

# **Auditor Reporting Conservatism as a Defence Mechanism against Increased post-Enron Litigation Risk**

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## **ABSTRACT**

The Enron debacle and the role of Andersen in that context has damaged the reputation of the audit profession, and especially that of Big 4 accounting firms. In the aftermath of Enron, audit firms were more than ever scrutinized by various categories of financial-statement users. This period of high scrutiny and public distrust in the audit profession definitely increased the threat of litigation for alleged audit failures and thus the auditor's business risk. One strategy for auditors to manage this increased business risk is to report more conservatively. In this paper we examine for a large sample of U.S. companies whether their auditors reacted defensively to the public trust crisis by issuing (*ceteris paribus*) more modified opinions following the collapse of Enron and Andersen. We find that this is clearly the case for Big 4 auditors, but not for non-Big 4 auditors.

**Keywords :** Auditor reporting, qualified / modified opinion, Enron, Andersen.

**Data availability:** All data are publicly available.

## INTRODUCTION

The Enron-Andersen debacle initiated a severe public trust crisis. Both corporate reporting and the public accounting profession have been under tremendous public scrutiny ever since. In the aftermath of Enron, not only Enron stock but also the stock of other Big 5 clients (whether a client of Andersen or not) fell, especially when negative news was released concerning the role of Andersen in the Enron case (See Asthana et al. 2003; Chaney and Philipich 2002; Krishnamurthy et al. 2002; Callen and Morel 2002). Scrutiny for errors and irregularities in financial statements of listed companies became extremely intense, and accounting irregularities at one company or another were frequently reported by the financial press. In times of such increased scrutiny, the threat of auditor litigation for alleged audit failure increases and so does the auditor's business risk.

In this paper we investigate whether auditors reacted defensively to this increased business risk by adapting audit reporting behavior, specifically by issuing more modified opinions, *ceteris paribus*. This question is relevant to the various parties involved: client firms, investors and auditors. First, an increase in the rate of modified opinions may have (negative) consequences for client firms and subsequently also for the economy as a whole because it may trigger bankruptcies (self-fulfilling prophecy). However, increased auditor reporting conservatism may be beneficial to the investor community: early signaling of bad company news by auditors is likely to offer investors an opportunity to seek protection against unanticipated business failures. This may then subsequently help to restore investor confidence in published financial information. Third, increased auditor reporting conservatism also affects the audit profession, as it may lead to subsequent auditor switching by upset clients and these auditor switches may redesign the (demand side of) audit market.

We contribute to the literature as follows. We contribute to the “Enron-Andersen” research stream by examining how the *audit profession* itself reacted to the increased business risk it faces. Prior studies (Asthana et al. 2003; Chaney and Philipich 2002; Krishnamurthy et al. 2002; Callen and Morel 2002) have documented how *investors* reacted to the audit failure of Andersen at Enron; or investigated how *clients* reacted to the debacle by looking at the determinants of the timing of auditor switching by Andersen clients (Chang et al. 2003; Barton 2003). Further, we contribute to the audit literature in that we document on changes in auditor reporting behavior following *increases* in the threat of litigation rather than decreases. Some previous studies (Geiger and Raghunandan 2001 and 2002; Francis and Krishnan 2002) already examined auditor reporting behavior following a *decreased* threat of litigation in the context of the Private Securities Litigation Reform Act (1995).

To address our research question of whether auditor reporting conservatism increased after Enron, we compare the proportion of modified audit opinions on the financial statements of a large sample of American listed companies for some fiscal years before the Enron-Andersen debacle (1999 and 2000) with the proportion of modified opinions issued during the first fiscal year after the Enron-Andersen debacle (2002). Consistent with our argument, we find that the rate of modified opinions significantly increased for the Big5/4 auditors. Note that we control for client financial distress, client size and audit risk in our analyses. We do not find evidence that non-Big5/4 auditors adjusted their reporting behavior following the collapse of Enron and Andersen.

The remainder of this paper is organized as follows. In the next section we motivate our research question. In Section III we provide a description of the data and the empirical model, and in section IV we present the results of our analyses. We conclude in Section V.

## **HYPOTHESIS**

The announcement by Enron on October 16, 2001 of bookkeeping errors was the first in a series of events that would eventually lead to Enron's filing for Chapter 11 bankruptcy protection (December 2, 2001), and the subsequent demise of its auditor, Andersen, after conviction by the Federal Jury for obstructing justice and being barred from auditing and reporting on the financial statements of SEC-registered companies after August 2002 (on June 15, 2002). A series of announcements about accounting issues at Enron posed serious questions concerning the independence of Enron's auditor – Andersen's Houston office – and fuelled a fierce debate concerning the quality of corporate reporting by U.S. companies and the involvement of the independent auditor in this process. Two events were especially detrimental to the audit profession, namely the confession by Andersen to having shredded documents related to the Enron audit on January 10, 2002, and the release of the Power's report, on February 2, 2002, stating that the Chicago office of Andersen was well aware of accounting problems at Enron.

Prior studies (Asthana et al. 2003; Chaney and Philipich 2002; Krishnamurthy et al. 2002; Callen and Morel 2002) have shown that stock prices of clients of both Andersen and other Big5/4 auditors dropped significantly, especially after the release of negative information concerning the role of Andersen in the Enron case. This clearly suggests that auditor brand names and reputations were severely damaged and that serious doubt existed concerning audit quality and, consequently, the credibility of audited financial statements. Increased scrutiny for errors and irregularities in published financial statements was a logical consequence. At some point almost every day the financial press released information concerning (potential) accounting irregularities at one company or another. This period of extreme scrutiny of financial statements and public distrust in the audit profession

definitely increased the threat of litigation for alleged audit failures and thus the auditor's business risk.

