The Impact of Litigation Risk on Audit Pricing: A Review of the Economics and the Evidence

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SUMMARY

This study investigates the relationship between audit pricing and litigation risk. The main question posed in the research is: Are audit fees adequate to compensate auditors for litigation risk? The answer to this question is an essential element in assessing the severity and implications of the liability crisis in auditing.

The paper approaches the question in several stages. First, there is an economic analysis of audit pricing. Second, there is a review and reinterpretation of the empirical literature related to audit pricing. Lastly, new evidence is provided from a sample of 249 audits done by a Big 6 auditor. The main results from these analyses are: increased litigation is likely to result in a demand displacement from high-quality to low-quality auditors; the archival evidence suggests that audit fees do reflect variations in litigation risk and that there is some evidence of the predicted demand displacement; and the evidence from the audits included in the sample suggests the incremental contribution margin from the change in audit fees attributable to litigation risk factors appeared to be adequate to cover the costs of litigation for the audit firm performing the audits during the period studied.

Key Words: Audit fees, Auditor litigation, Economics of auditing.

Much has been written about the litigation crisis facing public accounting firms in the United States (e.g., Arthur Andersen & Co. et al. 1992). An alleged consequence of the high rate of litigation against auditors is the possible business failure of one or more firms. For example, in their *Statement of Position* (Arthur Andersen & Co. et al. 1992, 1), the Big 6 argue that:

> The flaws in the liability system are taking a severe toll on the accounting profession. If these flaws are not corrected and the tort system continues on its present inequitable course, the *consequences could prove fatal to accounting firms of all sizes.* (emphasis added)

But auditing is, and has always been, a business in which the auditor must assume the risk of an uncertain rate of return from an engagement. One reason why the return is uncertain is because financial statements can contain undetected material misstatements which may be revealed after an audit report has been issued. Such *ex post* revelations may lead to accusations of negligence against the auditor resulting in costly litigation and/or a loss of auditor reputation.

While an auditor faces cost uncertainty, the return from an engagement also depends upon the fee paid by the client. In a competitive

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market, audits should be priced so that auditors expect to earn a normal return. *Ex post* litigation costs may make the realized return negative both for a particular engagement and, perhaps, over the firm's portfolio of clients. Because audit fees cannot normally be adjusted "after the fact" to cover actual litigation and/or reputation losses, an auditor has a strong incentive to try to minimize actual losses and to incorporate expected losses into the fee.[1]

In this setting, the prediction that litigation costs will lead to audit firm bankruptcy requires some special conditions such as: the auditor's wealth and/or the pool of clients in the firm's portfolio may be too small to cover large realized losses; the litigation environment may change in an unanticipated way between the time an audit is priced and the time a lawsuit is filed and damages assessed; auditors may systematically underprice their services due to an inability to assess future costs which are potentially very high in dollar amount, but have a very low probability of occurrence; auditors erroneously believe that their effort level will be judged to comply with generally accepted auditing standards; or, in a period of heightened contestability in audit markets, CPA firms may fall prey to the "winners curse" when bidding for engagements—whereby the bidder who is most optimistic about risk assessment wins the audit (see Thaler 1994). This variety of conditions under which a CPA firm may fail to earn a normal return illustrates the complexity of the problem.

The paper proceeds as follows, the basic economics of audit pricing is sketched out, first for a given level of litigation exposure and then when liability exposure increases. This provides a framework for thinking about the auditor's pricing decision and helps identify the conditions and mechanisms under which increasing liability exposure increases the risk of audit firm bankruptcy, *when audits are properly priced*. Next, results from experimental economics and existing empirical evidence concerning the actual impact of litigation risk on the pricing of audit services are reviewed. Finally, our findings—extending the work of O'Keefe et al. (OSS) (1994)—which compare the magnitude of audit fee risk premia for a specific Big 6 firm

to actual litigation costs incurred by the Big 6 in aggregate are reported.

Overall, the evidence indicates that CPA firms make client-specific audit fee adjustments in situations involving higher levels of liability exposure. Moreover, our extensions of the empirical tests in OSS suggest that fee adjustments are made almost exclusively through higher levels of auditor effort, rather than through a pure price premium. The resulting increase in total contribution margin appears adequate to compensate the partners of the audit firm in our sample for the level of losses actually incurred. Implications of our findings and conclusions are found in the last section of the paper.

THE ECONOMICS OF PRICING LITIGATION RISK
The Base Case

In this section, the effects of auditor liability exposure on market-determined fees and quantities of audit services purchased are examined. It is assumed that a quality differentiated market exists having two levels of audit quality offered for sale. This assumption is consistent with a large body of empirical evidence which shows that audits by Big 6 firms differ from non-Big 6 audits. A Big 6 audit is more costly (e.g., Craswell et al. 1995) and Big 6 audited information has a relatively greater impact on security prices (e.g., Teoh and Wong 1993). In addition, Big 6 auditors appear to have lower litigation rates than the non-Big 6 (Palmrose 1988). In sum, this evidence is consistent with Big 6 auditors supplying a relatively higher level of audit assurance. It is also assumed that the level of assurance is correlated with the quality of service produced.

The existence of at least two quality levels implies that the quantity demanded of the different service qualities is unlikely to be perfectly inelastic with respect to price in any market

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[1] Fees could be adjusted both for individual audits and for the public accounting firm's portfolio of audits. The former occurs when client-specific risk factors are identified, and the latter occurs in response to systemic risk, such as a change in liability regime or to portfolio risk (lack of diversification due to, say, industry specialization). See Simunic and Stein (1990).

segment. A publicly held company, subject to a mandatory audit requirement, still has a choice between a Big 6 or a non-Big 6 audit. In addition to the choice of higher or lower audit quality, a closely held company can also purchase a review engagement which only provides moderate assurance that financial statements are free of material misstatement or it can exit entirely from the market for financial statement attestation. Changes in the market-determined fees for different quality services can induce substitution by purchasers among the quality levels.

