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An empirical analysis of auditor resignations

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AN EMPIRICAL ANALYSIS OF AUDITOR RESIGNATIONS

by

Harold E. Davis, B.S., M.B.A.

**A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Business Administration**

**COLLEGE OF ADMINISTRATION AND BUSINESS
LOUISIANA TECH UNIVERSITY**

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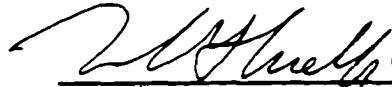
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We hereby recommend that the dissertation prepared under our supervision
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entitled An Empirical Analysis of Auditor Resignations

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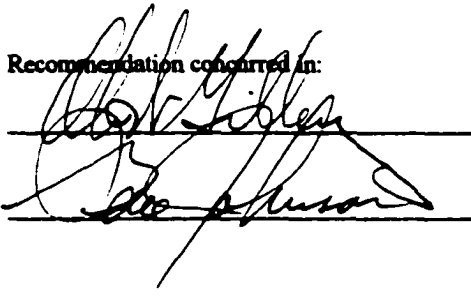


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ABSTRACT

There were two main objectives of this study. The first objective was to develop a theoretical model that will explain auditor resignations. To meet this objective, a model was developed which was primarily grounded in prior research related to auditor resignations as well as prior research addressing auditor switching. The second objective was to estimate the model at four different quarterly dates immediately prior to an event date (i.e., the resignation date) so that the effects of time on the explanatory power of the model and each independent variable could be ascertained. This objective was met by identifying and collecting data at each quarterly date for each variable in the model and by using logit regression to analyze the data (i.e., to estimate the model at each quarterly date prior to the event date). The sample of companies included both a resignation group of companies and a non-resignation group of companies.

Overall results from estimating the model suggest that the model was significant for each of the four quarterly time periods and that using information closer to the event date increased the model's explanatory power. In regards to the specific independent variables, the results suggest that, for all quarterly time periods, firms are more likely to resign from (1) clients who are smaller in size; (2) clients who are in financial distress as modeled by a net loss; (3) engagements in which the tenure of the auditor is low; and (4) clients who are in industries in which the auditor has an

increasing and/or a relatively high market share. Additionally, companies that had a greater likelihood of management misrepresentation were also associated with an increase in the likelihood of a resignation; however, this association was sensitive to time. Specifically, this association was only significant in the two quarterly time periods immediately prior to the event date. Overall, these results suggest that CPA firms do respond to risk factors associated with the client and (such firms) are not solely fixated on monetary rewards.

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CHAPTER 1

INTRODUCTION

The traditional contractual relationship between the independent audit firm (firm or auditor) and the client (company) begins when the company, via shareholder approval, engages the independent auditor to provide certain assurances with respect to certain financial statements of the company. In turn, this relationship ends when either the company dismisses the auditor (dismissal) or when the auditor terminates the engagement (auditor-initiated switch) by resigning (resignation) or declining to stand for re-election (declination).

Research regarding dismissals, resignations and declinations is encompassed within the broader research domain of auditor switching. To a large degree, prior research in this domain has focused on switching in general—not auditor-initiated switching. In regards to auditor-initiated switching, research to date has focused on resignations versus declinations presumably due to the greater frequency of resignations as opposed to declinations. Consistent with research to date regarding auditor-initiated switching, the focus of this study is on resignations.

1.1 Statement of the Problem

In regards to resignations, there are three issues that have not yet been addressed in the research to date. First, research has found that several variables are associated with resignations. These include, but are not limited to, changes in the

financial distress of the client (Shu 2000), changes in the litigation risk borne by firms (Shu, 2000) and the tenure of the auditor (Menon and Williams, 1999). Of the variables found significant in prior research, certain variables (e.g., change in financial distress and auditor tenure) have yet to be evaluated concurrently in the same explanatory model. Second, certain variables that have been shown to be significantly different between switchers and non-switchers (e.g., auditor independence) have yet to be evaluated in an explanatory model of resignations. Third, the effect of different measurement dates prior to a resignation (versus a single date) have yet to be evaluated. In order to gain additional insights regarding resignations, each of the three issues addressed above were incorporated into the methodology employed in this study.

1.2 Objectives

There are two objectives of this study:

1. To develop a theoretical model that will explain auditor resignations.
2. To estimate the model at several different quarterly dates immediately prior to an event date so that the effects of time on the explanatory power of the model and each independent variable can be ascertained.

1.3 Methodology

The structure of this section on methodology is as follows. In general, Section 1.3.1 comments on model development. Section 1.3.2 describes the sources used to collect data as well as the type of data collected. Section 1.3.3 describes, in general, how the data was analyzed in this study.

1.3.1 Model Development. Models employed in prior research have focused on different variables associated with the resignation decision. For example, Menon

and Williams (1999) found that misrepresentations made by the client as well as the expertise and tenure of the auditor were important variables. In addition, Shu (2000) found that a client's degree of financial distress as well as client's associated with high-tech industries were also important. In addition to certain variables found significant in prior research, the model developed in this study also included additional variables theorized to be significant (i.e., not yet evaluated in the auditor resignation context). These variables were included as the independent variables in a logit model while the dependent variable was the resignation status (i.e., resignation or non-resignation).

1.3.2 Data Collection. All publicly traded companies are required by the Securities and Exchange Commission (SEC) to report various types of information (filings) to the SEC. Filings include Form 10-K (annual report), Form 10-Q (quarterly report), and Form 8-K (current report). Compact D/SEC is a source of data that contains references to the SEC filings (filing reference) of all companies required to make such filings. Information about each filing reference includes the type of form filed, the date of the filing, and possibly other information specific to a particular form. The filing reference for Form 8-K (8-K) is critical to this study in that it contains a numeric item number that is associated with the contents of the actual 8-K. The specific item number necessary for this study is item four because this item number indicates that disclosures in the 8-K are related to an auditor switch.

Based on filing references contained in the July, 1996 to January, 2001 quarterly Compact D/SEC discs (i.e., information pertaining to the period June 1996¹

¹ June 1996 is the first full month in which 8-Ks for all public companies were required to be filed electronically with the SEC and thus become part of the publicly accessible Edgar database.

to December 2000), a resignation group of companies was identified as follows. First, a search for all filing references for all companies during the period June, 1996 to December, 2000 was performed. During this search process, all 8-K filing references that also had a reference to an auditor switch (i.e. item four) were extracted to form an auditor switching data set. Second, the filing date of each filing reference in the auditor switching data set was used to locate the actual 8-K in Lexis-Nexis or Edgar. Upon examination of each 8-K, auditor switches that were resignations (verses dismissals or declinations) were selected to form the resignation group of companies (i.e. resignation group).

Data for a control group was collected as follows. First, a group of non-resignation companies was formed by eliminating from the population of companies contained in Compustat any company that was part of the resignation group. Additionally, the non-resignation group was reduced further by eliminating companies that did not report any total assets during the study period (i.e., total assets was used as an indicator that financial information about the company was available) and by eliminating all financial companies (i.e., companies with SIC codes between 6000 and 6999). Second, a random sample of the non-resignation group of companies that was approximately the same size as the resignation group was extracted to form the control group of companies (i.e. control group).

Information for companies in both the resignation and control group was obtained from Compustat, Compact D/SEC, or Lexis-Nexis. For the resignation group, the information consisted of the most recent data prior to the resignation date. Since the control group did not have a resignation date, a random date during the

period under study was selected for each company. Based on this random date, information consisting of the most recent data prior to the random date was used. Thus, the event date for the resignation group was the actual resignation date disclosed in the 8-K and the event date for the control group was a date chosen at random.

1.3.3 Data Analysis. Logit estimation is an empirical technique used to estimate models (i.e. logit models) that have a dichotomous dependant variable. Since this study has a dichotomous dependant variable (i.e. resignation vs. non-resignation), a logit model was developed and estimated. The results were used to explain the occurrence of resignations and to evaluate the association between the independent variables and the dependent variable. Initially, the model was estimated using data available on and before the last quarter-end date prior to the event date (i.e., the date of the occurrence of the resignation, or for the control group, a random date). This estimation yielded information regarding the overall power of the model to explain resignations as well as information regarding the significance and explanatory power of the variables used in the model. The model was then re-estimated based on data available on and before the penultimate (i.e., next-to-last) quarter-end date prior to the event date. This estimation (i.e., one based on data relative to the penultimate quarter-end date) also yielded information regarding the overall explanatory power of the model as well as the significance and explanatory power of the variables used in the model. This process of re-estimating the model was repeated until the model had been estimated at four different points in time – once for each of the four quarter-end dates that immediately preceded the event date. The results of these estimations were used to evaluate hypotheses developed regarding each independent variable, to evaluate the

overall explanatory power of the model, and to evaluate the explanatory power of each independent variable. The evaluation of the results of the model was conducted both at each point in time (i.e., at each quarter-end date) as well as across time.

1.4 Differences from Other Research

This study differs from research to date in four manners. First, variables have typically been measured using annual data reported at the fiscal year-end (year-end) immediately preceding a resignation (i.e., the event date). As a consequence, the time interval between the date that each variable was measured to the event date could vary widely. For example, one company could report a resignation one month after the year-end while a resignation for another company could be reported nine months after the year-end. As a result, prior research has not minimized the effect that different time intervals have on the resignation decision. Consequently, the impact that different time intervals have on the results of prior research is unknown. In contrast, this study utilized the most recent quarter-end data available prior to the event date to measure the variables (verses the most recent annual year-end data). This yielded more consistent and timelier information related to the resignation decision.

Second, prior research has used a single measurement date (i.e., the year-end immediately prior to the event date) for the independent variables used in estimating models regarding the resignation decision. While using one measurement date prior to the event date has been useful in identifying variables that are significant in the resignation decision, the effects of different measurement dates prior to the event date on the significance of the variables is unknown. Therefore, this study estimated an explanatory model for several different measurement dates in order to determine the

effects of time on both the explanatory power of the model as well as the explanatory power of the independent variables. Third, certain other independent variables used in the auditor switching literature, but not previously used in the resignation literature (e.g., auditor independence), were employed in this study. And finally, the measurement of certain independent variables (e.g., financial distress) differed from that used in prior research.

1.5 Conclusion

An overview of this study was provided in this chapter. The remainder of this study is arranged as follows. First, a review of the literature relevant to this study is provided in Chapter 2. Second, a discussion of the methodology used is provided in Chapter 3. Third, the results of the study will be presented in Chapter 4. Finally, a summary of findings and a discussion of the limitations and implications for further research will be provided in Chapter 5.

CHAPTER II

LITERATURE REVIEW

Prior literature relevant to resignations can be classified into two general areas: laws and regulations (pertinent to clients and firms) and academic research. There are three sources of laws and regulations that will be discussed: the SEC, the American Institute of Certified Public Accountants (AICPA) Professional Standards, and Congress. Until relatively recently, academic research has primarily focused on auditor switching as opposed to resignations. Since resignations are a sub-group of switchers, the research related to switching may provide information relevant to resignations. Each of the sources of rules and regulations as well as academic research related to switching and resignations are discussed in the following sections.

2.1 Securities and Exchange Commission Regulations

The Securities Exchange Act of 1934 empowers the SEC to require companies with publicly traded securities to periodically report information to the SEC. In general, companies that have publicly traded securities must file annual and other periodic reports if they meet the following two criteria: (1) securities are held by more than 500 owners, (2) total assets are greater than \$10 million (SEC 2001). The 8-K is one form that may be filed on a periodic basis.

The 8-K is required to be filed if any one or more of the events specified in Table 2.1 occurred (unless a substantial part of the information that would be

TABLE 2.1
Events Reported in Form 8-K^a

Description of Event	Maximum Time to File Report
Item 1: Changes in Control of Registrant	15 calendar days after event
Item 2: Acquisition or Disposition of Assets	15 calendar days after event
Item 3: Bankruptcy or Receivership	15 calendar days after event
Item 4: Changes in Registrant's Certifying Accountant	5 business days after event
Item 5: Other Events ^b	N/A
Item 6: Resignation of Registrant's Directors	5 business days after receipt of resignation letter
Item 7: Financial Statements and Exhibits ^c	60 calendar days after event
Item 8: Change in Fiscal Year	15 calendar days after date change is made
Item 9: Sales of Equity Securities Pursuant to Regulation S ^d	N/A

^a The above table presents, in summary form, those events (Items) that are required to be disclosed in Form 8-K. Additionally, the maximum amount of time from the occurrence of the event to the filing of the 8-K is also presented. Source: Form 8-K Instructions.

^b Reporting other events is optional.

^c Financial statements are only required in connection with an acquisition reported in Item 2.

^d Item 9 has been removed effective January 1, 1999.

contained in the 8-K has been previously reported in another form such as the 10-Q or 10-K). Table 2.1 also details the maximum amount of time that can lapse from the occurrence of the event to the filing of the 8-K. In addition, companies may report multiple events in a single 8-K filing. As a result of the 8-K filing requirements, information relevant to investors is disclosed in the 8-K in a timely manner.

Certain disclosures contained in the 8-K will be a significant source of information that will be utilized in this study. Specifically, disclosures related to item four (auditor switching) will be used to determine the type of auditor switch that occurred. The remaining disclosures provided in the 8-K (i.e., those pertaining to other item numbers) are not directly relevant to this study and, accordingly, will not be discussed.

Specific disclosure requirements pertaining to auditor switching (i.e., item four) are embodied in Item 304 of the SEC Regulation S-K. These requirements state that if the relationship between the company and their auditor has ceased, then the

information related to this change must be disclosed under item four of the 8-K. In general, the following must be disclosed with respects to the predecessor auditor. First, the company must state whether the predecessor auditor resigned, declined to stand for re-election or was dismissed. In addition, the date on which this occurred must be disclosed. Second, the type of opinion expressed by the predecessor auditor during the two preceding years must be reported. If the opinion expressed was not a standard opinion (i.e., an unqualified opinion without modifications) then a description of the specific reservations mentioned by the predecessor auditor must be disclosed. Third, the company must state whether the decision to change auditors was recommended by the audit committee or the board of directors if the company has no audit committee. Fourth, any disagreement between the predecessor auditor and the company during the two most recent fiscal years must be disclosed. In general, disagreements are limited to those that pertain to accounting principles or practices, financial statement disclosure, or auditor scope or procedure issues regardless of whether the disagreement was resolved. Fifth, other conditions of the company must be disclosed as "reportable events" unless they have already been disclosed as a disagreement. These include, but are not limited to, a condition where the predecessor auditor acknowledged to the company that a lack of internal controls exists that prohibit the development of reliable financial statements and a condition where the predecessor auditor acknowledged to the company that it was unwilling to rely on the representations of management. Finally, the company is required to supply the predecessor auditor with a copy of the completed 8-K on or before the day that it is filed with the SEC. The company must request that the predecessor auditor review the

8-K disclosures and provide the company with a letter stating whether the predecessor auditor agrees or disagrees with the statements made therein. This letter from the predecessor auditor is also required to be filed by the company to the SEC within ten days from the initial filing of the 8-K.

