificant results. The overall meta-result is not significant ( $p = 0.0544$ ).

### *Governance*

Corporate governance is likely to have an effect on audit fees because improved corporate governance implies that the control environment is more effective. Measures of governance in published studies include the existence of an audit committee, separation of the duties of the chair and chief executive officer (CEO), and the number of nonexecutive directors. Unfortunately, research to date examining the relationship between corporate governance and audit fees is limited, and preliminary evidence indicates conflicting results as to whether the relationship between governance and fees is positive or negative (e.g., Tsui, Jaggi, and Gul 2001; Carcello, Hermanson, Neal, and Riley 2002). Only one variable — outside directors — has been included in enough studies for meta-analysis. There are two significant positive results and three insignificant, with an overall effect that is positive and significant, but only six studies with insignificant results need to exist in order to eliminate this result. Much more research is needed on this issue.

### *Industry*

A common assertion made by auditors and researchers is that some industries are more difficult to audit than others (Simunic 1980; Turpen 1990; Pearson and Trompeter 1994). For example, financial institutions and utilities have relatively large assets, but are generally easier to audit than companies with extensive inventory, receivables, or knowledge-based assets. The two industries that have most frequently been singled out in audit fee research are financial institutions (16 studies) and utilities (16). When a dummy variable is used to represent either industry, audit fees are significantly lower than in other industries (file drawer results of 91 and 599). In contrast, manufacturers do not have the advantages of these two

industries, and their audit fees are expected to be higher. Of six studies, three have positive coefficients, one negative, and two insignificant, for an overall significant positive meta-result (but a low file drawer statistic of 10).

### ***Auditor attributes***

#### *Auditor quality*

Higher audit fees might be expected when an auditor is recognized to be of superior quality. Researchers have attempted to use a large number of different proxy variables to represent audit quality, but the three that are most common are a dummy variable for firms that are classified as being in the Big 8/6/5/4 (85 studies), a dummy variable for Price Waterhouse (10), and a measure of industry specialization (9). The results on audit quality strongly support the observation that the Big 8/6/5/4 is associated with higher audit fees, with 58 percent of all studies finding a significant positive result. This strong result is reflected in the meta-analysis and file drawer result of nearly 14,000. However, with the exception of Price Waterhouse in the 1980s, no individual large firm has exhibited a fee premium.<sup>11</sup>

Auditor specialization was found to be significant in three studies (out of nine), and the combined result of the meta-analysis was significant ( $p < 0.0001$ ), but this variable had a file drawer statistic of only 37, indicating that the result is not clear-cut. The issue of auditor specialization has received increasing research attention in recent years, so we expect that more insight into this particular variable will be gained in time. Auditor specialization is generally measured as the percentage of an industry that is audited by a specific auditing firm. However, there is a great deal of debate as to how this measure should be operationalized. Should specialization be measured at the national or local level? Should an industry specialist be considered to be the firm that is the largest or next to largest in the market, or any firm that meets a certain level of business in the industry? Until these questions generate more consensus among researchers, the relationship between specialization and audit fees may continue to be elusive.

#### *Auditor tenure*

A common reason cited for clients to change auditors is to obtain a reduced fee from a new audit firm. Lower fees may be due to audit firms intentionally offering services at a discount in order to win new business (often referred to as low-balling) or because a new auditor can offer more efficient service, justifying a fee reduction. Regardless of the reason for the reduced fees, prior research has suggested that auditor tenure should be considered in models of audit fees. The two common proxies for auditor tenure are a dummy variable to reflect a recent change in auditor (23 studies) and the actual duration of the current auditor tenure (13). A dummy for a change in auditor is usually defined as auditor tenure of less than a specified period of time. Some papers define a change in auditor as auditor tenure of one year or less while others use a cutoff of two or three years. Regardless of the threshold, the dummy variable indicates audits where the auditor is relatively new and fees are likely to be lower. Eight studies report a significant negative result for

the change of auditor dummy, while 4 report a positive result (11 are insignificant). The meta-analysis supports the conclusion that audit fees are lower in audits where the auditor is relatively new to the engagement. Evidence based on the continuous variable for auditor tenure is less conclusive with 4 positive results, 2 negative results, and 7 insignificant results, and an overall result that is not significant.<sup>12</sup> Although auditor tenure may affect audit fees, a dummy variable indicating an auditor change seems to be a better proxy.

