THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

Do Longer Auditor-Client Relationships Lead to Limited Issues? The Impact of Auditor Tenure on Financial Restatements

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ABSTRACT

This thesis examines the relationship between auditor tenure and the likelihood of financial restatements. Using a sample of U.S company-year observations from the 2011-2020 period, this study aims to provide evidence about whether longer auditor-client relationships are associated with fewer instances of restated financial reports. The results of the study provide evidence that companies with longer auditor tenures are less likely to issue financial restatements, consistent with a positive effect of long auditor tenure on audit quality. In addition, the study highlights the importance of maintaining professional standards throughout auditor-client relationships to preserve financial integrity.

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Chapter 1

Introduction

Auditors are entrusted with the critical task of reviewing their client's financial statements, and the qualities that they must have include objectivity, sound judgement, and professional skepticism. Auditors can be penalized with not only fines but also jail time for disregarding the importance of their job or not following regulations. Auditors are trusted to check their clients' financial statements, and if they fail to complete this duty, it could put both companies at risk, along with their investors, shareholders, and the general public.

In order to try to maintain these qualities in auditors and to limit the risk of fraud, the Sarbanes-Oxley Act of 2002 made it mandatory for the lead engagement partners and review partners on client engagements to be switched every five years. This act was put in place shortly after numerous, large accounting scandals came to light, such as those at Waste Management in 1998, Enron in 2001, and WorldCom in 2002. When auditors get too comfortable reviewing the same documents for the same firms year over year, there is an inherent chance of bias or limited skepticism. Moreover, it could also be believed that one audit firm working with a company for an extended period of time would lead to better audited financial statements, as the auditor is familiarized with the innerworkings of the company. Despite the Sarbanes-Oxley Act making lead partner rotations mandatory, there is no requirement that audit firms need to rotate. Therefore, it is especially important that auditors exercise good judgement and attention to detail whether the auditor has been working with a company for just one year or many years.

The study conducted for this thesis explores current information regarding audit rotation guidelines, and the connections between auditor tenure and audit quality as it relates to financial restatements in U.S. companies from 2011 to 2020.

Chapter 2

Literature Review

Research abounds regarding the relationship between auditor tenure and audit quality. An article by Martani et al. (2021) examines the impact of auditor tenure and rotation on audit quality in Indonesia, comparing the effects between Big 4 and Non-Big 4 audit firms. Auditor tenure can be defined as the length of time an auditor has been engaged with its respective client. In addition, the "Big 4" refers to the four biggest accounting firms, who provide audit, tax, consulting, and advisory services to companies worldwide. These firms include Deloitte, PricewaterhouseCoopers, Ernst & Young, and KPMG. The study finds that the relationship between auditor tenure and audit quality is not significant. Audit firm rotation is shown to positively impact audit quality; however, the positive impact is found to be lower in Big 4 firms compared to Non-Big 4 firms. In Big 4 firms, audit partner rotation is deemed sufficient to enhance audit quality, which can be done easily since there are many partners at each company. The study suggests that there might be a need to reevaluate the decision to abolish mandatory audit firm rotation in Indonesia, especially for Non-Big 4 firms. The research emphasizes the importance of audit firm rotation and suggests potential policy changes to enhance audit quality in the country.

Furthermore, research by Pittman et al. (2022) reviews studies conducted on mandatory partner rotations, focusing on the importance of "within-firm network connections" in the selection of new partners and its impact on post-rotation audit performance using data from China from 2003 to 2015. The study finds that connections between incumbent and successor partners play a significant role in the selection process. For instance, the text states that the probability of a candidate partner being chosen as a successor increases by 35.16% with a one-standard-deviation increase in the number of engagements on which they collaborate with the outgoing partner. The research also finds that “engagements are more likely to be rotated to well-connected successors when the audit engagements are more complex, client-specific knowledge is not readily available to the succeeding partners, and the engagements are more valuable to the audit firms” (Pittman et al., 2022, p. 1114). In addition, the study finds that successor-incumbent connections are associated with fewer client defections and equal or better post-rotation audit quality. It also suggests that these workplace ties can facilitate information transfer, leading to better understanding of clients' auditing environments and improved audit performance.

