

Auditor Industry Specialization and Auditor Reporting

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ABSTRACT:

In this study, we investigate the impact of Big 6 auditor industry specialization/market concentration on audit quality. Specifically, we define a dichotomous audit quality measure based upon whether the auditor issued a going concern qualification for firms subsequently declaring bankruptcy. We then test whether 11 different Big 6 auditor industry specialization metrics – measured using auditor industry market shares and audit industry portfolios - are positively related to the issuance of going concern qualifications for 121 firms declaring bankruptcy between 1991 – 1997.

Of the eleven industry specialist metrics tested, only two are significantly, positively associated with our measure of auditor quality. Our results have at least two possible interpretations. First, our two significant specialization metrics may be correlated with an undocumented omitted variable. If so, this suggests that industry specialization – as measured using national audited market shares – is not associated with our measure of audit quality and is not a differentiable dimension of within-Big 6 audit quality. Alternatively, our two significant industry specialist measures adequately and uniquely capture the reputational effects of industry specialization, thus providing evidence of greater specialist-supplied audit quality.

Key Words: *Industry Expertise, Industry Specialization, Audit Quality.*

Data Availability: *Data is available from public sources identified in the manuscript.*

1. Introduction

Due to dramatic changes in the types of auditor solicitations allowed (Chaney, Jeter and Shaw, 1997), the U.S. external auditor market has become increasingly concentrated – especially within certain industries (Hogan and Jeter, 1999). Opinions on this trend are mixed. Some question the impact of auditor industry concentration on auditor independence, and, in turn, audit quality (AICPA Advisory Panel on Auditor Independence, 1994; Angelini et al., 1994). Others such as Hogan and Jeter (1999) conclude that there may be benefits to auditor industry concentration, including the possibility of higher audit quality. These comments suggest that the impact of auditor industry concentration on audit quality remains a largely unresolved issue.

To date, empirical support for a hypothesized positive relation between auditor industry concentration and audit quality has generally been indirect in nature and limited to audit fee studies (DeFond, Francis and Wong, 2000; Craswell, Francis and Taylor, 1995). The implication of these audit fee studies is that auditees pay a fee premium in return for higher audit quality. Since these studies also define industry specialization as the percentage of an industry's assets audited, such studies further assume that the *concentration* of an industry's publicly traded firms audited by an auditor equates to industry specialization for that auditor (Gramling and Stone, 1999; Krishnan, 1997).

Audit fee studies provide *indirect* evidence associating audit quality with industry specialization/auditor concentration. That is, audit fee studies do not purport to measure audit quality; rather, it is a construct proxied for by the audit fee paid on the part of the auditee (Gramling and Stone, 1999). In contrast, bankruptcy settings are often used to investigate the relation between auditor type and audit quality (Simunic and Stein, 1987; Beatty, 1989). In these studies, audit quality is defined and *measured* as the propensity to

qualify audit reports for subsequently bankrupt companies. These studies document a positive relation between auditor type – as defined by the Big 6/non-Big 6 dichotomy - and this type of outcome-based audit quality. However, evidence regarding the impact of industry specialization/auditor concentration on this particular definition of audit quality is much more limited (Gramling and Stone, 1999).

In this study, we investigate the impact of industry specialization/market concentration on one measure of outcome-based audit quality.¹ Consistent with prior research, we construct a dichotomous audit quality measure based upon whether the auditor issued a going concern qualification for firms subsequently declaring bankruptcy. We then test whether auditor industry specialization – measured using auditor industry market shares and audit industry portfolios - is positively related to the issuance of going concern qualifications for 121 firms declaring bankruptcy between 1991 – 1997.

In general, our analyses fail to document a positive relation between our measures of industry specialization and our measure of auditor quality. Of the eleven industry specialist metrics used, two are significantly, positively associated with our measure of auditor quality.² The first is a dichotomous specialization measure based upon the Palmrose (1986) method applied to focus industries, which are groupings of two-digit SIC codes per Abbott and Parker (2000) and Franz, Crawford and Johnson (1997). The second is another dichotomous specialization measure based upon the portfolio of revenues derived from two-digit SIC codes per Krishnan, 1997. Although the signs of the coefficient estimates are in the predicted direction, we find the remaining specialization metrics to be insignificantly associated with our measure of auditor quality.

Our results have at least two possible interpretations. First, our two significant specialization metrics may be correlated with an undocumented omitted variable. If so, this suggests that industry specialization – as measured using national audited market shares – is not associated with our measure of audit quality and is not a differentiable dimension of within-Big 6 audit quality.³ Alternatively, our two significant industry specialist measures adequately and uniquely capture the reputational effects of industry specialization, thus providing evidence of greater specialist-supplied audit quality.

Our study contributes to the extant literature in three ways. First, we document the correlation amongst the various industry specialist metrics. A portfolio-based or market share-based approach can be applied to focus industries or two-digit SIC codes. Further permutations create an unwieldy number – eleven – of industry specialist measures. We find the portfolio-based and marketshare-based methods of designating specialist auditors concur in approximately 80% of our observations when applied to focus industries. However, there is only a 56% agreement when these two methods are applied to two-digit SIC codes. Finally, there is very little agreement – 25.12% - between two-digit SIC code marketshare specialists and focus industry marketshare specialists. This suggests the mixed results of prior research may, in part, be attributable to measurement error resulting from applying the various specialist designation methods. It also suggests that additional research is needed to determine a consensus, industry specialist identification method.

Second, we investigate the impact of audit committees on the auditor's report qualification process. Specifically, we construct a dichotomous variable ACNOGREY that is equal to 1 if all audit committee members are independent directors, 0 otherwise.

Contrary to Carcello and Neal (2000), we find an unexpected negative relation between the likelihood of a going concern opinion and ACNOGREY. We interpret this result as evidence of mitigating circumstances. In particular, in cases where management must discuss its avenues for procuring additional financing and/or achieving solvency, the presence of an independent audit committee serves to underscore the validity of management's representation during the auditor reporting process.

Finally, we examine the impact of a previously unresearched variable, debtor-in-possession financing, in the auditor reporting process. As documented in Elayan and Meyer (1999), bankrupt firms receiving the debtor-in-possession financing have a significantly higher survivorship rate than firms that do not receive such financing. Although debtor-in-possession financing becomes public knowledge after the declaration of bankruptcy, the auditor likely has private information regarding the probability of procuring such financing (Lennox, 1999a). Perhaps not surprisingly then, we find that debtor-in-possession financing is significantly, negatively associated with the receipt of a going-concern report modification.

The remainder of the paper is organized as follows. Section Two reviews prior literature and develops our hypotheses, Section Three discusses sample selection, Section Four presents univariate and multivariate results, while Section Five concludes.