### *Auditor location*

In some countries, there is one metropolitan center where costs are higher than in the rest of the country. For example, this may be the case in the United Kingdom (London), the Netherlands (Amsterdam), or Norway (Oslo). There are 10 studies that have specifically considered whether the location of an audit client in London is associated with higher audit fees, and 1 has considered Oslo. Of the London studies, 8 found a significant positive coefficient, and the overall result was significant and positive, while the file drawer meta-result was 338. On the other hand, the remaining 2 London studies and the Norwegian (Oslo) study did not find significant results.

### *Engagement attributes*

#### *Report lag*

Audit report lag, the elapsed time from the balance sheet date to the issuance of the audit report, is sometimes interpreted as an indication of the efficiency of an audit because a longer delay is likely to indicate problems during the course of the audit, difficulties in resolving sensitive audit issues, or more complex financial reports to prepare (Knechel and Payne 2001). Consequently, audit report lag is expected to have a positive association with audit fees. We know of 12 studies that examined this issue, 6 of which report significant positive results, as expected. The meta-analysis is positive with a file drawer result of 187.

#### *Busy season*

Auditors are known to have a “busy season” that corresponds to the point in time when most companies have their fiscal year-end. In the United States, December 31 is the most common fiscal year-end, and the auditor’s busy season follows in January and February. An audit conducted during the busy season may be more costly if audit staff have to work overtime; alternatively, audit firms might offer discounted audit fees for work outside the busy season to use otherwise idle resources. In either case, there will be a positive relationship with audit fees. There are 32 studies that examine this issue. Only 5 of the prior studies find the hypothesized positive relationship while 2 find a negative association, and most report insignificant results (25 studies). The Stouffer test is significantly positive ( $p < 0.0005$ ), and the file drawer result is 95, suggesting that even though the results were not significant in most individual studies, the accumulated effect of those studies was positive on balance.<sup>13</sup> However, this situation varies among countries, sectors, and

periods. Two of the significant positive results were found in the United States and one in the Netherlands, while the significant negative results occur in studies from Australia and Hong Kong. Analysis of the U.S. studies that include the busy season reveals that both of the significant positive results were from studies of the municipal audit market. Studies in the United Kingdom also had a significant and positive result, but the file drawer statistic is only 8. No other countries were found to have a significant overall result. Analysis by period showed that studies using data from before 1990 gave an overall significant result ( $p < 0.0006$ , file drawer = 44), but this effect almost disappears after 1990.<sup>14</sup>

#### *Audit problems*

Problems in completing the audit may also increase the risk assumed by the auditor or the quantity of audit work done and therefore the cost (Simunic 1980). The existence of audit problems has been measured in different ways, with the most common proxy being a dummy variable to indicate the issuance of an audit opinion that was other than unqualified (46 studies).<sup>15</sup> A positive association with fees is expected when audit reports are qualified or modified. Of the 46 studies that included a proxy for audit opinion, only 13 (28 percent) found the expected positive relationship with fees while 31 studies reported insignificant results and 2 found a negative relationship. The combined results show that this effect is positive, with a file drawer result of 743. Closer examination shows that the two studies with significant negative results both dealt with pension plan audits in the United States (Cullinan 1997, 1998). Excluding these studies shows even more strongly significant positive results (file drawer result of 896). Examining the remaining studies shows variations between countries, with the positive relationship observed mainly in Australia and the United States. Of 10 studies in Australia, 3 have significant positive effects, and the combined meta-analysis is significant (file drawer = 49). There are 7 studies with significant positive coefficients in the United States and the combined meta-analysis is significant and positive (file drawer = 336). Furthermore, all but one of the significant results were obtained before 1990, and the meta-result for studies conducted after 1990 is not as significant. Consequently, the nature of the audit opinion may be less important as a driver of audit fees. This change may be due to the changes in reporting on going-concern issues that occurred in the late 1980s in many countries.