Mohapatra et al. (2021) also conducts a study of the impact of audit partner rotation on audit quality in India from 2011 to 2017, a period when audit partner rotation was voluntary in India. The empirical results “indicate that the audit partner rotation had no significant impact on audit quality as measured by discretionary accruals and going concern audit opinion” (Mohapatra et al., 2021, p. 1). However, other factors, such as loss year, size of the firm, value, and leverage have impacts on audit quality. Also, there was an inverse relationship between audit fees and audit partner rotation. The study suggests that the findings are in line with experiences in other countries where regulators have moved away from implementing mandatory audit rotations, recognizing the dominance of "knowledge spillover" effects. The study suggests that future research could focus on examining the impact of mandatory audit partner rotation on audit quality.

Alrshah (2015) analyzes the impact of corporate governance mechanisms on the reliability of audited financial statements (RAFS), with a focus on the mediating effect of auditor quality, using data from 188 respondents in the Libyan banking industry. The study uses multiple regression analysis to examine the relationship among independent variables (non-audit services, auditor rotation, measures of audit firm size, measures of audit firm fees, and measures of audit committee characteristics) and the mediating variable (auditor quality). Bivariate regression analysis was employed to analyze the relationship between the mediating variable (auditor quality) and the dependent variable (RAFS). The study finds a direct positive relationship between corporate governance practices and auditor quality in addition to a direct strong positive relationship between auditor quality and the RAFS. Auditor quality is identified as a partial mediator in the relationship between corporate governance mechanisms and the RAFS. The study investigates specific dimensions, indicating that auditor quality positively mediates the relationship between auditor rotation, audit firm size, audit committee characteristics, and the RAFS. However, auditor quality negatively mediates the relationship between non-audit services, audit firm fees, and RAFS. The study suggests that future research could benefit from using more variables and better measures to enrich the outcome.

Salleh and Jasmani (2014) analyze different types of audit reports and audit rotation for Malaysian publicly listed companies (PLCs) over a ten-year period (2003-2012) by reviewing 1445 audit reports from 156 publicly listed companies. The two types of audit rotation that are studied are mandatory rotation of audit partners and voluntary rotation of audit firms. Non-Big 4 audit firms were found to issue more qualified opinions compared to Big 4 audit firms. The paper suggests that audit quality is indirectly related to the type of audit report and auditor tenure. Extended auditor and client relationships are seen as potential threats to high-quality audit engagement that can threaten auditor independence. Over the sample period, 93.9% of annual reports from PLCs were issued with unmodified opinions and 6.1% received modified opinions. The study analyzes the association between audit opinions and audit firm size, which shows that Big 4 firms in Malaysia issue qualified audit opinions less often than Non-Big 4 audit firms. The study tests the hypothesis that audit opinion affects the rotation of audit partner, but fails to find empirical support for this prediction. Modified opinions were found to affect the rotation of audit firms. In addition, the size of the audit firm (Big 4 vs. Non-Big 4) was found to affect both types of audit rotation (firm and partner). The overall results from the test supported all hypotheses except for the association between the mandatory audit partner's rotation and the audit opinion issued.

Lastly, Ling (2023) states that "while regulators have found ethical judgment associated with the failure to detect fraud, very little academic research has explored the role of personal ethics in reporting actual fraud discovered during the audit process." Ling (2023) then reviews the influence of an auditor's moral judgments on their decision to report detected immaterial fraud. Applying the psychology of Moral Foundations Theory to behavioral accounting research to explain auditors' behavior, Ling (2023) finds that when an auditor detects actual immaterial fraud, it places the auditor in an uncomfortable ethical position, requiring the auditor to exercise their decision-making expertise. The study utilizes empirical evidence to substantiate that if auditors detect fraud, they will report it when discovered. Therefore, they will say something when they see something. Overall, the results of this study can reassure investors and financial statement users that, generally, auditors will notify others when they identify suspected immaterial fraud.

As indicated by these studies, there has been research regarding the linkage between auditor tenure and audit quality in other countries; however, this study will contribute to existing evidence by examining the relationship between auditor tenure and audit quality in a U.S. setting.

