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RIDING THE MERGER WAVE:

THE GATEKEEPING ROLE OF AUDITORS

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Robert R. Carnes

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The dissertation of Robert R. Carnes was reviewed and approved* by the following:

Karl A. Muller, III
Associate Professor of Accounting
Dissertation Adviser
Chair of Committee

Orie E. Barron
Professor of Accounting

Dane M. Christensen
Assistant Professor of Accounting (University of Oregon)
Special Member

David Haushalter
Associate Professor of Finance

Hal White
Associate Professor of Accounting

Brent W. Ambrose
Professor of Risk Management
Director of the Smeal College Ph.D. Program

*Signatures are on file in the Graduate School.

ABSTRACT

I investigate whether auditors engage in greater monitoring of firms during industry merger waves. Merger waves are time periods of industry transformation (i.e. disruption) that are accompanied by higher uncertainty about industry prospects, limited analyst and board monitoring, and poorer deal performance. These factors threaten the quality of firm financial reports. I test whether auditors increase effort during these periods and whether auditors are effective in achieving high audit quality. I do this using a sample where all firms engaged in an acquisition, which allows for comparison of audits conducted inside versus outside merger waves, both within and across industries. For in-wave audits, I find audit fees are higher, financial statements are less likely to be restated, auditors are more likely to timely identify and report internal control deficiencies, and auditor turnover is higher. Overall, these findings are consistent with auditors adapting to merger waves and effectively navigating industry disruptions.

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Chapter 1. INTRODUCTION

Industry merger waves are a well-established empirical regularity studied in corporate finance.[1] These are periods of industry transformation (i.e. disruption) in the literal sense that high deal volumes restructure industry operating environments and, theoretically, they are linked to firms responding to underlying industry changes (e.g., Gort 1969; Mitchell and Mulherin 1996). The economic impact of merger waves is impressive. For example, during peak merger activity from 2004 to 2008, approximately 6% of U.S. public companies were acquired in just one year (Baker and Kiymaz 2011). Further, in recent work, Duchin and Schmit (2013) find that the disrupted industries that undergo merger waves have higher uncertainty about industry prospects, limited analyst and board monitoring, and poorer deal performance. These factors threaten the quality of firm financial reports. The natural question then for investors is, can I trust the financial statements during these time periods? Are other gatekeepers within corporate governance systems operating effectively? In other words, where are the auditors?

In this paper, I investigate whether auditors engage in greater monitoring of firms during industry merger waves. Specifically, I investigate whether auditors increase audit effort during merger waves and whether auditors are effective in achieving high audit quality. Theory predicts auditors respond to the lower quality information and monitoring environments in merger waves by increasing audit effort, which increases audit quality and protects against asymmetric penalties for under-auditing, and by withdrawing from high risk engagements (e.g., Antle and Lambert 1988; Bockus and Gigler 1998). I test the impact of merger waves on these audit responses using audit fees (a proxy for audit effort), the incidence of restatements and auditor reported internal

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[1] For example, Gort (1969), Mitchell and Mulherin (1996), Jovanovic and Rousseau (2002; 2008), Harford (2005), Garfinkel and Hankins (2011), Ovtchinnikov (2013), Duchin and Schmidt (2013), Ahem and Harford (2014), and Bonaime, Gulen, and Ion (2017). See Baker and Kiymaz (2011, p.17-37) for a review of the merger wave literature.

control deficiencies (proxies for audit quality), and auditor turnover following M&A deal announcements. Whether auditors adjust audit effort and quality in response to merger waves is unclear. On the one hand, auditing standards require auditors to obtain a sufficient understanding of both their clients and their clients' *environments* in order to plan and execute their audits (AICPA 2001; PCAOB 2010a). On the other hand, prior literature indicates that auditors can struggle with recognizing patterns in financial and non-financial data (e.g., Bedard and Biggs 1991) and effectively assessing and responding to audit risk (e.g., Daniel 1988; Barron, Pratt, and Stice 2001).[2] These limitations may, therefore, lead auditors to be yet another relatively ineffective gatekeeper during merger waves.[3] Additionally, the majority of studies that have examined the effects of market conditions on auditing fail to find that auditors are responsive (Erickson, Mayhew, and Felix 2000; Copley and Douthett 2009; Leone, Rice, Willenborg, and Weber 2013; Desai, Rajgopal, and Yu 2016).[4]

Comparing audits conducted inside versus outside merger waves in a sample where all firms engaged in a material acquisition (i.e. holding M&A activity constant), I provide empirical evidence consistent with theory (e.g., Antle and Lambert 1988; Bockus and Gigler 1998). First, audit fees are 5.7% to 6.6% higher for in-wave audits. This evidence indicates auditors increase their monitoring of acquirers during merger waves. Second, financial statements that are audited during merger waves are 5.3% to 6.5% less likely to be restated and auditors are 2.4% to 4.6% more likely to timely identify and report internal control deficiencies. These findings corroborate increased auditor effort during merger waves, which appears to result in higher audit quality.

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[2] Audit risk is the risk that the auditor provides a "clean" or unqualified audit opinion to financial statements that are in fact materially misstated (PCAOB 2010b).

[3] The term "gatekeeper" in this paper broadly refers to any agent with a fiduciary responsibility to enhance investor confidence in capital markets (SEC 2014).

[4] Prior literature investigates banks during the Savings and Loan Crisis (Erickson et al. 2000), internet firms during the Dot-Com Bubble (Leone et al. 2013), all firms during IPO trends (Copley and Douthett 2009), and banks during the Financial Crisis (Doogar, Rowe, and Sivadasan 2015; Desai et al. 2016).

Finally, the likelihood of auditor turnover is 1.5% to 2.5% higher during merger waves. This finding is consistent with auditors protecting themselves against the increased likelihood of litigation and/or reputational damages. These results are robust to controlling for firm and deal attributes and including industry-, time-, and firm-fixed effects.

In mediation analysis, I find that higher industry uncertainty, limited industry monitoring, and poorer deal performance are paths through which merger waves affect auditor effort; as measured using properties of analyst forecasts following Barron, Kim, Lim, and Stevens (1998) and industry-level stock returns.

In additional tests, I explore alternative explanations for my findings. First, I check whether my findings are an artifact of ongoing trends during the 2004-2008 clustering of industry merger waves by both conducting a placebo test and re-estimating my models with a 2004-2008 fixed effect. Second, I address the possibility of strategic auditor-client matching influencing my results by re-estimating my models without firms who changed auditors prior to their acquisitions. Finally, I address the possibility that my results are driven by a correlated omitted variable by calculating the impact threshold of a confounding variable (ITCV) for my analyses (Frank 2000). Across all tests, the results are inconsistent with these alternative explanations.

This study is the first to connect the literature in corporate finance on merger waves to the role of the external auditor, an important independent agent in corporate governance systems. Duchin and Schmidt (2013) provide evidence that uncertainty is higher and internal and external corporate monitoring is lower during merger waves. The gatekeeping responsibilities of the auditor and potential value of auditor oversight are therefore elevated during these periods. In contrast to other gatekeepers (i.e. analysts and directors), I provide evidence that auditors are responsive to merger waves and provide higher quality corporate monitoring within the scope of their influence.