In a competitive market equilibrium, fees will equal the economic costs including a normal profit incurred by efficient suppliers of the various service qualities. When considering auditors' costs, two issues need to be considered: the client-specific nature of audit costs, and the fact that total audit costs include a resource cost and an expected liability loss component.

Audit costs are known to vary considerably with the size, complexity, riskiness and other characteristics of the audited entity. This makes comparisons and aggregation across clients difficult. However, for a given client, a higher level of assurance (quality) is presumably more costly to produce.

When producing a specific service, an auditor's cost function consists of two components: a resource cost component which is increasing in the level of auditor effort and an expected future loss component. The relationship between effort and expected loss is not straightforward because auditors face a negligence regime. If the auditor's level of effort does not satisfy the legally required minimum in the circumstances, then the auditor is liable for losses suffered either by the client or third parties. The legal minimum is normally considered to be an audit in accordance with generally accepted auditing standards (GAAS).[2]

We assume a vague negligence standard where the level of effort which constitutes a GAAS audit is not clearly specified. Thus, an auditor is never certain the legal standard has, in fact, been met. However, as the level of audit effort is increased, the probability that a GAAS audit is *not* produced decreases. As a result, the auditor faces a penalty function where the expected liability losses decrease with increasing effort for two reasons: the auditor is more likely to detect any material misstatements which exist in the financial statements, and the level of effort is more likely to satisfy the requirements of GAAS.[3] Under the assumption that there is no clear GAAS standard, fees for both high- and low-quality audits (and perhaps reviews) would include some liability loss component.

To determine the cost for different quality services, it is necessary to link auditors' effort levels to the level of assurance. This is an input/output relationship. Because effort levels are not observable by clients or third parties, service quality must be inferred by these parties from the auditor's brand name (Simunic and Stein 1987). Since each CPA firm has a single brand, it can only sell a single level of assurance for all engagements performed at a moment in time. For a given engagement, the firm is motivated to minimize costs. Since resource costs increase in effort while expected liability losses decrease in effort, we assume that a client-specific cost minimizing effort level exists. The cross sectional average over the firm's client portfolio of the assurance produced by these client-specific effort levels is the service quality associated with the CPA firm's brand name.

Regarding the supply side of the market, two audit quality levels can arise if the penalty functions facing high- vs. low-quality auditors are different. It is usually argued that Big 6 firms have more wealth at risk in any audit engagement. These "deep pockets" imply that, *ceteris*

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[2] The auditor's liability in review engagements is not well established. However, reviews are analogous to audits in that compliance with professional standards for review engagements would likely constitute a good defense against a charge of negligence.

[3] An auditor can only be successfully sued by third parties if both of the following conditions exist: the auditor fails to detect a material misstatement and the auditor's examination fails to comply with GAAS. Thus each effort level can be thought of as mapping into a joint probability of these two events. For a risk-neutral auditor, expected liability losses would then be the expected dollar penalty for a Type II reporting error (issuing an unqualified opinion on materially misstated financial statements) times this joint probability. This ignores Type I reporting errors (issuing a qualified or adverse opinion on financial statements which are fairly presented), which auditors argue rarely occur in practice.

paribus, the penalty for incorrectly expressing an unqualified opinion is larger for the Big 6 than for the non-Big 6. Thus, for a given client, a cost minimizing audit by a Big 6 firm should result in a higher effort level than if the audit were performed by a non-Big 6 firm.[4] Since the effect is expected to be systematic across the market, the Big 6 will be identified with the production of higher average assurance levels than the non-Big 6.

A client's decision to purchase a particular quality of service can be assumed to maximize the net benefits to current shareholders. These benefits derive from the varying probabilities conveyed by these services that audited financial statements are free of material misstatement (see, for example, Datar et al. 1991). Whatever their source, the benefits of attestation determine the maximum reservation fee a client is willing to pay for each service quality. It is reasonable to assume that, for a given client, higher quality services yield higher total benefits. That is, a client's shareholders would be better off if, at a given price, higher quality services were available. But, of course, higher quality services are also more costly. Assuming the markets for all attestation levels are competitive, market-determined service fees equal supplier costs and each potential client chooses the particular service quality which maximizes its net benefits. For a closely held company, if the net benefits from all attestation levels are negative, none will be purchased. A publicly held company, on the other hand, is constrained to purchase at a minimum a lower quality audit from a non-Big 6 firm.

Effects of Increased Liability Exposure

Suppose there is a change in the liability regime which auditors face so that their possible losses increase. For example, the courts might change from allowing only a foreseen and limited class of third party financial statement users to sue auditors for negligence to allowing negligence actions by all reasonably foreseeable users. Or courts might apply joint and several liability as opposed to comparative negligence rules in assessing the amounts of damages which can be recovered from auditors.

To the extent that the benefits of attestation to clients are derived from fundamental firm-specific problems—such as a desire to ameliorate agency costs or to signal private information—maximum reservation prices for different quality services would not change.[5] The first-order effect of an increase in liability exposure is to shift auditors' penalty functions upward, making the production of attestation more costly and increasing competitive service fees. If the result is an equal, lump sum increase in client-specific costs for all service qualities, clients' purchase decisions would normally not change. The only effect would be to reduce the net gain from the optimum attestation level purchased. Of course, if this net gain became negative, the client would choose no attestation unless it was a publicly held company.

If the cost increase differed across service qualities, the effect would depend upon the pattern of cost change. It is reasonable to assume that the increase in cost for a review would be less than the cost increase for a low-quality auditor, which would be less than the cost increase for a high-quality auditor. Auditors face little litigation risk when performing reviews,

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[4] It is reasonable to assume that for a given audit, the liability loss function facing a Big 6 firm would be above (i.e., expected losses are greater at any level of effort) that of a non-Big 6 firm. In addition, at any level of effort, the slope of a Big 6 loss function is likely to be more negative than that of a non-Big 6 firm. That is, the marginal value of effort in terms of expected loss reduction is greater for a Big 6 than for a non-Big 6 firm. Moreover, the slopes of both loss functions are likely to increase in effort (i.e., additional effort is always less effective in reducing expected losses). As a result, assuming all public accounting firms face the same resource cost function, the marginal resource cost and benefit (loss reduction) of effort should be equal at a higher effort level if a Big 6 rather than a non-Big 6 firm performs a given audit.