Chapter 3

Methodology and Hypotheses

The intended outcome of this study is to investigate the relationship between auditor tenure and financial restatements among publicly traded U.S. companies from 2011 to 2020.

Data Retrieval and Analysis Method Used

Using Python and data obtained from the Wharton Research Data Services (WRDS) platform, this study aims to determine whether longer auditor-client relationships are associated with fewer instances of restated financial reports. WRDS is a research platform managed by the Wharton School of Business at the University of Pennsylvania. It allows users to access wide ranges of business-related datasets, making it a great resource for this study. The data obtained from WRDS for the purpose of this study was auditor data from one of its vendors, Audit Analytics, and other company financial data from the vendor, Compustat – Capital IQ. Importing the WRDS data into Python allowed for this study to utilize the various libraries in the Python program to run the logit regression. Python enabled this study to test variables against each other and use a regression model to test correlations and their statistical significances.

The logit regression model in Python, also known as a logistic regression, was used to measure the likelihood of a financial restatement occurring. The variable used to measure this likelihood is the dependent variable referred to as "restated," and it was measured using a set of independent variables. Logit regression was the best regression type for this study since it is useful when the dependent variable is binary. The "restated" variable is a binary variable in this case, where it indicates whether a financial restatement occurred. A “1” indicates that there was a restatement, and a “0” indicates that there was no restatement.

In addition, the dataset included 44,621 observations, meaning that it is a sufficiently large dataset with more reliability and accuracy, and the regression model used Maximum Likelihood Estimation (MLE). MLE helps the logistic regression be more reliable by figuring out which coefficients make the observed data most likely. The statsmodel function in Python used MLE automatically, which made it ideal for running the logit regression.

Variables Used

The independent variables used in this study were “tenure”, “log_rev”, “gm_ratio”, “current_assets”, and “big4”. These variables were tested to determine whether they caused an effect on the dependent variable, which is whether a financial restatement occurred, as stated previously in this chapter. The variable, “tenure”, represents auditor tenure, which is the length in years that a company had the same auditor. The remaining independent variables were used as control variables in an attempt to improve the accuracy of the test and eliminate outside factors that could bias the results. The variable, “log_rev”, represents the log of revenue, which was used to determine the size of each company based on its revenue amount. The log of revenue was taken since it transforms the revenue data to make it normalized, as the revenue variable is known to be skewed by outliers. Furthermore, the variable, “gm_ratio,” represents the gross margin ratio, which is used as another independent variable to measure the gross profit of each company. It is calculated by dividing the gross profit of each company by its revenue. In addition, the variable “current_assets” represents the number of current assets at each company to measure company size. In order to find current assets, this study divides the current assets by the total assets at each company. Lastly, the binary variable “big4” was used to determine whether or not each company was being audited by a big 4 accounting firm.

Table 1. Independent Variable Descriptive Statistics

Variable	Mean	25th Percentile	Median (50th Percentile)	75th Percentile
Tenure	12.292	3.003	8.005	15.008
Revenue ($ millions)	4392.470	42.020	401.177	2116.340
Gross Margin Ratio	-9.752	0.205	0.361	0.567
Current Assets	0.468	0.226	0.448	0.697
Big 4 Auditor	0.663	0.000	1.000	1.000

The table above displays the descriptive statistics, such as the mean, the 25th percentile, 50th percentile, and 75th percentile of each independent variable in the dataset. The mean represents the average of each value in the dataset for each variable. It is calculated by adding up all of the values and dividing that number by the total number of data points. The 25th percentile, which is also known as the first quartile of the dataset, represents the value below which 25% of the data points lie. The median, also known as the 50th percentile, represents the middle value of the dataset, and the 75th percentile represents the value below which 75% of the data points lie.

The first variable, “tenure”, has a mean of 12.292 years and a median of 8.005 years, which means that the average length of the auditor-client relationships in this dataset are generally quite long. Next, the revenue variable has a mean of $4392.47 million, which is much higher than the 25th, 50th, and 75th percentiles. The table displays the actual revenue number instead of the log of revenue to show its actual dollar value. In addition, the mean gross margin ratio is -9.752, which indicates that the average company in this dataset is experiencing losses, and the mean of the current assets is 0.468, showing that 46.8% of the assets are current at these companies on average. Lastly, since the big 4 auditor variable is binary, the percentiles are especially significant, which show that the middle and 75th percentile of the dataset displayed a "1." The mean is also 0.663, which shows that more often than not, the company is audited by a big 4 auditor.