These findings begin to address the gap in the literature identified by Donovan, Frankel, Lee, Martin, and Seo (2014), who note that "…additional research is needed to identify settings where audit quality is likely salient" (p.330). Given the cyclical nature of merger waves, it is important to understand how auditors behave during these economically consequential periods.

This study also fills a significant void in the literature on the responsiveness of auditors to industry disruptions. The economic importance of industry disruptions is apparent "…by the fact that more than half of the companies on the Fortune 500 have disappeared since 2000 and estimates are that four in 10 companies could be displaced by digital rivals by 2020" (Ernst & Young 2017). The auditing profession has focused on maintaining audit quality during these dynamic market conditions, as evidenced by, market condition specific, PCAOB inspection findings (PCAOB 2010c), practice alerts (PCAOB 2008, 2011a), and auditing standards (PCAOB 2010a).[5] Indeed, the PCAOB even lists merger waves as a key area of inspection focus in its 2017 Staff Inspection Brief (PCAOB 2017).[6] Research on how changing market conditions affect audit practice, however, is relatively scarce.[7] The extant empirical evidence generally finds little evidence that auditors are responsive. Prior studies have taken one of two approaches: (1) investigate macro-economic phenomena where a valid comparison group may not be available to rule out contemporaneous time trend effects (e.g., the Great Recession), or (2) investigate individual

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[5] Relatedly, one of the three pillars in the mission statement of the Center for Audit Quality, a nonprofit organization supported by accounting firms registered with the PCOAB, is "Advocating policies and standards that promote public company auditors' objectivity, effectiveness, and responsiveness to dynamic market conditions" (CAQ 2017).

[6] In its Staff Inspection Brief, the PCAOB (2017) notes as a key inspection focus: "Economic factors - Audit areas affected by factors related to current economic conditions, including Brexit and its effect in the European financial sector, the continued high rate of merger and acquisition activity [i.e. the current merger wave], the search for higher yielding investment returns in a low interest rate environment, and the fluctuations in oil and natural gas prices." (p.1)

[7] DeFond and Zhang (2014) note: "Auditors' incentives and competencies are also affected by audit environment factors such as regulatory intervention, market conditions, auditing standards, and the institutional environment. However, with the exception of regulatory intervention, research on these other factors is relatively scarce" (p.303). Relatedly, Knechel, Krishnan, Pevzner, Shefchik, and Velury (2012) recommend researchers explore the question of "How does audit quality vary over time and business cycles" (p.406). Hurtt, Brown-Liburd, Earley, and Krishnamoorthy (2013) also note that they "…could not identify studies that examined the impact of the client's industry… on an auditor's skeptical judgment" (p. 61).

industries during *unique* time periods where the risk facing the auditor was, on average, not understood by capital market participants (e.g., the Savings and Loan Crisis of the 1980s, the Dot Com Bubble of the late 1990s, and the Financial Crisis of the 2000s). In contrast, I investigate the M&A setting where merger waves allow for the investigation of *cross-sectional* and *temporal* variation in industries undergoing disruption. Using this rather unique setting, this study provides large-scale multi-industry evidence on the ability of auditors to adjust to *cyclical* changes in industry operating environments.

As with any study, the generalizability of the findings in this paper are subject to limitations. First, this paper studies the equilibrium of supply and demand for auditor assurance and is not able to disentangle auditor supply from firm demand. For example, rather than auditors driving supply of greater auditor monitoring in-waves, boards could be substituting for their weaker governance in-waves by demanding greater auditor assurance. Second, this paper focuses solely on auditor behavior in the M&A setting, an area where auditors appear to have a strategic advantage over analysts and boards in monitoring M&A trends. This advantage likely stems from auditors having access to private M&A information across firms, the ability to bill firms for inter-year work load adjustments, and the extra time during the audit process to analyze ex-post market trends. To the extent these monitoring advantages are less pronounced in other environmental settings, such as economic crises where phenomena is less predictable, auditors may be less responsive. Nevertheless, merger waves are an economically significant phenomena and this paper provides novel evidence that speaks to how auditors respond to these important time periods and provides insights into how auditors processes industry-level market conditions.

Chapter 2. BACKGROUND AND HYPOTHESIS DEVELOPMENT

2.1 Background on Merger Waves

The extant empirical literature has established that mergers cluster by industry in waves. Early observations of the phenomenon extend back to the clustering of mergers in the 1890s (Moody 1904; Bain 1944; Stigler 1950; Nelson 1959). Subsequently, merger waves have been observed on a regular basis with industry wave clusters occurring in the 1920s, 1960s, 1980s, 1990s, and 2000s (Berk, DeMarzo, and Harford 2012).[8] Empirically, merger waves have been rigorously documented with Town (1992) demonstrating that M&A time series data can be reasonably fit using a two-state, Marvok switching-regime model and Mitchell and Mulherin (1996) documenting non-random clustering of M&A activity by industry.

The two major theories that have been set forth to explain merger waves are not mutually exclusive and can be classified as neoclassical and behavioral (Baker and Kiymaz 2011, p.17-37). Neoclassical economic theory suggests that rational merger waves arise in response to technological, regulatory, and/or economic shocks to industry environments, because mergers and acquisitions are often the least-cost means for industry structure to adjust to the shocks (Mitchell and Mulherin 1996). Gort (1969) was the first to formally propose an economic disturbance theory of merger waves, noting that standard theories of merger activity alone (e.g., economies of scale and monopoly power) are incomplete and cannot explain observed variation in transactions across industries and over time. An economic disturbance model is necessary to explain what induces and perpetuates the clustering of M&A activity in some industries and time periods but not others.

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[8] A common practice in the merger wave literature is to label industry wave clusters by a single economic phenomenon (e.g., "monopoly" for the 1890s, "oligopoly" for the 1920s, "conglomerate" for the 1960s, etc.). Mitchell and Mulherin (1996) note that these characterizations are ad hoc and underrepresent the dynamic motivations driving individual industry merger waves. For example, the aggregate M&A activity in the 1990s was largely driven by industry shocks pertaining to deregulation, technological advancement, and other fundamental factors, however the aggregate activity for the period was given the generic label "strategic, synergistic factors."

Relatedly, behavioral theory of merger waves generally suggests that, although both the standard and neoclassical theories are valid, the theories are incomplete because they do not account for financial market inefficiencies that cause observed asset misvaluations during merger waves (Shleifer and Vishny 2003; Rhodes-Kropf and Viswanathan 2004). Behavioral theory thus complements neoclassical theory by suggesting that merger waves tend to cluster by industry when macro-level market-to-book ratios are high relative to their true valuations.[9] The co-existing nature of the neoclassical and behavioral theories is supported empirically by studies such as Dong, Hirshleifer, Richardson, and Teoh (2003), Harford (2005), and, recently, by Bhagwat, Dam, and Harford (2016), who note, "the general conclusion from the extant literature is that many factors contribute to merger activity, but economic shocks and macroeconomic conditions are the dominant factors" (p. 3001).