[5] A change in liability regime which increased the liability loss component in fees could increase a client's reservation price for attestation. In the limit, the increased client benefit would equal the auditor's increased costs (fee). This could occur if third party plaintiffs and their economic decisions were clearly specified and known to the auditor. Under these circumstances, the benefit to third parties from a more stringent liability regime could be bid away by competition among third parties and accrue to the client. In such a case, a fully anticipated change in liability regime would have no effect on a client's decision to purchase attestation. Its an empirical question whether these conditions are realized in practice.

while Big 6 auditors' "deep pockets" make their losses relatively higher in any legal environment. This pattern of cost increases could result in clients moving down the quality scale in terms of their *optimal* choice of service purchased. Some clients, not required to purchase audits, may leave the audit market altogether. Thus, the aggregate number of high-quality audits purchased can be expected to decrease, the number of reviews purchased can be expected to increase, while the aggregate purchase of lower quality audits is indeterminate.

A likely second-order effect of the increase in liability is an increase in the assurance levels associated with each service quality. That is, the cost minimizing effort levels increase following an upward shift in liability loss functions as a "defensive action" by auditors to the new liability regime. As a result, the difference between the quality levels supplied by Big 6 vs. non-Big 6 firms could increase, as the Big 6 optimally moved to protect their "deep pockets" by increasing (relatively more than the non-Big 6) the probability of detecting material misstatements and being deemed in compliance with GAAS for the audits they perform.

To summarize, a change in liability regime which imposes relatively greater costs on the Big 6 firms as potential "deep pocket" defendants will tend to shift demand away from these firms to lower quality levels of attestation because Big 6 audits may cease to be net benefit maximizing for some clients.[6] To the extent that some Big 6 auditors have capacity costs which cannot be changed quickly, they may earn less than normal returns in the short run, possibly leading to bankruptcy as some firms exit the now smaller market segment. Moreover, the move to lower levels of attestation may increase the average economy-wide probability that audited financial statements are materially misstated, with a consequent increase in harm to those financial statement users who are unable to price protect themselves for this greater information risk.

On the other hand, lower quality auditors (the smaller CPA firms who are also the major suppliers of review engagements) may be better off under the new liability regime because of the increased demand for their services. Given our assumption of pervasive market competition, these suppliers cannot earn excess profits but will enjoy higher firm growth rates.

Finally, we note that the argument of the Big 6 in their *Statement of Position* (Arthur Andersen & Co. et al. 1992) that the current onerous joint and several liability regime "could prove fatal to accounting firms of all sizes" is reasonable, if it is interpreted to mean that a shrinking marketplace could force exit through the bankruptcy of some CPA firms. But, as discussed above, the Big 6 seem more at risk from "demand reallocation" than smaller CPA firms. However, it is not clear how the auditing industry as a whole could be destroyed by litigation, so long as a mandatory audit requirement remains in place for publicly held companies.

EVIDENCE ON THE PRICING OF LITIGATION RISK

The previous section examined how increased liability exposure can harm some CPA firms by decreasing the demand for services. In the discussion, it was assumed that auditors correctly anticipate their future litigation losses and include the relevant risk adjustment in their service fees. However, future liability losses are likely to be difficult to estimate. This section examines the evidence as to whether or not audit fees appear to be appropriately adjusted for litigation risk.

Evidence from Experimental Markets Studies

To our knowledge, there are only two studies in the experimental economics literature which address the pricing of audit services as a function of litigation risk. Dopuch and King (1992) examine how different liability regimes affect the demand for and supply of auditing, in a setting where audit services attesting to the value of an asset can be purchased voluntarily by asset sellers. Specifically, they contrast a *no*

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[6] When the liability regime changes, auditors' costs increase. By attenuating the cost increase, the increase in assurance provides a higher total benefit to the client at a lower total fee than would otherwise be possible. However, relative to the initial conditions, higher assurance is provided at a higher total fee.

liability base case, to a *negligence regime* where sufficient auditor effort revealed to all parties during litigation is a good legal defense, to a *strict liability* regime where auditor effort serves only to detect misstatements, but is irrelevant in court.

They find that auditors tend to overprice their services relative to the predicted market equilibrium price under strict liability, apparently because risks and possible monetary losses are difficult to assess in that context. However, audits are properly priced consistent with risks and possible losses under the negligence regime. The overpricing induced by strict liability significantly reduces the number of times audits are purchased in that market setting relative to the negligence regime, and also tends to reduce the number of times sellers make costly investments which can increase the value of their assets. To the extent that real-world auditors face a vague negligence regime which approaches strict liability as the vagueness of GAAS increases, these results suggest that audit supply prices will be sufficiently high to restrict the quantity demanded of Big 6 audits by publicly held companies and reduce the quantity demanded of all audits by closely held companies.

In a subsequent paper, Dopuch at al. (1994) investigate the impact of different damage sharing regimes on managers, investors and auditors. In one regime, *only the auditor is liable for damages* to investors for undetected material misstatements if the auditor is negligent. The second regime involves *proportionate liability* where a negligent auditor shares damages with a misrepresenting but solvent client. In the third regime, *damages are proportionate but clients are insolvent*. In all scenarios, the purchase of auditing is mandatory. Note that the first regime is analogous to the current situation in the U.S. where auditors argue they are forced to bear a disproportionate share of liability losses because of joint and several liability with insolvent clients. The relevant finding is that auditors underprice their services in the first regime, although fees tend to drift upward toward the equilibrium price over the 20 experimental periods.

With respect to pricing, the experiments in these two papers yield consistent results in the sense that participants have significant difficulties pricing audit services. They "overprice" under strict liability and voluntary auditing, and "underprice" with joint and several liability, an implicitly insolvent client, and mandatory auditing. These experiments suggest that the complexities of liability loss assessment may create pricing problems for auditors in the real world.