#### *Nonaudit services*

The relationship between audit fees and the existence of nonaudit services has received a great deal of attention from researchers and commentators (Simunic 1984; Simon 1985; Turpen 1990). On the one hand, it is argued that the provision of audit services can lead to lower fees because of cross-subsidization of fees or synergies between audit and nonaudit services. On the other hand, nonaudit services could be associated with higher audit fees because such services may lead to extensive changes in an organization that require additional audit effort, or because clients that buy consulting services may be problematic in general, or because monopoly power and service efficiency in the nonaudit service market allow auditors to

charge fee premiums. Nonaudit services had a significant positive relationship in 84 percent of studies (16 out of 19) that include this variable. Only 1 study was insignificant and 2 were significant but negative. Consequently, the meta-analysis shows that the overall results are strongly positive and significant ( $p < 0.0000$ , file drawer = 1,014). This result does not support the prediction that nonaudit services will be associated with fee cutting. However, these studies do not really help to disentangle the explanation for this relationship.

### *Reporting*

The more complicated the reporting requirements that a client has to satisfy, the more audit work will be needed and the greater the risk to the auditor. Although different proxies have been used for reporting complexity, the most common variable is the number of audit reports to be issued (eight studies). Six studies found a significant positive relationship between number of reports and fees, while two reported insignificant results. The meta-analysis shows that the overall results are positive and highly significant ( $p < 0.0000$ , file drawer = 240). Although interesting, in most cases this result is based on audit firm data that is internal and proprietary so it does not provide much guidance for most researchers who use public data.

## **5. Potential limitations of current models of audit fees**

Existing research based on the production function view of audit fees has provided a great deal of insight into the determinants of audit fees. However, our analysis highlights some anomalies (for example, internal auditing), mixed results (for example, profitability), and areas where additional research could be beneficial (for example, governance). In the case of anomalies and mixed results, the results may be due to low-power tests or incompatible research methodologies, or they may lead to questions about the assumptions that underlie the production view of audits. For example, Tsui et al. (2001) suggest that an independent board (that is, separate chair and CEO) will improve control and reduce audit fees, while Carcello et al. (2002) argue that the existence of an audit committee will be positively associated with audit fees.<sup>16</sup> A negative association between governance mechanisms and audit fees would be expected if good governance can substitute for external auditing, leading to a reduction of audit fees. This argument is fully consistent with the production view of audit fees. However, if fees are higher when governance improves (for example, when an audit committee exists), it is hard to argue that auditors need to do more work or that they face greater risk for which they can charge a fee premium. In this section, we consider how these results may arise from problems related to the empirical model for audit fees.

### *Potential omitted variables*

All empirical models suffer from an omitted variables problem to some extent. The general presumption is that omitted variables do not have a systematic effect on the relationship between the dependent and independent variables (Gujarati 2003, 517). For example, researchers have become increasingly sensitive to the inclusion/exclusion of nonaudit services in audit fee models, even though the theoretical

justification for including nonaudit services fees is less than clear-cut. Potentially compounding the omitted variables problem is the fact that much of the research discussed in this review used publicly available data, so important factors that affect audit fees may be omitted from such empirical models because of the lack of internal data about the audit process. For example, both complexity (eight significant positive results out of nine) and the number of audit reports (six positive results out of eight) were found to be highly significant in the meta-analysis, but both are based on proxies that were obtained directly from one or more audit firms and are not readily available to other researchers (and may even be considered to be proprietary). Furthermore, the mixed results for internal auditing proxies illustrate the difficulties of obtaining reliable measures for attributes that may be important to the empirical specification of audit fees but for which public data is lacking. In general, it may be that the proxies used to measure risk are too noisy or coarse to be adequate, or the observed anomalous results may be due to omitting factors related to both the dependent and independent variables in the model (for example, governance). In short, omitted variables may relate to important drivers of audit fees, thereby creating a potential weakness for which it is difficult to compensate.

#### ***Potential problems with specification of control variables***

Even when data are available for important control and experimental variables, problems may arise that are related to measurement and calibration. Failure to measure a theoretical construct in a rigorous and robust manner can influence whether that construct has a significant relationship with audit fees (Gujarati 2003, 30). At one extreme, using continuous measures of underlying concepts may imply an unrealistic assumption of linearity between the dependent variable (audit fees) and the independent variables. Although nonlinear relationships can be transformed using common techniques, the resulting measure may still not be well calibrated. For example, our meta-results looked at the relationship between auditor tenure and audit fees. Models that use a continuous measure of auditor tenure (in years) are presuming that there is a predictable and consistent relationship between a one-year change in tenure and the level of audit fees. This level of calibration may be too refined and precise for the data used in audit fee studies. Other variables where the imposition of a continuous relationship between dependent and independent variables may be problematic include measures of profitability (previously mentioned) or the number of outside directors (that is, does adding one more independent director really add  $x$  percent to the audit fee?).