In summary, the SEC requires disclosures of specified events as they occur rather than requiring disclosures only on a quarterly or an annual basis. This increases the value of the disclosed information to investors because it is timely. The 8-K is the form that is used to disclose information about certain changes (events) that occur within a company. The specific disclosures related to auditor switching will be a significant source of information that will be used in this study.

2.2 Professional Standards

The AICPA Professional Standards identify certain instances in which it would be appropriate for an auditor to resign from an audit engagement. Specifically, guidance concerning auditor resignations can be found in the Statements on Auditing Standards, the Code of Professional Conduct and the Statements on Quality Control. Admittedly, such guidance was not designed to be all-inclusive.

2.2.1 Statements on Auditing Standards. The Statements on Auditing Standards identify several instances when it would be appropriate for the auditor to resign from an audit engagement. First, if the auditor concludes that it is not practicable to modify audit procedures to sufficiently address the risk of material misstatement due to fraud, then the auditor should resign and communicate the reasons for the resignation to the audit committee or other corporate body with equivalent authority and responsibility (AICPA, §AU 316.26 and §AU 316.36, 1998). Second,

the auditor may discover during the performance of the audit that an illegal act occurred that has a material impact on the financial statements. As a result, the auditor should modify the audit opinion appropriately. If the client refuses to accept the modified report, then the auditor should resign and communicate the reasons for the resignation to the audit committee or other corporate body (AICPA, §AU 317.20, 1999). Third, if an illegal act is discovered during the course of the audit and the client does not take corrective action that the auditor deems warranted under the circumstances, the auditor should resign even if the illegal act is not material to the financial statements (AICPA, §AU 317.22, 1999). Fourth, if non-audited information presented with the financial statements contains material inconsistencies with the financial statements, the auditor should evaluate this information to determine if the financial statements or the audit report should be revised. If the financial statements do not require revision, the auditor should request that the client revise the non-audited information. If the client does not make the necessary revisions to the non-audited information so that the material inconsistency is eliminated, then the auditor should consider remedial actions. Remedial actions include revising the audit report to include an explanatory paragraph that describes the material inconsistency, withholding the use of the audit report, and resigning from the engagement (AICPA, §AU 550.04, 1996).

2.2.2 Code of Professional Conduct. The Code of Professional Conduct also provides guidance related to two circumstances that would warrant the resignation of an auditor. First, if the auditor determines that he is not competent and is unable to gain sufficient competence to complete the audit engagement then the auditor should

resign from the engagement (AICPA, §ET 201.02, 1999). Second, if the auditor believes that his independence has been impaired by actual or potential litigation (i.e., against the auditor by the client), the auditor should either resign, suspend the work on the audit engagement until the matter is resolved, or disclaim an opinion due to lack of independence (AICPA, §ET 101.08, 1999).

2.2.3 Statements on Quality Control. The Statements on Quality Control require that firms establish and maintain a system that evaluates the decision to accept or continue an audit engagement. The system policies and procedures encompassed in making this decision should provide the firm with reasonable assurance that the integrity of management is sufficiently high to warrant association with the client (AICPA, §QC 20.14, 2000). Implicit in this decision making process is the idea that if management lacks sufficient integrity, then the auditor should resign.

2.2.4 Summary. The AICPA has developed professional standards that its members should follow when providing services to clients. In regard to resignations, the Statements on Auditing Standards, the Code of Professional Conduct, and the Statements on Quality Control contain guidance that an auditor should consider when evaluating a resignation decision.

2.3 Changes in the Legal Environment

The litigation risk associated with an audit engagement is significantly influenced by the nature of the legal environment. The laws that govern such litigation as well as their interpretation and use are an important component of this risk. In recent years, new laws enacted by Congress have had an impact on litigation that alleges violations of securities laws. These new laws have impacted both the

litigation risk born by auditors as well as auditor disclosure and resignation requirements.

2.3.1 Changes Affecting Litigation Risk. A significant law that was enacted to decrease the level of litigation risk associated with securities filed with the SEC is the Private Securities Litigation Reform Act of 1995 (PSLRA). The primary motivation for this legislation was to reduce frivolous lawsuits that firms as well as other parties (e.g., officers, directors, the company itself) faced. Prior to the enactment of the PSLRA, firms involved in shareholder suits were liable jointly and severally, thus a firm involved in such a suit could be forced to pay the full amount of damages awarded to the plaintiff regardless of the degree of fault that resided with the firm or other defendants. As a result, firms with perceived “deep pockets” were subject to numerous frivolous suits. Even though most firms that went to trial would eventually pay either a small amount in damages or none at all, many firms responded to these meritless suits by seeking a settlement rather than going to trial because, regardless of the merits of the case, the costs associated with defending a suit were significant (Palmrose 1994). With the enactment of the PSLRA, joint and several liability was replaced, in most cases, with proportionate liability if the firm has no knowledge that security laws have been violated (violations). Under proportionate liability, firms that act “recklessly” (undefined in the law) but without knowledge of violations are subject to judgments that reflect their proportionate responsibility in the suit. However, firms remain joint and severally liable if it can be shown that they knew of violations that would materially impact the financial statements, but they did not take the appropriate

action to disclose them (e.g., communications with the audit committee, board of directors, management, or the SEC).

Other provisions of the PSLRA were also designed to decrease litigation risk. In general, the safe harbor provision provides litigation protection for firms that allow forward-looking statements to be included in the financial statements as long as these statements are clearly identified. Other provisions include limiting attorney's fees to a "reasonable" amount, prohibiting the use of the Racketeer Influenced and Corrupt Organizations Act in civil cases involving securities fraud, increasing the amount of proof required by a plaintiff, and eliminating certain abusive practices involving fees paid to plaintiffs. Given all the provisions in the PSLRA, the risk of litigation associated with issuing an audit opinion should decline; however, this is based on the assumption that the law cannot be circumvented in some fashion.

For example, upon the passage of the PSLRA, lawyers began to evade this law by bringing a number of class action lawsuits in state courts, which the act did not cover (Gitenstein & Rothfeld 2001). In order to counter this action by lawyers, Congress passed the Securities Litigation Uniform Standards Act of 1998 (SLUSA). The intent of this legislation was to "prevent certain State private securities class action lawsuits alleging fraud from being used to frustrate the objective of the Private Securities Litigation Reform Act of 1995" (Administrative Procedure Act 1998). Upon the passage of this act, this "state loophole" in the PSLRA was closed.

Admittedly, other loopholes may exist. Thus, the extent to which firms perceive a reduction in their litigation risk as a result of these new laws is contingent upon the ability of lawyers to bypass the intent of these laws as well as how these laws

are interpreted by a judge/jury in court cases. Some of the main objectives of these new laws appear to have been successful: frivolous cases are being dismissed, settlements of meritless cases appear to be diminishing, and the settlement value of cases with real merit is increasing (Gitenstein & Rothfeld 2001). However, King & Schwartz (1997) note that the determination of liable parties as well as the apportionment of fault is determined by a judge/jury. In this regard, the PSLRA gives two factors that should guide a judge/jury in allocating responsibility: the nature of the conduct that contributes to the loss, and the nature and extent of the causal relationship between the conduct and damages. In spite of these guidelines, the ultimate decision lies with the judge/jury who may yet look to the “deep pockets” of the firm when making their decisions. Given that the SLUSA has only been enacted recently, the true impact of this law may not be observable at present. Therefore, firms may still pay a greater amount in damages than their “fair share.”

2.3.2 Changes Affecting Disclosure and Resignation Requirements. The PSLRA provided legislation directed towards auditors as well as other parties. In addressing auditors, the PSLRA does place a disclosure burden on auditors in the form of a “whistleblower” provision. Under this provision, if the auditor discovers the possibility that an illegal act (act) occurred, regardless of potential materiality, the auditor is required to further assess the likelihood that the act occurred and the possible effects on the financial statements. If the act is deemed material, then the auditor is required to communicate this information to management and the audit committee (or board of directors if there is no audit committee). If after making this communication, the auditor concludes that (1) the act continues to have a material

effect on the financial statements, (2) senior management has not taken actions that are both appropriate and timely, and that (3) this failure of management to address the problem would result in a departure from a standard report or a resignation, the auditor should report these conclusions directly to the board of directors, which should then immediately notify the SEC. If within one day after this communication to the board of directors the auditor does not receive information that indicates that the board has submitted the firm's conclusions regarding the act to the SEC, the auditor is then required to report its conclusions directly to the SEC or resign (and report the conclusions to the SEC). If the auditor complies with these requirements, then they will not be held liable in any private action for information contained in the conclusions reported to the SEC.

2.3.3 Summary. With the enactment of the PSLRA and the SLUSA, the litigation risk faced by firms should be reduced. This reduction is primarily due to the replacement of the joint and several liability method of awarding damages to a proportionate liability method. These laws also have direct effects on the disclosures made by firms as well as guidance on when a firm should consider resigning from an engagement.

2.4 Academic Literature – Switching

There are many studies in prior research that have investigated auditor switching. Some studies have examined the audit opinion and switching (Chow and Rice 1982, Krishnan 1994, Krishnan and Stephens 1995, Krishnan et al. 1996) as well as switching and the pricing of audit engagements (DeAngelo 1981, Simon and Francis 1988, Gregory and Collier 1996, Walker and Casterella 2000). Other research

has sought to uncover variables associated with switching (DeFond 1992, DeFond and Subramanyam 1998) and to determine what impact that switching has on stock returns (Fried and Schiff 1981, Smith and Nichols 1982, Nichols and Smith 1983, Johnson and Lys 1990, Carter and Soo 1999).

Prior research on switching (resignations being a part of switching) may reveal variables that may be associated with resignations. Specifically, variables that were significant in studies that examined switchers and a control group of non-switchers prior to the switching event may also be significant when examining resignations and a control group that did not resign. Additionally, research related to the market response of switches may provide additional information relevant to this study.

2.4.1 Switchers vs. Non-Switchers. A review of switching studies was performed to determine which variables have been consistently different between switchers and non-switchers. Based on this review, six studies were found that investigated various aspects of these two groups (i.e., switchers and non-switchers) before the actual switching event (Chow and Rice 1982, Williams 1988, Haskins and Williams 1990, Krishnan 1994, Krishnan et al. 1996, DeFond and Subramanyam 1998). Table 2.2 provides a summary of the findings of these studies. Overall, the audit opinion has received the most attention and has been shown to be a variable that, in most studies, distinguishes switchers and non-switchers. Net income, financial distress, client size, residual standard deviation from the standard market model, time listed on stock exchange, client beta, audit firm industry dominance, and a Big Six (now Big Five) classification have also been shown to be important variables in two or three studies. Since the variables previously mentioned have been significantly

TABLE 2.2
Studies Examining Switchers and Non-Switchers Prior to Switch^a

	Study					
	Chow and Rice 1982	Williams 1988	Haskins and Williams 1990	Krishnan 1994 ^b	Krishnan et al. 1996	DeFond and Subramanyam 1998
Sample Years	1973-1974	1977-1982	1985	1986-1987	1986-1988	1990-1993
Sample Size: ^c						
Switchers	418 (8) ^d	186	149	197	116	503 ^e
Non-switchers	9,042 (158) ^d	186	3,320	2,792	1,762	f
Variables:						
Financial						
Audit opinion ^g	+	*	0	*	+	
Net income				*	*	*
Financial distress			#		^	*
Size			#	*	-	
Growth			#		0	
Sales / assets						*
Accruals / assets						*
Cash flows / assets						*
Market related						
Residual standard deviation				*	*	
Time				*	*	
Beta				*	*	
Firm related						
Firm dominance		*	#		0	
Big Six				*	-	
Auditor tenure		*				
Other						
Change in management		*				
Client negative publicity		*				

Accruals/assets: (Net income before extraordinary items - operating cash flows) / total assets.

Audit opinion: CR and W88 - 1 if modified, 0 otherwise; HW - 1 if unqualified, 2 if "subject to," 3 if nonconsistency "except for," 4 if disclaimer; K94 and K96 - 1 if unqualified, 2 if asset realization or litigation uncertainties, 3 if going concern.

Auditor tenure: Data was coded based on five year increments that predecessor auditor served client (i.e., 0, 5, 10, 15, 20).

TABLE 2.2 continued

Beta: K94 and K96 – slope coefficient of the standard market model regression.
Big six: K94 and K96 – 1 if a big six auditor, 0 otherwise. Pre-merger firms are included with post-merger firms.
Cash flows/assets: Operating cash flows / total assets.
Change in management: 1 if client changed president, chief executive officer, chief financial officer or treasurer during the two years prior to switch.
Client negative publicity: 1 if client accused of fraud, financial statement error, foreign bribe, or for issuing misleading financial information; 0 otherwise.
Financial distress: HW and K96 – Zmijewski's (1984) financial condition index; DS – Altman's (1968) Z-score.
Firm dominance: W88 – firm's industry market share based on sales and four-digit standard industrial classification code, HW and K96 – same as W88 except results are generally based on a two-digit standard industrial classification code.
Growth: HW – percentage change in sales; K96 – 1 if client falls in the top quartile of growth rate of assets, 0 otherwise.
Net income: K94 and K96 – 1 if net income is negative, 0 otherwise; DS – net income before extraordinary items.
Residual standard deviation: K94 and K96 – residual standard deviation from a standard market model regression.
Sales/assets: Net sales / total assets.
Size: HW – net sales; K94 and K96 – natural logarithm of the book value of total assets deflated by the implicit price deflator for GNP.
Time: K94 and K96 – 1 if the company has been listed on the NYSE, AMEX, or NASDAQ for more than five years; 0 otherwise.

^a Throughout this table the following abbreviations will be used: CR refers to Chow and Rice (1982), W88 refers to Williams (1988), HW refers to Haskins and Williams (1990), K94 refers to Krishnan (1994), K96 refers to Krishnan (1996), and DS refers to DeFond and Subramanyam (1998).

^b The same data were also reported in Krishnan and Stephens (1995); therefore, that study is not presented in this table.

