

**Voluntary Disclosures and Auditor Specialization:
The Case of Commodity Derivative Disclosures**

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ABSTRACT

We investigate the association between auditor specialization and the extent of voluntary disclosures. Specifically, we find that clients of specialized auditors (as measured by the importance of an industry to the auditor's client base) issue less extensive commodity derivative disclosures. The results hold after controlling for disclosure incentives, proprietary costs, and proxies for general levels of information asymmetry. This result contrasts with prior literature that has concluded that auditor specialization is associated with higher levels of client disclosure quality or transparency. This is important because it is not clear whether the results of prior studies are due to specialized auditors proactively affecting company disclosure policies or if the presence of specialized auditors lends credibility to a company's selected level of disclosure. Our evidence supports the view that specialized auditors are employed in order to reduce information asymmetry by lending credibility to firms' disclosures.

1. Introduction

This study addresses whether companies make auditor choices in order to compensate for limited disclosures of ongoing operating activities in financial reports. Our study is based on the view that audits reduce information asymmetries resulting from policies of limited disclosure by conveying credibility to the financial reports. Credibility is assumed to be a positive function of audit quality, which is assumed to be a positive function of auditor specialization. Specifically, we examine whether the extent of voluntary commodity derivative disclosures is associated with use of specialized auditors.

Current research (Dunn et al 2000) generally associates auditor specialization with greater degrees of disclosure quality. It is not clear whether this association is due to the specialized auditors proactively affecting company disclosure policies or if the presence of a specialized auditor simply lends credibility to a company's selected level of disclosure. Our research attempts to shed light on this puzzle.

Prior research suggests firms can increase the value of the firm by increasing voluntary disclosures (e.g., Diamond and Verrecchia 1991; Barry and Brown 1985, Fishman and Haggerty 1989). Similarly agency cost theory would suggest that managers rent the reputation of a high quality auditor in order to lend credibility to their disclosures and avoid costs of nondisclosure (Jensen & Meckling 1976). Given these benefits firms have incentives to increase disclosure and employ high quality auditors as complements to increase the value of the firm.

However, managers also face the threat of disclosing proprietary information to competitors as well as the presence of information uncertainty when selecting the firms' level of disclosure (e.g., Verrecchia 1983; Gigler 1994; Dye and Sridhar 1995). Thus, in

practice we observe less than full disclosure. Lower disclosure levels would require the employment of alternative signaling mechanisms such as the employment of specialized auditors in order to avoid the costs of nondisclosure (i.e. discounting of firm value). In turn, after controlling for levels of information asymmetry and other influences on disclosure our study should find that the use of specialized auditors reflects lower levels of disclosure (i.e. substitution effect).

We investigate this role of specialized auditors within the setting of commodity derivative disclosures. These specific disclosures are particularly suitable for this type of study because they are voluntary and measurable within the sample period and they are also subject to the influence of perceived proprietary costs and disclosure benefits (Peters, 2000). This is important because it allows us to control for these influences on disclosure and more clearly observe the role of specialized auditors. This is in contrast to general overall disclosure measures.

Our sample consists of 178 firms across multiple non-financial industries during 1996. Preliminary results suggest that auditor specialization is associated with clients who choose to disclose less and thus require additional levels of credibility to evade costs of nondisclosure (discounting of firm value). This result is important because prior literature generally associates auditor specialization with higher levels of disclosure quality or transparency. This study shows that the previous results do not necessarily translate into higher levels of disclosure quantity.

The remainder of the paper is organized as follows. Section two develops the research question with background on voluntary disclosures. Section three describes the research methodology including sample selection, measure of disclosures and auditor

specialization. Section four describes the results of the tests. Finally, section five concludes with a discussion of ongoing work.

2. Background and Hypothesis Development

Disclosure Determinants

This study focuses on the cross-sectional variation in voluntary disclosures and its association with audit quality or specialization. For cross-sectional disclosure variation to exist there must be tension between the incentives and disincentives of disclosing. This tension is the consequence of information asymmetries produced by the separation of ownership and management (Jensen and Meckling 1976).

Firms have incentives to offer voluntary disclosures in order to avoid the discounting of firm value resulting from information asymmetries (Akerlof 1970; Grossman 1981; Milgrom 1981)¹. However these incentives are tempered by the presence of proprietary costs (Verrecchia, 1983)². This in turn supports a policy of limited disclosure.

In addition to the benefits and costs of disclosure, information uncertainty resulting from the separation of ownership from management can also drive the extent of disclosure. For example, Dye and Sridhar (1985), Dye (1986), and Jung and Kwon (1988) suggest that limited disclosure may be optimal when outside parties are unsure whether or not the firm has private information. In order to alleviate the effects of this

¹ The theoretical research on disclosure benefits is extensive. Building on the early economic theory, several streams in the finance literature suggest that in imperfect capital markets the level and content of disclosure affect firm value. (e.g. Merton 1987; Diamond and Verrecchia 1991; Trueman 1996; Barry and Brown 1985; Diamond 1985; Fishman and Hagerty 1989).