2. Prior Research and Hypotheses Development

2.1 The Auditor Report Modification Process and Audit Quality

While the financial statements of a firm subsequently declaring bankruptcy may, strictly speaking, be free of material misstatement, the failure of an auditor to qualify the audit report is often considered an error or misclassification. For example, McKeown et al. (1991) note that ‘financial statement users may want the auditor to issue a warning signal, regardless of the auditing standards, and accordingly, they might consider absence of any warning signal to be an error.’ Similarly, Carmichael and Pany (1993) note that the public, media, and legislators view bankruptcies without prior modified audit reports as errors. As such, properly qualifying the audit reports of subsequently bankrupt companies is often used as a proxy for audit quality (Beatty, 1989).

The two most common motivations used to explain why auditors qualify their opinions – and, thus, provide audit quality in the context of audit reporting – are the reputation hypothesis and the deep pockets hypothesis (Lennox, 1999a). The reputation hypothesis states that an audit firm signals quality to financial statement users by investing in brand name capital. An established brand name that signals a reputation for quality audits acts as a bond guaranteeing the auditor’s performance (DeAngelo, 1981). As a result, the audit firm can earn quasi-rents on its reputation (DeFond, et. al, 2000; Craswell, Francis and Taylor, 1995). However, should an audit quality error occur and be discovered, the value of an audit firm’s reputation diminishes, as well as its ability to earn quasi-rents on that reputation. This provides a motivation for the auditor to maintain reputation via the provision of high quality audits (Franz, Crawford and Johnson, 1997).

An alternative motivation for providing audit quality is the deep-pockets hypothesis. In this case, the auditor acts as a partial guarantor of the value of investments (Menon and Williams, 1994). Investors regard the audit firm as a major source of financial recovery for subsequent investment losses that result from an error or materially misstated financial statements. According to this view, auditors with more wealth at risk – i.e. Big 6 auditors – have more incentive to issue accurate audit reports and maintain audit quality (Dye, 1993; Willenborg, 1999).

Empirically, there is a great deal of support for *either* the deep pockets or reputation hypotheses – especially when using a Big 6/non-Big 6 dichotomy to infer audit quality. In particular, Beatty, (1989), Lennox (1999b) and Raghunandan et al. (2000) find that Big 6 auditors are more likely to qualify their audit reports of subsequently bankrupt companies than non-Big 6 auditors. The troublesome aspect of these competing hypotheses is the inability to distinguish one from the other when using only the Big 6/non-Big 6 dichotomy. Because of the well-documented size difference between Big 6 and non-Big 6 auditors, it is difficult to determine whether audit quality is attributable to the reputation hypothesis or deep pockets hypothesis.

Previous audit fee studies providing evidence of within Big 6 audit quality differences rely exclusively on the reputation hypothesis (DeFond, et al., 2000; Craswell, Francis and Taylor, 1995). Because audit fee studies generally assume that all Big 6 auditors have equally deep pockets, differences in fee premiums cannot be attributable to Big 6 industry specialists having deeper pockets. Therefore, any observed differences in audit quality – as proxied by audit fees - must be attributable to the reputation effects of industry specialization. By restricting our analysis to only Big 6 auditors, we make a

similar assumption and investigate whether the reputation effects of industry specialization result in higher outcome-based audit quality.

2.2 The Reputational Effects of Industry Specialization and its Impact on Audit Quality

Several prior studies find support for the reputational effects of industry specialization. DeFond, Francis and Wong (2000) and Craswell, Francis and Taylor (1995) both find that Big 6 industry specialist auditors command audit fee premiums relative to Big 6 industry non-specialist auditors. The authors interpret their findings as evidence of reputational effects on the part of Big 6 industry specialist auditors. These studies focus on the benefits of building industry specific reputations.

In contrast to audit fee studies, Franz, Crawford and Johnson (FCJ, 1997) study the impact of litigation against Big 6 industry specialist auditors. FCJ find that litigation against an industry specialist auditor results in significantly larger, negative stock price reactions by ‘nonevent’ firms, which are defined as specialist-audited firms in the same industry not subject to the litigation. FCJ interpret their findings as additional, market-based evidence in support of the reputational effects of industry specialization.

While there is growing support for the reputational effects of industry specialization, evidence regarding the impact of industry specialization on the quality of financial statements is much more limited. Financial statement-related audit quality is an *outcome-based* measure of audit quality. More specifically, since the output of the audit process is the audited financial statements, outcome-based audit quality is often defined in terms the quality of audited financial statements. For example, DeAngelo (1981) defines audit quality as the joint probability that an auditor will detect and report a material financial misstatement. Audit errors, defined as financial statements that are ex

post materially misstated, can thus serve as an outcome-based measure of audit quality (Lys and Watts, 1994).

Two recent studies, Dunn, et al. (2000) and Gramling, et al. (2000) examine the impact of auditor market share/specialization on two different measures of outcome-based audit quality. Dunn, et al. (2000) find a positive association between auditor industry specialization and disclosure quality, as measured by AIMR rankings. Gramling, et al. (2000) document a positive association between auditor industry specialization and the association between reported earnings and future realized cash flows. Both studies use a variation of DeAngelo's (1981) definition of audit quality to infer higher industry specialist audit quality. Specifically, instead of reducing the possibility of the financial statements being materially misstated, the employment of an industry specialist auditor results in increased financial reporting quality.⁴

2.3 Hypothesis

The results of DeFond, Francis and Wong, (2000), Craswell, Francis and Taylor, (1995) and FCJ (1997) all provide support for the reputational effects of industry specialization. These studies suggest the additional level of reputation generates the ability to earn abnormal rents. In turn, the results of Dunn et al. (2000) and Gramling, et al. (2000) suggest the reputational effects of industry specialization lead to greater financial reporting quality on the part of Big 6 industry specialist auditors. These studies suggest the additional level of reputation and its ability to generate future abnormal rents create incentive for industry specialist auditors to provide higher audit quality.

In this study, audit quality is defined as the likelihood of audit qualification for subsequently bankrupt firms. The reputational effects of industry specialization suggest

that industry specialist auditors are more likely to qualify their audit reports for subsequently bankrupt firms. This leads to our hypothesis (stated in alternative form):

Hypothesis: Big 6 industry specialist auditors are more likely to qualify the opinions of subsequently bankrupt companies relative to Big 6 industry non-specialist auditors.