Various strategies are available to an audit firm to address such an increase in business risk. One possibility is to buy more coverage from insurance companies. However, given the Andersen collapse, it may have been very hard to find an insurer who was willing to take on additional risk at a price that was affordable to an audit firm. A next option for an audit firm could be to self-insure through charging a much higher risk premium. A third option is to increase the audit effort on engagements, and thus reduce the probability of undetected error and irregularities in the client's financial statements, that is, reducing audit risk. Note that both the first and third options imply higher costs to the audit firm, and that all three options would lead to increased audit fees. Prior audit fee studies indeed suggest that fees do reflect variations in *client-specific* litigation risk factors (see for example Simunic 1980; Palmrose 1986; Francis and Simon 1987; Simunic and Stein 1996). It is however unlikely that the demand side of the audit market would accept an increase in audit pricing immediately after Enron, given that the quality of audit services had become questionable. So risk-management strategies that would require an audit-fee increase may not have been feasible options for the auditor in the short run. Two more options that do not, or not necessarily, affect audit cost and fee are client screening and reporting conservatism. Screening out high risk clients and subsequently resigning from high-risk engagements would lead to a decrease in potential audit losses from litigation later on. Krishnan and Krishnan (1997), Johnstone (2000) and Francis and Krishnan (2002) report some evidence consistent with auditors screening out high-risk clients. An alternative to resigning from high-risk engagements, is to become more conservative in terms of audit reporting, that is to more readily issue a modified opinion on high-risk engagements in order to reduce the likelihood of an audit failure (namely issuing an non-modified opinion where in fact a modified

opinion was appropriate). In this paper we focus on the latter strategy. Carcello and Palmrose (1994) indeed document that litigation against auditors of bankrupt companies is less likely if the auditors issued a modified opinion. There is also some evidence that auditors relaxed their reporting behavior following a *decrease* in the likelihood of litigation: Geiger and Raghunandan (2001, 2002) and Francis and Krishnan (2002) report that auditors are less likely to issue a going-concern modified opinion after the Private Securities Litigation Reform Act of 1995<sup>1</sup>, which reduced the likelihood of litigation against auditors. By analogy it is reasonable to expect that the *increase* in litigation risk induced by the Enron-Andersen debacle may increase the occurrence rate of modified opinions, *ceteris paribus*. Thus we test the following hypothesis:

**REPORTING CONSERVATISM HYPOTHESIS:** *Ceteris paribus, the proportion of modified opinions on financial statements significantly increased during the fiscal years after the Enron-Andersen debacle, as compared to the fiscal years before the Enron-Andersen debacle.*

### EMPIRICAL MODEL

We test whether auditors are more likely to issue a modified opinion after the Enron-Andersen debacle, *ceteris paribus*, by estimating the following logistic regression model:

$$\begin{aligned} \text{MOD} &= \beta_0 + \beta_1 T + \beta_2 B5/4 + \beta_3 T * B5/4 + \beta_4 PBANK + \beta_5 LOSS + \beta_6 LNTA \\ &+ \beta_7 ARTA + \beta_8 INVENTA, \end{aligned}$$

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<sup>1</sup> The “Reform Act” made “it more difficult for plaintiffs’ attorneys to successfully pursue class-action litigation against auditors”, and provided “for proportionate liability in damage awards” (Geiger and Raghunandan 2001, 198).

where variables are defined as in Table 1.

[Insert Table 1 about here]

The dependent variable (MOD) is an indicator variable, coded one if the auditors' opinion has been modified or qualified<sup>2</sup>. For ease of exposition, we will further refer to any type of modified or qualified audit opinion as a modified opinion. The main test variable is an indicator, T, taking a unit value if the observation is from a fiscal year ending in 2002, unambiguously after the Enron-Andersen debacle, and zero otherwise. Problems with Enron's accounting were first disclosed on October 16, 2001. Concerns regarding the involvement of the auditor were raised soon after, would peak on January 10, 2002 with the admission by Andersen to having shredded documents regarding the Enron audit, and on February 2, 2002 with the release of the Power's report and would continue for a while after. Only in July 2002 passed the Sarbanes-Oxley act before Congress which included a set of measures in order to restore public and investor confidence in corporate reporting and the audit profession. As it takes some time to implement those measures, there is no hard evidence yet that attempts to regain investor trust have been effective. While the first effects of the Enron-Andersen debacle may already have been visible in the audit reports of some financial statements with 2001 fiscal year ends<sup>3</sup>, we first exclude 2001 from our main test<sup>4</sup>. We take data from the first fiscal year

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<sup>2</sup> Depending on the circumstances, auditors may either issue a standard unqualified audit report, a modified unqualified audit report, a qualified opinion, an adverse opinion or a disclaimer of opinion (see Knechel (1998) for an overview of the various auditor reports and a discussion of which reports are appropriate in specific circumstances). In contrast to most previous auditor reporting studies (for example, Chen and Church 1992; Mutchler et al. 1997; DeFond et al. 2002; Reynolds and Francis 2001; Geiger and Raghunandan 2001 and 2002) we do not limit our analysis to modifications for going-concern issues, but code as a "modified" opinion, any audit report other than the standard unqualified audit report. We do exclude disclaimers of opinion from our analysis.

<sup>3</sup> Most firms have December 31, fiscal year ends and Knechel and Payne (2001) report that the audit report lag (i.e. the time period between a company's fiscal year end and the date of the audit report) takes on average between one and a half and three months (depending on industry). Auditors thus had time to adapt their opinions on most 2001 financial statements.

after Enron, that is, 2002 (post-Enron), and compare these data with the data of two fiscal years before Enron, 1998 and 1999 (pre-Enron).

Our choice of control variables is consistent with prior audit reporting studies. A first control variable is an indicator (B5/4) equal to unity if the company's auditor is a Big5 or Big4 auditor, and zero otherwise. We include this variable because previous research suggests that auditor reporting behavior is linked to auditor size (Mutchler et al. 1997). We also include an interaction variable (T\*B5/4) between our main test variable, T, and the B5/4 indicator. This allows us to examine whether Big5/4 auditors' reaction to increased risk exposure differed from that of non-Big5/4 auditors. Thus the coefficient for T in the model measures the change in the likelihood that the non-Big5/4 auditors modify their opinions, *ceteris paribus*. The sum of the coefficients on T and the interaction variable T\*B5/4 measures the change in the likelihood that B5/4 auditors modify their opinions, *ceteris paribus*.

A third control variable, PBANK, is a proxy for the probability of bankruptcy and is computed using Zmijewski's (1984) model<sup>4</sup>. Higher values indicate a larger probability of bankruptcy and a larger likelihood that auditors will issue a modified opinion (Francis and Krishnan 2002; DeFond et al. 2002). As another measure of financial distress we include LOSS – an indicator taking a unit value if current-year earnings are negative and zero otherwise (Francis and Krishnan 1999). We control for client size by including the natural logarithm of total assets (LNTA). Client size may have two opposite effects on the auditor's opinion. On the one hand the potential damage from an audit failure increases in client size which could lead to reporting conservatism. On the other hand, larger client size implies larger audit fees, which could lead to less conservative reporting. Auditors may also be more confident that large clients may survive financial difficulties, because

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<sup>4</sup> We later relax this assumptions.