² Similar to disclosure benefits, the theoretical research on proprietary costs is also extensive. Verrecchia 1983 is used to provide a simple and straightforward basis for this paper.

information asymmetry firms may employ high quality auditors to provide credibility to their limited disclosures.

For example, Beatty (1989) shows that audits conducted by prestigious firms were associated with lower share offering discounts for companies seeking a stock exchange listing for the first time. Similarly, Hogan (1997) shows that the owners of businesses must choose between accepting greater underpricing and providing more credible financial information by means of an auditor of higher standing.

This evidence supports the premise that the quality or reputation of the auditor has a negative effect on the costs imposed by information asymmetries. Therefore, after controlling for general levels of information asymmetry and alternative signaling mechanisms, managers who choose to disclose less will seek out auditors of greater reputation or quality. The reputation of the high quality auditors provides assurance that the observed disclosures are a fair and accurate portrayal of the firm's pertinent activities at a given point in time. This leads to our primary hypothesis:

H1: Disclosure levels will be negatively associated with auditors of greater quality.

This is an important question because it departs from the traditional association found in previous research. Craswell and Taylor (1992) study the voluntary disclosure of reserves by oil and gas companies. They find a weak positive association between the presence of a high quality auditor and disclosure.

Their study is limited to a dichotomous disclosure measure, single industry, and a dichotomous audit variable that simply distinguishes Big-eight from Non-Big eight auditors. Craswell and Taylor (1992, pg. 305) state that "an alternative approach to the

one adopted in (their) paper would be to include proprietary costs in the disclosure model and develop a more detailed measure of disclosure.” We extend their study by including a detailed measure of disclosure, multiple industries, proprietary costs, disclosure benefits and several measures of auditor quality.

Dunn et al. (2000) finds that disclosure quality as measured by analyst’s rankings of corporate communication is positively associated with the presence of specialized auditors. Assuming the transparency of the firm is positively associated with disclosure quality, Dunn’s result would predict a positive association between the level of voluntary disclosure and the presence of specialized auditors. However, the link between analyst’s rankings, disclosure quality, transparency, and voluntary disclosures is not unambiguously clear. Thus, our research question remains unresolved.

To control for the general level of information asymmetry and alternative signaling mechanisms we also investigate the role of management ownership and audit committee influences. Controlling for these items increases the power of our auditor specialization investigation and reduce concerns of omitted correlated variables. As noted earlier, since we base our primary hypothesis information asymmetry arguments it is important to control for the extent of separation between management and shareholders. As the separation between shareholders and managers increases we expect disclosure to increase in an effort to offset increasing level of information asymmetry. Conversely, as managers own more of the company the amount of disclosure is expected to decrease.

Gelb (2000) posits that management faces trade-offs in its subset of costly signaling mechanisms. We’ve noted that one costly signaling mechanism is the

employment of a specialized auditor. An alternative costly signaling mechanism is the establishment of an active and independent audit committee. Audit committees are charged with the responsibility of financial reporting oversight (Parker, 2000; BRC, 2000). While audit committees are charged with this responsibility, prior research has shown that audit committee independence and activity critically impact the performance of these financial oversight responsibilities. Based on the costly signaling and reporting credibility arguments presented earlier, we would expect a negative association between the presence of an active and independent audit committee and the level of disclosure.

Audit Specialization and Audit Quality

We explore the role of audit quality on voluntary disclosure by considering the presence of specialized auditors. Audit quality must be positively associated with auditor specialization in order to make inferences. Our tests rely on this assumption based on the findings of previous research.³

In general, prior research has used the Big 6/non-Big 6 dichotomy to differentiate audit quality (Palmrose, 1986). However, a second body of research suggests that industry specialization represents an additional level of audit quality beyond the Big6/non-Big 6 dichotomy. As discussed by Gramling and Stone (1999) industry specialist auditors may provide higher quality audits due to: (1) better audit technologies (Dopuch and Simunic 1980, 1982), (2) superior knowledge obtained through economies of scale (Walker et al. 1998), (3) reduced dependence on a particular client (Krishnan and Krishnan, 1997; De Angelo, 1981), (4) maintenance of reputational investments

³ We acknowledge the mixed results found in other research regarding audit specialization and audit quality.

preserved through higher audit quality (Franz, Crawford and Johnson, 1997; Craswell, Francis and Taylor, 1995).

Several empirical studies find specialized auditors are able to demand fee premiums (Defond, Francis, and Wong, 2000; Craswell, Francis and Taylor, 1995). These studies imply that specialized auditors provide greater levels of audit quality under the assumption that higher audit fees are associated with higher audit quality.