3. Sample Selection

We identify bankrupt firms and their bankruptcy petition filing dates from three sources: (1) Prentice-Hall's *Capital Adjustments* (1991-1992 addenda), (2) Predicast's *F&S Index of Corporate Changes* and (3) LEXIS-NEXIS. We limit our sample period to 1991 - 1997 for two reasons. First, by restricting our sample period to only those post-1990 bankruptcies, sample firms are required to maintain audit committees if trading on any of the three major exchanges.⁵ This enables us to investigate the impact of audit committees on auditor reporting. Second, it is after the consummation of the two large accounting mergers – which are partly explained by a desire to improve in market presence in certain industries (Francis, Anderson and Stokes, 1999).

We also deleted companies that had already filed for bankruptcy at the time of the audit report. We further required 10-K's for the period covering the last financial statements, in order to examine audit committee composition. Finally, consistent with prior research, we deleted companies in the banking, other financial, and real estate sectors, as well as utilities, because such companies have unique financial characteristics. Complete data were obtained for 121 companies declaring bankruptcy within one year of the financial statement date for which a Big 6 audit report was issued.

Sample selection results are summarized in Table 1. In terms of industry membership, Table 1 provides frequency data for 12 focus industries. These 12 focus

industries are based upon groupings of two-digit SIC codes per Franz, Crawford and Johnson (1997) and Abbott and Parker (2000a, 2000b). One particular industry, Retailing and Wholesaling, is disproportionately large, which is likely due to the inherent operating risk involved with ownership of a large amounts of inventory. There is also a predominance of later period observations, due primarily to data availability. Finally, observations are distributed fairly evenly amongst the Big 6, with KPMG Peat Marwick having the greatest number of observations (24) and Coopers & Lybrand the least (17).

4. Research Design and Results

4.1 Research Design and Independent Variables

Consistent with prior research (Carcello, et al., 2000; Raghunandan and Rama, 1995), a multivariate logistic regression framework is employed to investigate our research question. The logistic regression model used to estimate the coefficients is given below:

$$(1) GC = \alpha + B_1\text{DEFAULT} + B_2\text{CR} + B_3\text{TLTA} + B_4\text{SALES} + B_5\text{EARLY} + B_6\text{BANKLAG} + B_7\text{REPLAG} + B_8\text{ACNOGREY} + B_9\text{DEBTPOSS} + B_{10}\text{SPECAUD} + \varepsilon$$

Where

GC	=	Going-concern modified report (1 if yes, else 0),
DEFAULT	=	Default status at time of audit report (1 if in default, else 0),
CR	=	Current Ratio,
TLTA	=	Leverage (measured as the ratio of total liabilities to total assets),
SALES	=	Client sales (in millions of dollars),
EARLY	=	If in early portion of sample period (1 if in 1991-1992, 0 else),
BANKLAG	=	Number of days between bankruptcy date and audit report date,
REPLAG	=	Number of days between fiscal year-end and audit report date,
ACNOGREY	=	Composition of audit committee (1 if audit committee comprised entirely of independent, non-employee directors, 0 else),
DEBTPOSS	=	Whether auditee has received debtor-in-possession financing,
SPECAUD	=	Whether auditor is an industry specialist.

Default is used as an explanatory variable as auditors are more likely to qualify their opinions for firms defaulting on debt obligations (Chen and Church, 1992). Similarly, auditors may be more likely to issue going-concern modifications for clients with significant liquidity issues (Raghunandan and Rama, 1995). Consistent with Raghunandan and Rama (1995), variables used to proxy for these non-default liquidity measures include the current ratio (CR) and leverage (TLTA). As auditors are more reluctant to qualify the opinions of larger clients due to fee pressures (McKeown et al, 1991), SALES is also used as a control variable.

SAS 59 became effective December 31, 1989 and required auditor to evaluate whether is ‘substantial doubt’ about the client’s ability to continue as a going-concern for a reasonable period of time in every audit. Carcello, et al. (2000) find evidence suggesting that auditors were overly concerned about the legal ramifications and heightened ‘expectations gap’ arising from this standard – especially in the period immediately following its adoption. We control for this with a dichotomous variable, EARLY, coded 1 for audit opinions covering years 1991-1992, 0 otherwise.

We also include two time lag variables, BANKLAG and REPLAG, in our analysis. BANKLAG, the time lag between the audit opinion date and bankruptcy date, is included as auditors may find it more difficult to distinguish failing and surviving companies in shorter time frames (McKeown et al., 1991; Citron and Taffler, 1992; Mutchler et al., 1997). REPLAG, the time lag between the client year-end and the audit report date, is included as prior research has shown that auditors give modified opinions more often the longer the lag between a client’s fiscal year-end and the audit opinion date (McKeown et al., 1991).

Recent studies suggest that audit committees comprised of independent directors enhance the independence of the external auditor (Beattie, et al., 1999). Carcello and Neal (2000) find a negative relationship between the percentage of independent audit committee directors and the likelihood of auditor switches for a sample of firms receiving initial going-concern modifications. The authors interpret this as evidence that independent audit committees reduce an auditor's cost of issuing a qualified audit opinion. Our measure of audit committee composition, ACENOGREY, is coded 1 for audit committees comprised entirely of outside, independent directors, 0 otherwise. We expect a positive relation between ACNOGREY and an auditor's propensity to qualify their opinions.

DEBTPOSS is a dichotomous variable equal to 1 if a firm receives debtor-in-possession (DIP) financing, 0 else. DIP financing is a term applied to lending money to a company which has declared bankruptcy. Claims for funds advanced to the firm, with court approval, are given priority status over other claimants. Banks can therefore lend money to the bankrupt company and be treated as the senior creditor even though the debtor's assets may have already been pledged to other creditors before the bankruptcy filing (Elayan and Meyer, 1999). Elayan and Meyer (1999) demonstrate a direct relation between obtaining DIP financing and the probability of recovering from Chapter 11, as well as lower bankruptcy duration. This information is obtained from the *Bankruptcy Yearbook and Almanac* per New Generation Research.

Note that the procurement of DIP financing occurs *after* the declaration of bankruptcy. As such, it becomes a public signal regarding the firm's ability to continue as a going concern after the audit report has been issued. Nonetheless, Lennox (1999b)

argues that auditors likely have *private*, non-financial statement related signals about the firm's ability to continue as a going concern. If the auditor is aware of the likelihood of procuring DIP financing before the audit report is issued, it likely will affect the going concern qualification process. Accordingly, we control for this possibility with the DEBTPOSS variable.

4.2 Test Variable Measures

Review of prior research yields two different approaches to calculating auditor industry specialization. The first approach uses audited market shares of particular industries (Craswell, Francis and Taylor, 1995; Franz, Crawford and Johnson, 1997). In this case, auditor market share is hypothesized to be a result of industry-specific investments made on the part of an industry specialist auditor. A second method of identifying industry specialization uses a portfolio approach (Gramling, et al., 2000; Krishnan, 1999). These studies argue that the percentage of auditor-specific resources devoted to a specific industry is likely to be a function of the percentage of revenue derived from that industry. In turn, it is argued that apportioning a large percentage of auditor-specific resources likely leads to greater auditor industry expertise. This approach calculates auditor industry specialization as the percentage of overall revenues that an auditor derives from a particular industry.