<sup>5</sup>This model is as follows:  $PBANK = F(LEV, ROA, LIQ)$ , where LEV = financial leverage (total debt/total assets), ROA = return on assets (net income/ total assets), LIQ = liquidity (current assets/ current liabilities).

they have greater negotiating power with creditors and more resources (Reynolds and Francis 2001, 392). Finally, we control for audit risk by including the proportions of inventory and receivables to total assets (ARTA and INVENTA, respectively), two accounting items that are typically more prone to errors and irregularities (Dopuch et al. 1987, Bell and Tabor 1991).

## DATA AND RESULTS

### Sample Selection

Our sample includes all U.S. listed firms for which data are available on *Worldscope* for the fiscal years 1999 through 2002. As in prior audit reporting research (Reynolds and Francis 2001; DeFond, Raghunandan and Subramanyam 2002) we exclude financial institutions (SIC codes 6000-6999) because the measures of financial distress that will be used in our empirical model are not applicable to the financial sector. We also exclude observations with missing values. This process results in a sample of 12686 firm-years (relating to 3367 different companies) of which 6.4% have a modified opinion. We present the sample selection procedure in Table 2.

[Insert Table 2 about here]

### Descriptive Statistics

In Table 3 we report descriptive statistics for our sample observations. Panel A lists the percentage of modified opinions for the full sample, the sub-sample of clients audited by a Big 5/4 auditor and the clients audited by a non-Big5/4 auditor per year. Column 4 shows that more than 90 percent of the sample firms are audited by a Big5/4 auditor. Column 3 shows that, consistent with our expectations,

the overall percentage of modifications has increased from 5.26% in 1999 and 5.41% in 2000 (the years before Enron) to 6.85% in 2002 (the first year after Enron). A chi-square test for independence (not reported) shows that the difference in the average modified-opinion rate between the years before and after Enron is significant at the 1 percent level ( $p = 0.0034$ ). Panel A, column 3 further shows that there was already a significant jump in the modified opinion rate for the year 2001 (6.84%) as compared to 2000 (5.41%) (significant at the 1 percent level), which suggests that auditors already adapted their reporting behavior soon after the Enron-Andersen debacle. Table 3, Panel A, column 6 shows a similar – and even more pronounced – pattern for the Big5/4 auditor sub-sample. The percentage of modified opinions increased from 4.12 percent in 1999 to 6.09 percent in 2002, with a significant increase already between 2000 and 2001. By contrast, column 8 of Panel A shows that for the non-Big5/4 sub-sample, the percentage of modified opinions first increased, from 19.89% in 1999 to 21.49% in 2000, but later fell back to its 1999 level. Comparison of the modified-opinion rate between the Big5/4 and non-Big5/4 auditor sub-samples shows a significantly higher proportion of modified opinions for the non-Big5/4 auditors ( $p$  of chi-square for independence  $< 0.0001$  for total sample and year-by-year sub-samples). This result seems to contradict a well accepted argument in the audit literature, namely that larger audit firms have more collateral at stake and therefore are expected to provide higher audit quality (DeAngelo 1981). However our finding is in line with some prior studies which find that the materiality thresholds of non-Big6 auditors are much lower than those of Big6 auditors (Messier 1983), and that non-Big6 auditors are more likely to issue a consistency modification (Chewning et al. 1989).

The above results bear on the dependent variable in the full sample. We now turn to the test samples, i.e. the total sample minus the observations from 2001 (since we first leave year 2001 out of the analyses). In Panels B of Table 3 we report descriptive statistics for the independent variables in

our empirical model for the full test sample, and in Panel C for the Big 5/4 auditor test sample respectively. In Panels D and E we report the results of t-tests of differences in means and Wilcoxon rank sum tests of differences in medians for these independent variables between the periods before and after Enron, and between companies receiving a modified and those receiving an unmodified report. From inspection of Panels D and E it is clear that there are significant differences between the pre- and post-Enron means and medians of almost all regressor variables. Only the proportion of inventories over total assets does not significantly change over the two periods. Panels D and E also report significant differences (between the means and medians) on all variables between companies receiving a modified report and those that receive a clean opinion.

[Insert Table 3 about here]

### **Logistic Regression Results**

In Table 4 we report the results of our logistic regression analyses for the full test sample, the Big5/4 auditor sample and the non-Big5/4 auditor samples. All three models are significant (p of chi-square test < 0.0001) and have explanatory power (pseudo R-squares ranging from 23.96% to 29.55%). Pearson and Spearman correlation coefficients reported in Appendix A do not indicate multicollinearity problems.

We expect to find a significant increase in the likelihood that auditors issue a modified opinion in the post-Enron period. Testing the full sample (of big 5/4 and non-big 5/4 audit opinions, see column 3), a significant positive coefficient on the test variable T *and* on the sum of T and the interaction variable T\*B5/4, would be consistent with our hypothesis. While the sum of the coefficient on T and T\*B5/4 is significantly positive at the 1 percent level (results not reported), we

do not find a significant coefficient on T itself. This means that our hypothesis is only partially supported: Big5/4 auditors are reporting more conservatively in the post-Enron period, *ceteris paribus*, as compared to the pre-Enron period, while non-Big4/5 auditors do not. The results for T from testing both sub-samples (see columns 4 and 5) indeed support this finding: T is significantly positive for companies audited by a Big5/4 auditor ( $p=0.0002$ ) but not for companies audited by a non-Big5/4 auditor. Recall from the descriptive statistics in Table 3, Panel A that Big 5/4 auditors already reported more conservatively than Big5/4 auditors before the Enron-Andersen debacle. This may explain why we do not find an Enron-effect on this sub-sample.

As to the control variables, our measures of financial distress, more specifically the probability of bankruptcy (PBANK,  $p$ -value  $< 0,01$ ) and the existence of negative net income in the current year (LOSS,  $p$ -value  $< 0.01$ ) are significant and positively correlated with opinion type. This is consistent with prior findings (DeFond et al. 2002; Reynolds and Francis 2001; Mutchler 1997): firms in financial distress are more likely to receive a modified opinion. Client size is also significant at the 1 percent level (LNNTA,  $p < 0.01$ ). Like in Mutchler et al. (1997), smaller firms are also more likely to receive a modified audit opinion. Finally, audit risk the rate of accounts receivable and inventory are not significant (ARTA and INVENTA).

[Insert Table 4 about here]

### **Results from tests excluding Andersen clients**

If before its collapse, Andersen was more likely to issue modified opinions than the other Big 4 auditors (*ceteris paribus*), the increase in qualification rates after Enron may be merely caused by the demise of Andersen and there would be no post-Enron effect at all. To rule out this possibility, we

delete all Andersen clients from our pre-Enron sample, and rerun our logistic regression models on this reduced sample. By doing this, we compare the reporting behavior of the same set of auditors before and after Enron – that is, the remaining Big 4 clients and the non-Big 4 clients. The results of these analyses are reported in Table 5, and are qualitatively similar to the results including Andersen (see Table 4).