EVIDENCE FROM ARCHIVAL TESTS

The impact of litigation risk on audit prices and quantities has been examined in a variety of studies. Cross-sectional tests of the determinants of audit fees normally include variables intended to measure differences in litigation risk across clients. The data in these studies consist of market determined fees which reflect both auditor effort and unit prices. Such studies have been performed using data from many countries and comparisons of results across countries can potentially provide evidence concerning pricing under different liability regimes. Finally, indirect evidence on the influence of litigation risk on offering prices can be obtained from studies of auditor choice, since different auditors' supply prices are likely to be an important factor in this client decision.

Evidence from Audit Fee Studies

The audit fee model developed in Simunic (1980) contains two independent variables which measure client characteristics deemed to increase an auditor's liability loss exposure:[7]

- a dummy variable (LOSS) indicating the existence of a client net loss in either the current or any of the two previous fiscal years;

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[7] In that paper, Simunic (1980) interpreted these variables as increasing the share of third party litigation losses likely to be borne by the auditor in a joint and several liability regime. Both variables measure the probability of client financial distress, which is known to be an important stimulus for litigation against the auditor (see St. Pierre (1981) and Carcello and Palmrose (1994)). The fee function also includes client size and complexity measures which Simunic (1980) then interpreted as increasing liability exposure. However, a more contemporary interpretation would view these client characteristics as affecting the level of effort an auditor must expend in order to produce a desired level of audit assurance.

- a dummy variable (SUBJ) if the current year's audit opinion was a "subject to" because of significant uncertainties.

In a sample of 397 audits of U.S. publicly held companies performed in 1977 by Big 8 and non-Big 8 firms, both variables were found to significantly increase client size-deflated audit fees (p-value of .02 for coefficient of LOSS, and p-value of .01 for coefficient of SUBJ). This evidence is consistent with auditors at that time responding (through higher effort and/or higher unit prices) to engagement-specific factors which indicated that litigation risk was higher than usual. Furthermore, in Simunic's dissertation (1979, table 16), he found that while the magnitudes of the regression coefficients of the LOSS variable were virtually the same for Big 8 vs. non-Big 8 auditors, the coefficient of SUBJ was significantly higher for Big 8 than for non-Big 8 firms. This is consistent with Big 8 firms facing relatively higher potential litigation loss functions than non-Big 8 firms in 1977.

Chung and Lindsay (1988) closely replicated Simunic's (1980) study using data for 233 Canadian audits of publicly held companies performed in 1980. Because the "subject to" audit opinion for uncertainties was no longer allowed in Canada at that time, the only litigation risk variable measured was LOSS. In Simunic's (1980) data SUBJ and LOSS were positively correlated ($\varsigma = .25$). Thus the coefficient of the LOSS variable with Canadian data can be expected to be larger than in the U.S., other things remaining constant. Chung and Lindsay (1988) found the coefficient on LOSS was not significantly different from zero while the results for other independent variables were very similar across the two countries. As discussed in Clarkson and Simunic (1994), in the early 1980s auditors faced a very mild litigation environment in Canada, relative to the U.S., and they may have priced their services differently, in response to the different legal environments. A follow-up study (Anderson and Zeghal 1994), based on data for 1980, 1982 and 1984 audits for 172 publicly held Canadian companies, also found that the existence of client net losses was unrelated to auditors' fees.

Subsequent research using U.S. data generally finds that at least some variables which proxy for the risk of client bankruptcy are associated with statistically significant increases in audit fees. Palmrose (1986) examined a sample of 361 audits for 1980–1981, stratified across various client industries. A unique feature of her sample was that 25 percent of the companies were closely held firms. Two litigation risk measures included in the model—public (SEC) vs. non-public client, and the receipt of a modified audit opinion—were both associated with higher audit fees (p-value < .001 for SEC clients, and p-value < .001 for modified opinion). Francis and Simon (1987) found that the 1985 audit fees of a sample of 220 smaller publicly held companies were significantly higher when the client received a "subject to" opinion. Turpen (1990) examined a sample of 146 publicly held companies which switched audit firms during 1982–1984 and found that audit fees increased significantly if the client had operating losses, but the presence of a "subject to" opinion had no significant effects. However, Simon and Francis (1988) found that 1984 audit fees increased significantly if the client received a "subject to" opinion. Their sample consisted of 440 publicly held companies, 214 of which had changed auditors in the six preceding years.

The most recent test of the effect of litigation risk on audit fees was performed by Beatty (1993) in an initial public offering (IPO) context. Unlike previous research where litigation risk measures were not the focus of the studies but merely "control variables" for extraneous factors, the purpose of this paper was to specifically test how cross-sectional differences in litigation risk in the high-risk IPO environment influenced audit pricing. The data consist of 1,191 firms going public from 1982 through 1984. The audit fee proxy variable is a measure of "all expenses in connection with the issuance and distribution of the securities to be registered, other than underwriting discounts and commissions." Beatty (1993) first replicated the Simon and Francis (1988) analysis and found that the receipt of a "subject to" uncertainty qualification had no significant effect on audit fees in his sample, while the relationship between

his fee measure and the other independent variables measuring client size, complexity, and auditor identity, were pretty much the same. He then added the following litigation risk measures to the regression:

- a dummy variable (DELIST) indicating that the security was subsequently delisted from the CRSP files because of financial distress (24 percent of sample);
- a dummy variable (BANKRUPTCY) indicating that the company filed for bankruptcy prior to December 31, 1987 (8 percent of sample);
- a dummy variable (LAWSUIT) indicating the existence of subsequent litigation under the Securities Act of 1933 (3 percent of sample).