^c Sample size without parenthesis in CR is large because it is based on a Chi-squared test for independence of classification. This test is based on counts of observations; therefore, lack of financial and market data does not cause observations to be excluded. DS doesn't include market variables, which caused fewer observations to be excluded. K94 and K96 include market variables, which cause a reduction in the sample size as compared to DS. Differences between K94 and K96 sample sizes are due to K96 drawing their sample from the September 1998 Disclosure Inc. disc while K94 drawing his sample from the March 1988 to March 1990 Disclosure Inc. discs. Data in W88 and HW are limited to intra-Big eight switches only; however, W88 is also limited to clients that trade only on the NYSE or AMEX while HW does not impose this restriction.

^d The amounts in parenthesis denote a sub-sample of a larger sample denoted without parenthesis. Analysis on the larger sample was conducted using a Chi-square test for independence and analysis on the sub-sample was conducted using logistic regression.

^e Due to data limitations, sample data for switcher's Z-score was between 400 and 437 instead of 503.

^f Actual number not reported.

^g Prior to SAS No. 58, auditor's issued 'qualified' opinions when material uncertainties were present, whereas, after auditor's issued an unqualified opinion with modifications (i.e., modified opinion). The current terminology will be used in this table unless otherwise noted.

0 Variable was insignificant in univariate and multivariate analysis or unimportant in the recursive partitioning algorithm modeling technique.

± Variable was significant at the .01 or .05 level in a multivariate analysis and univariate analysis. The sign of the coefficient in the multivariate analysis is given.

• Variable was significant at the .01 or .05 level in a univariate analysis.

HW use a recursive partitioning algorithm modeling technique that doesn't base it's results on conventional significance levels. Variables that were found to be most important are included.

^ Variable significant in univariate analysis but insignificant in multivariate analysis.

different between switchers and a control group of non-switchers, they may also be significantly different between resignations and a control group that did not experience a resignation. While the analysis in Table 2.2 was designed to illuminate variables that have been significant in several studies regarding switchers and non-switchers, variables that were significant in only one study may provide additional insights regarding resignations as well.

2.4.2 Market Reaction. The market reaction related to the date information is thought to be released about switches (i.e., release date) has been examined in the literature. Several studies have found that there is no market response when the release date is the 8-K filing date (Johnson and Lys 1990, Schwartz and Soo 1996, Carter and Soo 1999). However, Fried and Schiff (1981) found a negative market response, but subsequent tests in their study that were designed to determine the underlying motives to the negative response were not fruitful. In summarizing their results, Fried and Schiff questioned the information content of the disclosure requirements in spite of the negative market reaction found. Other studies have used the event date in the 8-K disclosures (i.e., the actual date that the auditor change took place) to test market responses. Schwartz and Soo (1996) study market responses to switches based on the event date during the period 1988 to 1993 and find no significant market response. In contrast, Carter and Soo (1999) study the market response to switches during 1993 and find a significant negative market response. Given Carter and Soo's (1999) limited study period, their findings may not be generalizable to other periods.

In contrast to studies that have focused on the market response at a release date, other studies have examined the market reaction based on the disclosure or lack of disclosure of disagreements between the client and auditor. Fried and Schiff (1981) found no market response related to the disclosure of disagreements. However, Smith and Nichols (1982) comment that the sample size used by Fried and Schiff was too small and may have biased their results. In other studies, Smith and Nichols (1982) find a negative market reaction to the disclosure of disagreements and Dhaliwal et al. (1993) find that switches disclosing disagreements have a significantly lower market reaction than switches that do not disclose any disagreements. Carter and Soo (1999) suggest that both disagreements as well as resignations convey negative information to the market. Therefore, part of the negative market response found in prior research on switching and disagreements may be related to resignations.

2.4.3 Summary. With respect to switching, prior research related to differences between switchers and non-switchers could provide insights to variables that may be associated with resignations since resignations are a sub-group of switchers. Based on a review of six studies, the audit opinion, net income, financial distress, client size, residual standard deviation from the standard market model, time listed on a stock exchange, client beta, audit firm dominance and Big Six classification have been shown to distinguish switchers from non-switchers. In addition, most research has not found a market reaction related to switching when the switch is disclosed; however, negative market reactions have been found related to the disclosure of disagreements.

2.5 Academic Literature - Resignations

While most of the prior research regarding auditor changes has focused on auditor switching, several studies related to resignations have been written in recent years. The general areas that these studies have addressed can be categorized as follows: differences between resignations and dismissals, determinants of resignations, and market reactions to resignations.

2.5.1 Differences Between Resignations and Dismissals. The SEC requires that companies delineate between resignations, declinations and dismissals in their 8-K disclosures (FRR No. 31). This delineation implies that the information content related to these types of auditor changes is different and meaningful to investors. DeFond et al. (1997) provide evidence that resignations differ from dismissals. Specifically, DeFond et al. (1997) find that resignations are associated with more auditor-client disagreements and greater declines in company cash flows than dismissals. In contrast, Scholz (1996) finds that there were no distinguishing characteristics between the two groups in the computer industry. Krishnan and Krishnan (1997) find that resignations are associated with more reportable events and/or disagreements disclosed in the 8-K and that resignations are associated with more clients that are in a greater degree of financial distress than dismissals. In addition, resignations as opposed to dismissals are more likely to be associated with clients that have been issued a modified opinion, less likely to have an auditor with a long tenure, and are less likely to occur as the proportion of revenues generated by the client to the total revenues of the firm increases. Raghunandan and Rama (1999) find that Big Six (now Big Five) firms are less likely to serve as a successor auditor when

the predecessor auditor had resigned rather than being dismissed. Shu (2000) finds that resignations are associated with a greater change in litigation risk, a greater likelihood of a client being mismatched with their auditor (e.g., a client who should be audited by a larger firm but the incumbent firm is small), and a greater likelihood of being associated with clients in high technology (high-tech) industries as defined by the client's standard industrial classification (SIC) code.

2.5.2 Determinants of Resignations. Schroeder and Verreault (1987) conducted an experimental study that was designed to determine the following: the variables that influence resignations, the relative weight of each variable, and whether decision-makers (i.e., partners) in different sized firms weighed the variables differently. Their results suggest that disagreements over fees, audit scope restrictions, management integrity, disagreements over the application of GAAP, and disagreements over the audit report or opinion were the main variables that would lead a partner to consider resigning from an audit engagement. Additionally, their results suggest that partners of both large and medium sized firms were consistent on ranking management integrity and scope restrictions as the most important variables while partners of small firms ranked scope limitations and disagreements over the audit opinion as the most important. Thus, partners in different sized firms do weight the variables differently (i.e., partners in different sized firms differ as to what would lead a partner to consider resigning from an audit engagement). Overall, management integrity and scope restrictions were deemed the most influential variables.

Scholz (1996) finds that the most important variables associated with resignations in the computer industry were the existence of modified audit opinions,

the existence of litigation either against the auditor or the client in general, and the reliability of management. Scholz also concludes that market related information is not widely used by auditors in evaluating clients. This conclusion is based on a review of client continuance programs as well as conversations with audit partners. Sholz states that “auditors argue that measures of past volatility, which aggregate market information across several years, are not useful in predicting precisely which clients will eventually suffer the type of price decline that will trigger an auditor lawsuit.” This conclusion is consistent with the results of Schroeder and Verreault (1987) in that none of the variables that the partners identified as important relied on measures of stock market volatility. In addition, Pratt and Stice (1994) find very little support to the argument that auditor’s use the volatility of a client’s common stock when assessing litigation risk.

Menon and Williams (1999) find that firm-initiated auditor changes (resignations and declinations) can be partially explained by audit error cost. This cost is the product of the auditor’s assessment of the likelihood of client misrepresentation (CM) and the expected losses to the firm that may result from the CM being subsequently disclosed. In Menon and Williams (1999), resignations and declinations are modeled separately. In regards to resignations, the study finds that CM, low levels of firm expertise in the client’s industry and a shorter auditor tenure are likely to increase audit error costs and increase the likelihood of a resignation. In regards to declinations, Menon and Williams (1999) find that the results are similar to that of resignations except that the level of expertise and auditor tenure are insignificant. Finally, another analysis is performed to determine the characteristics that differentiate

resignations and declinations. The findings provide some evidence that firms are more likely to resign, rather than decline renewal, when the tenure is shorter and the clients are smaller.

Shu (2000) extends the literature by proposing and examining two competing hypothesis regarding resignations. First, Shu proposes the litigation risk hypothesis, which states that incumbent auditors are more likely to resign when they are exposed to increased litigation risks. In order to test this hypothesis, Shu develops a litigation prediction model and applies this model to data associated with a sample of clients whose firm had resigned and another sample of non-switchers. The result was a composite measure of the litigation risk faced by the auditor for each client. Other studies have developed litigation prediction models that could have been used to calculate a composite measure. Table 2.3 provides a summary of the variables that prior research has shown to be significant in several litigation prediction models including the model developed by Shu. In a subsequent analysis using the composite measure, Shu finds that increases in the composite measure of litigation risk were associated with a greater probability of a resignation; however, the direct effects that each variable has, if any, on a resignation is unknown.

Second, Shu proposes the clientele-adjustment hypothesis, which states that firms are more likely to resign when intra-firm decisions to modify the criteria used to establish and maintain their client-portfolio result in a client becoming “mismatched” with their auditor. In turn, Shu develops and implements a methodology to isolate the mismatch condition. The results suggest that the mismatch condition is associated with a higher probability of a resignation. Additionally, Shu finds that increases in a

TABLE 2.3
Summary of Litigation Risk Variables^a

Litigation Risk Variables ^c	Study ^b			
	Stice 1991 ^d	Carcello and Palmrose 1991	Lys and Watts 1994	Shu 2000
Financial Variables:				
Accrual/assets			-	
Financial condition ^e	-	0	-	
Financial leverage				+
Inventory/assets	0/+			+
Net income		+		
Probability of acquisition			+	
Receivables/assets	0			+
Return on assets				+
Sales growth	+/-0			+
Size	+	+	+	+
Market Variables:				
Delist status				+
Stock return			0	-
Stock turnover				+
Stock variability	+			0
Other Client Variables:				
Financial irregularity		+		
Independence ^f	-/0		+	
Opinion		0	0	+
High-tech industry				+
Tenure	-/0			

Accruals/assets: accruals to total assets.

Delist status: 1 if client was delisted from CRSP due to financial difficulties in Year +1; 0 otherwise.

Financial condition: S91 – Altman's Z score (Altman 1968).

CP – (i) Zmijewski's (1984) financial condition index for non-financial companies. Sinkey et al.'s (1987) financial condition index for banks and (ii) 1 for net income and 0 for net loss.

LW – Ohlson's (1980) bankruptcy prediction model.

Financial irregularity: 1 if a SEC enforcement action exists against the client or its officers or directors involving material omissions or misstatements in financial statements and disclosures prior to bankruptcy; 0 otherwise.

Financial leverage: total liabilities / total assets.

Independence: LW – ratio of client's sales to total sales of all clients of the auditor.

S91 – calculated as [1 – (ratio of client's sales to total sales of all clients of the auditor)].

Inventory/assets: S91 – inventory / total assets.

S00 – inventory / lagged assets.

Opinion: S91 – (i) 1 if the opinion on the financial statement before the earliest of bankruptcy or onset of litigation was modified, 0 otherwise and (ii) 1 if the opinion on the last two financial statements before bankruptcy were modified, 0 otherwise.

CP, LW & S00 – 1 if client received a non-standard audit opinion; 0 otherwise.

Net income: 1 if net income, 0 otherwise.

Probability of acquisition: Palepu's (1986) model.

Receivables/assets: S91 – net receivables / total assets.

S00 – net receivables / lagged assets.

Sales growth: S00 and S91 – rate of change in sales from Year -1 to Year.

Size: CP, LW and S00 – natural logarithm of total assets.

S91 – natural logarithm of a clients market value.

Stock return: LW – stock return over Year -1.

S00 – stock return over Year.

TABLE 2.3 continued

Stock turnover: the proportion of shares that were traded at least once over Year.

Stock variability: S91 – the variance of abnormal returns.

S00 – standard deviation of daily stock returns.

High-tech industry: 1 if client's standard industrial classification code is in the 2830s, 3570s, 7370s, 8730s, or between 3825 and 3839; 0 otherwise.

Tenure: 1 if audit tenure is more than three years, 0 otherwise.

^a Throughout portions of this table the following abbreviations will be used to note the source of the litigation factor: S91 refers to Stice (1991), CP refers to Carcello and Palmrose (1994), LW refers to Lys and Watts (1994), and S00 refers to Shu (2000). In addition, only those variables that were significant in a multivariate analysis in at least one of the studies are presented.

^b The sign listed gives the nature of the relationship between the independent and dependent variable; zero indicates that the variable was insignificant.

^c Litigation variables are given a brief description in this table if the factors are not self-explanatory. Additionally, the point in time when the variables are measured relative to the date of litigation against the auditor is not consistent for each study; therefore, "Year" will be used as a general reference point when needed. For more details regarding specific calculations, refer to the appropriate study.

^d A sign or zero to the left of the forward slash (i.e., "/") represent results of the litigation model when a control sample that was matched on the year that the litigation took place was used. A sign or zero on the right of the forward slash represents results using a control sample on industry and year.

^e Lower values generated by the Altman (1968) Z-score used by S91 represent a poorer financial condition. Higher values of the Ohlson (1980) model used by LW represent a poorer financial condition. LW reports an unexpected negative association between financial condition and auditor litigation; however, LW do perform additional analyses and find that increases in the probability of bankruptcy from the Ohlson (1980) model are associated with increases in auditor litigation.

^f LW reports a positive relationship while S91 reports a negative relationship. This is due to LW calculating the importance of the client to the firm (importance ratio) and S91 using a measure of auditor independence [$1 - \text{importance ratio}$].

client's financial distress as well as client's associated with high-tech industries also increase the likelihood of a resignation.

Table 2.4 summarizes the results of multivariate models used in the resignation studies reviewed in this section except for Schroeder and Verreault (1987) who did not perform a multivariate analysis and Scholz (1996) whose study was limited only to the computer industry. Each study has used resignations as the dependent variable and a control group that consists of non-switchers or a random set of clients whose auditor had not resigned. The results of these studies are summarized below.