[Insert Table 5 about here]

Thus, we find that the Big 4 auditors (as a group) are reporting more conservatively after the Enron-Andersen debacle than before, *ceteris paribus*. To test whether this result is not driven by the defensive behavior of one particular Big 4 auditor, we also test the logistic regression model for each of the remaining big 4 auditors separately, i.e. Deloitte & Touche, Ernst & Young, KPMG, and PricewaterhouseCoopers. The results reported in Table 6 suggest that audit reporting conservatism was a strategy that was adopted by each of the four big audit firms after the Enron-Andersen scandal.

[Insert Table 6 about here]

### **Results including 2001 observations**

As discussed in section II, problems with Enron's accounting were first disclosed on October 16, 2001. On January 10, 2002 and on February 2, 2002 significant news was released pertaining to Andersen's involvement in the Enron debacle (shredding the documents and Power's report respectively). Given that most companies have December 31, fiscal year-ends and that the average audit report lag is between one and a half and three months (depending on industry, see Knechel and

Payne (2001)), auditors may already have adjusted their reporting behavior on most 2001 financial statements. Recall that we document a significant increase in the percentage of modified opinions in 2001 as compared to 2000 in our descriptive statistics (see Table 3, Panel A). In order to confirm that this result is not caused by factors other than the Enron-Andersen events, we re-estimate our regression on the full sample, including the year-2001 observations and treating them as post-Enron. Table 7 reports the results from these logistic regressions and shows that they are qualitatively similar to the results reported in Tables 4 and 5.

[Insert Table 7 about here]

### **Testing random year effects**

To assess whether the observed change in Big 4 auditor reporting behavior before and after Enron is not a random year-effect, we test for differences in Big 4 auditor reporting behavior between the two pre-Enron years in our sample (that is, 1999 and 2000) by estimating our empirical model on the sub-sample of observations from 1999 and 2000. In particular, we replace  $T$  in our model by an indicator ( $Y00$ ) that takes a unit value if an observation is from 2000, and zero otherwise. We also include the interaction between  $Y00$  and  $B5/4$  (that is,  $Y00*B5/4$ ). The results of these tests are reported in Table 8, column 3. We find that neither  $Y00$  nor the sum of  $Y00$  and the interaction term  $Y00*B5/4$  are significant which indicates that there is no significant difference in audit reporting behavior in 2000 as compared to 1999, *ceteris paribus*. The results on the control variables are qualitatively similar to those reported in Tables 4 and 5. We next run a similar model on year 2001 and 2002 observations. We now include an indicator ( $Y02$ ) which takes a unit value if the observation is from the year 2002, and zero otherwise, and the interaction  $Y02*B5/4$ . The results of these tests are reported in Table 8,

column 3. We find that neither the indicator Y02 nor the sum of Y02 and  $Y02*B5/4$  are significant at conventional levels, which indicates that the likelihood that a modified opinion is issued in 2002 is clearly not different from in 2001. This result suggests that the effect of the Enron-Andersen debacle was already impounded in year 2001 audit reports. Finally, we also ran a regression on year 2000 and 2001 observations, and included a variable Y01 which takes the value 1 if the observation is from year 2001 (and zero otherwise), as well as the interaction of Y01 and B5/4 ( $Y01*B5/4$ ). The results are reported in Table 8, column 4 and indicate that Y01 is not significant, whereas the sum of Y01 and the interaction  $Y01*B5/4$  is significant at the 5 percent level ( $p = 0.0108$ ). These results confirm that Big4 auditors are more likely to issue a modified opinion just after the Enron-Andersen demise.

[Insert Table 8 about here]

### **Results from testing the distressed clients sub-sample**

Prior auditor reporting studies often focus on the auditor's going-concern opinion. Most of those studies limit their analysis to a sample of financially distressed firms (Mutchler, Hopwood and McKeown 1997; Reynolds and Francis 2001; DeFond, Raghunandan and Subramanyam 2002), since the going-concern report decision is especially relevant for this type of companies (Reynolds and Francis 2001, 390). Even though our sample does not exclusively exist of going-concern modifications we also estimate our empirical model on a sub-sample of distressed companies. As in Reynolds and Francis (2001) and DeFond, Raghunandan and Subramanyam (2002), we define financially distressed firms as firms that report either negative earnings or operating cash flows during the current fiscal year. This distressed sample consists of 4696 firm-years, including 520 firm-

years (12.45%) with modified opinions. In Table 9 the results of these tests are reported. The results on the test and control variables are qualitative similar to the results reported in Tables 4 and 5.

[Insert Table 9 about here]

## CONCLUSIONS

In this paper we examine whether auditor reporting behavior has become more conservative following the Enron-Andersen collapse. Prior studies focused on investors' and clients' reactions to the audit failure of Andersen at Enron, but did not examine how auditors reacted. We argue that increased scrutiny of the audit profession and client financial reporting in the post-Enron period has increased the threat of auditor litigation and thus the auditors' business risk. Consequently, we hypothesize that, *ceteris paribus*, auditors will report more conservatively to protect themselves against this increased business risk. Consistent with our expectation, we find that, Big5/4 auditors issue more modified opinions, *ceteris paribus*. Non-Big 4 auditors do not, however. These results are robust to a number of sensitivity checks.

Increasing reporting conservatism is not the only viable strategy an audit firm has to deal with increased business and litigation risk. Further research into alternative risk management strategies by audit firms in the post-Enron time period would be useful. However, as increased auditor reporting conservatism has a number of consequences to various parties, the evidence we present is already important. Increased conservatism may lead to subsequent auditor switching by unhappy clients and this may re-model the audit market and equilibrium prices. Further, as modified opinions may accelerate client bankruptcies (self-fulfilling prophecy), increased reporting conservatism may have

negative consequences on client firms in distress which, in turn, may trigger negative effects on the economy as a whole. On the other hand, increased conservatism may also be beneficial to the investor community, as early signaling of bad news by auditors is likely to offer investors an opportunity to seek protection against unanticipated business failures. This may then help restore investor confidence in audited financial information.