Two recent studies, Dunn et al. (2000) and Gramling, et al. (2000) examine the impact of auditor market share /specialization on outcome-based audit quality. Dunn, et al. (2000) find a positive association between auditor industry specialization and disclosure quality, as measure by analysts' rankings of corporate communication. Gramling, et al. (2000) document a positive association between auditor industry specialization and the association between reported earnings and future realized cash flows. These studies suggest that employment of an industry specialist auditor results in increased financial statement quality.

Finally, Bonner and Lewis (1990) explore the association between audit quality and specialization at the firm level. They assert industry experience imparts specialized knowledge. They then link industry experience to audit quality by evaluating the ability of the auditor to recognize and account for an interest rate swap. They find a strong, positive correlation between industry knowledge and the audit task. This association holds even after controlling for knowledge of financial instruments. This is important because it provides evidence that industry knowledge is associated with the identification of relevant disclosures (not to mention disclosures associated with derivatives, which our paper considers).

Taken together, these studies are consistent with a positive association between audit quality and auditor specialization. The next section describes the methodology and proxies employed in the study.

3. METHODOLOGY

Sample Selection

Our sample of voluntary commodity derivative disclosures comes from 1996 fiscal year-end 10-K's. Using 1996 as the research period is particularly important. First, in the three years since the issuance of FASB's guidance on derivative disclosures (SFAS 119), firms' disclosure choices and industry patterns likely developed and stabilized. In turn, this would enable specialized auditors to develop expertise in dealing with commodity derivative disclosures in specific industries. It is important to note that FASB's SFAS 119 excluded commodity derivatives from the disclosure requirements. Thus commodity derivative disclosures are voluntary during the sample period.⁴

Since we are interested in the association of *specialized* auditors and voluntary disclosure, the sample must provide cross-sectional variation in auditor industry characteristics and in the types of commodities. The sample is taken from a study conducted by Peters (2000). Sample selection procedures collected the largest possible number of observations, industries, and commodities. The selection process identified five commodity groups where firms in related industries are most likely to use commodity derivatives. The five commodity groups include 31 commodities and lead to

⁴ The SEC strongly criticized FASB for not including commodity derivatives and increased the derivative disclosure requirements by broadening the scope of applicable derivatives and disclosure line items. 1996 was the last period firms could *voluntarily* provide the SEC derivative disclosures. ⁴ The earliest effective date of the SEC derivative disclosure standard is June 15, 1997.

the identification of 82 four-digit SIC industries likely to trade these commodities. Table 1 lists the commodity groups and the resulting sample firms with 10-K filings available.

Compustat lists 1484 firms with positive revenue within the 82 four-digit SIC industries. 1996 fiscal year-end 10Ks were available for 1137 firms from the SEC EDGAR database.⁵ Of these firms, 178 firms disclosed a meaningful use or holding of commodity derivatives as of the 1996 fiscal year-end. A keyword search facilitated the identification of firms disclosing the use of commodity derivatives.⁶

Measurement of Derivative Disclosure

Our dependent variable is the level of voluntary commodity derivative disclosure. This departs from previous research because it represents a specific accounting disclosure choice as opposed to accounting recognition choices such as accruals (Gramling et al. 2000) or overall corporate communication (Dunn et al. 2000). Using commodity derivative disclosures is particularly valuable for this type of study. First, as mentioned earlier, commodity derivative disclosures are voluntary and measurable during this period. Secondly, there is some merit to the assertion that the disclosures were of a concern to management and shareholders. Peters (2000) documents evidence that suggests the disclosure levels were associated with perceived proprietary costs and disclosure benefit concerns. In light of the importance of risk management policies and intensified concern over derivatives, a specialized auditor could signal that management disclosures are a fair and accurate description of the material activities involving commodity risks and derivative strategies.

⁵ Firms without 10Ks generally included foreign registrants, small registrants, and registrants who were acquired or no longer listed.

The measure of disclosure was obtained from Peters (2000). Similar to the method employed by Botosan (1997), the measure represents a firm-specific index of the extent of disclosure. A checklist which records the extent of commodity derivative disclosures found in each firm's 10K creates a disclosure score or index for each firm. The disclosures included in the checklist were selected based on assertions made by the SEC, FASB, and comment letters written to the SEC regarding the sensitivity of each disclosure.⁷ The power of the tests is improved by recognizing those disclosures that are more likely to contain sensitive or notable information.

Table 2 lists the elements contained in the checklist. The checklist assigns 1 point to each disclosure item found in the firms' 10K. The total number of points is then accumulated to assign a disclosure score or index for each firm. The maximum score possible is 22 points.

Measurement of Auditor Specialization

The first measure of auditor specialization uses a *market share approach*. The *market share approach* captures audit firm concentration within a specific industry. It measures the proportion of client sales in a particular industry audited by a specific auditor. We calculate the measure as follows:

⁶ The keyword search used language commonly found in derivative disclosures such as: commodity, hedge, derivative, futures, swap, option, and forward. Industry-specific key words, such as the word 'fuel' in the transportation industries were also used.