In recent work, Duchin and Schmit (2013) find that the industries that undergo merger waves have lower quality information and monitoring environments. Specifically, they find that merger waves are accompanied by higher uncertainty about industry prospects, poorer quality analyst forecasts, and lower quality corporate governance. Additionally, Duchin and Schmidt (2013) find that managerial herding and the absence of effective monitors (i.e. analysts and directors) during merger waves lead to worse deal outcomes. They attribute the poor performance in merger waves to the ability of managers to share responsibility for deal outcomes with industry peers. In the neoclassical tradition, however, Mitchell and Mulherin (1996) note that poor deal performance inside merger waves is the natural outcome of underlying industry economic changes, which increase the probability of adverse outcomes. In this study, I note these factors are outside the direct control of the auditor and seek to understand how auditors respond to dynamic merger

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[9] Harford (2005) argues that, even if industry disturbances do not cluster in time, the ability of industry structures to respond to the disturbances is dependent on macro-level liquidity.

wave conditions.

2.2 Merger Waves, Audit Risk, and Auditor Business Risk

All mergers threaten the quality of firm financial reports because of mechanical changes that occur when firms combine, however, the circumstances surrounding merger waves pose an increased challenge to auditors. In this section, I discuss the impact of industry uncertainty, limited industry monitoring, and poorer deal performance on audit risk and auditor business risk.

2.2.1 Industry Uncertainty and Audit Risk

As industries change during merger waves, information about the past becomes less effective in predicting the future (Gort 1969), which impacts all three elements of audit risk.[10] First, industry changes increase inherent risk by increasing uncertainty over the accounting treatment of firm financial statement balances. Given the definition of an asset is a "…*probable future* economic benefit…" and the definition of a liability is a "…*probable future* economic sacrifice…" (FASB 1985), industry disruptions that alter industry *futures* inherently increase the difficulty of determining the proper valuation and/or classification of transactions. This uncertainty impacts a wide range of financial statement accounts that require auditor judgment, including accounts based on fair values (AICPA 2003) and accounting estimates such as uncollectible receivables, depreciation and amortization, warranty claims, etc. (AICPA 1989a; Bratten, Gaynor, McDaniel, Montague, and Sierra 2013).

Second, the industry changes that accompany merger waves increase control risk by challenging the design of firm internal control systems and increasing the complexity of their operation. As firms adapt to new market conditions through actions such as introducing new

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[10] The three elements of audit risk are inherent risk, control risk, and detection risk. Inherent risk is the susceptibility of balances to misstatement absent intervention by either firm internal controls or the external auditor. Control risk is the risk that firm internal controls will not prevent or detect potential misstatements. Detection risk is the risk that the auditor will not detect misstatements incurred by the firm (PCAOB 2010b).

revenue streams or downsizing employees, the likelihood of new weaknesses in the design of firm internal control processes increases. Additionally, as the accounting treatment of financial statement balances becomes more uncertain, the review procedures required to operate internal controls become more complex and subject to error (Doyle, Ge, and McVay 2007; Ashbaugh-Skaife, Collins, and Kinney 2007).

Finally, as industries change, firms become less comparable both across years and within industries, which decreases the relevance and reliability of auditor analytical procedures. Analytical procedures are integral to auditing as they are used to substantively test the reasonableness of accounting balances (e.g., accounting estimates) and are so important that they are required during the planning and final review stages of every audit (AICPA 1989b). To compensate for the reduced effectiveness of analytical procedures, auditors must gather more informative information, which includes increasing expensive substantive audit procedures.

In summary, industry uncertainty threatens the quality of auditor monitoring by concurrently increasing the risk of material misstatement for firms (i.e. inherent risk and control risk) and increasing the costs of obtaining more informative information for auditors.

2.2.2 Limited Industry Monitoring and Audit Risk

During merger waves, higher industry uncertainty and constrained monitoring resources reduce the quality of analyst and board monitoring and threaten audit quality. Industry uncertainty affects analysts and boards similarly – as the future of an industry becomes less predictable, it becomes more difficult to assess and monitor management and firm performance. While the objectives of these two gatekeepers are different, both play an important role in shaping the corporate governance systems that impact the quality of firm financial reports (e.g., Karamanou and Vafeas 2005; Beyer, Cohen, Lys, and Walther 2010). When these corporate governance

systems are impaired during merger waves, firms' risk of material misstatement rises, which increases the responsibility placed on auditors to ensure the quality of the firms' financial reports.

Additionally, in the short run, corporate monitors have limited ability to increase resources to respond to merger waves. Indeed, Duchin and Schmidt (2013) note that overwhelming deal volumes contribute to poorer quality analyst forecasts and impair the ability of boards to assess and respond to the performance of management. In regards to auditors, resource constraints may also affect audit quality. For example, Bills, Swanquist, and Whited (2016) find that discretionary accruals and financial statement restatements are higher when auditor offices experience sudden growth. To the extent that auditors are unprepared for variation in M&A deal volumes, merger waves may consequently constrain the ability of auditors to reduce audit risk.

2.2.3 Poorer Deal Performance and Auditor Business Risk

The higher incidence of bad deal outcomes during merger waves increases auditor business risk – or the risk of reputational and/or financial injuries to an auditor's professional practice due to client relationships (Houston, Peters, and Pratt 1999). Reputational and/or financial injuries arise because firm losses provide stakeholders a basis for pursing litigation against auditors. When investors sustain losses, they will attempt to recover the losses from auditors via litigation as long as the costs of pursuing litigation do not exceed estimated recoveries (Narayanan 1994). As losses increase, the size of estimated recoveries increases, which consequently increases the likelihood of auditor litigation. During merger waves, auditors therefore not only face increased audit risk, but also encounter increased business risk.

2.3 Merger Waves and Auditor Risk Response Actions

Theory predicts that auditors are responsive to audit risk because ex-post financial misstatements carry litigation and/or reputational penalties that reduce auditor profit (Simunic

1980; Pratt and Stice 1994). Similarly, auditors are responsive to business risk because of its direct tie to auditor penalties. The objective of auditors is therefore to maximize profits by not only maximizing revenue and minimizing audit production costs, but also minimizing audit risk and auditor business risk (e.g., Antle and Lambert 1988; Antle and Nalebuff 1991).

Auditors are likely to respond to the increased audit risk and auditor business risk present in merger waves through complying with risk assessment guidelines in generally accepted auditing standards (GAAS) and monitoring industry trends. The second standard of fieldwork in GAAS requires auditors to obtain a sufficient understanding of both their clients and their clients' *environments* in order to plan and execute their audits (AICPA 2001; PCAOB 2010a). In the context of audit clients participating in M&A transactions, one of the most important investment decisions made by a firm, auditors' understanding of their clients' "environments" inextricably includes consideration of M&A trends. Auditors may have the ability to assess M&A trends through their unique access to M&A deal proceedings throughout their lifecycles and across firms. Indeed, auditors serve as thought leaders in providing M&A insights (e.g., PwC 2017, EY 2015, Deloitte 2017, KPMG 2016).[11] This knowledge could place auditors at an advantaged position over other corporate monitors to timely recognize and plan adequate resources to respond to merger waves. Additionally, the reconstitutions of firm boundaries during mergers provide auditors the opportunity to renegotiate and risk adjust their work.