First, the results show that the integrity of management, as modeled by client misrepresentation (CM), is an important variable such that increases in CM increase the likelihood of a resignation. The interaction terms of CM and investment loss an

TABLE 2.4
Summary of Determinants of Firm-Initiated Auditor Changes

Dependent Variable	Study ^a	
	Menon and Williams 1999	Shu 2000
	Resignation (1) Non-switchers (0)	Resignation (1) Random (0) ^b
Sample Size ^c	217 (2,168)	269 (645) ^d
Years	1990-1996	1985-1996
Independent Variables:		
Client misrepresentation (CM)	+	
CM * Investment loss	-	
CM * Stock turnover	+	
Firm market share	-	
Size	-	
Tenure	-	
Change in financial distress		+
Change in litigation risk		+
Change in mismatch status		+
High-tech industry		+

Change in financial distress: Financial distress is based on a bankruptcy model mentioned only in the footnotes of the study; however, the author reports that the results are similar to other probability of bankruptcy models such as Zmijewski (1984). Change in this measure is based on the difference between Year -3 to Year -1 where Year refers to the year that the resignation occurred.

Change in litigation risk: Litigation risk is a composite measure calculated using a litigation prediction model developed in the study. Change in litigation risk is based on the difference between Year -3 to Year -1 where Year refers to the year that the resignation occurred.

Change in mismatch status: 1 if the client and auditor have become mismatched between Year -3 and Year -1 where Year refers to the year that the resignation occurred, 0 otherwise. The mismatch status in a given year is based on the results of a auditor size (i.e., large or small) prediction model developed in the study. For example, if the model predicts that a client should be paired with a large auditor in Year -3 and a small auditor in Year -1 while the client has continued to engage a large auditor, then a change in the mismatch status is deemed to have occurred.

Client misrepresentation (CM): 1 if any one of the following were detected prior to the date of the resignation: accounting errors/irregularities or debt covenant violations during the prior 12 months, free-cash-flow deficiencies, or a high percentage of insiders on the board of directors; 0 otherwise.

*CM * Investment loss:* This variable is an interaction term between the existence of client misrepresentations and losses incurred by investors. Losses are calculated by first determining the maximum price of the client's common stock over the six-month period ending nine months prior to the date of the firm-initiated change. Investors losses are calculated based on the return from this maximum-price date to the date of the firm-initiated change.

*CM * Stock turnover:* This variable is an interaction term between the existence of client misrepresentations and the turnover of the client's stock over a 250-day period preceding the date of the firm-initiated change.

Firm market share: The percentage of total sales in an industry audited by a firm.

Size: Natural logarithm of total assets.

Tenure: The number of years that the predecessor auditor had been engaged to the client before the firm-initiated change. This variable was capped at nine years.

High-tech industry: 1 if client's three digit standard industrial classification code is 283, 357, 737, 873, or between the four digit standard industrial classification codes 3825 and 3839; 0 otherwise.

^a To be included in this table, a study must have measured all of the independent variables before the firm-initiated auditor change date and used a control sample of non-switchers or clients whose auditors did not resign. Additionally, any sample could not be limited to any one industry or group of related industries.

^b Shu (2000) runs two separate logistic regressions. One uses resignations as the focus group and a random control group while the other models resignations against other client-initiated changes. The results from the analysis using the random sample are presented. This sample is described as a random sample of clients whose auditor did not resign.

^c Numbers outside the parenthesis represent the number of resignations or declinations while those inside represent the number of control observations (i.e., non-switchers or random).

TABLE 2.4 continued

^d Total observations of 914 were given in Table 5 of the study, but a breakdown between resignations and random samples was not delineated. However, the resignation sample was stated to be 269 in the text prior to Table 5; therefore, the random sample was calculated to be 645.

± Sign of coefficient of a variable that was significant at the .01 or .05 level.

stock turnover are also significant. However, the use of market volatility data in the resignation decision is questionable (see section 2.5.2).

Second, a firm's market share in an industry and a firm's tenure are also important variables. A firm's market share in an industry is theorized to be closely related to the level of industry expertise of the firm. Consequently, given a high level of industry expertise, firm's can use this expertise to lower their overall audit risk through specialized audit procedures developed for a client. In a similar fashion, the greater the tenure of the firm, the greater the client expertise. As a result of increases in industry and/or client expertise, the overall level of audit risk is reduced. Therefore, as the level of expertise increases, the likelihood that an auditor will resign decreases. The sign of the market share variable (i.e., firm expertise) supports this conclusion.

Third, the size of the client is another important variable. The variable used to control for the size of the client is significant and negative, which indicates that resignations are more likely to occur with small clients rather than large ones.

Fourth, the change in a client's financial distress, the change in a client's mismatch status and clients associated with high-tech industries are also important variables. Results show that the greater the financial distress (i.e., probability of bankruptcy) of the client the greater the likelihood that a firm will resign. In addition, changes in the client's mismatch status as well as clients associated with high-tech industries increase the likelihood of a resignation.

Finally, increases in the composite measure of litigation risk increase the likelihood that a resignation will occur. While the variables used to calculate litigation risk are associated with actual litigation against auditors, the direct effect that these variable have upon resignations is not known.

2.5.3 Stock Market Reactions. Defond et al. (1997) analyze excess returns (i.e., stock market returns for a company less an overall market return for the same period) for a sample of resignations and dismissals that occurred during the period 1982 to 1987. For each resignation or dismissal that occurred during these years, the excess returns were computed over three time periods: pre-filing period (from the date of the auditor change to the date of the 8-K filing), post-filing period (from the 8-K filing date plus five business days), and a combined period (pre-filing period plus post-filing period). Based on these excess returns, the results of this study suggest that the excess returns associated with resignations were significantly less than zero for all three time periods, while the excess returns associated with dismissals were significantly less than zero only during the post-filing period. In addition, the excess returns for resignations and dismissals were found to be indistinguishable in the post-filing period. Thus, the results of this study suggest that the market only views resignations as bad news in the pre-filing period indicating that there may be a “leakage” of information regarding a resignation prior to the filing of the 8-K. Also, during the post-filing period the market makes no distinction between resignations and dismissals and views them both as negative information.

Wells and Loudder (1997) analyze the abnormal returns (i.e., actual returns less expected returns) associated with a sample of resignations that occurred during

the period 1988 to 1991. The expected returns were based on a 190-day estimation period that ended ten days before the 8-K filing date. Expected returns were then calculated for the two-day period that began on the day that the disclosure of the resignation was made public via the filing of the 8-K. Results of this study suggest that companies do experience significant negative returns during this two-day period when a company discloses that the incumbent auditors have resigned. An additional test was performed to determine if other variables (i.e., the size of the company, the disclosure of non-resignation information in the 8-K, and the disclosure of a specific reason for the resignation in the 8-K) caused the negative returns rather than just the disclosure of the resignation. Results of this additional test show that the other variables had no impact on the negative returns. Furthermore, the results suggest that the disclosure of the resignation caused the negative returns.

Shu (2000) also finds a negative market reaction during a three-day window around the filing date of the resignation. In addition, Shu (2000) suggests that increases in litigation risk are associated with a larger decrease in stock price, provided that the resignation occurs during the annual audit.

2.5.4 Summary. Prior research has shown that resignations differ from dismissals, and that variables such as the change in a composite measure of litigation risk and the change in the level of financial distress are associated with an increase in the likelihood that a firm will resign. Given that some of the variables used to determine the composite measure of litigation risk have not been modeled against resignations directly, modeling such variables along with other variables that have been shown to influence a resignation may provide additional variables significant in a

firm's decision to resign. Finally, resignations have been shown to have a negative impact on a company's stock price.

CHAPTER III

Methodology

The structure of this chapter on methodology is as follows. Section 3.1 presents the development of the model. Section 3.2 describes the process of data collection that was employed. Section 3.3 presents the data analysis technique that was used to test the hypotheses. Section 3.4 presents the time-varying aspect of the methodology. Section 3.5 presents a summary of this chapter.

3.1 Model Development

Logit estimation is an empirical technique used to estimate models that have a dichotomous dependant variable. This technique has been used in prior research to estimate resignation models (Menon and Williams 1999, Shu 2000). Similarly, this technique was used in this study to gain increased insights regarding the variables that distinguish companies whose auditor resigns as opposed to companies whose auditor does not resign (i.e., a dichotomous dependent variable). The results were used to determine the statistical relationship between the independent variables (measured at time t) and the dependent variable. The remainder of this section focuses on the development of each variable. Specifically, each variable will be developed as follows: general overview, findings of prior research, statement of hypothesis, and measurement specifications.

3.1.1 High Technology Industry (TECH). The industry in which a client operates could, in itself, be an indicator of an increase in risk that an auditor faces. Specifically, clients in high technology related (high-tech) industries have undergone significant growth and change in prior years. In addition, the level of competition among industry participants has increased significantly. As a result, clients are under pressure to meet earnings expectations. Consequently, the tendency for managers to issue misleading financial statements may be greater than in other industries. Auditors should be keenly aware of these pressures and may adjust audit procedures to compensate for this increase in audit risk. Therefore, as auditors evaluate the increase in audit risk associated with clients in a high-tech industry, some may consider the risk to be too great and may, in turn, resign from the audit engagement.

Prior research has found that high-tech industries are generally associated with a higher number of occurrences of fraudulent financial reporting (Loebbecke et al. 1989) and a higher level of auditor litigation risk (Bonner et al. 1998, Shu 2000). In addition, Shu (2000) finds that clients in high-tech industries increase the likelihood that an auditor will resign. These findings support the theory previously presented and lead to the following hypothesis:

H₁: Clients operating in high technology industries are positively related to the probability of an auditor resignation.

An indicator variable was used to denote if a client is in a high-tech industry. Following Shu (2000), a client's primary SIC will be used to determine whether the client operates in a high-tech industry. Specifically, the indicator variable was set to one if client's SIC code was in the 2830s, 3570s, 7370s, 8730s, or between 3825-3839; zero otherwise.

3.1.2 Financial Distress (FDB, FDL, FDI). An increase in the financial distress of a company is believed to increase the likelihood that managers will manipulate financial statement information in an effort to shield themselves from negative reactions from external parties (e.g., investors and creditors) as well as to fulfill a manager's inherent self-interest (e.g., increased compensation where compensation is based on financial statement information). As a result, the likelihood that financial statement manipulation will go undetected increases and, in turn, the likelihood of the firm attesting to misleading financial statements increases. Consequently, this can lead to lawsuits against the auditor. Stated another way, an increase in the financial distress of a company is likely to be positively associated with a firm's risk of litigation. As a result, the auditor is likely to consider this increased risk when evaluating the decision to continue or resign from the audit engagement.

In prior research, the financial distress of a company has been proxied by the presence of a net loss (St. Pierre and Anderson 1984, Carcello and Palmrose 1994, Krishnan 1994, Krishnan et al. 1996) and by the probability of bankruptcy (Haskins and Williams 1990, Stice 1991, Lys and Watts 1994, Krishnan et al 1996, DeFond and Subramanyan 1998, Shu 2000). Some of the results from these studies suggest that the presence of a net loss is a distinguishing characteristic between switchers and non-switchers (Krishnan 1994, Krishnan et al 1996) and it is positively related to litigation against auditors (Carcello and Palmrose 1994). In addition, St. Pierre and Anderson (1984) find that a net loss that followed periods of net income increased the likelihood of litigation against the auditor. Other results of these studies show the probability of bankruptcy to be a distinguishing characteristic between switchers and non-switchers

(Haskins and Williams 1990, Krishnan et al 1996, DeFond and Subramanyan 1998). In addition, results suggest that the probability of bankruptcy is positively related to resignations (Shu 2000) and to litigation against auditors (Stice 1991). In contrast, Lys and Watts (1994) report an unexpected negative relationship between the probability of bankruptcy and an auditor's litigation risk. However, in subsequent analyses the authors do find a positive relationship. Other results also show that when both the presence of a net loss and the probability of bankruptcy were modeled together in a multivariate analysis regarding litigation against auditors, the presence of a net loss was shown to be positively related to litigation against auditors while the probability of bankruptcy was insignificant (Carcello and Palmrose 1994).

In summary, the results of prior research suggest that the presence of a net loss and the probability of bankruptcy are characteristics that distinguish switchers from non-switchers. In addition, results suggest that the presence of a net loss and the probability of bankruptcy are positively related to an auditor's litigation risk if these two variables are not included in a model simultaneously. When both variables are included in a model, results suggest that the presence of a net loss is positively related to litigation against auditors while the probability of bankruptcy is not significant. Further, results suggest that the probability of bankruptcy is positively related to resignations. Based upon prior research, this study theorizes that both measures of financial distress are positively related to resignations.

This study employed both the probability of bankruptcy as well as the presence of a net loss as indicators of financial distress. First, in general, the probability of bankruptcy was used to create a more comprehensive measure of financial distress

than measures used in prior research (FDB). Second, in general, the presence of a net loss was also used as an indicator of financial distress (FDL). Furthermore, the presence of a net loss that followed periods of net income was used to measure a “surprise” factor associated with financial distress (FDI). The use of a “surprise” factor based on the presence of a net loss also differs from prior research. Therefore, the following three relationships are hypothesized:

- H₂: An increase in the financial distress associated with the probability of bankruptcy is positively related to the probability of an auditor resignation.
- H₃: An increase in the financial distress associated with the presence of a net loss is positively related to the probability of an auditor resignation.
- H₄: An increase in the financial distress associated with the presence of a net loss following periods of net income is positively related to the probability of an auditor resignation.

The remainder of this section provides the specific details regarding the calculation of both measures of financial distress.

In regards to using the probability of bankruptcy to proxy for a company’s financial distress, Zmijewski’s (1984) bankruptcy model was used. Bamber et al. (1993) note that this bankruptcy model, as opposed to others, is more useful because the coefficients of the model were given in the study, it yields a standard normal variable than can be converted into the probability of bankruptcy rather than yielding a dichotomous classification, it was constructed based on a broad range of industries and types of companies, and it is parsimonious (i.e., uses only a few variables to obtain a large explanatory power). This bankruptcy model has also been shown to yield similar results when compared to other bankruptcy models that were estimated with

data in recent years (Shu 2000). Therefore, the financial distress associated with a client's probability of bankruptcy was calculated as follows:

$$FDB = CFD * IFD$$

where:

$$CFD = \frac{PB_t}{PB_{t-2}}$$

and

$$IFD = \frac{PB_t}{IPB_t}$$

The composition of the financial distress measure associated with the probability of bankruptcy (FDB) incorporates a change in a client's probability of bankruptcy between two points in time (CFD) along with the relative disparity between the client's probability of bankruptcy and the average probability of bankruptcy in the client's industry (IFD). In deriving the financial distress measure, let t represent a quarter-end date. Therefore, CFD is the ratio of the client's probability of bankruptcy at time t (PB_t) to the probability of bankruptcy that existed two years prior to PB_t (PB_{t-2}). Thus, values of CFD larger (smaller) than one represent an increase (decrease) in the probability of bankruptcy. IFD is the ratio of the client's probability of bankruptcy at time t to the average probability of bankruptcy at time t for all companies in the client's industry (IPB_t). Thus, larger (smaller) values of IFD represent an increase (decrease) in the probability of bankruptcy of the client over the average probability of bankruptcy of a company in the client's industry. Therefore, by taking the product of the change in the client's probability of bankruptcy (CFD) and the client's probability of bankruptcy as compared to the industry average

(IFD), larger (smaller) values of FDB correspond to an increase (decrease) in the financial distress of a client and, in turn, a greater (lesser) likelihood of a resignation.