⁷ The checklist was derived from: (i) the checklist used in FASB's review of 1994 SFAS 119 disclosures (FASB, 1995) and (ii) the recently mandated SEC derivative disclosure requirements (SEC, 1997). Additional sources used to develop the checklist include: (i) guidelines used by the Association for Investment Management and Research (AIMR) during their annual review of financial statements (AIMR 1997), (ii) Financial Reporting Developments publications provided by Ernst & Young LLP (Ernst & Young LLP 1994) and (iii) Linsmeier and Pearson (1997) "Quantitative Disclosures of Market Risk in the SEC Release."

(2) Market Share Approach

$$\text{Audit Specialization} = \text{Total Client Sales}_{ai} / \text{Total Industry Sales}_i$$

$i = \text{industry} \quad a = \text{Audit Firm}$

The second method of identifying industry specialization uses a *portfolio approach* (Gramling, et al., 2000; Krishnan, 1999). These studies argue that overall market share in an industry may be a noisy measure of auditor industry specialization. In particular, Krishnan (1999) argues 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. Further, it is argued that apportioning a large percentage of auditor-specific resources likely leads to greater auditor industry expertise or audit quality. Thus, under the portfolio approach, total revenue derived from a specific industry represents the amount of audit resources or quality committed to that industry.

The *portfolio approach* assumes that client size (measured by sales) proxies for the auditor revenues associated with that client in a specific industry. The degree of audit specialization is therefore calculated as follows:

(1) Portfolio Approach:

$$\text{Audit Specialization} = \text{Total Client Sales}_{ai} / \text{Total Sales of all Clients}_a$$

$i = \text{industry} \quad a = \text{Audit Firm}$

Review of prior research yields two basic methods for defining industries. First, Dunn, et al. (2000) and Gramling, et al. (2000) use two-digit SIC codes to define industries. Gramling and Stone (1999) note that it is unclear to what extent two-digit SIC codes accurately capture industry-specific characteristics of firms. Potential problems arise because SIC codes recorded by various data sources, such as Compustat and CRSP,

are not necessarily uniform, and because of difficulties that exist in categorizing firms with multiple business lines. Thus, we also use a second approach that classifies firms into auditor-identified focus industries used by Franz et al. (1998) and Abbott and Parker (2000a, 2000b). Although this method is based on merging two-digit SIC codes, it may be preferable in that minor errors in SIC code might disappear in the broader groupings. Table 3 lists the two-digit SIC codes and focus industries included in the study.

All specialist variables are measured on a continuous basis. We are currently expanding the tests to include dichotomous measures of auditor specialization. The dichotomous work is preliminary and unreported.

Control Variables

In developing disclosure strategy, managers weigh the benefits of disclosure against the costs of disclosure. Too much disclosure can put the firm at a competitive disadvantage by revealing proprietary information. Too little disclosure can devalue the firm by increasing the amount of information uncertainty surrounding a firm. Thus it is crucial to control for perceived costs and benefits of disclosure.

Peters (2000) finds that the extent of commodity derivative disclosure during the sample period was associated with variables proxying for the perceived costs and benefits of disclosures contain in specific industry environments. The evidence suggested that firms limited disclosure when their derivative positions involved the procurement of raw materials in the product market. Because raw material disclosures reveal product cost information and expectations regarding anticipated transactions, firms limit voluntary disclosure of this information due to higher perceived proprietary costs. The presence of

derivatives related to the purchase of raw materials is a dummy variable set equal to 1, 0 otherwise. Information regarding derivatives is determined from each firm's 1996 10K.

Previous evidence also suggests that firms disclose less when operating in more concentrated industries (Peters 2000; Bamber and Cheon, 1997; Clarkson, Kao, and Richardson 1994). This result suggests that firms that face greater perceived product market proprietary costs within their industry are less likely to disclose disaggregated information. Industry concentration is calculated as total sales held by the top four firms divided by total sales for each 3-digit SIC industry.

Peters (2000) also found firms disclose less when trading in commodity derivative markets with less volume and more speculators and large traders. This implies that firms limit disclosure when they are more susceptible to proprietary costs arising from lack of anonymity in the commodity derivative market. Annual commodity futures contract volume is obtained from the 1997 CRB Commodity Yearbook for each commodity. The weekly mean number of large traders and percentage of speculators during 1996 are obtained from the Commodity Futures Trading Commission (CFTC) for each commodity.

Previous research also finds that firms disclose more when they have recently issued capital (Peters 2000; Lang and Lundholm 1993; Healy et al. 1995; Frankel et al. 1995; Clarkson et al. 1994). The findings are consistent with firms strategically selecting the level of voluntary disclosure in an attempt to increase the value of the firm. The issuance of equity and public debt is identified from the Investment Dealers Digest during the period December 31, 1995 through December 31, 1997. Peters (2000) also

find that larger firms offered less commodity derivative disclosures. Size is obtained from Compustat and is measured as the log of assets.