Both the market share and portfolio approaches are applied to industries. Review of prior literature reveals two industry classification schemes. Dunn, et al. (2000) and Gramling, et al. (2000) use auditor market shares using two-digit SIC codes to define industries. Abbott and Parker (2000a, 2000b) and Franz, Crawford and Johnson (1997)

use auditor market shares based for 12 focus industries. The 12 focus industries result from the grouping of two-digit SIC codes.

Finally, within each of these four approaches, one can calculate a continuous measure or a dichotomous measure by applying the Palmrose (1986) method. The Palmrose (1986) method identifies an industry specialist auditor if the auditor has the greatest market share within that two-digit SIC code industry or focus industry. Any other auditor within 15% of the leader’s overall market share is also designated a specialist (Palmrose, 1986). The Palmrose (1986) method can also be tailored to the portfolio approach. In this case, the auditor with the highest percentage of its overall revenue derived from a particular focus industry is deemed a specialist and any auditor within 15% of that percentage is also deemed a specialist. This yields a total of eight industry specialist measures: four dichotomous measures and four continuous measures. These are summarized in the table below:⁶

Industry Classification	Market-Share Approach		Portfolio Approach	
	Continuous	Dichotomous	Continuous	Dichotomous
Focus Industries	Abbott and Parker (2000);	Franz, Crawford & Johnson (1997)	DeFond, Francis and Wong (2000)	DeFond, Francis and Wong (2000)
Two-Digit SIC Codes	Gramling, et al. (2000); Dunn, et al. (2000)	Gramling, et al. (2000); Dunn, et al. (2000)	Gramling, et al. (2000); Dunn, et al. (2000)	Gramling, et al. (2000); Dunn, et al. (2000)

4.3 Univariate Results

Table 2 presents descriptive statistics for our dependent and independent variables. Consistent with prior research, approximately half of our observations (46%) did not receive a qualified opinion prior to bankruptcy. Surprisingly, we find a majority

of sample companies (68%) having audit committees comprised solely of outside directors. 28% of our sample companies received debtor-in-possession financing.⁷

Table 3 provides Mann-Whitney tests for differences between firms receiving qualified versus unqualified opinions. Consistent with prior research, firms receiving unqualified opinions had later bankruptcy dates, earlier report dates, and exhibited lower leverage, higher sales, higher current ratios and were more likely to receive debtor-in-possession financing.

Curiously, firms receiving an unqualified opinion were more likely to have an audit committee comprised entirely of outside directors. In particular, Carcello and Neal (2000) find that for firms in financial distress, firms having independent audit committees were more likely to receive a going-concern qualification. However, Carcello and Neal (2000) focus on the propensity to qualify opinions for financially distressed firms, whereas our sample consists of subsequently bankrupt firms. Our results are consistent with audit committees underscoring of validity of management representations regarding firm viability. Finally, there was not a statistically significant difference in the incidence of specialist auditors – regardless of identification method - between the two groups.

4.4 Correlations between the industry specialist measures

Table 4 presents a correlation matrix between the various independent variables. Table 4 has two panels. Panel A presents the correlations amongst the dichotomous industry specialization measures, whereas Panel B presents the correlations amongst the continuous marketshares and portfolios. Of particular interest is the extremely high and statistically significant correlation between the dichotomous - focus industry (market share) and the dichotomous – focus industry (portfolio). These measures were in

agreement 79.63% of the time. This indicates that Big 6 auditors who enjoy the largest focus industry marketshare also derive a more substantial percentage of their revenues from that particular focus industry. This is intuitively appealing and reconciles the arguments advanced by Krishnan (1997) and Craswell, Francis and Taylor (1995).

In contrast, the correlation between the dichotomous – two-digit SIC code (market share) and the dichotomous – two-digit SIC code (portfolio) was only 55.91%. This correlation coefficient suggests that in only 55.91% of the firms, the auditor with the largest two-digit SIC code market share was also the auditor most likely to devote the largest percentage of their resources towards that two-digit SIC code. This suggests that aggregating two-digit SIC codes into focus industries likely reduces the misclassification of firms into incorrect two-digit SIC codes (Gramling and Stone, 1999).⁸

Finally, we find the two marketshare-based, dichotomous industry specialist metrics (i.e. the two-digit marketshare based industry specialist and the focus industry marketshare based industry specialist) agree only 25.12% of the time. Put another way, in approximately one of out four observations is the same auditor considered a two-digit SIC-code specialist and the corresponding focus industry specialist auditor. This low correlation suggests considerable variation between studies that measure industry specialization. It also suggests that additional research is necessary before concluding which is the appropriate specialist identification method.

4.5 Multivariate Results – Market-share based Industry Specialization Measures

Table 5 presents logit regression results for market-share based auditor industry specialization measures. Panel A (B) of Table 5 uses auditor market-shares based upon focus industries (two-digit SIC codes). Within each panel, there are two specialist

measures. This first is a dichotomous specialization measure, while the second is a continuous measure equal to the percentage of focus industry (two-digit SIC code) assets audited by a particular auditor.⁹

Panel A of Table 5 indicates that, for one measure, industry specialist auditors are more likely to issue a qualified opinion for subsequently bankrupt companies. Specifically, the coefficient estimate for the dichotomous specialist variable is statistically significant, whereas the coefficient estimate for continuous marketshares is not. There exist two, non-mutually exclusive explanations for this. First, dichotomously designating specialist may actually represent better the differential, reputational impact of industry specialization. Second, the continuous marketshare-based specialist measure may contain noise unrelated to the reputational effects of specialization, thus resulting in a less powerful test.

Panel B of Table 5 presents results based upon auditor marketshares of two-digit SIC codes. Although both the continuous and dichotomous specialization coefficient estimates are in the predicted direction, neither is statistically significant. This may be due, in part, to measurement error induced by incorrect two-digit SIC classifications. In particular, Gramling and Stone (1999) note that many multi-segment firms are incorrectly categorized when using a primary two-digit SIC code. This is partially offset in the focus industry method by the grouping of several two-digit SIC codes.¹⁰

Finally, with the exception of REPLAG and ACNOGREY, coefficient estimates for our other test variables are statistically significant and in the predicted direction. The coefficient estimate for REPLAG is insignificant, whereas for ACNOGREY it is statistically significant but opposite the predicted direction.