At the other extreme, researchers often use dummy variables to measure independent variables where the relationship with audit fees can be expected to be very rough. For many control variables, this is perfectly reasonable because the underlying attribute is essentially dichotomous (for example, Big 8/6/5/4 versus other firms, busy versus nonbusy season, public versus private). However, dummy variables are often used to map a continuous variable onto a dichotomous measurement space. In these cases, the mapping process can be critical. The estimation of audit fees may be sensitive to this mapping and may account for some of the mixed results reported in the meta-analysis, especially for auditor specialization, major



shareholding, and financial loss. In the case of auditor specialization, there is a lack of agreement as to what constitutes a specialist: Is it the firm that is the market leader in an industry or is it any firm that has more than a minimum share of the market? In addition, Carson and Fargher (2004) find that any fee premium to industry specialization is confined to the few largest clients in each industry. Other variables of interest could also be correlated with size. For major shareholding, the issue is determining the ownership cutoff used to define a major shareholder. Should the cutoff be 5 percent, 10 percent, or 20 percent? Does it depend on the country and public status of the company? Does it matter whether the major shareholder is an institution, an overseas company, or an individual/family? For financial losses, as previously mentioned, a dummy variable cutoff at zero may not actually reflect the riskiness of the engagement; better thresholds might be earnings less than an industry average, losses over time, or results that fall short of analyst forecasts. Due to these potential problems, it is important that researchers perform and report adequate sensitivity analyses for the reader of a paper to appreciate whether reported findings are sensitive to the mapping from continuous to noncontinuous measures.

### *Endogeneity and the omission of demand attributes*

Another possible explanation for some prior research anomalies lies in the nature of the demand for auditing and how that demand may also affect other control mechanisms in an organization, creating a potential problem of endogeneity between audit fees and some of the right-hand variables included in (1). For example, the existence of governance mechanisms may create more demand for external auditing, which can increase audit fees because of a change in the assurance provided by the auditor, not a change in the audit process as envisioned in a production model of the audit (Eilifsen, Knechel, and Wallage 2001). Unfortunately, the current theoretical underpinnings of basic audit fee models do not deal well with issues of endogenous demand. Two critical assumptions underlie most audit fee models: (1) the market for audit services is competitive, and (2) the level of audit quality, or audit assurance, is assumed to be held constant across audit clients of a firm. Thus, auditors do not provide higher or lower levels of assurance but, rather, adjust the audit process to provide the desired level of assurance conditional on the nature of the client. Differences in quality across firms are captured by brand value (that is, Big 8/6/5/4). However, if the market for audit services is not competitive, demand can influence fees. Because many of the variables that have been studied in previous fee research may surrogate for demand attributes, it is important to consider how demand might influence the empirical results of prior studies (Copley, Doucet, and Gaver 1994; Copley, Gaver, and Gaver 1995; Copley and Douthett 2002; and Chaney, Jeter, and Shivakumar 2004 examine the issue of endogeneity in audit fee models). For example, differences in auditor quality, ability to provide nonaudit services, and specialization may create an endogenous demand that leads to higher audit fees.

Where demand-related attributes were included in prior studies, the typical reasoning was based on the assumption that external auditing may substitute for

other controls — that is, an increase in the demand for external auditing reduces the need for other controls (a negative relation), and vice versa. The observation that the demand for audit services (as measured by fee levels) is positively related to measures of internal audit, audit committees, form of ownership, and nonaudit services suggests that the assumptions of the production model may be violated. Equation (1) reflects the typical single-equation approach, using ordinary least squares (OLS) to calculate the parameter estimates. However, a single-equation model may not be appropriate and may lead to biased parameter estimates if endogenous demand factors are included as independent variables in the model (Studenmund and Cassidy 1987, 342, 344). Whisenant, Sankaraguruswamy, and Raghunandan (2003) have shown that endogeneity can exist between audit fees and nonaudit services but can be corrected by using a simultaneous equation approach.<sup>17</sup> Endogeneity is also possible between audit fees and other governance or control variables (Knechel and Willekens 2004; Hay and Knechel 2002) and should be addressed in future research.