All three variables are *ex post* measures of liability exposure which, if correctly anticipated, should increase auditors' fees at the time of the IPO. The actual significance levels of the estimated coefficients were as follows:

$$\text{DELIST} \rightarrow p\text{-value} = .12;$$
$$\text{BANKRUPTCY} \rightarrow p\text{-value} = .05;$$
$$\text{LAWSUIT} \rightarrow p\text{-value} = .007.$$

On balance, the U.S. evidence is consistent with audit firms increasing their audit fees in the face of higher than usual litigation risk. However, the relationship between litigation-risk measures and audit fees is generally not very strong. Researchers conventionally classify audit fee determinants into measures of client size, client operating complexity and risk. Of the three groups, variables in the risk category typically exhibit the weakest relationship with fees. The non-U.S. evidence is more mixed. In addition to the Canadian studies already mentioned, Francis (1984) found that client operating losses, increasing financial leverage and the receipt of a qualified opinion had no significant effect on Australian auditors' fees. However, the power of that test was relatively low since the sample size consisted of only 136 audits for publicly held Australian companies, pooled over the years 1974 to 1978. In a follow-up paper, Francis and Stokes (1986) found that audit fees increased significantly with client financial leverage and when a qualified opinion was received, but only for very small clients (mean assets about A\$2 million). In the most recent study using Australian data, Craswell et al. (1995) find that audit fees *increase* significantly with client leverage and the receipt of a qualified opinion, but *decrease* significantly if the client incurred a net loss in the last three years. However, the sample size in that study (1,484 audits of publicly held companies in 1987) is very much larger than in other work. This can cause variables with weak quantitative effects to be statistically significant. Yet another audit fee study by Firth (1985) found that for a sample of 96 publicly held New Zealand companies audited in 1983 fees were not affected if the client incurred losses. He also found that fees increased with unsystematic security risk.

Overall, it is not possible to generalize about the non-U.S. evidence. Two Canadian studies found no evidence of litigation risk adjustments to audit fees, but the sample sizes in these studies were modest. Studies from Australia and New Zealand, on the other hand, suggest that audit fees are risk adjusted, but different independent variables were used. It appears that insights into possible differences in auditor behavior in different national legal environments will require carefully designed comparative studies.

To summarize, the empirical evidence indicates that U.S. audit fees increase with higher litigation risk. However, the relationship is statistically not very strong. A possible reason is that, with the exception of Palmrose (1986), all of the studies use data from publicly held client firms, which eliminates an important risk measure (ownership dispersion) from the empirical test. In addition, none of the studies attempt to quantify the magnitude of the increase in fees, nor determine whether the fee increase is a function of greater audit effort or a "risk premium" in unit price.[8] This needs to be done before it is

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[8] An exception is a recent working paper by Bell et al. (1995), who show that audit fees increase with increasing auditor business risk as assessed by engagement partners. Moreover, the fee increase occurs only through an increase in labor hours, with no observable change in the audit price per unit of service. Because that paper is based on much the same data as OSS, we only mention it here and discuss these issues more fully in a subsequent section.

possible to conclude whether or not audits are properly priced in the face of higher litigation risk. We pursue these issues later in the paper.

Evidence from Auditor Choice Studies

The purpose of this section is to examine evidence relevant to determining whether the Big 6 firms face higher incremental costs than the non-Big 6 as litigation risk increases. Above, circumstances were described in which the Big 6 will suffer the greatest harm among public accounting firms in the form of a shrinking market for their audit services.

This issue was addressed by Simunic and Stein (1987), when they showed that as the risk of client bankruptcy increases, a firm is less likely to choose a Big 6 (8) auditor in conjunction with an initial public offering of securities. The data consisted of 397 IPOs in 1981. Two hundred fifty-five of these firms used a Big 6 (8) auditor, while 142 used a small audit firm. In a logistic regression of auditor choice on a variety of independent variables they found that the single most significant explanatory variable was financial leverage. The higher the leverage, the less likely a Big 6 firm was the auditor. They interpreted this result to imply that more highly levered companies faced a higher risk of bankruptcy, thereby increasing the liability exposure and supply prices of all auditors, but particularly the Big 6. Alternatively, the Big 6 could be viewed as avoiding the audits of high bankruptcy-risk clients. Beatty (1986) examined an even larger sample of 1,026 IPOs for the years 1977 through 1982 and found that the mean values of all the following firm-specific risk measures were significantly greater for IPO's using non-Big 6 vs. Big 6 firms:

- number of risk factors in the prospectus;
- initial return (degree of underpricing);
- standard deviation of returns in the aftermarket.

Thus the evidence from the U.S. IPO market is strongly consistent with the hypothesis that increasing litigation risk has a differentially greater impact on the supply prices of Big 6 audits.

Clarkson and Simunic (1994) examined the impact of issuer risk on auditor choice in the U.S. vs. Canada. As mentioned earlier, the Canadian legal environment was fairly benign in the early 1980s and continues to be so relative to the U.S. because of the absence of federal securities laws defining auditor liability, few class action suits, use of a loser-pay rule by courts, the discouraging of contingent fee arrangements with lawyers, etc. There were only 19 legal cases involving allegations of audit failure in Canada from 1917 through 1984. In addition, about 50 percent of Canadian IPOs include earnings forecasts in the offering prospectus, a practice which would be considered too risky in the U.S., where few if any prospectuses include explicit earnings forecasts.

If litigation exposure is driving Big 6 firms in the U.S. out of the market for audits of riskier issuers of securities, then this phenomenon is much less likely in Canada. To test this hypothesis, Clarkson and Simunic (1994) contrasted auditor choices in the Simunic and Stein (1987) U.S. data set to auditor choices by 174 firms making IPOs in Canada in 1984–1987. They found that, unlike U.S. firms, as the riskiness of a Canadian issuer increased the company was *more* likely to use a Big 6 audit firm. This relationship held using all risk measures which included the following:

- financial leverage;
- number of risk factors in the prospectus;
- standard deviation of residual returns in the aftermarket from the market model.

This evidence strongly confirms that Big 6 firms in the U.S. face differentially higher litigation risk and presumably higher costs when servicing the IPO market and have as a consequence suffered a resulting loss of market share.

Outside the new issues context, Palmrose (1984) examined auditor choice for a sample of 276 audits in three industry groups: office equipment, retail trade, and electric and gas utilities. She found that higher leverage made the use of a Big 6 audit firm *less* likely for office equipment and retail trade companies while higher leverage had no impact on auditor choice by utility clients.