4.6 Multivariate Results – Portfolio-Based Industry Specialization Measures

Table 6 presents logit regression results for portfolio-based auditor industry specialization measures. Panel A (B) of Table 6 presents results based upon the percentage of an auditor's revenues derived from particular focus industry (two-digit SIC code). Within each panel, there are two specialist measures. The first one is dichotomous, while the second is a continuous measure representing the percentage of revenues derived from a particular focus industry (two-digit SIC code).

While all four of the portfolio-based specialist measures were in the predicted direction, none were statistically significant. Once again, with the exception of REPLAG and ACNOGREY, all of our other test variables are statistically significant and in the predicted direction. Consistent with Table 5, REPLAG is insignificant, whereas ACNOGREY is statistically significant but opposite the predicted direction.

4.7 Sensitivity Analysis

In regards to our test variables, several studies (Craswell, Francis and Taylor, 1995; Dunn, et al., 2000) use a 'threshold' measure of industry specialization. Note that the Palmrose (1986) method is a relative ranking method, namely, auditors are ranked based upon their relative market shares and only those with the highest market shares are identified as specialists. In a threshold method of specialist designation, auditors with more than a 15% market share of a particular two-digit SIC code or focus industry are deemed specialists, regardless of their ranking within the Big 6. We conducted regressions using three threshold specialist measures. These three threshold measures were based upon whether an auditor audited more than 15% of a particular focus industry, two-digit SIC codes, or derived more than 15% of its overall revenues from a

particular focus industry. Regression results (not reported) indicate that these measures were in the predicted direction, but statistically insignificant.¹¹

We also used a threshold-based specialist measure using two-digit portfolios. Since there are 67 two-digit SIC codes, most two-digit SIC codes represented less than 5% of the total portfolio of revenues earned by a particular auditor. Following Krishnan (1997), an auditor was designated a specialist if a two-digit SIC code represented more than 1.5% (approximately 1/67) of the total publicly-held assets audited by that auditor. Interestingly, regression results (not reported) indicate that this measure was in the predicted direction and statistically significant at $p=.08$. However, this designation is more a result of SIC-code characteristics than auditor-specific characteristics. In particular, the number of auditees within a two-digit SIC code, combined with the size of those auditees, appear to drive much of the variation in this measure.¹²

5. Summary and Conclusions

In this study, we have examined whether the reputational effects of industry specialization impact the propensity of auditors to qualify their opinions of subsequently bankrupt companies. In general, our analyses fail to document a hypothesized positive relation between industry specialization and this measure of outcome-based audit quality.

There are three interpretations of our results. First, our lone significant industry specialization metrics are correlated with an undocumented omitted variable, suggesting that industry specialization is not a differentiable dimension of within Big 6 audit quality. This would suggest that industry specialization may not necessarily result in higher audit quality. As such, audit fee premiums attributable to industry specialization may be more

a function of auditor supplied client satisfaction rather than of actual financial statement related accuracy (Behn, et al., 1999).

A second interpretation of our results is that industry specialization is a differentiable dimension of audit quality, but that two factors limit our ability to consistently document this relation. First, the bankruptcy arena may be too extreme a setting in which to test for this hypothesized relation. Indeed, many auditors explicitly state that they are not in the business of predicting company failures. As such, studies that focus on actual financial errors and/or misstatements may be a more appropriate test setting in which to examine this issue. Second, the relatively small number of observations may have further reduced the power of our empirical tests.

A final interpretation of our results is industry specialization is a differentiable audit quality trait and results in higher audit quality. However, this rests upon an assumption that our two significant, industry specialist metrics *uniquely* capture the reputational effects of industry specialization. Moreover, such an interpretation should be made with caution. In particular, as our correlation analyses demonstrate significant variation between the specialist metrics, this interpretation requires further research before a conclusion can be drawn about the superiority of certain industry specialist metrics, as well as the impact of industry specialization on audit quality.

References:

- Abbott, L.J. and S. Parker. 2000a. Audit committee characteristics and auditor selection. *Auditing: A Journal of Practice and Theory*, forthcoming.
- Abbott, L.J. and S. Parker. 2000b. Audit committee characteristics and auditor selection: evidence from auditor switches. Working paper. University of Memphis.
- AICPA Advisory Panel on Auditor Independence: *Report to the Public Oversight Board of the SEC Practice Section: Strengthening the Professionalism of the Independent Auditor*, New York Public Oversight Board, 1994.
- Angelini, J.P., M.R. Hutton, et al. (1994). Potential adverse effects of specialization within accounting firms, *Accounting Horizons* 8 (3): 36 – 47.
- Beattie, V., R. Brandt and S. Fearnley. 1999. Perceptions of auditor independence: U.K. evidence. *Journal of International Accounting, Auditing and Taxation*, Vol. 8 (1): 67 – 107.
- Behn, B.K., J.V. Carcello, D.R. Hermanson and R. Hermanson. 1999. Client satisfaction and Big 6 audit fees. *Contemporary Accounting Research*, Volume 16 (4): 587 – 608.
- Carapeto, M. 1999. Does debtor-in-possession financing add value? Working paper. London Business School.
- Carcello, J.V. and T. Neal. 2000. Audit committee composition and auditor reporting. forthcoming, *The Accounting Review*, 75 (October).
- Carmichael, D.R., and K. Pany. 1993. Reporting on uncertainties, including going concern. In *The Expectation Gap Standards: Progress, Implementation Issues, and Research Opportunities*. Jersey City, NJ: AICPA.
- Chaney, P., D. Jeter and P. Shaw. 1997. Client-auditor realignment and restrictions on auditor solicitation. *The Accounting Review*, 72 (July): 433 – 454.
- Chen, K. and B. Church. 1992. Default on debt obligations and the issuance of going-concern opinions. *Auditing: A Journal of Practice and Theory* (Fall): 30 – 49.
- Citron, D. and R. Taffler. 1992. The audit report under going-concern uncertainties: an empirical analysis. *Accounting and Business Research*, 22: 337 – 345.
- Craswell A.T., J.R. Francis, and S.L. Taylor. 1995. Auditor brand name reputations and industry specializations. *Journal of Accounting and Economics* 20 (December): 297-322.