FDB is a client-specific measure that is believed to impact a firm's decision to resign. However, a client's probability of bankruptcy is not included as a separate component (i.e., it is not a separate component along with CDF and IDF). If firm's use the probability of bankruptcy as a separate component in the resignation decision, it is assumed that they would compare this measure to some predetermined firm threshold that would apply to all of their clients (e.g., all clients with a probability of bankruptcy greater than .70). Thus, financially distressed clients beyond some firm threshold would be subject to a resignation. While financially distressed clients that are subject to this "threshold" criterion may be dispersed among various industries, it is more likely that many of these clients are concentrated in industries that have experienced a significant economic downturn. As a result, firms that use this "threshold" criterion would, in general, be transitioning out of an industry. Firm movements of this nature, generally referred to a mismatch, are discussed later in section 3.1.6.

In regards to a net loss, other dimensions of financial distress may include the simple presence of a net loss and/or the presence of a net loss that is preceded by periods of net income. In regards to the simple presence of a net loss, prior research has shown that the presence of a net loss was significant in switching studies (see section 2.4.1). As a result, the presence of a net loss prior to the event date will be included in this study. Specifically, an indicator variable (FDL) will be set to one if a company experienced a annual net loss at time t where the annual net loss is defined as

the sum of each quarterly net income amount immediately prior to and including time t . If the previous condition is not met, the indicator variable will be set to zero. In regards to the presence of a net loss that is preceded by periods of net income, prior research has found that when an unexpected net loss occurs after years of net income, the risk of litigation against the auditor increases (see the prior research part of this section). Thus, this “surprise” factor may also be associated with an increase in auditor resignations. Specifically, an indicator variable (FDI) will be set to one if an annual net loss was observed at time t and if this loss immediately followed two years of annual net income for the periods $t-1$ and $t-2$ where $t-1$ represents a time one year prior to t . The indicator variable will be set to zero if the preceding condition is not met.

3.1.3 Auditor Tenure (TEN). The tenure of an auditor is theorized to be inversely related to auditor changes because during the early part of an auditor’s tenure the auditor is seeking to develop client-specific expertise so that efficiencies in information gathering and evaluation can lead to an improved service that benefits the auditor, the client, and the public. However, during this client-expertise development period, the auditor faces a higher risk of audit failure because there is an increased risk that errors and/or irregularities will go undetected due to the unfamiliarity with the client. In fact, research has shown that in instances where material misstatements were detected, approximately 45% were detected during the first three years of the tenure of the auditor (Loebbecke et al. 1989). St. Pierre and Anderson (1984) also note that firm’s face a greater amount of litigation risk in the first three years of an audit engagement. Therefore, given a higher risk of audit failure during the early part

of their tenure, the auditor, in turn, also faces a greater risk of litigation. As a result, the auditor must evaluate both the risk of audit failure and the corresponding litigation risk during the early part of the auditor-client relationship. If the auditor concludes that these risks are too great, the firm may resign.

Prior research has supported the theorized association between auditor changes and auditor tenure. Specifically, auditor tenure has been inversely related to auditor changes (Williams 1988) as well as firm-initiated auditor changes (Menon and Williams 1999). Thus a change in auditor is more likely to occur during the first part of an auditor's tenure. Therefore, this leads to the following hypothesis:

H₅: The tenure of the auditor is negatively related to the probability of an auditor resignation.

To operationalize auditor tenure, a variable will be constructed that will contain the number of years that the incumbent auditor has been retained by the client.

3.1.4 Auditor Independence (INDEP). The independence of the auditor is a core element in the process of attesting to a client's financial statements. In this regard, an important issue is at what point does the client's importance to the firm impair the firm's independence (Goldwasser 2001). A client could become important to a firm if the audit fees paid by the client represent a significant portion of the total revenue of the firm (Stice 1991). Therefore, an important client could exert influence on the auditor to attest to financial statements that the auditor knows are misleading. Thus, the mere size of the audit fees relative to the firm's total revenue could give the client enough influence that could impair the auditor's independence.

A measure of auditor independence for a client could be generated by dividing a client's audit fees by the total audit fees earned by a firm during a given period.

Thus, low values would indicate that a firm was not dependent on the fees of the client and the firm could be considered independent. However, audit fee data has not been reasonably attainable. As a result, research has developed an alternative measure of auditor independence that is based on using a client's revenues as a surrogate for audit fees (Stice 1991, Krishnan and Krishnan 1997). Krishnan and Krishnan (1997) examine a sample of resignations and dismissals and found that the independence of the auditor was a significant variable in that differentiated resignations from dismissals. Stice (1991) examines lawsuits against auditors and finds that when a year-matched control sample is used, auditor independence is significant and inversely related to the likelihood of the auditor being sued. Thus, a higher level of auditor independence is associated with a lower level litigation risk. However, when an industry-year matched control sample is used, the independence of the auditor becomes insignificant. Stice concludes that industry characteristics play a role in determining variables associated with litigation against auditors. To control for certain industry effects, this study includes an indicator variable that is set to one if a client is in a high-tech industry, which has been shown to be associated with a higher degree of litigation risk (see section 3.1.1).

In regards to auditor independence and resignations, it follows that auditors with a low (high) level of independence would have a lower (higher) propensity to initiate a resignation. By contrast, extending the findings in Stice (1991) to resignations, one would conclude that an high (low) level of auditor independence would result in a low (high) level of resignations because of lower (higher) litigation risk. However, it is not reasonable to conclude that more resignations would occur

given that firms are more dependent on a client's audit fee (i.e., less independent). Therefore, a positive association between auditor independence and resignations is theorized to exist, which leads to the following hypothesis:

H₆: The independence of the auditor is positively related to the probability of an auditor resignation.

Both Stice (1991) and Krishnan and Krishnan (1997) compute the level of auditor independence based on the following formula which will be used in this study:

$$IND_{ij} = 1 - \frac{CR_{ij}}{\sum_{j=1}^J CR_{ij}}$$

where:

$i = 1, 2, \dots, I$ for all firms

$j = 1, 2, \dots, J$ for all clients

IND_{ij} = the level of auditor independence between client j and firm i

CR_{ij} = revenues of client j audited by firm i

Several limitations regarding this formula are noted by Krishnan and Krishnan (1997). First, the formula assumes that audit fees are a determining factor in the level of auditor independence and that a client's total revenues are a surrogate for audit fees. Second, a better measure for the denominator would be the total profits derived by the firm. Finally, when this formula has been employed in research the total revenues from all clients in the denominator has not included revenues from non-public clients.

In regards to the first limitation, the use of a client's total revenues may not be as great a limitation as mentioned in Krishnan and Krishnan (1997). A client's total revenue may be a better indicator of total fees paid by the client (audit and non-audit) rather than audit fees alone. As a result, total fees may have a greater correlation to auditor independence than audit fees alone.

3.1.5 Company Size (SIZE). The size of the client has implications in regards to (1) the size of judgments or settlements (awards) associated with a lawsuit, (2) the likelihood of audit failure and (3) the importance of the client to the auditor. First, the larger the client the larger the potential awards associated with a lawsuit, and, accordingly, the larger the litigation risk. As a result of increases in litigation risk, the likelihood of an auditor resignation is also theorized to increase. Second, larger clients have more complex organizational and information infrastructures that make the audit process more complex and more prone to audit failure. Consequently, more complex clients are theorized to be associated with an increase in resignations. Third, the fees paid by a large client may represent a significant portion of the firm's revenues. As a result, the firm may be reluctant to resign in spite of concerns over litigation risk or concerns over increased audit risk associated with a more complex client. Thus, the overall theorized effect of the size of the client and resignations is not clear.

Prior research finds that an increase in the size of the client is associated with an increased level of litigation against a firm (Stice 1991, Lys and Watts 1994, Carcello and Palmrose 1994, Shu 2000). While Shu (2000) finds a positive association between client size and auditor litigation, the study also notes that the mean client size associated with resignations was significantly lower than a control group. A similar finding is present in Krishnan and Krishnan (1997) who state that auditor's may be "more reluctant to resign from large clients than small ones (without regard to litigation risk)." In fact, in a study of resignations and non-switchers, Menon and Williams (1999) find that the size of the client is negatively related to resignations. Therefore, the following hypothesis is proposed:

H₇: The size of the client is negatively related to the probability of an auditor resignation.

To model the effect of client size, a variable containing the natural logarithm of the client's total assets was used.

3.1.6 Client-Firm Mismatch (MISM). The auditing industry has undergone many changes. These include, but are not limited to, changes in technology and an increase in non-audit services. The impact of these two changes on firms has been amplified due to an increase in the level of competition for audits and the inability of firms to generate more revenues from audit engagements. As a result, many firm's production functions have become more cost efficient and a greater number of firms have devoted more resources towards the development of non-audit services. Consequently, firms have modified their desired portfolio of clients. This change in the portfolio of clients has resulted in firms increasing their market share in industries that are matched with their core competencies and reducing their market share in others that are not. Thus, as a firm transitions out of an industry, a client may become associated with a firm that maintains a low involvement in the client's industry (i.e., the client's industry has over time become outside the core competency of the firm). Thus, another firm may better serve the client, and hence, the client-firm alignment has become mismatched. While a mismatched client may eventually dismiss the firm that performs their audit, it is also possible that a firm will decide to resign.

With respect to client mismatch, no prior research known to the author exists expect for Shu (2000). In this regard, Shu (2000) extends prior research by developing a methodology to determine if a client is mismatched with its current firm (mismatch status), and whether a change in the client's mismatch status is associated

with a resignation. While Shu finds a significant positive association between the change in mismatch status and resignations, the methodology developed to determine the mismatch status is only designed to predict mismatches that occur between large and small firms. Mismatches that occur between the same size firms are not considered. In other words, a client mismatched with a large firm that may be better aligned with another large firm is not considered. This omission is important because Shu also reports that 46% of the resignation sample represented changes between large firms and 20% were between small firms. Therefore, given that 66% of the auditor changes that occurred in the resignation sample were within the same firm size category, a significant number of mismatches may not have been detected. To compensate for this limitation as well as to identify mismatches in general, this study employs the use of an alternative methodology based on a firm's market share in an industry.

The alternative methodology is based on prior research that has examined the issue of firm market share concentration in client industries (firm concentration). Eichenseher and Danos (1981) find evidence of firm concentration in specific industries, but in a smaller subset of industries they find that the firm concentration had not changed significantly during the period 1964 to 1975. Danos and Eichenseher (1982) find that the firm concentration of larger firms tended to deteriorate over the period 1972 to 1979 in nonregulated industries; whereas this deterioration did not take place in industries that were regulated. In a later study, Kwon (1996) finds evidence that industries dominated by relatively few companies (high company concentration) will exhibit a lower level of firm concentration than those industries that have a larger

number of companies that operate in them. Kwon concludes that this situation arises because companies in a high company concentrated industry will be concerned about the leakage of proprietary information. Therefore, they would not want to engage a firm who also audits one of their competitors. As a result, Kwon concluded that a higher company concentration in an industry reduces the likelihood of a high firm concentration. While the results in Kwon (1996) were based on a cross-sectional study using data in 1989, Hogan and Jeter (1999) performed a longitudinal study and find that industries that have a higher company concentration were associated with higher levels of firm concentration. In addition, they find that firm concentration levels increased during the period 1976 to 1993 in both regulated and nonregulated industries. Furthermore, firms that were classified as having a high firm concentration in an industry increased their market shares over time while those firms with a low firm concentration in an industry found that their market shares had declined.

In general, the changes in firm concentration result from intra-firm decisions that are influenced by the market for accounting services. As these changes occur, the firm adjusts its portfolio of clients so that its clients would benefit from the firms existing or developing core competencies and the firm would benefit through increased profits and other non-financial benefits (e.g., enhanced reputation). Consequently, as firms reallocate resources over time to facilitate these decisions, some existing companies will become associated with a firm that has a low market share in the client's industry, or, in other words, the client and firm are mismatched. Given a mismatch, a client is more likely to experience a change in auditor (i.e., a resignation or dismissal). This does not imply that all mismatches will result in a

change in auditor. If the client-firm relationship is still mutually beneficial, then the engagement is likely to continue. However, if the beneficial nature of the relationship changes, then a change in auditor is likely to occur.

To determine the association between the mismatch status and resignations, the following hypothesis is proposed.

H₈: The degree that client-firm alignments are mismatched is positively related to the probability of an auditor resignation.

The development of this hypothesis is designed to detect mismatches where a firm resigns as a result of the decision to reallocate resources to a different mix of clients because the benefits associated with the new clients are greater. The calculation of the variable used to proxy for this hypothesis was based on the following firm market share formula provided in Hogan and Jeter (1999):

$$MS_{ik} = \frac{\sum_{i=1}^{J_{ik}} \sqrt{A_{ijk}}}{\sum_{i=1}^{I_k} \sum_{j=1}^{J_{ik}} \sqrt{A_{ijk}}}$$

where:

i = 1,2,...,I for all firms

j = 1,2,...,J for all clients

k = 1,2,...,K for all industries

I_k = the number of firms in industry k

J_{ik} = the number of clients served by firm i in industry k

A_{ijk} = total assets of client j in industry k by firm i

The degree of mismatch that exists between a client and firm was calculated as follows:

$$MISM = \frac{1}{RMS * IMS}$$

where:

$$RMS = \frac{MS_{ik_t}}{MS_{ik_{t-2}}}$$

and

$$IMS = \frac{MS_{ik_T}}{HMS_{ik_T}}$$

The composition of the degree of mismatch (MISM) incorporates a change in the market share of the client's audit firm between two points in time (RMS) along with the relative disparity of the firm's market share as compared to that of the firm with the dominant market share (IMS). In deriving the mismatch measure, let t represent a quarter-end date and let T represent the most recent fiscal year-end prior to t . Therefore, RMS is the ratio of the market share of the client's audit firm at the most recent fiscal year-end prior to t (MS_{ik_t}) to the market share of the client's audit firm that existed on the fiscal year-end two years prior to MS_{ik_t} ($MS_{ik_{t-2}}$). Thus, values of RMS smaller (larger) than one represent a decrease (increase) in market share. IMS is the ratio of the market share of the client's audit firm to the highest market share of an audit firm in the client's industry both measured at time T (HMS_{ik_T}). Thus, smaller (larger) values of IMS indicate that there is a larger (smaller) disparity between the market share of the client's audit firm and the dominant firm in the industry. Given that firms with smaller market shares, relative to other firms in an industry, will encounter declines over time in their already low market shares (Hogan and Jeter 1999), a smaller IMS would increase the likelihood that the client and firm were mismatched. Therefore, by taking the inverse of the product of RMS and IMS, high

(low) values of MISM represent a higher (lower) degree of mismatch that exists between the client and firm.