Johnson and Lys (1990) also considered the relationship between leverage and auditor choice

outside of the new issues context. They studied the correlates of auditor change for a sample of 603 publicly held companies who changed auditors from 1973 through 1982. Interpretation of their results is hindered by the fact that the authors did not use the Big 6/non-Big 6 distinction to classify audit firms, but constructed a continuous measure of relative predecessor audit firm size to successor audit firm size. The resulting variable, labelled RS, ranges in value from < .01 to > 100 with the largest values characterizing changes from non-Big 6 to Big 6 firms. They found that leverage was significantly negatively correlated with RS. That is, the higher the "stock of" leverage, the less likely that a company switched to a larger audit firm. This was true using leverage measured both before the auditor change and after new financing which was often associated with auditor changes. However, if new debt was issued around the time of auditor change, the client was more likely to choose a larger audit firm. Francis and Wilson (1988) found a similar negative association between "the stock" of leverage and the direction of auditor change (more highly levered firms tended to switch from Big 6 to non-Big 6 auditors) for a sample of 676 auditor changes by publicly held companies in 1978 through 1985. However, as in Johnson and Lys (1990), a new issue of debt or equity securities was more likely to be associated with a change from a non-Big 6 to a Big 6 auditor.

In the original papers, the authors had some difficulty interpreting these auditor switching results relying upon demand-side arguments. However the findings can be readily interpreted from the supply side *under the assumption that auditor liability exposure in the U.S. has been increasing over time*. As liability exposure becomes more onerous, the impact is greater the higher a client's financial leverage, hence bankruptcy risk. Moreover, if the change in liability regime has a relatively larger impact on the "deep pocketed" Big 6 firms than on the non-Big 6, client companies with high leverage who utilize Big 6 auditors are motivated to reduce audit quality. However, if a company plans to make a new debt or equity securities issue there is a marginal benefit to purchasing higher audit quality, increasing the motivation to switch from the non-Big 6 to the Big 6.

Thus, evidence from auditor change studies is consistent with evidence from the IPO market. Relatively higher Big 6 supply prices arising from litigation risk and high client leverage increase the probability a company will choose a non-Big 6 auditor. However, the fact that new securities are issued increases the probability a company chooses a Big 6 auditor. Although not reported in Simunic and Stein (1987), their sample included about 40 companies that changed auditors in the two years prior to the new issue of securities, and *all* of these changes involved a switch from a local CPA firm to a middle size or Big 6 firm.

FURTHER EVIDENCE FROM A MAJOR PUBLIC ACCOUNTING FIRM

In this section we extend the work of O'Keefe et al. (1994) (OSS), to obtain more evidence on the following issues:

- How do auditors adjust to greater litigation risk—through more audit effort or by charging a higher unit price?
- What is the *magnitude* of the change in audit fees as litigation risk increases?
- How does the magnitude of the "risk premium"[9] in fees compare to the magnitude of litigation losses actually incurred by CPA firms?

The OSS data base relates to audits by a single Big 6 firm performed mostly in 1989 and including both closely held and publicly held clients. The sample describes client and other engagement characteristics, audit hours by staff category, and the firm's audit fee—calculated at standard billing rates and the amount actually billed to the client. The data was obtained from 249 audits of U.S. companies engaged in manufacturing, merchandising or high technology. The inclusion in the sample of both closely held and publicly held companies is crucial because ownership dispersion is an important determinant of auditor litigation risk. Auditors are unlikely to be liable to third party investors when shares are closely held. Recall that in Palmrose (1986), the audit fees of SEC companies were

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[9] The term "risk premium" is in quotes because it is to compensate for higher liability exposure rather than risk aversion, *per se*.

significantly higher than those of non-SEC clients, *ceteris paribus*. As demonstrated by the studies of auditor choice, leverage captures another key aspect of auditor litigation risk. More highly levered firms face a higher risk of bankruptcy as well as have a larger number of creditors relying on the financial statements.

The basic regression results reported by OSS are shown in table 1. We used the following empirical model in those tests:

$$\ln h = \beta_0 + \beta_1 \ln A + \sum_{i=2}^{K} \beta_i \gamma_i \ln A$$

where h denotes the audit fee or audit hours, A denotes client size, the γ_i's represent all other client/characteristics, and the β_is are estimated regression coefficients. This linear model is derived from an underlying relationship of the form:

$$h = e^{\beta_0} A^{\beta_1} + \sum_{i=2}^{K} \beta_i \gamma_i$$

The underlying function recognizes the key role of client size as a determinant of audit hours and fees. All other characteristics are assumed to affect the dependent variable by changing the curvature of the hours/fees-size relationship.

The independent variables used by OSS are defined as follows:

ASSETS = client's total assets at end of the fiscal year (in thousands);

FRGN = client's percentage of non-U.S. to U.S. assets;

CMPLX = client's operational complexity (number from 1 to 5) as assessed by the engagement partner;

TREPORTS = number of separate audit reports issued;

PBLC = (0,1) where 1 denotes a publicly held company;

LEVERAGE = book value of client's liabilities divided by total assets;

INHRISK = (0,1) where 1 denotes an audit in which the inherent risk of material misstatements is greater than average for the firm's clients, as assessed by the engagement partner.

Both PBLC and LEVERAGE are measures of litigation risk. By definition, the INHRISK variable measures the probability that the financial statements contain a material misstatement *prior* to the audit. *Ceteris paribus*, auditors respond to higher inherent risk by exerting more audit effort, thereby increasing the probability that material misstatements are detected. Higher inherent risk may also indicate the existence of account balances and/or transactions whose valuation, etc. requires judgement. In such cases, the risk of misstatement and litigation may remain higher than normal irrespective of the auditor's effort level. Thus INHRISK may also measure post-audit litigation risk.[10]

Table 1 shows that audit fees increase significantly with all three risk measures. In addition, auditor effort (hours), in at least some of the labor categories, also increases significantly with all the risk measures. To determine the magnitude of these effects, we calculated the change in *predicted* fee and hours associated with each risk measure for the companies in the sample. These fee and hour increments, expressed as an average percentage of the total predicted fee or hours, are shown in table 2.