Research Question and Hypotheses

The research question and hypotheses tested within this study are listed below.

Research Question: Is there a relationship between the length of time the company has had the same auditor and the number of financial restatements the company has issued?

Alternative Hypothesis (H_A): Companies that keep the same auditor for a longer period of time are less likely to issue financial restatements to companies with shorter auditor tenures.

Null Hypothesis (H_0): There is no relationship between auditor tenure and the likelihood of a company issuing a financial restatement.

Chapter 4

Results and Analysis

The logit regression tested the hypothesis that companies that keep the same auditor are less likely to issue restatements. As stated previously in this paper, the regression tested the impact of various independent variables, such as tenure, log of revenue, gross margin ratio, current assets, and whether the auditor belonged to a big 4 accounting firm, on the dependent, binary variable, which was whether or not a restatement occurred. Based on the regression results, the statistically significant variables, where the p-value is less than 0.05, include tenure, log of revenue, and current assets. The p-value is the probability that one would observe data of this nature if the null hypothesis were true, so these extremely low p-values tell us that we can reject the null hypothesis, which is that there is no relationship between auditor tenure and the likelihood of a company issuing a financial restatement. The other variables, such as the gross margin ratio and whether or not the company was audited by a big 4 accounting firm, were not significant in this study, which shows that they did not influence the likelihood of the company issuing a financial restatement. The regression results are displayed in the table below.

Table 2. Logit Regression Output

Variable	Coefficient	Std. Error	Z-Statistic	p-Value	95% CI [Lower, Upper]
Intercept	-2.3482***	0.056	-41.811	0.000	[-2.458, -2.238]
Tenure	-0.0051***	0.001	-4.228	0.000	[-0.008, -0.003]
Log of Revenue	0.0460***	0.008	6.049	0.000	[0.031, 0.061]
Gross Margin Ratio	2.61e-06	9.24e-05	0.028	0.977	[-0.000, 0.000]
Current Assets	-0.3893***	0.066	-5.927	0.000	[-0.518, -0.261]
Big 4 Auditor	-0.0210	0.045	-0.469	0.639	[-0.109, 0.067]
The significance levels are as follows: a single asterisk (*) indicates a p-value less than 0.05, two asterisks (**) indicate a p-value less than 0.01, and three asterisks (***) indicate a p-value less than 0.001.					

The correlation coefficient for the tenure variable is -0.0051, with a standard error of 0.001. The z-score of -4.228 with a very low p-value of 0.000 show that the relationship between auditor tenure and the likelihood of financial restatements is statistically significant. The coefficient is the slope of the relationship between auditor tenure and the likelihood of a financial restatement, and the coefficient being negative indicates that the likelihood of a restatement occurring decreases as the company retains the same auditor for longer. Furthermore, the standard error measures how precisely the coefficient was estimated, and it being very low means that it is very reliable. Lastly, the z-score measures how far the coefficient is from 0, or the null hypothesis value, in terms of standard deviations. It is calculated by dividing the coefficient by the standard error.

This result supports the idea that a longer auditor-client relationship may contribute to a higher level of audit quality, which is most likely due to the auditor obtaining a deeper understanding of its client's business operations over time. Along with the idea of the auditors having a deeper understanding of the client, other positive effects of a longer auditor-client relationship are that there could be enhanced trust between the two firms and the ability for the auditor to complete more efficient audits. On the other hand, a longer auditor-client relationship could potentially pose a "familiarity threat," which may lead auditors to be more subjective in their audits of a client's financial statements rather than objective. This study, however, displays the idea that a longer auditor-client relationship contributes to a higher audit quality, as there is less likelihood of a financial restatement occurring as auditor tenure increases.