However, there are several reasons to question whether auditors adjust audit effort and quality to merger waves. First, prior research suggests that, in general, auditors may struggle with recognizing patterns in financial and non-financial data and attributing causation (e.g., Bedard and Biggs 1991). Relatedly, prior literature questions the ability of auditors to consistently and

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[11] Donovan et al. (2014) note auditors have a competitive advantage over other information intermediaries in supplying information that requires access to non-public information.

effectively apply the audit risk model (e.g., Daniel 1988; Barron, Pratt, and Stice, 2001). Second, adjustments to audit effort are costly, because they require both the reallocation of audit resources and difficult auditor-client fee negotiations. Third, the majority of studies that have examined other market disturbance settings fail to find that auditors are responsive (Erickson et al. 2000; Copley and Douthett 2009; Leone et al. 2013; Desai et al. 2016). Finally, PCAOB inspection findings indicate auditors were deficient in responding to market related audit risk factors during and after the Great Recession (PCAOB 2010c; 2011b; 2011c).

Despite these concerns, even with challenging market conditions, the majority of audited financial statements are not restated (Scholz 2008; 2014). This prima facie evidence indicates that the concerns above may underestimate the dynamic ability of auditors and are likely specific to unique time periods and/or research design specifications. For example, PCAOB inspections are non-random and targeted at high risk audit engagements (Lennox and Pittman 2010a). This inspection design choice produces evidence that is likely ungeneralizable to the entire population of U.S. public company audits. In contrast, this paper investigates the audit response to merger waves using large-scale multi-industry data.[12]

I formulate my hypotheses on how auditors respond to the increased audit risk and auditor business risk present in merger waves using the risk response framework of the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Under the COSO (2013) framework, the two broad risk response actions available to auditors facing increased risk are risk mitigation and risk avoidance.[13] Risk mitigation takes the form of auditors increasing audit effort

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[12] Collins and Kim (2015) note that 30% of Compustat firm-years contain M&A transactions from 1991 to 2012.

[13] There are four risk response actions available to an entity under the COSO (2013) framework: (1) risk mitigation (e.g., internal controls, monitoring, and other activities to reduce the likelihood or impact of risk), (2) risk avoidance (e.g., exiting or divesting of an activity), (3) risk transfer (e.g., hedging, insurance, and outsourcing), and (4) risk acceptance (e.g., no action taken). Risk mitigation and risk avoidance are the only two rational responses available to the auditor. Professional standards and the lack of functional insurance market prohibit auditors from effectively

to increase audit quality and protect against asymmetric penalties awarded for under-auditing (e.g., Antle and Lambert 1988; Antle and Nalebuff 1991). Risk avoidance takes the form of auditors terminating contracts with high risk firms. In the merger wave setting, it is likely that auditors use one or both strategies to respond to the increased audit risk and auditor business risk.

In regards to the relationship between merger waves and audit effort, both higher audit risk and higher auditor business risk in merger waves lead to the following prediction:[14]

H1: Audit fees are higher for audits inside merger waves than outside of merger waves.

If auditors increase audit fees inside merger waves, there are several reasons that suggest that a portion of this response is attributable to auditors conservatively increasing effort instead of simply pricing a risk premium. First, auditor effort levels are more observable in-waves because there is a higher risk the financial reports are misstated. This visibility incentivizes auditors to raise effort. Second, auditors are asymmetrically penalized for under-auditing versus over-auditing, which incentivizes auditors to conservatively error on the side of over-auditing when audit risk is higher in-waves (e.g., Antle and Lambert 1988; Antle and Nalebuff 1991). Finally, because merger waves are accompanied by poorer deal performance, auditors face higher auditor business/litigation risk in-waves, which further incentivizes conservative audit effort.

Higher audit effort should, on average, lead to the outcome of higher audit quality. In the M&A setting, conservative auditor effort should therefore manifest in higher ex-post audit quality for financial statements that are audited during merger waves. I use the incidence of restatements and auditor reported internal control deficiencies as proxies for audit quality. Restatements are a direct measure of financial reporting quality with high construct validity and low measurement

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transferring audit risk (CAQ 2008; U.S. Treasury 2008). Additionally, assuming competitive markets (Simunic 1980), risk acceptance is an unprofitable strategy.

[14] I use audit fees to proxy for audit effort given audit labor hours are not publically available to researchers and audit fees have a strong theoretical link to audit effort (e.g., Simunic 1980).

error (DeFond and Zhang 2014). Similarly, evidence of auditors timely identifying and reporting material weaknesses that pertain to financial statements that are not subsequently restated is an indication of the auditors' competence and independence.[15] The discussion above leads to the following predictions:

H2a: The likelihood of restatement is lower for audits inside merger waves than outside of merger waves.

H2b: The likelihood of auditors reporting material weaknesses that pertain to financial statements that are not subsequently restated is higher for audits inside merger waves than outside of merger waves.

Finally, an alternative to auditor risk mitigation is risk avoidance. Theory suggests that higher audit risk and auditor business risk, on average, should lead to higher auditor turnover as auditors seek to protect themselves from the increased likelihood of penalties (Bockus and Gigler 1998). Indeed, auditing standards require auditors to consider the "risks associated with providing professional services" as part of client continuance decisions (AICPA 1997). This leads to the prediction:

H3: The likelihood of auditor turnover is higher inside merger waves than outside of merger waves.

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[15] The PCAOB (2015) has identified timely reporting of internal control deficiencies as a potential indicator of audit quality noting that "a firm's failure to identify material internal control weaknesses may raise issues about staffing, training, or audit focus," (PCAOB 2015, A-23). The PCAOB (2015) measures material weakness reporting timeliness in relation to restatements. Material weaknesses reported without a corresponding restatement indicate timely reporting (i.e. preventative auditor action or high audit quality).

Chapter 3. SAMPLE SELECTION AND MERGER WAVE IDENTIFICATION

My sample consists of only years where firms completed a material acquisition, which increases the comparability of audits in my sample across several dimensions. First, it holds constant the mechanical increase in the scope of audits when firms expand their boundaries. Second, it holds constant the natural opportunity for auditors to renegotiate and risk adjust their work after an M&A transaction. Finally, following theory that the firms most affected by the underlying phenomena driving merger waves are the ones that acquire (e.g., Gort 1969; Mitchell and Mulherin 1996), an M&A only sample allows for more powerful analysis of inside- versus outside- merger wave effects.

My sample consists of 4,553 acquisitions completed by 1,755 U.S. public companies between 2003 and 2012 from the Security Data Corporation (SDC) Mergers and Acquisitions database.[16] My sample begins with the first full calendar year available after the enactment of SOX, and then spans ten years following the merger wave identification methodology in Harford (2005).[17] An acquisition is included in the sample if it satisfies the following criteria: (1) the acquirer is subject to U.S. public company accelerated filer reporting requirements in the current year, (2) the acquirer purchased majority ownership of the target (acquired > 50%), (3) the target is material to the acquirer (transaction value > 1% of the acquirer's prior year-end market capitalization and transaction value > $10M), (4) the acquirer does not operate in the financial sector, and (5) requisite data is available in Audit Analytics, Compustat, IBES, and CRSP. Table

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[16] Of the 4,553 acquisitions, there are 3,635 unique acquirer-years and 1,755 acquirers. There is also within acquirer variation in my sample, as 453 out of 1,755 acquirers (2,055 out of 4,553 acquisitions) execute deals both inside and outside of merger waves. This variation allows for the use of firm fixed effects in my multivariate analyses.