The presence of commodity derivative instruments that cannot be settled by delivery of the commodity is included as a control variable (Peters 2000). SFAS 119 distinguishes these as *financial* derivative instruments and requires them to be disclosed.⁸ Increased disclosure is expected if a firm includes these types of instruments within their commodity derivative portfolio because of the disclosure requirements. This variable is set to 1 if the firm uses collar or swap instruments related to their commodity positions, 0 otherwise.

As mentioned in hypothesis section, we also investigate the role of management ownership and audit committee influences in order to increase the power of our auditor specialization investigation and reduce concerns of omitted correlated variables. Management ownership levels are obtained from the proxy statements. The audit committee variable is coded 1 if the audit committee met at least twice and was entirely independent (Abbott and Parker, 2000a).

⁸ SFAS 119 the definition of derivative financial instruments excludes contracts that either require the exchange of a financial instrument for a non-financial commodity or permit settlement of an obligation by delivery of a nonfinancial commodity. For example, a swap instrument indexed on commodity prices would be considered a financial derivative instrument and would be included in the disclosure requirements. On the other hand, a commodity futures instrument would be considered a commodity derivative instrument and would be excluded from the disclosure requirements.

4. Results

Descriptive Statistics

Table 3 reports the sample selection results of industry and auditor membership. The final sample yielded a total of 175 firms. The firms were spread across 5 focus industries and 18 two-digit SIC codes. Finally, observations are distributed fairly evenly amongst the Big 6.

Table 4 reports descriptive statistics concerning the disclosure scores and independent variables used in the study. The mean and median overall scores are 10.41 and 11.00, respectively. The range in overall scores is from 1 to 21, with a standard deviation of 4.21. The maximum possible score is 22.

The auditor specialization variables were measured using four primary methods. The market share variable based on two digit-SIC codes ranged from 0.0002 to 0.922 with a mean and median of .201 and .186. The market share variable based on focus industries ranged from 0.049 to 0.458 with a mean and median of 0.192. The portfolio measure based on two-digit sic codes ranged from 0.002 to 0.413 with a mean and median of 0.137 and 0.146. Finally, the portfolio measure based on focus industries ranged from 0.000 to 0.203 with a mean and median of 0.026 and 0.021.

Management ownership within the firm ranged from 0% to 80.40 % with a mean and median of 11.89% and 4.75%. We calculated industry concentration ratios for the 34 different 3-digit SIC Code included in the final sample. The mean and median industry concentration ratios of sales captured among the 4 largest competitors ranged from 33% to 100% with a mean and median of 70% and 71%, respectively.

The final sample included 15 different commodities. The annual volume of futures contracts per commodity ranged from 300,000 contracts to 23,490,000 contracts with a mean and median of 6,500,000 and 3,920,000 contracts. The average number of large traders ranged from 37 to 448 with a mean and median of 141 and 118 large traders. The percentage of speculators in the trading markets compared to the total number of reportable traders ranged from 44% to 90% with a mean and median of 73% and 75%. Annual sales (millions) range from \$2 to \$71,129 with a mean and median of \$3,145 and \$398 respectively.

The percentage of firms with independent and active audit committees was 54%. The percentage of firms using derivatives associated with the purchase of raw materials is 48%. During the period December 31, 1995 through December 31, 1997, 41% of the firms issued public debt or equity. Finally, 49% of firms indicated the use of “*financial*” derivatives related to their commodity positions.

Regression Results

Table 5 presents the regression results from our initial tests. The initial regression model used to estimate the coefficients is as follows:

$$\text{Disclosure Level} = \alpha + b_1\text{Specialized Auditor} + b_2\text{Industry Concentration} + b_3\text{Raw Materials Derivatives} + b_4\text{Commodity Market Volume} + b_5\text{Large Traders} + b_6\text{Percentage of Speculators} + b_7\text{Log of Sales} + b_8\text{Capital Issuance} + b_9\text{Financial Commodity Derivatives} + \varepsilon$$

Panel A (B) of table 5 uses Market Share (Portfolio) auditor specialization variables. Each specialization variable is included in the regression model as a continuous variable. Within each panel, there are two specialist variables. The first is calculated across Focus Industries. The second is calculated across two-digit SIC codes.

Panel A of table 5 indicates that there is no evidence associating the presence of market share-based specialized auditors with lower levels of disclosure. The market share specialization variable calculated across focus industries has a p-value of 0.465. The market share specialization variable calculated across two-digit SIC code industries has a p-value of 0.265. Consistent with prior research, the control variables exhibit the predicted signs and are significant.