The statistically significant control variables in this study were log of revenue and current assets. The log of revenue's correlation coefficient being 0.0460 with a p-value of 0.000 signifies a positive statistically significant relationship. This presents the idea that larger companies, with higher revenues, tend to issue restatements more often. This can be due to increased complexity in their financial statements due to their large nature. In addition, the correlation coefficient for the current assets variable is -0.3893 with a p-value of 0.000, which shows a negative statistically significant relationship. This idea is interesting as it means that companies with a high amount of current assets are less likely to issue restatements. Moreover, the gross margin ratio variable and the variable indicating whether or not the company was audited by a big 4 auditor both had high p-values, meaning that there was no statistically significant relationship between these variables and the likelihood of a company needing to issue a financial restatement. Especially regarding the big 4 variable, this result displays the idea that there is not a significant relationship between auditor size alone and the quality of the audit.

It is clear that not all variables showed statistical significance; however, the study's research question can be answered by the tenure variable's statistically significant coefficient and p-value. This result confirms our alternative hypothesis that companies that keep the same auditor for a longer period of time are less likely to issue financial restatements to companies with shorter auditor tenures. Although other variables could have been used, such as the auditor's fees or the type of industry each company belongs in, the overall study contributed to some significant findings.

The findings of this study are impactful since they offer insightful evidence about the value of maintaining long-term auditor relationships. Investors and management involved with companies need to assess audit quality and financial health in order to make informed decisions. If auditor tenure plays a role in reducing the likelihood of restatements, it could be used as an indicator of financial reporting reliability. Therefore, it could be assumed that firms that maintain longer relationships with auditors may present themselves as a lower risk to investors and stakeholders.

Chapter 5

Conclusion

Auditors play an important role in ensuring the accuracy and integrity of financial statements, which requires them to uphold qualities such as objectivity, sound judgement, and professional skepticism. Failing to comply with these standards can have severe consequences, including penalties, fines, or imprisonment, and could jeopardize not only the companies involved but also their investors, shareholders, and the rest of the public. The trust placed in auditors is critical, and any neglect in their responsibilities can lead to financial instability and loss of confidence in the markets.

To mitigate the risks associated with complacency and fraud, the Sarbanes-Oxley Act of 2002 mandates the rotations of lead engagement partners every five years. While longer auditor-client relationships can foster efficiency and deeper understanding of a company's operations, they also carry the risk of reduced skepticism or unconscious bias. The balance between familiarity and independence remains a key consideration in auditing.

This study investigated the relationship between auditor tenure and the likelihood of financial restatements among U.S. companies from 2011 to 2020. The results support the hypothesis that companies with longer auditor tenures are less likely to issue financial restatements compared to those with shorter tenures. While not all variables showed statistical significance, the tenure variable's significant coefficient and p-value confirm the positive impact of auditor continuity on financial reporting quality. There are, however, some limitations to this study, such as the risk of omitted variables. It is very possible that there are outside factors that the study did not take into account, such as market conditions or management changes during the period. In addition, the study used publicly available financial data, so there is a lack of company-specific evidence that could affect the results. Future research can be conducted by incorporating other variables into the study to examine different insights of the relationship between auditor tenure and audit quality.

This study concludes that longer auditor-client relationships could lead to limited issues, but it is imperative that the auditors always remain diligent throughout their tenure. Although regulations since 2002 have sought to reduce the risks associated with long auditor tenure, this study highlights the need for ongoing attention to detail and judgement throughout the auditor-client relationship to ensure audit quality and public trust.

Appendix

List of Variables in Analysis

Variable	***Description***
Tenure (tenure)	Tenure represents the length in years of which a company had the same auditor.
Log of Revenue (log_rev)	The log of revenue was taken since it transforms the revenue data to become more normalized, as the revenue variable is known to be skewed by outliers. Revenue was used to determine the size of each company based on its revenue amount.
Gross Margin Ratio (gm_ratio)	The gross margin ratio was used to measure the gross profit of each company, and it was calculated by dividing the gross profit of each company by its revenue.
Current Assets (current_assets)	The number of current assets was used to measure company size, where current assets were divided by total assets for each company.
Big 4 Auditor (big4)	Big 4 Auditor was a binary variable used to determine whether or not each company was being audited by a big 4 accounting firm.
Restated (restated)	. Restated is the dependent variable, which represents whether or not a financial restatement occurred in the time period.