## REFERENCES

- Asthana, S.C., S. Balsam, and J. Krishnan. 2003. Audit Firm Reputation and Client Stock Price Reactions: Evidence from the Enron Experience. Working paper.
- Barton, J. 2003. Who cares about auditor reputation? Working paper, Emory University.
- Bell, T., and R. Tabor. 1991. Empirical Analysis of audit uncertainty qualifications. *Journal of Accounting Research* 29 (Autumn): 350-370.
- Callen, J. L., and M. Morel. 2002. The Enron-Anderson debacle: Do equity markets react to auditor reputation?. Working paper.
- Carcello, J.V., and Z.-V. Palmrose. 1994. Auditor Litigation and Modified Reporting on Bankrupt Clients. *Journal of Accounting Research* 32 (Supplement): 1-30.
- Chaney, P., and K. Philipich. 2002. Shredded reputation: the cost of audit failure. *Journal of Accounting Research* 40 (September): 1221-1245.
- Chang, C., W. Chi, and C. Liu. 2003. Client Characteristics and Auditor Switch in an Audit Failure. Working paper.
- Chen, K.C.W., and B. K. Church. 1992. Default on Debt Obligations and the Issuance of Going-Concern Opinions. *AUDITING: A Journal of Practice and Theory* 11 (Fall): 30-49.
- Chewning, G., K. Pany, and S. Wheeler. 1989. Auditor Reporting Decisions Involving Accounting Principles Changes: Some Evidence on Materiality Thresholds. *Journal of Accounting Research* 27 (Spring): 78-96.
- DeAngelo, L.E. 1981. Auditor Size and Audit Quality. *Journal of Accounting and Economics* 3 (December): 183-199.
- DeFond, M. L., K. Raghunandan, and K.R. Subramanyam. 2002. Do Non-Audit Service Fees Impair Auditor Independence? Evidence from Going Concern Audit Opinions. *Journal of Accounting Research* 40 (September): 1247-1273.
- Dopuch, N, R. Holthausen, and R. Leftwich. 1987. Predicting Audit Qualifications with Financial and Market Variables. *The Accounting Review* 62 (July): 431-454.
- Francis, J. R., and J. Krishnan. 1999. Accounting Accruals and Auditor Reporting Conservatism. *Contemporary Accounting Research* 16 (Spring): 135-165.
- Francis, J.R., and J. Krishnan. 2002. Evidence on Auditor Risk Management Strategies Before and After the Private Securities Litigation Reform Act of 1995. *Asia Pacific Journal of Accounting and Economics* 9 (December): 135-157.

- Francis, J.R., and D. Simon. 1987. A test of audit pricing in the small-client segment of the U.S. audit market. *The Accounting Review* 62 (January): 145-157.
- Geiger, M., and K. Raghunandan. 2001. Bankruptcies, audit reports and the reform act. *AUDITING: A Journal of Practice and Theory* 20 (March): 187-195.
- Geiger, M., and K. Raghunandan. 2002. Going-concern opinions in the “New” legal environment. *Accounting Horizons* 16 (March): 17-26.
- Johnstone, K.M. 2000. Client-acceptance decisions: simultaneous effects of client business risk, audit risk, auditor business risk, and risk adaptation. *AUDITING: A Journal of Practice and Theory* 19 (Spring): 1-25.
- Knechel, W. R. 1998. *Auditing: Text and Cases*. Cincinnati, Ohio: South Western Publ..
- Knechel, W. R., and J. L. Payne. 2001. Additional Evidence on Audit Report Lag. *AUDITING: A Journal of Practice and Theory* 20 (March): 137-146.
- Krishnamurty, S., J. Zhou ,and N. Zhou. 2002. Auditor Reputation, Auditor Independence and the Stock Market Reaction to Andersen’s Clients. Working paper.
- Krishnan, J., and J. Krishnan. 1997. Litigation risk and auditor resignations. *The Accounting Review* 72 (October): 539-560.
- Messier, W. 1983. The Effect of Experience and Firm Type on Materiality/ Disclosure Judgements. *Journal of Accounting Research* 21 (Autumn): 611-618.
- Mutchler, J., W. Hopwood, and J. McKeown. 1997. The Influence of Contrary Information and Mitigating Factors in Audit Opinion Decisions on Bankrupt Companies. *Journal of Accounting Research* 35 (Autumn): 295-310.
- Palmrose, Z.-V. 1986. Audit fees and auditor size: Further evidence. *Journal of Accounting Research* 24 (Spring): 97-110.
- Reynolds, J. Kenneth, and Jere R. Francis. 2001. Does size matter? The influence of clients on office-level auditor-reporting decisions. *Journal of Accounting and Economics* 30 (December): 375-400.
- Simunic, D.A. 1980. The pricing of audit services: Theory and Evidence. *Journal of Accounting Research* 18 (Spring): 161-190.
- Simunic, D.A., and M.T. Stein. 1996. The impact of litigation risk on audit pricing: a review of the economics and the evidence. *AUDITING: A Journal of Practice and Theory* 15 (Supplement): 119-134.

Zmijewski, M.E .1984. Methodological Issues Related to the Estimation of Financial Distress Prediction Models. *Journal of Accounting Research* 22 (Supplement): 59-82.

**TABLE 1**  
**Model Specification**

Variable	Description	Predicted sign
<i>Dependent variable</i>		
MOD	Dummy = 1 if modified audit report, = 0 otherwise	
<i>Test variables</i>		
T	Dummy = 1 if observation from post-Enron period (2002), zero if from pre-Enron period (1999)	+
<i>Control variables</i>		
B5/4	Dummy = 1 if company is audited by a Big5/ 4 auditor, zero otherwise	?
T * B5/4	Interaction variable	?
PBANK	Probability of bankruptcy computed using Zmijewski score (1984)	+
LOSS	Dummy = 1 if net income negative, zero otherwise	+
LNTA	Natural log of total assets	?
ARTA	Accounts receivable over total assets	+
INVENTA	Inventory over total assets	+

**TABLE 2**  
**Sample Description**

*Panel A: Selection Criteria*

Selection criteria	Observations
All American listed companies on Worldscope for 1999-2000	30016
Less: Financial institutions (SIC 6000 - 6999)	(5105)
Less: Observations with missing values	(12225)
Full sample observations	12686

*Panel B: Distribution of observations by year and auditor type*

	Total	B5/4 Auditor	NB5/4 Auditor
Full sample	12686	11865	821
1999	3327	3085	242
2000	3367	3125	242
2001	3087	2911	176
2002	2905	2744	161
Full <u>TEST</u> sample (= full sample minus observations from 2001)	9599	8954	645