[17] Importantly, my sample period fully encompasses the aggregate merger wave in the 2000s (2004 – 2008) and is not confounded by the neighboring aggregate merger wave in the 1990s (1998-2001) (Harford 2005). Multiple aggregate merger waves in the same 10-year period can be problematic when using the merger wave identification methodology in Harford (2005) because the methodology only allows for one merger wave per industry over a 10-year time period. Harford (2005) addresses this issue when analyzing the two aggregate merger waves in the 1980s and 1990s by splitting his sample where there was a distinct trough in merger activity in the year 1990.

1 reports the impact of these data requirements on my sample size.

I measure industry merger waves following the three step procedure in Harford (2005) for each Fama-French 48 industry over a 10-year period. First, I identify a candidate wave as the 24-month period with the highest concentration of merger activity for the industry.[18] Second, I calculate a "simulation wave" as the 24-month period with the highest concentration of merger activity (95th percentile) based on 1,000 random simulations of the distribution of the actual number of transactions that occurred during the ten year period. Third, I code a 24-month period as a wave if the candidate wave is greater than the "simulation wave."[19] Figure 1 shows the resulting distribution of industry merger waves over the 2003 to 2012 period.

Table 2 reports the distribution of M&A deals in my sample across firm fiscal years (Panel A) and industries (Panel B). Observations are partitioned based on whether they pertain to a merger wave (In-Wave vs. Out-Wave). Panel A shows that merger waves are concentrated between 2004 and 2008, which is consistent with the higher overall M&A activity during that time period.[20] Panel B reports there are 21 unique merger waves out of the 44 non-financial industries. The average number of bids in a 24-month merger wave period is 49.4 while the average number of bids during a 24-month non-wave period is 17.7. The largest wave in my sample occurs in the business services industry (962 deals from July 2005 – June 2007). The next most active waves occur in the petroleum and natural gas, electronic equipment, and machinery industries with 100, 96, and 62 deals respectively. Overall, there is significant variation in merger waves across industries and

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[18] For merger wave identification purposes, I follow Harford (2005) and count cross-industry mergers (e.g., acquirer in industry X and target in industry Y) as merger activity for both affected industries. Merger activity within the same industry (e.g., acquirer in industry X and target in industry X) is only counted once for that industry.

[19] As a robustness test, to assess the sensitivity of my findings to identifying merger waves following Harford (2005), I re-estimate my models without the six months before and after each industry merger wave and find similar results.

[20] Table 2, Panel A reports the distribution of M&A deal effective dates, rather than the deal announcement dates used to identify merger waves following Harford (2005). For comparability purposes, it is necessary to analyze audits of consolidated firms in the year deals become effective. The average difference between M&A announcement and effective dates in the sample is 52 days.

time, which allows for powerful tests of how auditors respond during these periods.

Chapter 4. RESEARCH DESIGN

4.1 Audit Response to Merger Waves: Audit Effort (H1)

To test whether auditors respond to the increased audit risk and auditor business risk present in merger waves by increasing audit effort, I estimate the following ordinary least squares model:

$$Log\ Audit\ Fee_t = \beta_0 + \beta_1 Merger\ Wave_{i,t} + \sum \beta_k Controls + \varepsilon_{i,t} \tag{1}$$

where *Log Audit Fee$_t$* is the natural log of audit fees for the combined firm in year *t*.[21] My main variable of interest, *Merger Wave$_{i,t}$*, is an indicator variable that equals one if the audit was conducted during a merger wave (i.e. target *i* was acquired during a merger wave and consolidated into the audited financial statements of the acquirer in year *t*), zero otherwise (refer to Section 3 above for merger wave identification details). I describe *Controls* below and cluster standard errors by industry; variable definitions are provided in Appendix A.[22] Hypothesis 1 predicts the sign on β_1 is positive.

Controls consists of deal and firm characteristics shown by prior research to impact the audit production function. Deal characteristics consist of variables that capture the scope and complexity of auditing the operations of the acquired target, including the size of the target (*Target Size$_{i,t}$*), length of time the target contributes to current year earnings (*Months Out$_{i,t}$*), whether the target has been subject to public company financial reporting requirements (*Private$_{i,t}$*), and the similarity of the target to the acquirer in terms of location (*Domestic$_{i,t}$*), ownership (*Toehold$_{i,t}$*), and industry (*Diversifying$_{i,t}$*). Deal characteristics additionally includes controls for the firm's abnormal return around the acquisition announcement (*M&A CAR$_{i,t}$*) and the percentage of the

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[21] Audit fees and assets are expressed in constant 2005 U.S. dollars using the U.S. Bureau of Labor Statistics CPI series as a deflator (e.g., Doogar, Sivadasan, and Solomon 2010). Inferences are unchanged without this adjustment.
[22] I find similar results (untabulated) if I cluster standard errors by firm, firm and year-end, or industry and year-end.

acquisition purchased using stock financing (*Stock Financing$_{i,t}$*). Prior literature indicates negative announcement returns (Bens, Goodman, and Neamtiu 2012) and stock financing (Louis 2004; Gong, Louis, and Sun 2008) are associated with management incentives to misreport firm performance.[23]

Firm characteristics include well-established determinants of audit fees (e.g., Hay, Knechel, and Wong 2006; DeFond and Zhang 2014), including auditor type (*Big 4$_t$*), auditor tenure (*Auditor Tenure$_t$*), the timing of the audit (*Busy Season$_t$*), and the following firm attributes: size (*Size$_t$*), asset composition (*RecInv$_t$*), liquidity (*Current Ratio$_t$*), solvency (*Leverage$_t$*), performance (*Loss$_t$*, *ROA$_t$*, *Book to Market$_t$*, and *Going Concern$_t$*), complexity (*Foreign Operations$_t$* and *Segments$_t$*), shareholder monitoring (*Institution$_t$*), and internal control quality (*ICD$_t$*).[24] I additionally control for auditor learning over the post-SOX time period using a time trend variable (Rice and Weber 2012) and include time fixed effects that capture differences in audit requirements over the SOX Section 302 (January 1, 2003 to June 14, 2004), Auditing Standard No. 2 (June 15, 2004 to November 14, 2007), and Auditing Standard No. 5 (November 15, 2007 and onward) regulatory regimes (SEC 2003; PCAOB 2004; 2007). Importantly, I also include Fama-French 48 industry fixed effects to both control for potential time invariant industry-level omitted variables and focus my analyses on variation in market conditions within and across industries.[25]

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[23] Another important deal characteristic is whether the acquired operations of the target were subject to a SOX Section 404(b) audit. On October 6, 2004, the SEC granted an exemption to M&A acquirers from purchasing a Section 404(b) audit for their targets in their year of acquisition. Carnes, Christensen, and Lamoreaux (2018) and Kravet, McVay, and Weber (2018) provide evidence these audits have implications to equity investors and the quality of firm financial reporting. Given the Section 404(b) exemption only exists during a portion of my sample period, I omit the exemption from consideration in my main analyses. In untabulated tests, I find my results are unchanged if I add a control variable for Section 404(b) exemptions to my models.

[24] I find similar results (untabulated) if I substitute *Big 4$_t$* with auditor or auditor-city fixed effects.

[25] As a robustness test, to ensure my findings are not driven by any one industry, I re-estimate my models omitting each industry individually and my inferences are unchanged.