- DeAngelo, L.E. 1981. Auditor size and audit quality. *Journal of Accounting and Economics* (December): 183 – 199.
- DeFond, M., J.R. Francis, and T.J. Wong. 2000. Auditor industry specialization and market segmentation: Evidence from Hong Kong. *Auditing: A Journal of Practice and Theory* 19 (Spring): 1-17.
- Dopuch, N., and D. Simunic. 1980. *The Nature of Competition in the Auditing Profession: A Descriptive and Normative View. Regulation and the Accounting Profession.* J. Buckley and F. Weston, Lifetime Learning Publications: 77 – 94.
- Dopuch, N., and D. Simunic. 1982. Competition in auditing: An assessment. *Fourth Symposium on auditing research.* University of Illinois.
- Dunn, K.A., B. W. Mayhew and S.G. Morsefield. 2000. Disclosure quality and auditor choice. Working paper. CUNY – Baruch.
- Dye, R. 1993. Auditing standards, legal liability and auditor wealth. *Journal of Political Economy*, 101, 887 – 914.
- Elayan, A., and T. Meyer. 1999. Market reaction to announcements of debtor-in-possession financing: an empirical investigation of bankruptcy outcome, duration and loan characteristics. Working paper. Massey University.
- Francis, J.R., D. Anderson and D. Stokes E.R. 1999. City markets as a unit of analysis in audit research and the re-examination of big 6 market shares. *Abacus* (October): 663-683.
- Franz, D.R., D. Crawford and E. N. Johnson. 1998. The impact of litigation against an audit firm on the market value of nonlitigating clients. *Journal of Accounting, Auditing and Finance* 13 (Spring): 117-134.
- Gramling, A.A., V.E. Johnson and I.K. Khurana. 1999. The association between audit firm industry experience and financial reporting quality. Working paper. Wake Forest University.
- Gramling, A. and D. Stone. 2000. A review and evaluation of industry concentration, specialization, experience and knowledge research in auditing. Working paper. University of Illinois.
- Hogan, C.E., and D.C. Jeter. 1999. Industry specialization by auditors. *Auditing: A Journal of Practice and Theory* 18 (Spring): 1-17.
- Krishnan, J. 1999. A comparison of auditor's self-reported industry expertise and alternative measures of industry specialization. Working paper. Villanova University.

- Krishnan, J. and J. Krishnan. 1997. The role of economic trade-offs in the audit opinion decision: an empirical analysis. *Journal of Accounting, Auditing and Finance*, 17: 565 – 586.
- Lennox, C. 1999a. Are large auditors more accurate than small auditors? *Accounting and Business Research*, 29 (No. 3): 217 – 228.
- Lennox, C. 1999b. The relationship between audit accuracy and auditor size: an evaluation of reputation and deep pockets arguments. *Journal of Business, Finance and Accounting*, 26: 779 – 806.
- Lys, T. and R.L. Watts. 1994. Lawsuits against auditors. *Journal of Accounting Research* 32: 65 – 93.
- McKeown, J.C., J.F. Mutchler and W. Hopwood. 1991. Towards an explanation of auditor failure to modify the audit opinion of bankrupt companies. *Auditing: A Journal of Practice and Theory* (Supplement): 1-13.
- Menon, K., and J. D. Williams. 1994. The insurance hypothesis and market prices. *The Accounting Review* 69 (April): 327 -342.
- Mutchler, J.F., W. Hopwood, and J.C. McKeown. 1997. The influence of contrary information and mitigating factors on audit opinion decisions on bankrupt companies. *Journal of Accounting Research*, 35 (2): 295 – 310.
- Palmrose, Z. 1986. Audit fees and auditor size: further evidence. *Journal of Accounting Research* 24 (Spring): 97 – 110.
- Parker, S. 2000. The effect of audit committees on financial reporting. Unpublished dissertation, University of Oregon.
- Raghunandan, K., and D.V. Rama. 1995. Audit reports for companies in financial distress: before and after SAS no. 59. *Auditing: A Journal of Practice and Theory* (Spring): 50 – 63.
- Walker, P., J. Casterella, and L. Moet, 1998. An investigation of audit failure in new audit engagements. *Research in Accounting Regulation* Vol. 12: 61-75.
- Willenborg, M. 1999. An empirical analysis of the economic demand for auditing in the initial public offerings market. *Journal of Accounting Research*, 37, No. 1: 225 – 238.

TABLE 1

*Sample Selection Results for 121 firms filing for bankruptcy between
1991 – 1997*

Panel A: Distribution of observations by focus industry

Focus Industry	Related Two-Digit SIC Codes	Number of observations
Construction	15 – 17	3
Consumer products & food	20 – 33	19
Energy	10 – 14, 46, 49	13
Financial Services	60 – 64, 67	0
Information & Communication	78, 79, 84	10
Manufacturing	34 – 39	28
Personal services, healthcare	72, 80, 83	5
Professional/commercial services, education	75, 76, 82, 87, 89	4
Real Estate	65, 70	1
Retail and Wholesale	50 – 59	30
Transportation	40 - 42, 44, 45, 47	7
All other	1, 2, 7, 8, 99	1

Panel B: Distribution of observations by year

Year	Number of observations
1991	5
1992	16
1993	12
1994	12
1995	15
1996	20
1997	41

Panel C: Distribution of observations by auditor

Auditor	Number of observations
Arthur Andersen	20
Coopers & Lybrand	17
Deloitte & Touche	22
Ernst & Young	20
KPMG Peat Marwick	24
Price Waterhouse	18

TABLE 2*Descriptive Statistics*

Variable Name	Mean	Median	Standard Deviation
<i>GC</i>	0.5372	1.0	0.5007
<i>DEFAULT</i>	0.3553	0.0	0.4806
<i>CR</i>	1.4571	1.0671	1.4689
<i>TLTA</i>	0.6833	0.6271	0.6694
<i>SALES (millions)</i>	412.8812	120.5021	806.6966
<i>EARLY</i>	0.1735	0.0	0.3787
<i>BANKLAG</i>	186.9587	186.0	89.0737
<i>REPLAG</i>	85.0744	75.0	71.749
<i>ACNOGREY</i>	0.6776	1.0	0.4693
<i>DEBTPOSS</i>	0.2809	0.0	0.4514
<i>SPECAUD1</i>	0.2231	0.0	0.4181
<i>SPECAUD2</i>	0.2149	0.0	0.4124
<i>SPECAUD3</i>			

LEGEND:

- GC* = Going-concern modified report (1 if yes, else 0),
DEFAULT = Default status at time of audit report (1 if in default, else 0),
CR = Current Ratio,
TLTA = Leverage (measured as the ratio of total liabilities to total assets),
SALES = Client sales,
EARLY = If in early portion of sample period (1 if in 1991-1992, 0 else),
BANKLAG = Number of days between bankruptcy date and audit report date,
REPLAG = Number of days between fiscal year-end and audit report date,
ACNOGREY = Composition of audit committee (1 if audit committee comprised entirely of independent, non-employee directors, 0 else),
DEBTPOSS = Whether auditee has received debtor-in-possession financing,
SPECAUD1 = 1 if auditor is a Palmrose (1987) industry specialist auditor for focus industry per Abbott and Parker (2000), 0 else.
SPECAUD2 = 1 if auditor is a Palmrose (1987) industry specialist auditor for two-digit SIC code, 0 else.
SPECAUD3 = 1 if auditor is a Palmrose (1987) industry specialist auditor for two-digit industry portfolio, 0 else.