**TABLE 3**  
**Descriptive Statistics<sup>a</sup>**

*Panel A: Percentage of modified opinions and percentage of B5/4 auditors*

	N	Full sample		N	Big5/4 auditor sub-sample	N	Non-Big5/4 auditor sub-sample
		Percentage modified opinions	Percentage B5/4 auditor				
1999	3327	5.26%	92.72%	3085	4.12%	242	19.89%
2000	3367	5.41%	92.81%	3125	4.16%	242	21.49%
2001	3087	6.84%	94.30%	2911	6.01%	176	20.45%
2002	2905	6.85%	94.46%	2744	6.09%	161	19.88%
TOTAL	12686	6.05%	93.28%	11865	5.05%	821	20.46%

*Panel B: Other descriptive statistics: full test sample (N = 9599)*

Variable	Mean	Std Deviation	Minimum	Maximum
BIG5/4	0.9328055	0.2503716	0	1.0000000
PBANK	0.0762420	0.2320478	9.08968E-295	1.0000000
LOSS	0.4401500	0.4964309	0	1.0000000
LNTA	12.3282165	2.1899242	0	18.5438271
ARTA	0.1543595	0.2251866	0	17.5000000
INVENTA	0.1109322	0.1438399	0	2.4997784

*Panel C: Other descriptive statistics: B5/4 test sample (N = 8954)*

Variable	Mean	Std Deviation	Minimum	Maximum
PBANK	0.0658954	0.2132308	9.08968E-295	1.0000000
LOSS	0.4280768	0.4948277	0	1.0000000
LNTA	12.5146576	2.0726676	1.3862944	18.5438271
ARTA	0.1500943	0.1368931	0	3.4976149
INVENTA	0.1094903	0.1419709	0	2.4997784

*Panel D: Means and medians (between brackets) of control variables for different time periods - and audit opinion groups: full test sample (N = 9599)*

Variable	Time period		t-statistic <sup>b,d</sup> (Wilcoxon Z <sup>c,d</sup> )	Audit opinion		t-statistic <sup>b,d</sup> (Wilcoxon Z <sup>c,d</sup> )
	1999-2000	2002		Unmodified	Modified	
	Mean (Median)	Mean (Median)		Mean (Median)	Mean (Median)	
B5/4	92.77% (1)	94.46% (1)	0.0014 (0.0024)	94.33% (1)	76.26% (1)	<0.0001 (<0.0001)
PBANK	0.076 (7.478E-05)	0.077 (1.138E-04)	0.9257 (0.0002)	0.054 (6.342E-05)	0.437 (2.292E-01)	<0.0001 (<0.0001)
LOSS	42% (0)	48% (0)	<0.001 (<0.0001)	41.14% (0)	90.83% (1)	<0.0001 (<0.0001)
LNTA	12.282 (12.271)	12.436 (12.385)	0.0015 (0.0042)	12.476 (12.402)	9.9195 (9.837)	<0.0001 (<0.0001)
ARTA	0.1581 (0.125)	0.1457 (0.121)	0.0012 (0.2007)	0.155 (0.124)	0.149 (0.107)	0.4318 (0.0011)
INVENTA	0.1118 (0.05)	0.1089 (0.054)	0.3546 (0.4267)	0.1117 (0.053)	0.0988 (0.021)	0.0504 (<0.0001)

*Panel E: Means and medians (between brackets) of control variables for different time periods - and audit opinion group:  
Big4/5 auditor test sample (N = 8954)*

Variable	Time period		t-statistic <sup>b,d</sup> (Wilcoxon Z <sup>c,d</sup> )	Audit opinion		t-statistic <sup>b,d</sup> (Wilcoxon Z <sup>c,d</sup> )
	1999-2000	2002		Unmodified	Modified	
	Mean (Median)	Mean (Median)		Mean (Median)	Mean (Median)	
PBANK	0.064 (0.000067)	0.070 (0.000111)	0.2504 (<0.0001)	0.050 (0.000061)	0.378 (0.124)	<0.0001 (<0.0001)
LOSS	40.87% (0)	47.19% (0)	<0.0001 (<0.0001)	40.45% (0)	90.09% (1)	<0.0001 (<0.0001)
LNTA	12.49 (12.411)	12.576 (12.520)	0.0616 (0.0667)	12.615 (12.523)	10.501 (10.582)	<0.0001 (<0.0001)
ARTA	0.1535 (0.1235)	0.1424 (0.118)	<0.0001 (0.0702)	0.150 (0.122)	0.146 (0.106)	0.5201 (0.0154)
INVENTA	0.1107 (0.05)	0.1068 (0.053)	0.2162 (0.7801)	0.110 (0.052)	0.0998 (0.023)	0.1744 (<0.0001)

<sup>a</sup> For variable definitions, see Table 1.

<sup>b</sup> t-test for difference in means.

<sup>c</sup> Wilcoxon rank sum test for difference in medians.

<sup>d</sup> Results of two-tailed tests.

**TABLE 4**  
**Logistic Regression Results<sup>a</sup>**

$$\text{MOD} = \beta_0 + \beta_1 T + \beta_2 \text{B5/4} + \beta_3 T * \text{B5/4} + \beta_4 \text{PBANK} + \beta_5 \text{LOSS} + \beta_6 \text{LNTA} \\ + \beta_7 \text{ARTA} + \beta_8 \text{INVENTA}$$

	Predicted sign	Full test Sample N =9599	B5/4 test sample N = 8954	Non-Big5/4 test sample N = 645
Intercept		-0.9803 (0.0052)	-1.5579 (0.0001)	-1.3463 (0.1014)
T	+	0.2338 <sup>b</sup> (0.3990)	0.4337 (0.0001)	0.2112 (0.4442)
B5/4	?	-0.6037 (0.0002)		
T*B5/4	?	0.1953 (0.5128)		
PBANK	+	1.8566 (<0.0001)	1.8349 (<0.0001)	2.0187 (<0.0001)
LOSS	+	1.7454 (<0.0001)	1.8021 (<0.0001)	1.4445 (0.0002)
LNTA	?	-0.2655 (<0.0001)	-0.2747 (<0.0001)	-0.1938 (0.0064)
ARTA	+	-0.2476 (0.1218)	-0.0596 (0.8666)	-0.3227 (0.3466)
INVENTA	+	0.4406 (0.1648)	0.4645 (0.1915)	-0.0207 (0.9783)
Model Chi-square		1187.5791, 8 DF (<0.0001)	818.0301, 6 DF (<0.0001)	193.1856, 6 DF (<0.0001)
Pseudo R-square Percentage correctly classified		27.96% 86.3	23.96% 84.7	29.55% 85.8

<sup>a</sup> For variable definitions, see Table 1. P-values between parentheses.