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ACADEMIC VITA

Natasha Nybro

Education

The Pennsylvania State University | Schreyer Honors College — **University Park, PA**
Smeal College of Business | Master and Bachelor of Science in Accounting — *Graduation Date: Dec 2024*
Smeal College of Business | Minor in Information Systems Management

Relevant Experience

PricewaterhouseCoopers LLP — **New York, NY**
External Audit Intern | Banking and Capital Markets Sector — *June 2024 – Aug 2024*
- Gained knowledge about the banking and capital markets industry through various client meetings
- Analyzed the client's financial data in Excel and picked samples for substantive testing
- Completed workpapers in order to help the team meet its audit planning objectives and deadlines

Master of Accounting (MAcc) Program Student Association — **University Park, PA**
President — *Dec 2022 – Dec 2023*
- Oversaw the executive board while supporting and assisting each board member to complete their assigned duties
- Coordinated large professional events and recreational activities for the MAcc community, such as the MAcc Kickoff event, to facilitate networking with recruiters and camaraderie within the program
- Acted as a liaison between recruiters and MAcc students to communicate information and plan networking events
- Enrolled in rigorous accounting courses to graduate with a master's degree on a compressed timeline of five years

Commerzbank AG — **New York, NY**
Corporate Banking Intern | Technology, Media, and Telecommunications Sector — *May 2022 – Aug 2022*
- Researched information about prospective clients and created presentations to inform the team of potential new business
- Extracted and analyzed market data by utilizing the Bloomberg and S&P Capital IQ platforms
- Obtained knowledge about the international aspects of the bank and the relationships between the branches abroad
- Job shadowed in the accounting sector to learn about the bank's broker-dealer subsidiary, Commerz Markets LLC

Alpha Kappa Psi Professional Business Fraternity — **University Park, PA**
Recruitment Chair | Fraternal Development Chair — *Feb 2021 – Present*
- Spearheaded the facilitation and organization of various informative recruitment events in order to induct new members
- Managed logistics and budgeting for several events aimed at strengthening unity for the brotherhood of 96 members
- Developed professional, networking, and interviewing skills through mock interviews, resume workshops, professional presentations, and informational sessions with the fraternity

Leadership & Involvement

Schreyer Honors Orientation (SHO TIME) — **University Park, PA**
Orientation Mentor | Finale Committee | Arrival Committee — *Jan 2021 – Aug 2022*
- Collaborated with an incoming class of over 300 scholars through different activities related to arrival, academics, entertainment, communications, and logistics over the span of 2 days
- Assisted a group of first-year students by offering insight on scheduling, research experiences, college study tips, time management strategies, Penn State culture, and extracurricular opportunities to aid in the college transition

Birravino Restaurant — **Red Bank, NJ**
Hostess — *May 2023 – Aug 2023*
- Efficiently scheduled reservations from incoming calls while providing guests with a warm and inviting atmosphere
- Demonstrated strong problem-solving skills during peak hours of business, ensuring smooth seating arrangements and optimizing table turnover in order to accommodate the large amount of customers
- Addressed customer needs and collaborated with the team of employees to enhance overall guest satisfaction

The Atlantic Club — **Red Bank, NJ**
KidZone Child Care Employee — *Jun 2019 – Jan 2022*
- Facilitated new employment training through comprehensive hands-on lessons and verbal instructions
- Interacted with up to 15 children every shift by engaging them in activities for an average of 14 hours per week
- Communicated with gym members to ensure customer satisfaction with children interaction

Honors, Skills, & Interests

Honors: Deans List, Academic Excellence Scholarship, Italian American Police of New Jersey Scholarship, Ellen Cunningham Akmentins Memorial Scholarship, FBLA Scholarship, Howard D. Osborn Scholarship
Skills: Proficient knowledge of Microsoft Office (Excel, PowerPoint, and Word), Introductory knowledge of SQL, Tableau, Visual Basic for Applications, Access, RapidMiner, Gephi, and Bloomberg
Interests: Bichon Frises, Chai Lattes, LBI Beach Trips, New York Yankees, Pickleball, Pizza, Singing, Show Tunes, Traveling, Trumpet