3.1.7 Management Misrepresentation (MR). Within the AICPA Professional Standards, the Statements on Auditing Standards as well as the Statements on Quality Control address issues where an auditor should resign if the integrity of management is considered too low to warrant association with a client (see sections 2.2.1 and 2.2.3). Although not specifically mentioned in the professional standards, four factors that might be an indicator of low management integrity that might lead to fraudulent financial reporting are a prior disclosure of irregularities, a deficiency in cash-flow, a prior disclosure of debt covenant violations, and a high percentage of officers on the board of directors (Menon and Williams 1999). Additionally, disclosed errors that cause the financial statements to be materially misleading may indicate a lack of sufficient internal controls or a lack of enforcing existing internal controls. In either case, disclosed errors are indicative of a weak system of internal controls that increase the likelihood of audit failure. Given the presence of one or more of these factors, an auditor may be more inclined to resign from an audit engagement.

Prior research regarding the factors previously mentioned has shown that they are associated with a significant positive relationship with resignations (Menon and Williams 1999). Specifically, Menon and Williams (1999) combine these factors into a single measure (an indicator variable) when testing the effects on resignations (see table 4). This leads to the following proposed hypothesis:

H₉: Clients whose management is considered to have a higher likelihood of issuing misleading financial statements are positively related to the probability of an auditor resignation.

Following Menon and Williams (1999), an indicator variable will be constructed to indicate that the management of the client has a higher likelihood of issuing misleading financial statements. Specifically, this variable will be set to one if any of the following four conditions are met. First, if errors or irregularities were disclosed during the twelve months prior to t . Second, if debt covenant violations were disclosed during the twelve months prior to t . Third, if the client is experiencing free-cash-flow deficiencies as defined by the following formula:

$$FREEC = \frac{OCF_t - ACE_{t-1 \text{ to } t-1}}{CA_{t-1}}$$

In the formula above, OCF_t represents the operating cash flows for the four quarters prior to and including t . $ACE_{t-1 \text{ to } t-1}$ represents average capital expenditures for the three year period ending one year prior to t (i.e., ACE_{t-1}). CA_{t-1} represents current assets one year prior to t . FREEC represents a continuous measure of free-cash flows. The indicator variable was set to one if the value of FREEC is less than -.5. Fourth, if the percentage of officers on the board of directors is greater than 67%. If any of the above four conditions are not met, then the indicator variable will be set to zero.

3.1.8 Legislation (LEG98). The litigation risk associated with an audit engagement is significantly influenced by the nature of the legal environment. The laws that govern such litigation as well as their interpretation and use are an important component of this risk. With the enactment of the PSLRA in December, 1995 and the SLUSA in November, 1998, the litigation risk faced by firms should be reduced. This reduction is primarily due to the replacement of the joint and several liability method of awarding damages to a proportionate liability method (see section 2.3).

Prior research supports the theorized reduction of litigation risk faced by firms. Gitenstein and Rothfeld (2001) find that frivolous cases are being dismissed and settlements of meritless cases appear to be diminishing. Geiger and Raghunandan (2001) find that in an analysis of bankrupt companies, auditors were less likely to issue a going-concern modification in an audit report after the passage of the PSLRA in 1995 than before. However, the effects of the SLUSA, if any, have not been investigated in any prior research known to this author. Therefore, the following hypothesis is proposed with respect to resignations:

H₁₀: The passage of the SLUSA of 1998 reduced an auditor's litigation risk and is negatively related to the probability of an auditor resignation.

To model the effect of the passage of the SLUSA, an indicator variable will be set to one for years subsequent to the passage of the legislation and zero otherwise.

3.1.9 Firm Size (BIG5). In maintaining a portfolio of clients, firms generally develop a set of client continuance criteria that will aid the firm in meeting their overall objectives (e.g., profitability, portfolio risk level, and industry market share). During or at the conclusion of the client continuance evaluation process, firms may decide to resign from some engagements. However, the continuance criteria may be different for Big 5 firms as opposed to non-Big 5 firms. Specifically, Big 5 firms may be in a better position to be more selective in establishing and maintaining their continuance criteria because of the greater number of clients in their portfolio of clients. As a result, Big 5 firms may be more likely to resign than non-Big 5 firms.² In turn, the following hypothesis is provided.

² Prior research has found that there is a negative relationship between the size of a firm (i.e., Big 5 versus non-Big 5) and the occurrence of an auditor switch (Krishnan et al. 1996). Specifically, clients of Big 5 firms are less likely to switch than those of non-Big 5 firms. However, three factors need to be

H_{11} : The size of the firm (i.e., Big 5) that audits a company is positively related to the probability of a resignation.

To operationalize this hypothesis, an indicator variable will be constructed that will be set to one if the company is audited by a Big 5 firm and zero otherwise.

3.1.10 Summary. The following logit model includes all the variables previous discussed in this section.

$$\text{RESIGN} = b_0 + b_1\text{TECH} + b_2\text{FDB} + b_3\text{FDL} + b_4\text{FDI} + b_5\text{TEN} + b_6\text{INDEP} \\ + b_7\text{SIZE} + b_8\text{MISM} + b_9\text{MR} + b_{10}\text{LEG98} + b_{11}\text{BIG5} + \varepsilon$$

where,

RESIGN = 1 for clients whose auditors resigned; 0 otherwise;

TECH = 1 if the client is in a high-tech industry defined as those industries that have three digit SIC codes beginning with 283, 357, 737 and 873 plus those industries in the SIC code range 3825-3839; 0 otherwise;

FDB = a composite measure of financial distress associated with the probability of bankruptcy;

FDL = 1 if the sum of each four quarterly net income amounts immediately prior to and including time t is less than zero; 0 otherwise;

FDI = 1 if the sum of each four quarterly net income amounts immediately prior to and including time t is less than zero and this net loss immediately follows two years that reported net income; 0 otherwise;

TEN = the number of years that the client has engaged the incumbent auditor;

INDEP = $[1 - (\text{client's sales}/\text{total sales of all clients of the auditor})]$;

SIZE = the natural logarithm of total assets;

MISM = a composite measure of the degree of client-firm mismatch;

MR = a composite measure denoting the likelihood of misrepresentation by the client;

LEG98 = 1 if the year is after 1998; 0 otherwise.

BIG5 = 1 if the company is audited by a Big 5 firm; 0 otherwise.

considered when seeking to gain insights into resignations based on the results of this study. First, the study did not distinguish between dismissals, declinations and resignations. Second, there are different decision makers based on the type of switch. Specifically, the decision maker for a dismissal is the client while the decision maker for a resignation or a declination is a firm. Third, dismissals occur more frequently than resignations and declination combined; therefore, the results of the switch study may be biased towards dismissals. Therefore, the effect that the size of firm has on the probability of a resignation is not known and may not necessarily conflict with prior research findings.

3.2 Data Collection

All publicly traded companies are required by the Securities and Exchange Commission (SEC) to report various types of information (filings) to the SEC. Filings include Form 10-K (annual report), Form 10-Q (quarterly report), and Form 8-K (current report). Compact D/SEC is a source of data that contains references to the SEC filings (filing reference) of all companies required to make such filings. Information about each filing reference includes the type of form, the date of the filing, and possibly other information specific to a particular form. The filing reference for Form 8-K (8-K) is critical to this study in that it contains a numeric item number that is associated with the contents of the actual 8-K. The specific item number necessary for this study is item four because this item number indicates that information in the 8-K is related to an auditor switch and that disclosures related a switch have been filed with the SEC.

Based on filing information contained in the July, 1996 to January, 2001 quarterly Compact D/SEC discs (i.e., information pertaining to the period June 1996 to December 2000), a resignation group of companies was identified as follows. First, a search for all filing references for all companies during the period June, 1996 to December, 2000 was performed. During this search process, all 8-K filing references that also had a reference to auditor switching (i.e. item four) were extracted to form an auditor switching data set. Second, the filing date of each filing reference in the auditor switching data set was used to locate the actual 8-K in Lexis-Nexis. Upon examination of each 8-K item four, auditor switches that are resignations (verses dismissals or declinations) were selected.

Third, based on further examination of the 8-K for each resignation previously selected, the following five criteria was used to determine which resignations were excluded from further analysis. First, firm related issues disclosed in the 8-K as the reason for the resignation were excluded. These include firm changes (e.g., mergers, splits or dissolutions), firm service issues (e.g., no longer serving public clients, no longer providing audit services or the death of partner) and firm independence issues (e.g., unpaid fees or significant business relationship with client). Second, resignations that the 8-K describes as a mutual agreement between the client and firm were excluded because the underlying decision maker in these cases is not clear. Third, resignations that were the result of a company merger, a change in company location or an audit of a subsidiary of the client were excluded. Fourth, financial companies (i.e., SIC codes 6000 to 6999) were excluded because the determinants of the client-firm alignment may be different than in other industries due to various regulations imposed on clients (Shu 2000). Fifth, additional exclusions include resignations in which the date of the resignation was not specifically mentioned or there were multiple resignations for the same client that occurred less than two years apart. After applying the five exclusion criteria previously mentioned, the remaining resignations comprise the resignation group that was used in subsequent statistical analyses.

A control group was formed based on the following steps. First, a group of non-resignation companies was formed by eliminating from Compustat any company that was part of the resignation group. Second, based on the number of companies in

the resignation group, an equal number of the non-resignation companies was selected at random to form the control group.

Additionally, a random event date was calculated for each company in the control group as follows. First, the number of days during the sample period (i.e., June 1, 1996 to December 31, 2000) was calculated as 1,675. Second, a random number between 0 and 1,674 was chosen for each company. Third, the random number was added to the beginning date of the study period (i.e., June 1, 1996) to form a random date for each company.

Financial information for companies in both the resignation and control group was obtained from Compustat, Compact D/SEC and Lexis/Nexis. Companies that do not have data available for all variables in the model were excluded.

3.3 Data Analysis

Logit estimation is an empirical technique used to estimate models (i.e. logit models) that have a dichotomous dependant variable. Since this study has a dichotomous dependant variable (i.e. resignation vs. non-resignation), a logit model was developed and estimated. The results were used to explain the occurrence of resignations and to evaluate the association between the independent variables and the dependent variable.

3.4 Time-Varying Methodology

In regards to the time-varying nature of this study, let t represent a measurement date of the independent variables (variables). In regards to this measurement date (t) and empirical testing, t was first set equal to the last quarter-end date that occurred prior to an event date. The event date for clients whose auditor

resigned was the actual date the resignation took place as noted in the 8-K. The event date for clients whose auditor did not resign was chosen at random based on the dates available during the study period (June 1996 to December 2000). Second, each variable was then measured based on quarterly data available at time t . Third, the model was estimated and the results regarding the significance of the variables and model were analyzed. Fourth, t was then set equal to the penultimate quarter-end date prior to the event date and then the second and third steps previously discussed were repeated based on this new t . Stated another way, each variable was be re-measured based on a new t , the model was re-estimated and the results were re-analyzed. Fifth, the last step (i.e., step four) was be repeated two more times except with different quarter-end dates for t . These two dates were the two remaining quarter-end dates of the four most recent quarter-end dates prior to the event date. In summary, the process of measuring, estimating and analyzing the model was repeated until the results associated with data relative to the four most recent quarters prior to the event date had been analyzed.

3.5 Conclusion

This chapter has presented a discussion of the methodology used in this study, the research hypotheses, the data sources, and the method of testing. Chapter four will present the results of the tests of hypothesis.

CHAPTER IV

Results

The results of this study are presented in this chapter. Section 4.1 describes the development of the data set. Section 4.2 provides the overall descriptive statistics related to the data. Section 4.3 provides the results of the statistical analyses.

4.1 Data Set

The structure of this subsection is as follows. Section 4.1.1 presents a description of the databases used in this study. Sections 4.1.2 and 4.1.3 describe the process of determining a group of companies in which the auditor resigned (resignation group). Section 4.1.4 describes the process of determining a group of companies in which the auditor did not resign (control group). Sections 4.1.5 and 4.1.6 describe the process of gathering data for the full sample (i.e., resignation and control group).

4.1.1 Database Description. Compact D/SEC (CDSEC) is a database that contains information on companies that file reports with the SEC. In general, companies included in this database have at least 500 shareholders of one class of stock, have at least \$5 million in assets, and have securities listed on a national securities exchange or trade securities Over-the-Counter. For each company in the database, a variety of corporate information is maintained including a list of the specific forms that a company filed with the SEC but not the actual form itself. The 8-

K is one form where CDSEC maintains specific filing information for each company, namely the date the 8-K was filed and a numerical code representing the item number(s) that are included in the 8-K (e.g., 4 for item four, see Table 2.1).

4.1.2 Resignation Filings. Using the 8-K information contained in each quarterly CDSEC disc beginning with the July 1996 disc and ending with the April 2001 disc, all 8-Ks that were reported as being filed during the period June 1996¹ through December 2000 that included a numerical code of four (i.e., indicating that a change in auditor had occurred) were selected for further analysis. This selection process yielded a total of 3,652 references to 8-Ks that potentially contained disclosures related to a change in auditor.²

Based upon an analysis of the 3,652 filing references initially selected, those that were not related to resignations were excluded as follows (see Table 4.1). First, before any attempt was made to locate an 8-K, the following three exclusions (pre 8-K exclusions) were employed: duplicate filing references (50), filing references of foreign companies (103), and filing references of financial companies (536). As a result of employing the pre 8-K exclusions (689), 2,963 filing references remained. Second, information in each of the 2,963 filing references was used to locate and examine the 8-K as stored in the Edgar and/or Lexis/Nexis databases in order to determine the type of auditor change. In this regard, two other exclusions (8-K search exclusions) were employed: 8-Ks not found (62) and 8-Ks with no auditor change

¹ Electronic filings became mandatory for all domestic companies during May 1996. Accordingly, data was included in the analysis beginning with June 1996 in order to ensure that all 8-Ks could be accessed in the SEC Edgar database or in the Lexis/Nexis database.