4.2 Audit Response to Merger Waves: Audit Quality (H2a & H2b)

To test whether audit quality is higher inside merger waves, consistent with auditors providing higher levels of audit effort and protecting against asymmetric penalties for under-auditing, I estimate the following probit models:

$$Restatement_t = \beta_0 + \beta_1 Merger\ Wave_{i,t} + \sum\beta_k Controls + \varepsilon_{i,t} \tag{2}$$

$$Timely\ Material\ Weakness_t = \beta_0 + \beta_1 Merger\ Wave_{i,t} + \sum\beta_k Controls + \varepsilon_{i,t} \tag{3}$$

where $Restatement_t$ is an indicator variable for whether the combined firm's fiscal year t audited financial statements are subsequently restated (e.g., Lobo and Zhao 2013) and $Timely\ Material\ Weakness_t$ is an indicator variable for whether the auditor reports a material weakness pertaining to fiscal year t and the year t audited financial statements are not subsequently restated (e.g., Fitzgerald, Omer, and Thompson 2018; Guo, Lin, Masli, and Wilkins 2018; Anantharaman and Wans 2018). *Controls* consists of the deal and firm variables included in my audit fee model (Equation 1) as prior literature indicates these variables are determinants of restatements (e.g., Bens et al. 2012) and material weaknesses (e.g., Doyle et al. 2007; Ashbaugh-Skaife et al. 2007). Hypotheses 2a predicts the sign on β_1 in Equation 2 is negative. Hypotheses 2b predicts the sign on β_1 in Equation 3 is positive.

4.3 Audit Response to Merger Waves: Contract Cessation (H3)

To test whether auditor turnover is more likely inside merger waves, consistent with auditors protecting themselves against the increased likelihood of litigation and reputational damages, I estimate the following probit model:

$$Auditor\ Change_{(M\&A\ Ann,\ M\&A\ Ann\ +365)} = \beta_0 + \beta_1 Merger\ Wave_{i,t} + \sum\beta_k Controls + \varepsilon_{i,t} \tag{4}$$

where $Auditor\ Change_{(M\&A\ Ann,\ M\&A\ Ann\ +365)}$ is an indicator variable that equals one if auditor turnover occurs over the one-year window (M&A Ann, M&A Ann + 365) following the

announcement of deal i.[26] *Controls* consists of the deal and firm variables included in my audit fee

model (Equation 1) as prior literature indicates these variables are determinants of auditor turnover

(e.g., Landsman, Nelson, and Rountree 2009; Hennes, Leone, Miller 2008). Hypothesis 3 predicts

the sign on β_1 is positive.

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[26] My dependent variable captures all auditor changes instead of focusing on only auditor resignations, because prior literature indicates that 8-Ks filed following an auditor change do not transparently communicate the reason for the change (e.g., Grothe and Weirich 2007; Hillison and Peecher 2017; Burks and Stevens 2017).

Chapter 5. EMPIRICAL RESULTS

5.1 Descriptive Statistics

Table 3, reports the descriptive statistics for my audit response measures in Panel A (i.e.

Log Audit Fee$_t$, *Restatement$_t$*, *Timely Material Weakness$_t$*, and *Auditor Change$_{(M\&A\ Ann,\ M\&A\ Ann\ +365)}$*)

and my control variables in Panel B. As indicated in Panel A, auditor responses are statistically

different in the predicted directions inside merger waves compared to outside of merger waves.

Panel B shows that target size and firm size are similar for in-wave and out-of-wave acquirers,

however differences exist in regards to other firm characteristics. This highlights the importance

of multivariate analysis in this setting.

5.2 Audit Effort Analysis (H1)

Table 4 reports the results from my test of H1, which predicts that audit fees are higher for

audits inside merger waves than outside of merger waves. The results are reported using OLS with:

a) industry and time fixed effects, b) industry and time fixed effects where all continuous

independent variables are transformed into scaled decile ranks (OLS w/ decile ranks), and c) firm

and time fixed effects.[27] Across these three tests, I find the sign on *Merger Wave$_{i,t}$* is positive and

statistically significant. Geometric mean audit fees are 5.7% to 6.6% higher for audits inside

merger waves compared to outside of merger waves. These results are consistent with auditors

seeking to mitigate merger wave risk and support H1.

5.3 Audit Quality Analysis (H2a & H2b)

Tables 5 and 6 report the results from my tests of H2a and H2b, which predict that the

likelihood of restatement is lower and the likelihood of auditors timely reporting material

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[27] Decile ranking ensures the independent variables in my model are all of similar scale, which allows for meaningful comparison of the economic significance of each variable. Additionally, the ranked regression specification is robust to both outliers and nonlinearities, therefore my ranked regression analysis also serves as a sensitivity check to my primary regression specification (Armstrong, Larker, Ormazabal, and Taylor 2013).

weaknesses is higher inside merger waves versus outside of merger waves. The results are reported using: a) probit with industry and time fixed effects, b) OLS w/ decile ranks with industry and time fixed effects, and c) OLS with firm and time fixed effects.[28] The sign on *Merger Wave$_{i,t}$* is statistically significant in the predicted direction across all tests. Financial statements that are audited during merger waves are 5.3% to 6.5% less likely to be restated and auditors are 2.4% to 4.6% more likely to timely identify and report internal control deficiencies. Given that the unconditional probability of restatements and timely internal control deficiencies are 11.1% and 5.0% respectively, the effects of merger waves on restatements and timely internal control deficiencies appear to be economically significant. Overall, these results corroborate that auditors conservatively increase effort to mitigate merger wave risk and are consistent with H2a and H2b.

5.4 Contract Cessation Analysis (H3)

Table 7 reports the results from my test of H3, which predicts that the likelihood of auditor turnover is greater inside merger waves than outside of merger waves. The results are reported using: a) probit with industry and time fixed effects, b) OLS w/ decile ranks with industry and time fixed effects, and c) OLS with firm and time fixed effects. Across these three tests, I find the sign on *Merger Wave$_{i,t}$* is positive and statistically significant. The likelihood of auditor turnover over the one-year window following the announcement of deal *i* is 1.5% to 2.5% higher inside merger waves. Given that the unconditional probability of auditor turnover is 3.6 percent, the effect of merger waves on auditor turnover appears to be economically significant. These results are consistent with auditors seeking to avoid merger wave risk and support H3.

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[28] Because restatements, material weaknesses, and auditor changes are low frequency binary events, caution is required when interpreting the results of my firm fixed effects analyses when one of these outcomes is the dependent variable.