Panel B of table 5 provides results that support the primary hypothesis. The portfolio approach specialization variable calculated across focus industries exhibits a negative coefficient with a p-value of 0.019. The portfolio approach specialization variable calculated across two-digit SIC code industries also exhibits a negative coefficient with a p-value of 0.044. Recall we predicted that the level of disclosure would be negatively associated with auditors of higher quality (greater specialization). This was due to management's need to signal disclosure credibility by hiring an auditor of higher quality in order to mitigate the agency costs caused by information asymmetry. Similar to the Panel A, the control variables exhibit the predicted sign and are significant.

Table 6 presents the regression results after controlling for management ownership and audit committees. Recall from the earlier discussion, we investigate the role of management ownership and audit committee influences in order to increase the power of our auditor specialization investigation and reduce concerns of omitted correlated variables. The number of available observations is reduced to 160 due to the lack of proxy statements.

The results found in Table 6 strengthen those found in Table 5. Similar to table 5, the only significant specialist variables are those calculated using the portfolio approach.

However, including management ownership and audit committee variables strengthens those results. The p-values for the specialized auditors under the portfolio approach decrease to 0.01 and 0.03 for the focus industry variable and two-digit SIC code variable, respectively.

As expected the coefficient for management ownership is negative and significant with p-values ranging from 0.049 to 0.069 across all four specialist regressions. Audit committee is only marginally significant within portfolio approach regressions with p-values of 0.10 (focus industries) and 0.07 (two-digit SIC code industries).

Results for the control variables remain qualitatively the same except for two. The coefficient for Industry Concentration is no longer significant after including the audit committee and managerial ownership variables. Interestingly, Size (Log of Sales) loses significance under the portfolio approach regressions. This provides indirect support for the model that includes portfolio specialist measures, managerial ownership, and audit committee variables since size is often associated with ambiguous predictions and often captures the influences or associations that researchers cannot explain.

The differing results among the approaches of calculating auditor specialization are not necessarily surprising. Gramling and Stone (1999) note that the common measures of auditor specialization found in research are qualitatively different and not necessarily proxies for each other. They discuss “Specialization”, which reflects a strategic decision on the part of the firm to focus on a specific industry (our portfolio measures) and “Concentration”, which is the market share measure and reflects the distribution of market share among clients in an industry (our market share measures). They argue that portfolio measures are most directly related to the firm’s strategy. They

also point out that the concentration in an industry can be lower, but the importance of the industry to an individual firm in terms of the revenues derived (specialization) can be high.

5. Conclusion

Several ongoing studies in accounting research examine the association between audit specialization (quality) and financial reporting. We are particularly interested in the association between auditor specialization and voluntary disclosures of ongoing operating activities versus accounting recognition of completed transactions. Our study departs from other research by exploring the role of audits as a signal of financial reporting credibility.

Preliminary results suggest that auditor specialization is positively associated with clients who choose to disclose less and thus require additional levels of credibility to evade costs of nondisclosure (discounting of firm value). Costs of nondisclosure result from information asymmetry caused by the separation of management and ownership. Management can mitigate these costs or reduce the amount of information asymmetry by taking on costly signaling mechanisms such as offering more disclosure or employing specialized (high quality) auditors. Renting the credibility of specialized or high quality auditors conveys that the limited disclosures offered by management are a fair and accurate description of the firm's activities.

Our results hold even after controlling for the degree of separation between management and ownership. The results hold after controlling for alternative costly signaling mechanisms, specifically the establishment of an independent and active audit committee. The results are important because prior literature generally associates auditor

specialization with higher levels of disclosure quality or transparency. This study shows that the previous results do not necessarily translate into higher levels of disclosure quantity. Ongoing and unreported work includes sensitivity tests. Among others, these tests are exploring alternative specifications of auditor specialization as well as the potential for specific audit firms or industries to drive the results.

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TABLE 1
Sample Firms by Commodity Groups

<i>Commodity Groups</i>	<i>Commodities</i>	<i>4-Digit SIC Industries</i>	<i>Total Firms</i>	<i>Firms With Available 10K</i>	<i>Firms Disclosing Material Commodity Derivatives</i>
Energy	5	15	541	414	115
Cotton	1	9	129	117	3
Lumber	1	12	115	91	2
Agriculture	19	19	227	176	28
Metal	5	27	472	339	30
Total	31	82	1484	1137	178

Note: 82 SIC codes are included in the commodity groups based on their potential for using commodity derivatives. Firms with positive revenue during fiscal year-end 1996 are obtained from Compustat. Each firm's 10K is obtained from the SEC EDGAR database. A key word search identifies firms that disclosed the use of commodity derivatives, using language commonly found in derivative disclosures such as: commodity, hedge, derivative, futures, swap, option, and forward. Firms without 10Ks include foreign registrants, small firms, and firms acquired.

Energy includes Crude Oil, Natural Gas, Heating Oil, Propane, and Unleaded Gasoline.