<sup>b</sup> p-value of test for whether sum of coefficients on T and T\*B5/4 differs from zero significant at 1 percent level.

**TABLE 5**  
**Logistic Regression Results for Reduced Sample (Excluding Andersen clients)<sup>a</sup>**

$$\text{MOD} = \beta_0 + \beta_1 T + \beta_2 B5/4 + \beta_3 T * B5/4 + \beta_4 \text{PBANK} + \beta_5 \text{LOSS} + \beta_6 \text{LNTA} \\ + \beta_7 \text{ARTA} + \beta_8 \text{INVENTA}$$

	Predicted Sign	Reduced Test Sample N = 9075	Reduced B5/4 test sample N = 8430	Reduced Non-Big4/5 test sample N = 645
Intercept		-0.6594 (0.0723)	-1.1678 (0.0063)	-1.3463 (0.1014)
T	+	0.2477 <sup>b</sup> (0.3740)	0.5351 (<0.0001)	0.2112 (0.4442)
B5/4	?	-0.6543 (<0.0001)		
T*B5/4	?	0.2826 (0.3485)		
PBANK	+	1.8462 (<0.0001)	1.8251 (<0.0001)	2.0187 (<0.0001)
LOSS	+	1.6483 (<0.0001)	1.6826 (<0.0001)	1.4445 (0.0002)
LNTA	?	-0.2884 (<0.0001)	-0.3046 (<0.0001)	-0.1938 (0.0064)
ARTA	+	-0.3273 (0.1551)	-0.3325 (0.3957)	-0.3227 (0.3466)
INVENTA	+	0.3145 (0.3578)	0.3582 (0.3551)	-0.0207 (0.9783)
Model Chi-square		1139.7178, 8 DF (<0.0001)	764.4251, 6 DF (<0.0001)	193.1856, 6 DF (<0.0001)
Pseudo R-square		28.77%	24.48%	29.55%
Percentage correctly classified		86.7	84.9	85.8

<sup>a</sup> For variable definitions, see Table 1. P-values between parentheses.

<sup>b</sup> p-value of test for whether sum of coefficients on T and T\*B5/4 differs from zero significant at 1 percent level.

**TABLE 6**  
**Logistic regression results for each of the remaining Big 4 Auditors<sup>a</sup>**

$$\text{MOD} = \gamma_0 + \gamma_1 T + \gamma_2 \text{PBANK} + \gamma_3 \text{LOSS} + \gamma_4 \text{LNTA} + \gamma_5 \text{ARTA} + \gamma_6 \text{INVENTA}$$

	Predicted sign	Deloitte & Touche N = 1758	Ernst & Young N = 2581	KPMG N = 1721	PricewaterhouseCoopers N = 2370
Intercept		-0.7919 (0.4649)	-1.2171 (0.1577)	-1.7092 (0.0383)	-0.8451 (0.2878)
T	+	0.7559 (0.0092)	0.4907 (0.0261)	0.5620 (0.0177)	0.4921 (0.0222)
PBANK	+	1.1264 (0.0037)	1.9982 ( $<0.0001$ )	2.0991 ( $<0.0001$ )	2.1003 ( $<0.0001$ )
LOSS	+	1.9289 ( $<0.0001$ )	1.9760 ( $<0.0001$ )	1.5215 ( $<0.0001$ )	1.5644 ( $<0.0001$ )
LNTA	?	-0.3610 ( $<0.0001$ )	-0.3685 ( $<0.0001$ )	-0.2252 (0.0002)	-0.3043 ( $<0.0001$ )
ARTA	+	-0.1172 (0.8916)	0.2153 (0.7437)	-2.2717 (0.0174)	0.3818 (0.5500)
INVENTA	+	-1.4104 (0.1841)	2.4888 (0.0006)	1.2963 (0.1168)	-0.7524 (0.3474)
Model Chi-square		116.3459, 6 DF ( $<0.0001$ )	280.6818, 6 DF ( $<0.0001$ )	191.2507, 6 DF ( $<0.0001$ )	206.9902, 6 DF ( $<0.0001$ )
Pseudo R-square		23.13%	29.85%	25.24%	22.79%
Percentage correctly classified		82.7	88.5	84.7	83.8

<sup>a</sup> For variable definitions, see Table 1. P-values between parentheses.

**TABLE 7**  
**Logistic Regression Results for Sample Including 2001 Observations<sup>a</sup>**

$$\text{MOD} = \beta_0 + \beta_1 T + \beta_2 \text{B5/4} + \beta_3 T * \text{B5/4} + \beta_4 \text{PBANK} + \beta_5 \text{LOSS} + \beta_6 \text{LNTA} \\ + \beta_7 \text{ARTA} + \beta_8 \text{INVENTA}$$

	Predicted sign	Full test Sample N = 12686	B5/4 test sample N = 11865	Non-Big5/4 test sample N = 821
Intercept		-0.9477 (0.0024)	-1.5367 (<0.0001)	-1.2151 (0.1143)
T	+	0.0785 <sup>b</sup> (0.7208)	0.3605 (0.0001)	0.0629 (0.7747)
B5/4	?	-0.5638 (0.0006)		
T*B5/4	?	0.2773 (0.2453)		
PBANK	+	1.9529 (<0.0001)	1.9382 (<0.0001)	2.1001 (<0.0001)
LOSS	+	1.7699 (<0.0001)	1.8255 (<0.0001)	1.4580 (<0.0001)
LNTA	?	-0.2774 (<0.0001)	-0.2832 (<0.0001)	-0.2087 (0.0017)
ARTA	+	-0.2247 (0.0942)	-0.0205 (0.9480)	-0.2894 (0.2466)
INVENTA	+	0.4583 (0.1046)	0.5781 (0.0628)	-0.5613 (0.4383)
Model Chi-square		1686.8296, 8 DF (<0.0001)	1211.6329, 6 DF (<0.0001)	265.7078, 6 DF (<0.0001)
Pseudo R-square Percentage correctly classified		29.13% 86.6	25.54% 85.1	31.93% 87.0

<sup>a</sup> For variable definitions, see Table 1. P-values between parentheses.

<sup>b</sup> p-value of test for whether sum of coefficients on T and T\*B5/4 differs from zero significant at 1 percent level.