Chapter 6. ADDITIONAL ANALYSES

6.1 Mediation Analysis

I next perform a mediation analysis to test my maintained assumption that industry uncertainty, limited industry monitoring, and poorer deal performance are paths through which merger waves affect auditor effort. I focus my analysis on the effect of *Merger Wave$_{i,t}$* on audit fees (*Log Audit Fees$_t$*) because auditors have a direct effect on audit fees and audit fees are a continuous measure that allows for powerful empirical tests. I decompose the impact of *Merger Wave$_{i,t}$* on *Log Audit Fees$_t$* by estimating the following model:

$$Log\ Audit\ Fee_t = \beta_0 + \beta_1 Merger\ Wave_{i,t} + \beta_2 Uncertainty_{(t-1,t+1)} + \beta_3 BHAR_{(t-1,t+1)}$$

$$+ \sum \beta_k Controls + \varepsilon_{i,t} \tag{5a}$$

$$Uncertainty_{(t-1,t+1)} = \alpha_0 + \alpha_1 Merger\ Wave_{i,t} + \sum \alpha_k Controls + \varepsilon_{i,t} \tag{5b}$$

$$BHAR_{(t-1,t+1)} = \gamma_0 + \gamma_1 Merger\ Wave_{i,t} + \sum \gamma_k Controls + \varepsilon_{i,t} \tag{5c}$$

where *Uncertainty$_{(t-1,t+1)}$* is measured at the industry level using the properties of quarterly analyst forecasts issued over fiscal year *t-1* to fiscal year *t+1* following Barron et al. (1998). This measure jointly proxies for industry uncertainty and limited industry monitoring by analysts surrounding the audit of year *t*. *BHAR$_{(t-1,t+1)}$* is calculated as buy and hold industry abnormal returns over fiscal year *t-1* to fiscal year *t+1* and captures actual and expected industry performance surrounding deal *i* in year *t*. The path coefficient β_1 captures the direct effect of *Merger Wave$_{i,t}$* on *Log Audit Fee$_t$*, while *α1 * β2* and *γ1 * β3* capture the indirect effects of *Uncertainty$_{(t-1,t+1)}$* and *BHAR$_{(t-1,t+1)}$* respectively.[29] *Controls* consists of the variables included in my audit fee model (Equation 1) and standard errors are bootstrapped and clustered by industry.

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[29] Prior studies use a similar approach to estimate path coefficients (e.g., DeFond, Lim, and Zang 2016).

Table 8 provides the path coefficients from my mediation analysis. The direct path coefficient between *Merger Wave$_{i,t}$* and *Log Audit Fee$_t$* is positive and statistically significant. Additionally, the indirect path coefficients on *Uncertainty$_{(t-1,t+1)}$* and *BHAR$_{(t-1,t+1)}$* are significantly positive and capture a combined 38 percent of the effect of *Merger Wave$_{i,t}$* on *Log Audit Fee$_t$* [12% *Uncertainty$_{(t-1,t+1)}$* (0.007 Indirect Effect / 0.063 Total Effect) + 27% *BHAR$_{(t-1,t+1)}$* (0.017 Indirect Effect / 0.063 Total Effect)]. Overall, this evidence indicates industry uncertainty, limited industry monitoring, and poorer deal performance are important factors considered by auditors during merger waves that explain a significant portion of the increased auditor effort during these periods.

6.2 Ongoing Trend Analysis

While my main analyses strongly support my central thesis that auditors are responsive to merger waves, a potential concern is that my findings could simply be the result of the continuation of ongoing audit trends during the 2004-2008 time period. The staggered nature of industry merger waves and my time period fixed effects partly alleviate this ongoing trend concern. Nevertheless, I supplement my analyses with two additional tests. First, I re-estimate my models including an indicator variable to absorb the average effect of the 2004-2008 time period (i.e. inclusion of a 2004-2008 fixed effect). Second, I conduct a placebo test where I re-estimate all my analyses with *Merger Wave$_{i,t}$* substituted with a dummy variable for M&A transactions conducted during 2004-2008 but outside of a merger wave (*Non-Merger Wave$_{i,t}$*).

Table 9 provides the results from these robustness analyses. In Panel A, I find my inferences are unchanged including a 2004-2008 fixed effect in my models.[30] Similarly, in Panel B, the coefficients on *Non-Merger Wave$_{i,t}$* are in the opposite direction of my hypothesized predictions and statistically different from the coefficients on *Merger Wave$_{i,t}$* in my main analyses.

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[30] I find similar results (untabulated) if I re-estimate my models using industry-regulatory period fixed effects, which capture potential audit differences within industries during the Section 302, AS No. 2, and AS No. 5 auditing regimes.

Collectively, these findings suggest that the results in my main analyses are not driven by unmodeled ongoing trends specific to the 2004-2008 time period.

6.3 Strategic Auditor Selection

Given firm acquisition decisions and auditor-client matching both arise endogenously in my analyses, I consider the potential effect of strategic behavior on the observed audit responses in my study. Although firm decisions to acquire are largely exogenous to auditors in the M&A setting, auditor-client matching is endogenous. It is therefore possible that firms strategically select auditors prior to entering into M&A transactions and that the audit responses observed in this study are the outcomes of these auditor selections. To address this possibility, I follow prior literature and examine the effect of auditor-client tenure on my findings (Cai, Kim, Park, and White 2016; Dhaliwal, Lamoreaux, Litov, and Neyland 2016).[31] My intuition is that, for a strategic auditor-client pairing to influence my results, the pairing would most likely occur within the time frame that the firm was contemplating an M&A transaction. As the time between M&A transactions and auditor changes increases, the likelihood that auditors were strategically selected to obtain (or avoid) the benefits of responsive auditing during M&A transactions decreases. I operationalize this intuition empirically by re-estimating my analyses excluding all transactions where auditor-client tenure is less than three years.

In untabulated analyses, I find that the inferences of my study are unaffected by removing observations with short auditor-client tenure. Further, average auditor-client tenure in my full sample is 11 years, which is well beyond the average time period M&A transactions are considered by acquirers (Heitzman 2011). This evidence indicates that strategic auditor selection does not appear to explain my findings.

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[31] Outside the M&A setting, Lennox and Pittman (2010b) additionally note that strategic auditor screening or selection is less of a concern when auditor tenure is longer.

6.4 Impact Threshold of a Confounding Variable

To address the possibility that my results are driven by an unmodeled correlated omitted variable, I calculate the impact threshold of a confounding variable (ITCV) for *Merger Wave$_{i,t}$* in each of my main analyses following Larcker and Rusticus (2010) and Frank (2000). ITCVs measure the necessary partial correlations between an omitted variable and the dependent and independent variables in my models to overturn the statistical significance of my results. In untabulated analyses, I find that it would take an omitted variable with an impact larger than the most influential control variable in each of my models to invalidate my results.

6.5 Non-M&A Sample Analysis

While my primary analyses are conducted using a sample where all firms completed an M&A transaction, in this section I consider the impact of merger waves on non-acquiring firms. I expect the effect of merger waves will be attenuated in the non-M&A setting because (a) the auditors of non-M&A firms do not have a natural reason/opportunity to renegotiate and risk adjust their work within firm fiscal years (i.e. face inter-year fee constraints), and (b) theory suggests that the firms most affected by the underlying phenomena driving merger waves are the ones that acquire (e.g., Gort 1969; Mitchell and Mulherin 1996). I test for these attenuated effects by re-estimating my analyses using a sample of firm-years satisfying my main sample selection criteria, but that have no M&A transactions reported in the SDC Mergers and Acquisitions database.

Table 10 reports the results. I find the sign on *Merger Wave$_{Non-M&A\ Sample}$* is positive and statistically significant for my audit fee analysis. Geometric mean audit fees are 3.3% higher for in-wave audits, which is lower than the 5.7% to 6.6% higher in-wave effect observed in my main M&A analysis (Table 4). Additionally, in my audit quality and auditor turnover analyses, there is no significant difference in the outcomes for audits inside merger waves compared to outside of

merger waves. These weaker results are likely due to auditors facing fee constraints and/or non-M&A firms being less affected by merger waves. I test this possibility by comparing the coefficients on *Merger Wave* across my M&A (Tables 4-7) and non-M&A (Table 10) analyses and, consistent with expectations, find the coefficients are statistically different.