² Since there could be more than one filing per auditor change, the number of filings doesn't represent the number of auditor changes during June 1996 through December 2000. Also, 14 filing references for forms other than the 8-K (e.g., 10-Q) were found based on an item four code used as part of the filing reference for these forms. These are included in the 3,652 total filing references found.

disclosure (74). As a result of the additional 8-K search exclusions (136), 2,827 8-Ks remained. Third, while the remaining 8-Ks all related to an auditor switch, not all of the auditor switches specifically related to resignations. The 8-Ks not related to a resignation were also excluded (non-resignation auditor switch exclusions) as follows: dismissals (1,853), declinations (105), and 8-Ks found but the type of switch was not specifically stated (143). As a result of employing the additional non-resignation auditor switch exclusions (2,101), a total of 726 8-Ks specifically related to resignations remained.

4.1.3 Resignation Group. An analysis of the 726 8-Ks (representing a preliminary resignation group) was performed to determine which 8-Ks should be excluded from further analysis. The primary resignation exclusion resulted from multiple 8-Ks that were related to the same auditor change (198). In general, this occurred because the successor auditor was not known when the initial 8-K was filed and, subsequently, another 8-K was filed to disclose this information. There were several additional reasons for excluding 8-Ks from the preliminary resignation group. First, 34 observations were excluded because the firm encountered some form of independence problem that motivated them to resign. These problems included unpaid fees, a significant business relationship with the company, or litigation related to the company. Second, 18 observations were excluded because the firm was no longer providing audit services, in general, or the firm was no longer providing audit services specifically to public companies. Third, 16 observations were excluded because it was unclear whether the change in auditor was a decision made solely by the firm or a joint decision by the firm and company. In these cases, the 8-K disclosed

TABLE 4.1
Resignation Group Formation

Total filing references indicating an auditor change: June 1996 to December 2000		3,652
Pre 8-K Search Exclusions:		
Duplicate filing references	50	
Filing references of foreign companies	103	
Filing references of financial companies	<u>536</u>	<u>689</u>
		2,963
8-K Search Exclusions:		
8-Ks not found	62	
8-Ks with no auditor switch disclosure	<u>74</u>	<u>136</u>
		2,827
Non-resignation Auditor Switch Exclusions:		
8-Ks related to dismissals	1,853	
8-Ks related to declinations	105	
8-Ks with auditor switch disclosure but type of switch not specifically stated	<u>143</u>	<u>2,101</u>
		726
Resignation Exclusions:		
8-Ks filed subsequent to the initial resignation disclosure	198	
Firm independence issues	34	
Firm service issues	18	
Decision-maker in resignation not clear	16	
Firm changes	16	
Engagement problems	8	
Company merger	7	
Resignation not related to parent company	5	
Change in company location	3	
One or more of the reasons above combined	5	
Resignation date unknown	1	
Multiple resignations less than two years apart	<u>16</u>	<u>327</u>
Resignation Group		<u>399</u>

that either there was a mutual agreement between the company and the firm or that the resignation was a result of negotiations between the company and firm. Fourth, 16 observations were excluded because the firm underwent structural changes that motivated them to resign. These included mergers, the sale of an office or an entire practice, a relocation of the firm, or the dissolution of the firm. Fifth, 8 observations

were excluded because of engagement problems encountered with the client. These included instances of coordination or timing problems, scope limitations and problems with other work performed for the company. Sixth, 7 observations were excluded because the resignation was linked to a company merger. In general, these resignations were due to the desire of the company to maintain the continuity of the audit engagement with the firm that audited the other company that was part of the merger. Seventh, 16 observations (i.e., 8 individual companies) a company had two resignations that were two years or less apart. These were excluded due to methodological concerns about independence among the observations in the study. The remaining reasons (indicated in Table 4.1) for excluding observations are fairly self-explanatory and, for convenience, no additional discussion is provided. In sum, after all exclusions have been considered, the final resignation group (resignation group) consists of 399 observations.

4.1.4 Control Group. A control group was formed using data contained in the Compustat database as follows. First, the population of Compustat companies (21,369 research and active) was reduced to form a non-resignation group. In this regard, companies were excluded if they met any of the following criteria: the company did not report any total assets during the study period (i.e., total assets was used as an indicator that financial information about the company was available), foreign companies, financial companies, non-parent companies (e.g., subsidiaries), or the company was included in the resignation group. As a result of applying these exclusions (13,411), a total of 7,958 companies remained to form the non-resignation

group. Second, a random sample of 400 companies from the non-resignation group was extracted to form the control group.

Additionally, a random event date was calculated for each company in the control group as follows. First, the number of days during the sample period (i.e., June 1, 1996 to December 31, 2000) was calculated as 1,675. Second, a random number between 0 and 1,674 was chosen for each company. Third, the random number was added to the beginning date of the study period (i.e., June 1, 1996) to form the random date.

4.1.5 Data Collection. The data used in this study to measure each variable was accumulated from four different sources: Edgar, Lexis/Nexis, Compustat, and CDSEC. As previously described in sections 4.1.1 and 4.1.2, CDSEC, Edgar and Lexis/Nexis were used to determine the set of companies in which the auditor resigned (i.e., resignation group). Also, section 4.1.4 described how Compustat was used to form a set of companies that formed the control group. As a result, the dependant variable, RESIGN, was set to one for each company in the resignation group and zero for each company in the control group.

CDSEC data was used to measure all or part of four independent variables. First, the TECH variable was set to one if the SIC code obtained from CDSEC was within the ranges of SIC codes that prior research has used to denote high-tech industries (see section 3.1.1). Second, the calculation of the variable used to proxy for the independence of the auditor (INDEP) required that total revenues for each client audited by a firm, both Big 5 and non-Big 5, be available. CDSEC provided this level of detail, whereas Compustat does not distinguish between the names of the auditors

of all non-Big 5 firms. Third, the calculation of the variable used to measure the level of mismatch between the auditor and client (LMISM) required that market shares of each firm be calculated based on total audited assets of each client. CDSEC provides the name of each firm as well as the amount of total assets whereas, as previously stated, Compustat does not. Fourth, one component of the variable designed to indicate the likelihood of future client misrepresentation (MR) was the percentage of officers on the board of directors (see section 3.1.7). This percentage was calculated based on the list of officers and the list of directors available for each company in CDSEC.

Compustat and Lexis/Nexis were other sources of data. Compustat was used to calculate the variables that proxied for financial distress (LFDB, FDL, FDI), the tenure of the auditor (TEN), and the size of the company (SIZE). In addition, Compustat was used to calculate the component of the client misrepresentation variable (MR) that was designed to measure the deficiencies in a company's free-cash flows (FREEC). Lexis/Nexis was used to search for disclosures related to loan defaults and errors and/or irregularities as previously discussed in section 3.1.7.

During the data collection process, data for some variables were not available. As a result, observations that did not have complete data for all variables for a quarter-end date prior to the event date were excluded. Additionally, companies whose audit firm maintained a low involvement in their industry were also excluded. A low involvement of a firm was defined as auditing five or fewer companies in an industry. Consequently, the total number of observations in the resignation group (399) and the control group (400) were reduced based on the additional exclusions. As shown in

Table 4.2, the resignation (control) group contained a total of 116 (121) observations that had complete data for the first quarter-end date prior to the event date. The total number of observations after all exclusions for the three remaining quarter-end dates is also displayed.

4.1.6 Data Transformations. Three variables were transformed in order to provide values that would better approximate a linear relationship between the variables and the dependant variable used in subsequent model estimation. Specifically, the calculation of variables FDB, SIZE, and MISM resulted in a range of values within each variable that had a large variation. As a result, it is possible that each variable's effect on the dependant variable might be different at different levels of the variable; hence, the relationship might not be linear in nature. As a result, each of the values in each variable was transformed by calculating the natural logarithm and placing the result in a new variable. Thus, the following three variables were formed: LFDB, LSIZE, and LMISM.

4.2 Descriptive Statistics

The descriptive statistics for each variable in each of the four time periods prior to the event date (e.g., t_1 , t_2 , t_3 and t_4) are shown in Table 4.2. In regards to the continuous variables, univariate statistics designed to show differences between the means of variables in the resignation and control groups reveal that variables LFDB, TEN and LSIZE are significantly different in all four time periods. Specifically, the tenure of the auditor (TEN) and the size of the company (LSIZE) were significantly lower for the resignation group. Additionally, clients in the resignation group were in greater financial distress (LFDB) than companies in the control group. The means of

TABLE 4.2
Descriptive Statistics^a

Variable ^{bc}	t ₁		t ₂		t ₃		t ₄	
	Resign (n = 116)	Control (n = 121)	Resign (n = 129)	Control (n = 123)	Resign (n = 123)	Control (n = 118)	Resign (n = 123)	Control (n = 117)
LFDB	1.563 ^d (4.368)	-1.172 (4.089)	1.543 ^d (4.763)	-1.228 (3.921)	1.541 ^d (5.515)	-1.481 (4.346)	1.185 ^d (5.766)	-1.008 (4.451)
TEN	5.980 ^d (4.071)	10.580 (5.038)	5.710 ^d (3.919)	10.430 (5.052)	5.770 ^d (3.763)	10.410 (4.901)	5.590 ^d (3.836)	10.080 (4.828)
INDEP	.999 (.002)	.999 (.004)	.999 (.002)	.999 (.004)	.999 (.002)	.999 (.002)	.999 (.001)	.999 (.003)
LSIZE	2.913 ^d (1.729)	5.170 (2.061)	3.022 ^d (1.708)	5.188 (2.08)	3.104 ^d (1.694)	5.285 (1.995)	3.127 ^d (1.711)	5.116 (2.202)
LMISM	1.413 (2.068)	1.359 (2.123)	1.377 (2.000)	1.312 (2.170)	1.338 (1.927)	1.265 (2.000)	1.287 (1.932)	1.332 (2.054)
TECH	30 (25.9)	26 (21.5)	31 (24.0)	24 (19.5)	31 (25.2)	26 (22.0)	27 (22.0)	26 (22.2)
FDI	1 (0.9)	2 (1.7)	6 (4.7)	2 (1.6)	3 (2.4)	1 (0.8)	1 (0.8)	3 (2.6)
FDL	91 (78.4)	34 (28.1)	99 (76.7)	35 (28.5)	87 (70.7)	34 (28.8)	87 (70.7)	33 (28.2)
MR	68 (58.6)	15 (12.4)	76 (58.9)	13 (10.6)	58 (47.2)	16 (13.6)	57 (46.3)	21 (17.9)
LEG98	51 (44.0)	52 (43.0)	52 (40.3)	40 (32.5)	46 (37.4)	35 (29.7)	31 (25.2)	33 (28.2)
BIG5	102 (87.9)	111 (91.7)	113 (87.6)	113 (91.9)	108 (87.8)	110 (93.2)	108 (87.8)	108 (92.3)

^a Descriptive statistics are given for four quarter-end dates immediately prior to an event date t and are denoted by t , where $x = 1, 2, 3, 4$. The event date for resignation companies is the date of auditor resignation, and the event date for the control group is a random date.

^b LFDB is the natural logarithm of a measure of a company's financial distress based on a bankruptcy prediction model. TEN is the tenure of the auditor in years. INDEP is a proxy for the level of independence of the auditor. LSIZE is the natural logarithm of a company's total assets. LMISM is the natural logarithm of a measure designed to capture the degree of mismatch between a company and their auditor. TECH = 1 if a company's SIC code is in the 2830s, 3570s, 7370s, 8730s, or between 3825 and 3839, zero otherwise. FDI = 1 if the sum of quarter-end net income over the four quarters prior to and including t is less than zero and this loss is immediately preceded by two years (based on quarterly net income) of net income; zero otherwise. FDL = 1 if a company has a net loss based on the four quarters immediately prior to and including t , zero otherwise. MR = 1 if there is a greater likelihood of misrepresentation on the part of management; zero otherwise. LEG98 = 1 if the year at t is greater than 1998; zero otherwise. BIG5 = 1 if a company is audited by a Big 5 firm; zero otherwise.

^c Means (standard deviation) of continuous variables (LFDB to LMISM) are presented first. Frequency (percentage) of dichotomous variables (TECH to BIG5) are presented second.

^d Difference in means between the resignation and control group is significant at the .01 level.

the remaining continuous variables representing the independence of the auditor (INDEP) and the degree of client-firm mismatch (LMISM) were not significantly different at the .01 level in any time period. In regards to the dichotomous variables, the percent occurrence of each variable in each group over the four time periods reveals that the resignation group had companies that had a greater occurrence of a net loss (FDL) and were more likely to issue misleading financial statements (MR). The variable designed to indicate that a sudden loss had occurred (FDI) revealed that only a small number of companies in the sample met this condition. As a result, this variable was excluded from further analysis. Additionally, the resignation group, in general, contained a slightly greater percentage of companies that operated in high-tech industries (TECH) except for the last period in which the percentage was approximately equal. Also, a large percentage of the companies in both groups were audited by a Big 5 firm (BIG5); however, the percentage occurrence of a Big 5 auditor for companies in the resignation group was slightly lower than that of the control group over all time periods. Finally, the percent occurrence of quarter-end dates after 1998 (LEG98) was slightly greater for the resignation group except for the last time period in which the percent occurrence was slightly lower than the control group.

4.3 Results

As a result of preliminary analysis, three variables were excluded from the model. First, as noted in section 4.2, variable FDI was excluded because of the limited number of companies in either the resignation or control group that met the criteria that caused the variable to be set to one. Second, variable INDEP was excluded because of the limited variation in this variable. The standard deviation over all time periods was

between .001 and .004, and given that the values associated with this variable are percents and are constrained by zero and one, the variation in this variable is very small. As a result, there is an insufficient variation to accurately measure the intended effect associated with this variable. Additionally, the low variation in this variable caused many of the DFBETAs for this variable to be extremely large and well beyond acceptable limits (Neter et al. 1996). Third, variable LFDB was also excluded. LFDB was designed to be a more comprehensive continuous measure of the financial distress of a company and therefore provide better fit in the regression models over the simpler variable FDL, which is a dichotomous variable set to one if the company currently has a net loss. However, the use of FDL alone in the models produced a better overall fit. Therefore, FDL was used in subsequent model estimations instead of variable LFDB. Based on the exclusion of the three variables previously mentioned, hypotheses two, four, and six (see sections 3.1.2 and 3.1.4) were not able to be empirically examined and thus are not supported.