TABLE 3

*Univariate Tests for sample firms
receiving qualified/unqualified opinions*

Variable Name	Mean for Firms Receiving Qualified Opinion	Mean for Firms Receiving Unqualified Opinion	Difference	Mann- Whitney Statistic
<i>DEFAULT</i>	0.5846	0.0893	0.4954	43.19***
<i>CR</i>	0.9546	2.0404	-1.0858	18.89***
<i>TLTA</i>	0.7674	0.5856	0.1818	2.94*
<i>SALES (mill.)</i>	298.8266	545.2654	-246.4388	2.85*
<i>EARLY</i>	0.2615	0.0714	0.1901	7.95***
<i>BANKLAG</i>	158.6615	219.8036	-61.1421	15.94***
<i>REPLAG</i>	98.6923	69.2678	29.4245	5.24**
<i>ACNOGREY</i>	0.6308	0.7321	-0.1013	2.97*
<i>DEBTPOSS</i>	0.1538	0.4286	0.2748	12.18***
<i>SPECAUD1</i>	0.2000	0.2500	0.0500	0.51
<i>SPECAUD2</i>	0.2000	0.2300	0.0300	0.67
<i>SPECAUD3</i>				
<i>OBSERVATIONS</i>	65	56		

Note: Variables are defined in table 2.

*, **, *** = p value < .10, .05, .01, respectively (one-tailed).

TABLE 4*Correlation Table amongst
Auditor Industry Specialization Measures***Panel A: Correlation between dichotomous industry specialization metrics**

	Marketshares Focus Industries	Marketshares Two-digit SIC Code	Portfolios Focus Industries	Portfolios Two-digit SIC Code
Marketshares Focus Industries	1.000 (0.0000)	0.2512 (0.0054)	0.7963 (0.0001)	0.2712 (0.0045)
Marketshares Two-digit SIC Code		1.000 (0.0000)	0.0181 (0.8453)	0.5591 (0.0001)
Portfolios Focus Industries			1.000 (0.0000)	0.1162 (0.2063)
Portfolios Two-digit SIC Code				1.000 (0.0000)

Panel B: Correlation between continuous auditor marketshares and portfolios

	Marketshares Focus Industries	Marketshares Two-digit SIC Code	Portfolios Focus Industries	Portfolios Two-digit SIC Code
Marketshares Focus Industries	1.000 (0.0000)	0.5415 (0.0001)	0.2393 (0.0085)	0.1090 (0.2339)
Marketshares Two-digit SIC Code		1.000 (0.0000)	0.0224 (0.8078)	0.1671 (0.0669)
Portfolios Focus Industries			1.000 (0.0000)	0.39162 (0.0001)
Portfolios Two-digit SIC Code				1.000 (0.0000)

Note: Correlations appear on the top line of the square; p-values of the correlations appear in parentheses below.

TABLE 5
 Logistic Regression Results using Market Share-Based
Auditor Industry Specialization Measures

$$GC = \alpha + \beta_1 \text{DEFAULT} + \beta_2 \text{CR} + \beta_3 \text{TLTA} + \beta_4 \text{SALES} + \beta_5 \text{EARLY} + \beta_6 \text{BANKLAG} + \beta_7 \text{REPLAG} + \beta_8 \text{ACNOGREY} + \beta_9 \text{DEBTPOSS} + \beta_{10} \text{SPECAUD} + \varepsilon$$

Panel A: Auditor Market Shares based upon focus industries

		Dichotomous Auditor Specialization Measure		Continuous Auditor Specialization Measure	
Variable	Expected Sign	Parameter Estimate	Wald χ^2	Parameter Estimate	Wald χ^2
Intercept		2.2259	4.3713**	2.4638	4.3895**
DEFAULT	+	1.7468	8.1251***	1.7288	8.0436***
CR	-	-0.3532	1.9641*	-0.3671	2.0747*
TLTA	+	0.3708	1.6541*	0.3687	1.7213*
SALES	-	-0.0043	6.2471***	-0.0043	5.4992***
EARLY	+	1.0471	1.7215*	1.0237	1.6739*
BANKLAG	-	-0.0077	5.4308***	-0.0078	5.6540***
REPLAG	+	0.0007	2.2471*	0.0011	2.1214*
ACNOGREY	+	-0.8152	2.3776*	-0.8274	2.4291*
DEBTPOSS	-	-1.1909	4.0451**	-1.2404	4.1382**
SPECAUD	+	0.1068	1.8651*	1.2955	1.0123
Model $\chi^2 = 59.801$ ***; Psuedo-R ² = .5209			Model $\chi^2 = 60.033$ ***; Psuedo-R ² = .5225		

Panel B: Auditor Market Shares based upon two-digit SIC codes

		Dichotomous Auditor Specialization Measure		Continuous Auditor Specialization Measure	
Variable	Expected Sign	Parameter Estimate	Wald χ^2	Parameter Estimate	Wald χ^2
Intercept		2.1783	4.3913**	2.4500	5.0125**
DEFAULT	+	1.7907	8.4877***	1.8212	8.6861***
CR	-	-0.3595	2.0514*	-0.3711	2.1076*
TLTA	+	0.3522	1.0130	0.3619	1.0741
SALES	-	-0.0042	7.1675***	-0.0042	7.3329***
EARLY	+	1.0346	1.8133*	1.0729	1.7438*
BANKLAG	-	-0.0074	4.8950**	-0.0078	5.5570***
REPLAG	+	0.0008	1.3752	0.0005	1.4738
ACNOGREY	+	-0.7911	2.3994*	-0.8198	2.6545*
DEBTPOSS	-	-1.1567	3.9661**	-1.1494	3.6836**
SPECAUD	+	0.2402	0.7413	1.3085	0.5582
Model $\chi^2 = 59.991$ ***; Psuedo-R ² = .5216			Model $\chi^2 = 60.330$ ***; Psuedo-R ² = .5245		

Dependent variable, GC, equals 1 if going concern, 0 otherwise. Independent variables defined in table 2.

*, **, *** = p value < .10, .05, .01, respectively, based on one-tailed tests, two-tailed if coefficient is not in predicted direction.