**TABLE 8**  
**Logistic Regression Results for Random Year Effects Tests<sup>a</sup>**

$$\text{MOD} = \lambda_0 + \lambda_1 \text{Y0X} + \lambda_2 \text{B5/4} + \lambda_3 \text{Y0X} * \text{B5/4} + \lambda_4 \text{PBANK} + \lambda_5 \text{LOSS} + \lambda_6 \text{LNTA} \\ + \lambda_7 \text{ARTA} + \lambda_8 \text{INVENTA}$$

	Predicted sign	Years 1999-2000 N = 6694	Years 2000-2001 N = 6454	Years 2001-2002 N = 5992
Intercept		-1.3882 (0.0022)	-1.5570 (0.0008)	-0.7033 (0.1387)
Y0X	+	-0.0964 <sup>b</sup> (0.7215)	-0.0478 <sup>c</sup> (0.8757)	0.4042 <sup>d</sup> (0.2532)
B5/4	?	-0.7031 (0.0020)	-0.5667 (0.0130)	0.00311 (0.9908)
Y0X* B5/4	?	-0.0108 (0.9716)	0.3847 (0.2480)	-0.2093 (0.5769)
PBANK	+	1.5875 (<0.0001)	1.9810 (<0.0001)	2.3823 (<0.0001)
LOSS	+	2.0444 (<0.0001)	2.1465 (<0.0001)	1.5505 (<0.0001)
LNTA	?	-0.2288 (<0.0001)	-0.2671 (<0.0001)	-0.3305 (<0.0001)
ARTA	+	-0.2315 (0.1665)	0.4373 (0.3039)	0.1959 (0.6693)
INVENTA	+	0.2379 (0.5304)	0.3984 (0.3672)	0.8457* (0.0540)
Model Chi-square		764.8341, 8 DF (<0.0001)	930.0468, 8 DF (<0.0001)	939.3819, 8 DF (<0.0001)
Pseudo R-square Percentage correctly classified		27.44% 86.6	31.41% 87.9	31.41% 86.9

<sup>a</sup> For variable definitions, see Table 1. Y0X equals Y00 in the 1999-2000 regression, Y01 in the 2000-2001 regression and Y02 in the 2001-2002 regression. Y00 = 1 if observation is from 2000, zero otherwise; Y01 = 1 if observation is from 2001, zero otherwise; Y02 = 1 if observation is from 2002, zero otherwise. P-values between parentheses.

<sup>b</sup> p-value of test for whether sum of coefficients on T and T\*B5/4 does NOT differ from zero (p=0.4325).

<sup>c</sup> p-value of test for whether sum of coefficients on T and T\*B5/4 differs from zero significant at the 5 percent level.

<sup>d</sup> p-value of test for whether sum of coefficients on T and T\*B5/4 does NOT differ from zero (p=0.1284).

**TABLE 9**  
**Logistic Regression Results for Stressed Sample<sup>a</sup>**

$$\text{MOD} = \beta_0 + \beta_1 T + \beta_2 \text{B5/4} + \beta_3 T * \text{B5/4} + \beta_4 \text{PBANK} + \beta_5 \text{LOSS} + \beta_6 \text{LNTA} \\ + \beta_7 \text{ARTA} + \beta_8 \text{INVENTA}$$

	Predicted sign	Full test Sample N = 4696	B5/4 test sample N = 4245	Non-Big5/4 test sample N = 451
Intercept		-0.3099 (0.4453)	-0.9734 (0.0450)	-0.6122 (0.4848)
T	+	0.2645 <sup>b</sup> (0.3547)	0.4392 (0.0002)	0.2571 (0.3721)
B5/4	?	-0.6134 (0.0003)		
T*B5/4	?	0.1704 (0.5806)		
PBANK	+	1.8976 (<0.0001)	1.8702 (<0.0001)	2.0596 (<0.0001)
LOSS	+	0.8585 (0.0019)	0.9732 (0.0035)	0.5985 (0.2442)
LNTA	?	-0.2442 (<0.0001)	-0.2528 (<0.0001)	-0.1826 (0.0116)
ARTA	+	-0.2345 (0.1359)	0.0403 (0.9122)	-0.3708 (0.4215)
INVENTA	+	0.2743 (0.4134)	0.2715 (0.4745)	-0.0915 (0.9064)
Model Chi-square		623.0175, 8 DF (<0.0001)	387.8564, 6 DF (<0.0001)	120.7997, 6 DF (<0.0001)
Pseudo R-square Percentage		19.05% 78.3	14.84% 74.9	22.45% 81.1
correctly classified				

<sup>a</sup> For variable definitions, see Table 1. P-values between parentheses.

<sup>b</sup> p-value of test for whether sum of coefficients on T and T\*B5/4 differs from zero significant at 1 percent level.

## Appendix A

**Panel 1: Correlation matrix for independent variables, full test sample (N =9599)**


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	B5/4	PBANK	LOSS	LNTA	ARTA	INVENTA
B5/4	1.00000	-0.08860 <.0001	-0.09062 <.0001	0.29250 <.0001	-0.04953 <.0001	-0.01062 0.2982
PBANK	-0.16614 <.0001	1.00000	0.33371 <.0001	-0.00764 0.4542	-0.04171 <.0001	-0.02279 0.0255
LOSS	-0.09062 <.0001	0.31035 <.0001	1.00000	-0.36316 <.0001	-0.18322 <.0001	-0.22851
LNTA	0.31722 <.0001	-0.33313 <.0001	-0.35961 <.0001	1.00000	-0.09429 <.0001	0.05077 <.0001
ARTA	-0.07057 <.0001	0.02150 0.0352	-0.06050 <.0001	-0.12290 <.0001	1.00000	0.28502 <.0001
INVENTA	-0.03037 0.0029	-0.05633 <.0001	-0.15141 <.0001	-0.04864 <.0001	0.08525 <.0001	1.00000

---

Pearson correlation coefficients below diagonal, Spearman correlations above diagonal  
 Prob > |r| under H0: Rho=0

*Panel 2: Correlation matrix for independent variables, Big5/4 test sample (N = 8954)*


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	PBANK	LOSS	LNTA	ARTA	INVENTA
PBANK	1.00000	0.30819 <.0001	0.04513 <.0001	-0.03488 0.0010	-0.01763 0.0952
LOSS	0.29315 <.0001	1.00000	-0.34953 <.0001	-0.18931 <.0001	-0.23050 <.0001
LNTA	-0.26925 <.0001	-0.34493 <.0001	1.00000	-0.09870 <.0001	0.04685 <.0001
ARTA	-0.01596 0.1310	-0.12078 <.0001	-0.13875 <.0001	1.00000	0.28554 <.0001
INVENTA	-0.05161 <.0001	-0.15292 <.0001	-0.05620 <.0001	0.15024 <.0001	1.00000

---

Pearson correlation coefficients below diagonal, Spearman correlations above diagonal

Prob > |r| under H0: Rho=0