Agriculture includes: Cocoa, Coffee, Feeder Cattle Corn, Frozen Pork Bellies, Frozen Concentrated Orange Juice, Lean Hogs, Live Cattle, Live Hogs, Milk, Oats, Rice, Soybean Meal, Soybean Oil, Soybeans, Sugar No. 11, Sugar No. 14, Wheat, and White Wheat.

Metal includes Copper, Gold, Palladium, Platinum, and Silver.

TABLE 2 Summary of Commodity Derivative Disclosures

Disclosure Categories and Items

Derivatives Used:

- Description of derivative class or instrument.
- Description of derivative commodity.
- Indicates commodity volumes contracted upon.
- Indicates average commodity prices contracted upon.
- Description of contract settlements.
- Description of contract terms.

Impact of Price Fluctuation:

- Quantifies the impact of price fluctuation on income.
- Quantifies the impact of price fluctuation on derivative positions.
- Description of model characteristics or assumptions.

Impact of Derivatives:

- Disclosure of recognized gains and losses.
- Quantifies impact on commodity prices.
- Description impact on commodity exposure.
- Disclosure of costs to finance derivative positions.
- Description of derivative activity during the year.

Notional Value Disclosures:

- Indicates total notional value of derivative positions.
- Indicates notional value by class of derivative
- Indicates notional value by commodity.
- Indicates notional value by term periods.
- Indicates percentage of inventory hedged.

Fair Value Disclosures:

- Indicates total fair value of derivative positions.
- Indicates fair value by class of derivative.
- Indicates fair value by commodity.

Table 3
Sample Selection Results for Specialized Auditors

Panel A: Distribution of observations by Two-Digit SIC Code

Focus Industry	Related Two-Digit SIC Codes	Number of observations
Consumer Products & Food	20 – 33	54
Energy	10 – 14, 46, 49	82
Manufacturing	34 – 39	6
Retail and Wholesale	50 – 59	12
Transportation	40 - 42, 44, 45, 47	16
All other	1, 2, 7, 8, 99	5
Total		175

Panel B Distribution of observations by 2-Digit SIC Code

2-Digit SIC Code	Number of observations
01XX	5
10XX	17
13XX	65
20XX	20
22XX	3
24XX	1
26XX	1
28XX	1
29XX	20
33XX	8
35XX	1
36XX	4
37XX	1
40XX	6
41XX	1
42XX	4
45XX	5
51XX	12
Total	175

Panel C: Distribution of observations by auditor

Auditor	Number of observations
Arthur Andersen	53
Coopers & Lybrand	22
Ernst & Young	31
Delloite & Touche	20
KPMG Peat Marwick	29
Price Waterhouse	20
Total	175

TABLE 4
Descriptive Statistics

Panel A:

<i>Variable</i>	<i>n</i>	<i>Mean</i>	<i>Median</i>	<i>Std Dev</i>	<i>Max</i>	<i>Min</i>
Dependent Variable						
Disclosure Score (Maximum Possible: 22 Points)	175	10.41	11.00	4.21	21.00	1.00
Auditor Specialization Variables						
Market Share Specialization – Two-Digit SIC	175	0.201	0.186	0.144	0.922	0.002
Portfolio Specialization – Two-Digit SIC	175	0.137	0.146	0.098	0.413	0.002
Market Share Specialization - Focus Industries	175	0.192	0.169	0.103	0.458	0.049
Portfolio Specialization- Focus Industries	175	0.026	0.021	0.345	0.203	0.000
Control Variables						
Management Ownership Percentage	160	11.89	4.75	16.59	80.40	0.00
Industry Concentration	34 ^A	0.70	0.71	0.18	1.00	0.33
Market Volume (millions)	15 ^A	6.50	3.92	6.84	23.49	0.30
Number of Large Traders	15 ^A	141.44	118.81	100.27	448.34	37.19
Percentage of Speculators	15 ^A	0.73	0.75	0.13	0.90	0.44
Sales (000,000s)	175	3,145	398	8,070	71,129	2.02

Panel B:

<i>Variable</i>	<i>n</i>	<i>Percentage</i>
Firms With Active and Independent Audit Committees	160	54%
Firms Using Derivatives Related to Raw Material Purchases	175	48%
Firms Issuing Equity or Public Debt	175	41%
Firms Using <i>Financial</i> Derivatives Related to Commodities	175	49%

^AThe final sample of 175 firms yielded 34 distinct three-digit SIC code industries and 15 distinct commodities. The descriptive statistics for these variables are calculated based on the number of distinct observations versus the number of firms.