Table 2 indicates that whether or not a company's shares are publicly held has a large impact upon both fees and audit hours. Leverage and inherent risk have considerably smaller effects. It is important to remember that to the extent these risk measures convey information unrelated to liability risk, they over-estimate the auditor's response to liability exposure. As discussed earlier, this is likely to be particularly true of inherent risk which auditing theory suggests should primarily change the level of effort required to produce the auditor's target level of assurance. Conversely, the risk variables only

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[10] The data base also includes a measure of auditor business risk. This term is often used by practitioners to denote the auditor's assessment of the probability of post-audit losses arising from litigation. We found that when this additional risk measure was included in the regressions reported in table 1, it was a statistically significant determinant of the audit fee (p-value .04), but the coefficient of leverage became insignificant. Moreover, the R^2 for the equation was virtually unchanged. Since leverage is an objective measure of capital structure and bankruptcy risk which has been used in previous auditing research, we opted to exclude the self-assessed subjective business risk measure from the empirical analysis.

TABLE 1
Regression of Audit Fee and Disaggregated Labor Hours on Client Characteristics for 249 U.S. Audits of Companies Engaged in High Technology, Manufacturing or Merchandising Performed by a Big 6 Firm in 1989 (Basic Model)

Independent Variable Name	Dependent Variable					
	Fees[a] Billed	Partner Hours	Manager Hours	Senior[a] Hours	Staff Hours	Q-Statistic[b]
ASSETS	.352[d]	.310	.270	.236	.380	27.64**
	15.80**	10.81**	9.77**	10.33**	13.14**	
FRGN	.001	.001	.001	.001	.001	1.31
	2.97**	2.94**	3.44**	3.14**	2.57**	
CMPLX	.006	.005	.007	.007	.010	3.11
	2.76**	2.10*	3.05**	4.01**	3.96**	
TREPORTS	.001	.001	.001	.001	.001	.91
	2.97**	3.24**	3.10**	3.49**	2.80**	
LEVERAGE	.007	.011	.012	.002	.005	6.89*
	1.86*	2.32**	2.68**	.61	.94	
PBLC	.024	.042	.034	.017	.019	28.02**
	5.48**	7.76**	6.58**	4.18**	3.57**	
INHRISK	.010	.006	.002	.009	.014	7.72*
	3.06**	1.33	.50	2.73**	3.08**	
Constant	—[c]	−2.319	−.767	.929	−1.522	69.74**
		−5.55**	−1.90*	2.88**	−3.61**	
R^2	.85	.77	.75	.79	.79	
F	200.25**	118.23**	110.64**	134.41**	141.16**	

* Significant at .05 level (one-tail test).
** Significant at .01 level (one-tail test).
[a] Reported t-statistics were calculated using White's heteroskedastic-consistent covariance matrix estimation method.
[b] The Q-statistics test the null hypothesis that coefficients reported in each row are equal across the four labor hour equations.
[c] Value of intercept deleted at the request of firm providing our data.
[d] Top number in each pair is the estimated b coefficient and the bottom number is the t-statistic. All coefficients of the independent variables are expected to be positive.

measure client-specific increases in liability risk. However, closely held companies with no debt constitute the base case. Auditors of such companies are typically only sued by their clients for failing to detect employee theft and these types of legal actions usually involve limited damages. Thus, we believe our three risk variables capture the essential sources of third party liability risk.[11]

The other notable result from table 2 is that the percentage increase in fees is approximately matched by percentage increases in audit hours. That is, the firm's auditors appear to respond to higher client-specific litigation risk by increasing their effort levels rather than by charging a higher price premium. To obtain further evidence on this issue, we tested whether the risk measures affected the audit fee "realization ratio" for engagements. Recall that our data base includes both the actual audit fee

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[11] Note that the risk variables all interact with client size, as measured by total assets, given the empirical function used in the estimation of the regression coefficients. We also estimated the regressions incorporating additional interaction variables between the risk measures and the other independent variables in the model (i.e., FRGN, CMPLX and TREPORTS). While these interaction variables were occasionally statistically significant, they had no qualitative impact on our results.

TABLE 2
Mean Percentage of Predicted Fees and Audit Hours Attributable to Litigation Risk Measures

Variable	Fee	Partner Hours	Manager Hours	Senior Hours	Staff Hours	Total Hours
All firms in the sample (n = 249)						
Public	7.0%	10.0%	9.0%	5.0%	6.0%	6.0%
Leverage	8.0	11.0	13.0	2.0	5.0	6.0
Inherent risk	10.0	6.0	2.0	9.0	13.0	10.0
Total	25.0%	27.0%	24.0%	16.0%	24.0%	22.0%
Public firms in sample (n = 49)						
Public	34.0%	52.0%	46.0%	26.0%	29.0%	33.0%
Leverage	7.0	11.0	12.0	2.0	5.0	6.0
Inherent Risk	12.0	7.0	3.0	10.0	15.0	12.0
Total	53.0%	70.0%	61.0%	38.0%	49.0%	51.0%
Closely held firms in sample (n = 200)						
Leverage	8.0%	12.0%	13.0%	3.0%	5.0%	6.0%
Inherent Risk	10.0	6.0	2.0	9.0	13.0	10.0
Total	18.0%	18.0%	15.0%	12.0%	18.0%	16.0%

billed to the client and the "standard audit fee," which is the product of the actual hours utilized times standard billing rates for each labor category. The realization ratio is defined as the fee billed divided by the standard fee for the engagement. By increasing the amount of audit fee billed relative to the standard fee, the firm increases the unit price of its services.

The realization ratio variable has the following values in our sample:

Mean	71.4%
Standard deviation	15.4%
Range	24.3% to 144.7%

The results of the regression of the realization ratio on client size and the three risk measures are shown on table 3. Note that the realization ratio increases significantly only with client size. None of the risk measures nor any of the other independent variables included in table 1 are significantly related to the ratio. This test confirms that auditors in the subject public accounting firm responded to client-specific changes in litigation risk only by changing their audit effort.