TABLE 6
Logistic Regression Results using Portfolio-Based Auditor Industry Specialization Measures

$$GC = \alpha + \beta_1 \text{DEFAULT} + \beta_2 \text{CR} + \beta_3 \text{TLTA} + \beta_4 \text{SALES} + \beta_5 \text{EARLY} + \beta_6 \text{BANKLAG} + \beta_7 \text{REPLAG} + \beta_8 \text{ACNOGREY} + \beta_9 \text{DEBTPOSS} + \beta_{10} \text{SPECAUD} + \varepsilon$$

Panel A: Auditor portfolios based upon focus industries

		Dichotomous Auditor Specialization Measure		Continuous Auditor Specialization Measure	
Variable	Expected Sign	Parameter Estimate	Wald χ^2	Parameter Estimate	Wald χ^2
Intercept		2.7850	4.4788***	2.4307	3.2281**
DEFAULT	+	1.7359	7.9285***	1.7290	7.8086***
CR	-	-0.3480	1.9613*	-0.3474	1.8867*
TLTA	+	0.3510	1.0686	0.3731	1.1881
SALES	-	-0.0004	5.2764***	-0.0004	5.2973***
EARLY	+	1.0800	1.7177*	1.0425	1.7111*
BANKLAG	-	-0.0073	5.2841***	-0.0075	5.2644***
REPLAG	+	0.0006	0.0135	0.0017	0.0983
ACNOGREY	+	-1.478	2.9531*	-1.4910	2.7277*
DEBTPOSS	-	-1.1844	3.9515**	-1.2145	4.1131***
SPECAUD	+	0.1899	0.7669	2.3288	0.9775
Model $\chi^2 = 56.592$ ***; Psuedo-R ² = .5087			Model $\chi^2 = 57.499$ ***; Psuedo-R ² = .5151		

Panel B: Auditor portfolios based upon two-digit SIC codes

		Dichotomous Auditor Specialization Measure		Continuous Auditor Specialization Measure	
Variable	Expected Sign	Parameter Estimate	Wald χ^2	Parameter Estimate	Wald χ^2
Intercept		1.9994	3.6758**	2.2792	4.2062**
DEFAULT	+	1.7096	7.8188***	1.7536	8.2485***
CR	-	-0.3216	1.6940*	-0.3434	1.8925*
TLTA	+	0.4009	1.3123	0.3632	1.1140
SALES	-	-0.0004	5.3001***	-0.0004	5.2781***
EARLY	+	1.1414	1.8215*	1.0345	1.6808*
BANKLAG	-	-0.0076	5.3190***	-0.0075	5.2886***
REPLAG	+	0.0008	0.8088	0.0011	0.0391
ACNOGREY	+	-0.8134	2.6998*	-1.4699	2.7117*
DEBTPOSS	-	-1.3114	4.6629**	-1.2047	4.1014**
SPECAUD	+	0.6760	1.1810	3.4461	0.4295
Model $\chi^2 = 60.437$ ***; Psuedo-R ² = .5316			Model $\chi^2 = 58.043$ ***; Psuedo-R ² = .5153		

Dependent variable, GC, equals 1 if going concern, 0 otherwise. Independent variables defined in table 2.

*, **, *** = p value < .10, .05, .01, respectively, based on one-tailed tests, two-tailed if coefficient is not in predicted direction.

¹ Outcome-based audit quality refers to the output of the audit process – i.e. the audited financial statements. Audited financial statements, including the audit report, that are, ex post, misstated can serve as an indicator of audit quality provided on the part of auditors.

² Eight of the eleven are presented tables 5 and 6, whereas three other threshold based metrics are presented in the sensitivity analysis section.

³ Lennox (1999a) makes a similar assertion stating that ‘large auditors offer higher quality services...but this does not necessarily mean that large auditors are more accurate.’

⁴ Two recent studies, Abbott and Parker (2000a) and Parker (2000), provide evidence suggesting the results Dunn, et al. (2000) and Gramling, et al. (2000) be interpreted with caution. Abbott and Parker (2000a) document a statistically significant association between firms with active and independent audit committees and Big 6 industry specialist auditors. Parker (2000) demonstrates a negative association between firms with active and independent audit committees and aggressive financial reporting. Parker (2000) does not, however, find a corresponding negative relation between industry specialist auditors and aggressive financial reporting. Together, these studies demonstrate that active and independent audit committees are not only associated with better financial reporting quality, but also with the employment of industry specialist auditors. Accordingly, this suggests a correlated omitted variable from the previous studies that attribute financial reporting quality to the employment of an industry specialist auditor.

⁵ Firms trading on the American Stock Exchange (AMEX) were required to maintain an audit committee for years starting in 1992. However, our sample does not contain any AMEX-traded firms declaring bankruptcies in the years 1990 – 1992.

⁶ The table is not intended to be all-inclusive; rather, it provides the most recent papers utilizing the various auditor specialist identification methods.

⁷ Many of these companies were wholesalers or retailers. This appears reasonable as manufacturers are well served by the continuing operations of their retailers. Further, retailers and wholesalers also have substantial amounts of inventory which can serve as collateral in these types of agreements (Elayan and Meyer, 1999; Carpeto, 1999).

⁸ This is perhaps best illustrated with a numerical example. Consider two auditors, A and B. A audits a total of \$10,000 worth of publicly held assets, whereas B audit a total of \$8,000 worth of publicly held assets. Within a particular two-digit SIC code, A audits \$200 and B audits \$160. A derives 2% of its revenue from that two-digit SIC code, whereas B also derives 2% of its revenue from that two-digit SIC code. Hence, whereas A is the market-share based industry specialist, A and B are coded specialists per the portfolio approach. The lower correlation between two-digit portfolio and two-digit marketshare specialist suggests this scenario occurs more frequently at the two-digit SIC code level than the focus industry level.

⁹ The Palmrose (1986) method identifies the auditor with the highest market-share in that particular focus industry (two-digit SIC code) and any other auditor within 15% of that lead auditor’s market share as a specialist.

¹⁰ This is underscored when noting the relative lack of time-series consistency when designating industry specialist auditors. In particular, we find that two-digit based marketshares demonstrated much higher time-series variation than focus industry based marketshares.

¹¹ We also conducted sensitivity analysis for other explanatory variables. Raghunandan and Rama (1995), find that auditors are more likely to qualify their opinions if the firm has experienced recurring losses from operations. To control for this, we added an additional dichotomous variable coded 1 for firms with negative income from operations in the current and prior year, 0 else. This coefficient estimate for this variable was not insignificant and the results were qualitatively identical to those reported in Tables 5 and 6. Including a variable designating firms receiving a prior year going-concern opinion (Raghunandan and Rama, 1995) also did not qualitatively impact results reported in Tables 5 and 6 and the coefficient estimate on this variable was not significant at conventional levels.

¹² The inclusion of auditor-specific dummy variables did not materially impact our results, either.