TABLE 5
Regression Results using Continuous Auditor Specialization Variables

Panel A: Auditor Specialization Using Market Share Approach (n = 175)

Variable	Expected Sign	Specialization by Focus Group		Specialization by 2-Digit SIC Groups	
		Parameter Estimate	p-value	Parameter Estimate	p-value
Intercept		22.05	0.000***	22.20	0.000***
Specialized Auditor	-	0.20	0.465	-1.05	0.265
Industry Concentration	-	-2.66	0.056*	-2.45	0.072*
Raw Materials Derivatives	-	-1.74	0.002***	-1.80	0.001***
Commodity Market Volume	+	0.06	0.066*	0.07	0.056*
Large Traders	-	-0.01	0.029**	-0.01	0.026**
Percentage of Speculators	-	-11.28	0.005***	-11.34	0.004***
Log of Sales	?	-0.35	0.004***	-0.35	0.005***
Debt or Equity Issuance	+	1.38	0.004***	1.34	0.011***
Financial Commodity Derivatives	+	3.21	0.000***	3.17	0.000***
Prob > F			0.000		0.000
Adj R-square			0.460		0.463

Panel B: Auditor Specialization Using Portfolio Approach (n=175)

Variable	Expected Sign	Specialization by Focus Group		Specialization by 2-Digit SIC Groups	
		Parameter Estimate	p-value	Parameter Estimate	p-value
Intercept		22.65	0.000	21.39	0.000
Specialized Auditor	-	-5.81	0.019**	-13.86	0.044**
Industry Concentration	-	-2.54	0.062*	-2.66	0.054**
Raw Materials Derivatives	-	-1.65	0.003***	-1.75	0.001***
Commodity Market Volume	+	0.07	0.051**	0.07	0.041**
Large Traders	-	-0.01	0.034**	-0.01	0.027**
Percentage of Speculators	-	-12.12	0.024**	-10.94	0.005***
Log of Sales	?	-0.24	0.071*	-0.25	0.073*
Debt or Equity Issuance	+	1.37	0.004***	1.25	0.008***
Financial Commodity Derivatives	+	3.18	0.000***	3.26	0.000***
Prob > F			0.000		0.000
Adj R-square			0.4739		0.469

Parentheses contain one-tailed p-values when signs are predicted.

*Significant at 0.10, ** Significant at 0.05, ***Significant at 0.01

TABLE 6
*Regression Results Controlling for
 Managerial Ownership and Audit Committee*

Panel A: Auditor Specialization Using Market Share Approach (n = 160)

<i>Variable</i>	<i>Expected Sign</i>	<i>Specialization by Focus Group</i>		<i>Specialization by 2-Digit SIC Groups</i>	
		<i>Parameter Estimate</i>	<i>p-value</i>	<i>Parameter Estimate</i>	<i>p-value</i>
Intercept		23.08	0.000***	23.14	0.000***
Specialized Auditor	-	-0.33	0.443	-1.23	0.235
Audit Committee	-	-0.60	0.125	-0.56	0.145
Management Ownership	-	-0.03	0.053**	-0.27	0.049**
Industry Concentration	-	-1.76	0.160	-1.54	0.164
Raw Materials Derivatives	-	-2.30	0.000***	-2.34	0.000***
Commodity Market Volume	+	0.06	0.084*	0.06	0.073*
Large Traders	-	-0.01	0.075*	-0.01	0.073*
Percentage of Speculators	-	-12.73	0.004***	-12.78	0.003***
Log of Sales	?	-0.28	0.046**	-0.27	0.051**
Debt or Equity Issuance	+	1.04	0.025**	1.01	0.033**
<i>Financial Commodity Derivatives</i>	+	3.51	0.000***	3.45	0.000***
Prob > F			0.000		0.000
Adj R-square			0.485		0.488

Panel B: Auditor Specialization Using Portfolio Approach (n=160)

<i>Variable</i>	<i>Expected Sign</i>	<i>Specialization by Focus Group</i>		<i>Specialization by 2-Digit SIC Groups</i>	
		<i>Parameter Estimate</i>	<i>p-value</i>	<i>Parameter Estimate</i>	<i>p-value</i>
Intercept		23.87	0.000	22.67	0.000
Specialized Auditor	-	-6.43	0.012***	-16.11	0.034**
Audit Committee	-	-0.67	0.101*	-0.77	0.075*
Management Ownership	-	-0.03	0.056*	-0.02	0.069*
Industry Concentration	-	-1.65	0.171	-1.93	0.135
Raw Materials Derivatives	-	-2.23	0.000***	-2.24	0.000***
Commodity Market Volume	+	0.06	0.068*	0.07	0.045**
Large Traders	-	-0.01	0.090*	-0.01	0.074*
Percentage of Speculators	-	-13.89	0.002***	-12.82	0.002***
Log of Sales	?	-0.146	0.326	-0.15	0.330
Debt or Equity Issuance	+	1.04	0.028**	0.95	0.041**
<i>Financial Commodity Derivatives</i>	+	3.44	0.000***	3.51	0.000***
Prob > F			0.000		0.000
Adj R-square			0.5021		0.4962

Parentheses contain one-tailed p-values when signs are predicted.

*Significant at 0.10, ** Significant at 0.05, ***Significant at 0.01