Table 4.3 presents the results of estimating the model using a logit regression analysis at the four quarter-end dates immediately prior to an event date. The number of observations is slightly greater than that shown in Table 4.2 because the exclusion of variables LFDB, FDI and INDEP reduced the number of observations that had data limitations. Overall, the model is statistically significant at each date in which the model was estimated (estimation date). Chi-square statistics for the model ranged from 110.4 to 144.3 with associated p-values of .000 for all estimation dates. Additionally, the likelihood ratio index (i.e., $LR = 1 - \log \text{likelihood at convergence} / \log \text{likelihood at zero}$) was also calculated. The LR (sometimes called

McFadden's- R^2 statistic) is a psuedo R^2 measure that indicates a model's explanatory power. As shown in Table 4.3, the LR index decreases as estimation dates further away from the event date are used. Stated another way, using information closer to the event date increases the explanatory power of the model.

Three variables were statistically insignificant at each estimation date (i.e., TECH, LEG98 and BIG5). First, variable TECH was associated with hypothesis one. This hypothesis states that clients operating in high technology industries are positively related to the probability of an auditor resignation; however, this was not supported. Second, variable LEG98 was associated with hypothesis ten. This hypothesis states that the passage of the SLUSA of 1998 reduced an auditor's litigation risk and is negatively related to the probability of an auditor resignation. Results show that this hypothesis was not supported. Third, variable BIG5 was associated with hypothesis eleven. This hypothesis states that the size of the firm (i.e., Big 5) that audits a company is positively related to the probability of a resignation. This hypothesis was not supported.

Variables FDL, TEN and LSIZE were statistically significant at each estimation date and the signs of the coefficients were consistent with the associated hypotheses. Therefore, it appears that resignations are more likely to occur when companies are in financial distress (FDL), when the tenure of the auditor is low (TEN), and when the size of the client is small (LSIZE). Thus, hypotheses three, five, and seven (respectively) are supported.

The likelihood of misrepresentations on the part of management was modeled by variable MR. This variable was statistically significant with the expected sign only

TABLE 4.3
Results^a

Variable	t_1	t_2	t_3	t_4
	Coefficient Marginal Effect ^b (t-value)	Coefficient Marginal Effect (t-value)	Coefficient Marginal Effect (t-value)	Coefficient Marginal Effect (t-value)
Constant	3.144 * .786 (2.564)	3.074 * .765 (2.655)	3.899 * .972 (3.414)	3.805 * .948 (3.573)
TECH	-.678 -.169 (-1.492)	-.331 -.082 (-.749)	-.456 -.114 (-1.122)	-.682 -.170 (-1.690)
FDL	.963 ** .241 (2.439)	.945 * .235 (2.584)	.872 ** .217 (2.420)	1.077 * .268 (3.074)
TEN	-.126 * -.031 (-3.049)	-.129 * -.032 (-3.264)	-.152 * -.038 (-3.789)	-.169 * -.042 (-4.317)
LSIZE	-.469 * -.117 (-4.150)	-.478 * -.119 (-4.348)	-.511 * -.127 (-4.675)	-.419 * -.104 (-4.118)
LMISM	-.333 * -.083 (-2.308)	-.300 * -.075 (-2.160)	-.379 ** -.094 (-2.715)	-.388 ** -.097 (-2.961)
MR	1.629 * .407 (4.008)	1.629 * .405 (4.017)	.654 .163 (1.632)	.413 .103 (1.101)
LEG98	.032 .008 (.088)	.444 -.110 (1.201)	.516 .129 (1.423)	.051 .013 (.134)
BIG5	-.791 -.198 (-800)	-.806 -.201 (-838)	-.740 -.184 (-799)	-.809 -.202 (-934)
N	243	259	250	248
Chi-square	133.7 *	144.3 *	119.6 *	110.4 *
LR index ^c	.40	.40	.35	.32
Classification rate ^d	81.1%	83.4%	78.4%	77.4%

^a Results reported for a logit regression analysis estimated at four quarter-end dates immediately prior to an event date t and are denoted by t_x , where $x = 1, 2, 3, 4$. Variables in the model are as follows. RESIGN = 1 for companies whose auditor resigned. TECH = 1 if a company's SIC code is in the 2830s, 3570s, 7370s, 8730s, or between 3825 and 3839. FDL = 1 if a company has a net loss based on the four quarters immediately prior to and including t_x . TEN is the tenure of the auditor in years. LSIZE is the natural logarithm of total assets at t_x . LMISM is the natural logarithm of a measure designed to capture the degree of mismatch between a client and their auditor. MR = 1 if there is a greater likelihood of misrepresentation on the part of management. LEG98 = 1 if the year at t_x is greater than 1998. BIG5 = 1 if a company is audited by a Big 5 firm.

^b Marginal effects are calculated as the partial derivatives of the expected probability of a resignation conditioned on the vector of independent variables evaluated at each variable's mean.

^c LR index is the log likelihood ratio index computed as $1 - \log \text{likelihood at convergence} / \log \text{likelihood at zero}$.

^d Classification rate is based on models ability to classify both resignations and non-resignations.

* Significant at the .01 level.

** Significant at the .05 level.

for the two quarter-end dates immediately preceding the event date (i.e., t_1 and t_2), thus lending support to hypothesis nine. This suggests that the impact of the

disclosure of information that indicates a greater likelihood of misrepresentation on the part of management on a firm's decision to resign is sensitive to time. Specifically, recall that MR was based on the disclosure of such information within 12 months prior to each estimation date (see section 3.1.7) and that the results that showed that this variable was statistically significant only for the two estimation dates immediately preceding the event date (see Table 4.3).

Variable LMISM was designed to measure the degree of client-firm mismatch, and as proposed in hypothesis eight, this variable had a predicted positive relationship to the probability of an auditor resignation. Results show that this variable was significant at each estimate date; however, the sign is opposite to that proposed. A possible explanation of this result is that in the context of resignations the variable is measuring a different motivation associated with a firm's evaluation of their client portfolios than that proposed. Specifically, recall that LMISM is based on the theory that a decrease in a firm's market share and/or a relatively low market share compared to the market share of the firm with the highest market share is associated with an increased likelihood of a client-firm mismatch and an increased likelihood of a resignation (see section 3.1.6). However, based on the results, it is possible that the use of firm market shares in this context indicates that firms that have an increase in their market share and/or a relatively high market share (i.e., a low LMISM) may re-evaluate their client portfolio and choose to resign from those engagements that are more risky and/or less profitable. Conversely, firms that have a decrease in market share and/or a relatively low market share (i.e., a high LMISM) may be less likely to

resign in order to maintain the current and future profitability associated with their clients.

In addition to the results presented above, the marginal effects of each variable are also given in Table 4.3. These represent the partial derivatives of the expected probability of a resignation conditioned on the vector of independent variables evaluated at the mean of each variable. While using the mean for continuous independent variables in these calculations is intuitive, using the mean of dichotomous independent variables is not; however, the marginal effect of dichotomous variables evaluated at their mean does provide a reasonable approximation to the change in the probability of the dependant variable given that sample sizes are large (Greene 2000).

Based on the marginal effects in Table 4.3, it appears that certain statistically significant independent variables play a larger role in the resignation decision than others. Specifically, the largest impact on the decision to resign is produced by variable MR. In this case, factors that may lead a firm to suspect potential misrepresentations by management increase the probability that an auditor will resign by approximately 41% on average over the first two estimation dates (i.e., t_1 and t_2). However, as previously stated above, this effect is sensitive to time. The next variable that has the most influential marginal effect is FDL. Based on its marginal effect, companies that have a net loss increase the likelihood that their auditor will resign by approximately 24% on average over all estimation dates. LSIZE is another variable whose marginal effect is presented; however, since this variable is based on the natural logarithm of total assets, its interpretation is somewhat obscured by the transformation. Still, an interpretation based on the transformation does provided

some information. Therefore, based on the results, a one unit increase in LSIZE decreases the likelihood of a resignation by 11.7% on average over all estimation dates. The remaining two variables have a smaller impact on the probability of a resignation relatively speaking. Based on the results for TEN, each additional year of an audit engagement reduces the likelihood of a resignation between 3% and 4%, and based on the results for LMISM, a one unit increase in this variable reduces the likelihood of a resignation by approximately 8.7% on average.

CHAPTER V

Conclusions

The structure of this chapter is as follows. Section 5.1 provides a summary of the study. Section 5.2 provides the implications that relate to the results of the study. Section 5.3 provides a summary of the limitations and possible extensions of the study.

5.1 Summary

There were two main objectives of this study (see section 1.2). The first objective was to develop a theoretical model that will explain auditor resignations. To meet this objective, a model was developed which was primarily grounded in prior research related to auditor resignations as well as prior research addressing auditor switching. In this regard, the following variables were included in the model: the industry in which the client operates (specifically, high-tech industries), the client's financial distress as measured by the presence of a net loss, the tenure of the auditor, the level of independence of the auditor, the size of the client, the likelihood of misrepresentations on the part of management and the size of the auditor (specifically, Big 5 firms).

Additionally, two other variables, each representing derivations from variables employed in prior research related to auditor resignations and/or prior research related

to auditor switching, were also included in the model. Specifically, a variable that measured the financial distress of the client in a more comprehensive fashion by utilizing a bankruptcy prediction model was included as well as a variable that measured the level of client-firm mismatch based on changes in firm's market shares. Finally, two other variables, not included in the literature to date regarding auditor resignations and auditor switching, were also included in the model. Specifically, a variable was included to model the impact of the changes in the legal environment (specifically, the Securities Litigation Uniform Standards Act of 1998) as well as a variable to model a current net loss that follows two periods of net income (sudden net loss).

The second objective was to estimate the model at several different quarterly dates immediately prior to an event date so that the effects of time on the explanatory power of the model and each independent variable could be ascertained. This objective was met by identifying and collecting data for each variable in the model for a sample of companies and by using a regression technique to estimate the model. In regards to identifying and collecting data, the first step performed was to use the Compact D/SEC (CDSEC) database to identify the resignations that took place from June, 1996 to December, 2000. The result of this process was a resignation group of companies in which the event date was the actual date of the resignation. Second, the Compustat database was used to form a control group of companies, and an event date was assigned to each company by selecting a date at random from all the possible dates during the sample period. Third, data for companies in both the resignation and control groups were obtained from Compustat, CDSEC, and/or Lexis/Nexis.

In regards to estimating the model, a logit regression technique was employed. As a result of preliminary analysis, three variables were excluded from the model. First, the variable designed to measure a client's financial distress by utilizing a bankruptcy model (FDB) was excluded because the financial distress measure based on the presence of a net loss provided a better overall fit in the model. Second, the variable designed to measure a sudden net loss (FDI) was excluded because of the limited number of companies that met this condition. Third, the variable designed to measure the independence of the auditor (INDEP) was excluded because the variation of this variable was not sufficient to measure its effect in the model.

Overall results from estimating the model suggest that the model was significant for each of the four quarterly time periods and that using information closer to the event date increased the model's explanatory power. In regards to the specific independent variables, the results suggest that, for all quarterly time periods, firms are more likely to resign from (1) clients who are smaller in size (LSIZE); (2) clients who are in financial distress as modeled by a net loss (FDL); (3) engagements in which the tenure of the auditor is low (TEN); and (4) clients who are in industries in which the auditor has an increasing and/or a relatively high market share (LMISM). Additionally, companies that had a greater likelihood of management misrepresentation (MR) were also associated with an increase in the likelihood of a resignation; however, this association was sensitive to time. Specifically, this association was only significant in the two quarterly time periods immediately prior to the event date. Finally, the following variables were not significant at any estimation date: (1) changes in the litigation environment (LEG98); (2) clients in high-tech

industries (TECH); and, (3) clients audited by larger firms (BIG5). Thus, the results suggest that these variables were not an important part of a firm's decision to resign.

5.2 Implications

As previously indicated, the results suggest that firms were more likely to resign from clients who currently had a net loss. Given that a net loss is a proxy for financial distress, this result is consistent with prior resignation research (Shu 2000). The results also suggest, consistent with prior resignation research, that firms were more likely to resign from clients who had a greater likelihood of misrepresentation on the part of management (Menon and Williams 1999). These results suggest that firms do respond to variables related to the client that may indicate a greater degree of audit risk and (such firms) are not solely fixed on generating audit fees at the expense of external parties to the client.

Additionally, the results, which are consistent with prior resignation research, suggest that firms were also more likely to resign from clients in situations where auditor tenure was low (Menon and Williams 1999). This may indicate that, as firms become increasingly knowledgeable of the negative attributes of their client relatively soon after the client acceptance decision (e.g., significant weaknesses in internal controls not known at the time of the client acceptance decision), such firms may respond by resigning. If this is true, then this also suggests, as previously mentioned, that firms do respond to increases in audit risk by resigning and are not solely fixed on generating audit fees.

Further, the results suggest, consistent with prior resignation research, that firms are more likely to resign from smaller clients (Menon & Williams 1999). This

may suggest a bias (to some degree) on the part of firms toward those clients that generate larger fees for the firm. It also appears that as firms gain market share in an industry, this allows them to be more selective of the clients that they keep, perhaps resigning from those engagements that are less profitable and/or more risky.

Finally, the results suggest two additional implications. First, the enactment of the Securities Litigation Uniform Standards Act of 1998 (SLUSA) did not change the overall litigation risk faced by firms such that they would alter their decision making regarding resignations. It is possible that firms may require that the SLUSA be tested in actual court cases before they will perceive a reduction in litigation risk. Second, differences in the resignation decision criteria between Big 5 and non-Big 5 firms may not be as substantial as expected. However, significant differences may exist in these criteria among the Big 5 (non-Big 5) firms, but they may offset each other when the Big 5 (non-Big 5) firms, as in this study, are considered as a group.

5.3 Limitations and Extensions

The findings of this study may be limited in generalizability given that (1) the sample period corresponded with a period of relative economic prosperity and (2) the sample was limited to publicly traded companies. Accordingly, additional insights regarding resignations may be obtained from future research in which (1) the sample period corresponds with a period of economic uncertainty and/or (2) the sample includes privately held companies. Admittedly, a firm's decision to resign may be based on client or firm factors not yet addressed in the literature. Accordingly, future research regarding the nature of such factors could provide additional insights regarding resignations.

Proxies were used to indirectly measure several factors (i.e., independent variables) in this study. In this regard, future research could rely on direct measures of such factors as additional information becomes available. For example, effective February 5, 2001, the SEC modified the reporting requirements on proxy statements such that the following information must be disclosed: aggregate audit fees, aggregate fees for financial information systems design and implementation, and aggregate fees for non-audit services. As a result, data related to one or more of these types of fees could be used to directly measure audit fees (versus, as in this study, the use of client revenues as a proxy for audit fees).

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