Our final test is to compare this evidence with published statistics on public accounting firms' litigation costs as a percentage of their revenues. Recently, Mednick and Peck (1994), both partners in Arthur Andersen and Co., report that the Big 6 firms in aggregate incurred the following accounting and audit practice "protection costs", expressed as a percentage of the firms' accounting and auditing revenues: 1990: 07.7%; 1991: 09.0%; and 1992: 10.9%. They define protection costs as the costs of judgements, settlements and legal defense, plus insurance premiums, minus insurance recoveries. The absolute dollar amounts were $404 million, $477 million and $598 million in the three years. The 1994 *Report of the Public Review Board* of the Arthur Andersen Worldwide Organization states that the percentage had increased to 19.4% or $1,082 million for 1993.

These percentages of *ex post* losses to CPA firm revenues can be compared to the "risk premium" results reported in table 2 by estimating the contribution margin a CPA firm is likely to generate through additional audit hours. It is our understanding that CPA firms traditionally set their standard billing rates at about three times salary costs or, for partners, the opportunity cost of their labor. Since, on average, our sample firm only bills about 71 percent of standard fees, an estimated contribution margin percentage (CM%)
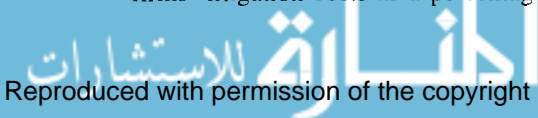
TABLE 3
Regression of Audit Fee Realization Rates on Log at Assets and Risk Variables

	Coeff.	Standard error	t-value	p-value
Constant	.418	.096	4.343	.000
Assets	.019	.006	3.354	.001
Inherent Risk	−.001	.001	−.861	.390
Public	.001	.001	.514	.608
Leverage	−.001	.001	−1.028	.305
$R^2 = .051$				

would be about 50 percent of incremental revenue [CM% = ((.71) (3 Cost) − Cost) /.71 (3 Cost) = 53%)]. This estimate may be overstated because incremental overhead costs incurred are assumed to be zero. Conversely, the estimate is too low if the firm's standard billing rates are more than three times salary costs.

Based on the 50 percent contribution margin estimate, the firm's litigation risk premium—averaged over the entire client base in the sample—was between 7.5% [(7% for PBLC + 8% for LEVERAGE) × 50%] and 12.5% [(7 % for PBLC + 8% for LEVERAGE + 10% for INHRISK) × 50%]. Recall that the audits in the sample were for fiscal years ending in 1989, so the risk premiums are roughly comparable to the actual loss percentages incurred by the profession in the early 1990s. Moreover, the subject firm has a lower percentage of publicly held clients than the Big 6 as a whole. A larger proportion of publicly held companies would increase the estimated risk premium.

In summary, the evidence from one Big 6 firm indicates that, in 1989, auditors responded to higher client-specific litigation risk relative to the base case of a closely held company with no debt by increasing their effort levels. This reduced expected litigation losses, both by increasing the probability of detecting material misstatements and by reducing the probability that the auditors would be found negligent in a court of law. Moreover, the resulting increases in contribution margins from more risky audits appear sufficient to cover aggregate actual litigation costs over firms' client portfolios at about the time these audits were performed. Of course,

we cannot say whether or not auditors were able to correctly anticipate the massive increase in litigation costs which apparently occurred in 1993.

CONCLUSIONS

A purpose of this paper is to critically evaluate the accounting profession's expressed concern that the legal liability problems faced by CPA firms could destroy the profession, particularly by driving some firms into bankruptcy. The risk of bankruptcy would be exacerbated if CPA firms systematically underprice audit services.

The basic economics suggests that if increasing litigation exposure differentially increases the costs of the Big 6 firms with the "deepest pockets" this can result in a shift away from the Big 6, particularly by more risky clients. The evidence from studies of auditor choice in the IPO market and from studies of auditor changes is consistent with this prediction. Loss of audit market share can increase the risk of a CPA firm's bankruptcy if its capacity costs cannot be adjusted relatively quickly or used in the production of other services. The anecdotal evidence that financial problems motivated the merger of Arthur Young & Co. with Ernst & Whinney and recent major restructurings by the firms of KPMG Peat Marwick and Coopers & Lybrand is consistent with this concern.

However, our limited empirical evidence suggests that audits are not being systematically mispriced. Auditors from the Big 6 firm in our sample appear to have correctly anticipated actual litigation costs over the firm's client

portfolio in pricing their services when these costs were at their levels in the early 1990s—some 10 percent of accounting and auditing revenues. While we find no evidence of mispricing, research using experimental methods suggests this can occur. Moreover, the costs of litigation appear to have risen sharply in the short period since our data were collected. Thus, this critical question clearly warrants further research.

Finally, there is an important issue for which investigation is outside the scope this paper but should be considered in evaluating the causes and consequences of the "liability crisis" facing public accounting firms in the United States. In this paper, it is assumed that increasing liability exposure over time occurs within the context of competitive audit markets. However, changes in CPAs' codes of ethics during the 1980s were designed to stimulate the competitiveness of auditors—suggesting that the market was less than perfectly competitive when the process began. Thus changes in the contestability of audit markets may have interacted with contemporaneous changes in auditors' liability exposure in recent years. For example, in a "winner's curse"

the firm which is most optimistic in underestimating liability risk will bid the lowest for a new engagement, and the magnitude of winner's curse losses increases in the number of bidders (Thaler 1994). Also, increasing competition decreases the contribution margin from auditing reducing partners' equity and decreasing the "cushion" available to cover large realized litigation losses and increasing the risk of firm bankruptcy.

Therefore, declines in CPA firm profitability could have been caused by greater competition rather than by increasing litigation risk. Evidence consistent with this argument was recently reported by Beatty and Drake (1994) who found that "audit fee premiums" in the IPO market declined in the decade from 1982 to 1992. Again, it is the Big 6 firms which would tend to suffer the greatest "profit squeeze" as they faced both differentially higher litigation costs and heightened competition. This creates a strong incentive to try to improve profitability. Obviously one cannot argue for limits on competition, so arguments to limit liability costs are the only politically feasible alternative.

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