## 6. Concluding remarks

A meta-analysis provides a means of understanding the body of knowledge developed over more than 20 years of audit fee research. While the audit fee literature continues to evolve, our study confirms that well-established control variables for size, complexity, and risk are related to audit fees. We highlight several areas where uncertainties still remain in the audit fee literature and discuss the theoretical and practical reasons why these uncertainties may exist. On the basis of our observations about anomalies, inconsistencies, and gaps in the previous literature, we believe that research could be particularly useful in a number of areas: (1) examining how different forms of ownership (for example, types of dominant shareholders, such as parent/subsidiary relationships versus family-run businesses) and local institutional structures (for example, financing arrangements, tax laws) affect audit fees; (2) developing more refined measures of internal control that could be used in modeling audit fees; (3) investigating how a firm's governance and the regulatory environment that the firm operates in affect the market for audit services and the fees that the external auditor charges; (4) studying audit quality and the circumstances in which increased quality is demanded and paid for by stakeholders; and (5) analyzing the relation between nonaudit services and audit fees.

## Endnotes

1. The average number of independent variables in audit fee models pre-1990 was 7.7; the average number post-1990 was 9.5 (*t*-test for difference,  $p < 0.03$ ).
2. We did not include papers listed in the Social Science Research Network (SSRN) because many researchers do not post current working papers to SSRN. Additionally, papers on SSRN have not been subject to a review and editorial process at the time they are posted and may be published in a different form at a later date.
3. For example, Anderson and Zéghal (1994) report results for 158 small companies and 216 large companies, but provide no combined results. We include more than one

regression from a paper only in cases like the foregoing example when there are two or more regressions using different data and no combined results are reported.

4. Few audit fee studies report the “zero-order” correlation between the independent variable and audit fee, which is needed for the Hunter and Schmidt 1990 method (used by Trotman and Wood 1991).
5. We only report the results of the outlier test when they differ from the results of the basic file drawer test.
6. An alternative approach is to deflate audit fees by total assets. This approach was used by Simunic 1980, 1984, but otherwise has not been used frequently and seems to have lost favor among researchers.
7. As an alternative, city population is often used as a measure of size in studies of municipal audit markets. Meta-analysis of the six studies using city population shows strong significant positive results.
8. Note that in the case of business segments, the number of insignificant results increases for high-quality journals because the omission of some papers changes whether other papers are included or excluded in the analysis due to independence concerns.
9. In a study of the pricing of initial audit engagements, Johnstone and Bedard (2001) find that engagement partners’ actual assessments of both fraud risk and inherent risk are positively associated with the audit fee. We do not include this study in our meta-analysis because it concerns planned fees for initial engagements, not actual fees charged following performance of the engagement.
10. Because most audit fee studies are based on publicly available data, there has been limited opportunity to study differences between public and nonpublic companies, at least in the United States and the United Kingdom.
11. Some studies have used individual proxies for each of the Big 8/6/5/4, but the only firm that has been included in sufficient studies for the meta-analysis is Price Waterhouse (prior to becoming PricewaterhouseCoopers). However, the significant results all date back to the 1980s (with one exception: a study of companies in Ireland in the 1990s), and more recent studies have not shown a significant premium for any firm. One significant Price Waterhouse premium was found in an unusual setting (New Zealand) at a time when the other Big 8 firms could not use their international names (Firth 1985).
12. Considering only high-quality journals yields a different result, though with a significant positive relationship and a file drawer statistic of 35.
13. If only high-quality journals are considered, the significant meta-result disappears for the busy season attribute.
14. One study included data from both pre- and post-1990, but was excluded from the subgroup analysis.
15. A few papers have used legal costs as a measure of audit problems. The extent of legal costs paid by the client appears in eight analyses, but six of those appear in a single published paper.
16. Both studies found support for their hypotheses, even though they represent potentially conflicting views. However, Tsui et al. (2001) controlled for growth opportunities and the interaction of growth opportunities and governance. Their argument is that internal control is effective over physical assets, but not over growth opportunities that might be

reflected in the share price but not in the accounting records. Carcello et al. (2002) did not include such a measure.

17. A similar finding is shown in unpublished papers by Antle, Gordon, Narayanamoorthy, and Zhou 2002, and Hay, Knechel, and Li 2004.

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