Chapter 7. CONCLUSION

I investigate whether auditors engage in greater monitoring of acquirers during merger waves. Merger waves are accompanied by higher uncertainty about industry prospects, limited industry monitoring, and poorer deal performance, which threaten the quality of financial reports and increase the risk of auditor penalties. The gatekeeping responsibilities of the auditor and potential value of auditor oversight are therefore elevated during these periods.

I find auditors respond to merger waves by increasing audit effort, which improves audit quality and protects against asymmetric penalties for under-auditing, and by withdrawing from high risk engagements. These results hold after controlling for M&A deal and acquirer performance, inclusion of multiple fixed effects, and conducting numerous robustness analyses. Additionally, using mediation analysis, I find that higher industry uncertainty, limited industry monitoring, and poorer deal performance are paths through which merger waves affect auditor effort. Taken together, these findings are consistent with auditors protecting themselves against the increased likelihood of penalties for audits conducted during merger waves.

This study makes two primary contributions. First, it connects the literature in corporate finance on merger waves to the role of the external auditor, an important independent agent in corporate governance systems. Additionally, this study fills a significant void in the literature on the responsiveness of auditors to industry disruptions. Overall, this study provides large-scale multi-industry evidence that auditors adapt to industry merger waves and provide high audit quality during these periods of industry transformation.

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APPENDIX A
Variable Definitions

Variable Name	Description	Source
Variable of Interest		
Merger Wave$_{i,t}$	Indicator variable that equals one if the audit was conducted during a merger wave [i.e. target i was acquired during a merger wave per the procedures discussed in Harford (2005) and consolidated into the audited financial statements of the acquirer in time t], zero otherwise. Refer to Section 3 for merger wave identification details.	SDC
Variables of Interest – Additional Analyses		
Non-Merger Wave$_{i,t}$	Indicator variable equal to one if the M&A deal did not occur during a merger wave (*Merger Wave$_{i,t}$* =0) but the M&A deal occurred during peak merger wave activity (2004 – 2008), zero otherwise.	SDC
Merger Wave$_{Non-M\&A}$ Sample	Indicator variable equal to one if the firm did not engage in an M&A transaction in fiscal year t, however the firm's fiscal year-end coincided with its industry's merger wave, zero otherwise.	SDC, Compustat
Dependent Variables		
Log Audit Fee$_t$	Natural log of all audit and audit-related fees paid to the external auditor (MATCHFY_SUM_AUDFEES) in the fiscal year corresponding to the effective date of deal i; expressed in constant 2005 dollars (using the BLS CPI series as deflator).	Audit Analytics, Compustat, SDC
Restatement$_t$	Indicator variable equal to one if the combined firm's fiscal year t audited financial statements are subsequently restated, zero otherwise.	Audit Analytics, Compustat, SDC
Timely Material Weakness$_t$	Indicator variable equal to one if the firm receives a year-end material weakness pertaining to fiscal year t and the year t audited financial statements are not subsequently restated, zero otherwise.	Audit Analytics, Compustat, SDC
Auditor Change$_{(M\&A\ Ann,\ M\&A\ Ann\ +365)}$	Indicator variable equal to one if auditor turnover occurs over the one-year window (M&A Ann, M&A Ann + 365) following the announcement of deal i, zero otherwise.	Audit Analytics, Compustat, SDC

Path Analysis Mediator Variables

Uncertainty$_{(t-1,t+1)}$	Decile ranked industry-level uncertainty over fiscal years *t-1* to *t+1*, calculated using the uncertainty measure in Barron et al. (1998) and quarterly analyst earnings forecasts.	IBES, Compustat, SDC
BHAR$_{(t-1,t+1)}$	Decile ranked industry-level buy and hold abnormal returns over fiscal years *t-1* to *t+1* (value-weighted, market-adjusted).	CRSP, Compustat, SDC

Deal Controls

Target Size$_{i,t}$	Natural log of the dollar value of deal *i* per SDC; expressed in constant 2005 dollars (using the BLS CPI series as deflator).	SDC
Months Out$_{i,t}$	Number of months between the M&A effective date of deal *i* and the acquirer's fiscal year-end date in fiscal year *t*.	Compustat, SDC
Private$_{i,t}$	Indicator variable equal to one if the target of deal *i* was private per SDC, zero otherwise.	SDC
Domestic$_{i,t}$	Indicator variable equal to one if the target in deal *i* was domiciled in the U.S.A., zero otherwise.	SDC
Toehold$_{i,t}$	Indicator variable equal to one if the acquirer owned a percentage of the target prior to deal *i*, zero otherwise.	SDC
Diversifying$_{i,t}$	Indicator variable equal to one if the acquirer and target of deal *i* do not share the same Fama-French 48 industry, zero otherwise.	SDC
M&A CAR$_{i,t}$	Cumulative abnormal return over the [-1,+1] day trading window surrounding the announcement of deal *i* (value-weighted, market-adjusted).	CRSP, SDC
Stock Financing$_{i,t}$	Indicator variable equal to one if at least 50 percent of the value of deal *i* was financed with acquirer stock, zero otherwise.	SDC

Firm Controls

Size$_t$	Natural log of the firm's fiscal year-end total assets (AT), less the dollar value of deal *i*; expressed in constant 2005 dollars (using the BLS CPI series as deflator).	Compustat, SDC
RecInv$_t$	Firm's fiscal year-end receivables (RECT) plus inventory (INVT) divided by total assets (AT).	Compustat
Current Ratio$_t$	Firm's fiscal year-end current ratio, calculated as current assets (ACT) divided by current liabilities (LCT).	Compustat
Leverage$_t$	Firm's fiscal year-end leverage, calculated as total liabilities (LT) divided by total assets (AT).	Compustat

Loss$_t$	Indicator variable equal to one if the firm's net income was negative (NI), zero otherwise.	Compustat
ROA$_t$	Firm's fiscal year return on assets, calculated as operating income before depreciation (OIADP) divided by total assets (AT).	Compustat
Book to Market$_t$	Firm's fiscal year book to market ratio, calculated as total common equity (CEQ) divided by the acquirer's year-end market capitalization (CSHO* PRCC_F).	Compustat
Going Concern$_t$	Indicator variable equal to one if the firm received a going concern audit opinion, zero otherwise.	Compustat
Foreign Operations$_t$	Indicator variable equal to one if the firm reports a foreign currency translation (FCA) other than zero, zero otherwise.	Compustat
Segments$_t$	Natural log of the number of firm segments.	Compustat
Institution$_t$	Natural log of the percentage of acquirer shares held by institutional investors.	WorldScope
ICD$_t$	Indicator variable equal to one if the firm receives a year-end material weakness pertaining to fiscal year t, zero otherwise.	Audit Analytics, SDC
Big4$_t$	Indicator variable equal to one if the firm was audited by PricewaterhouseCoopers, Ernst & Young, Deloitte, or KPMG, zero otherwise.	Audit Analytics
Auditor Tenure$_t$	Natural log of auditor-client tenure.	Compustat
Busy Season$_t$	Indicator variable equal to one if the acquirer's fiscal year-end falls in December or January, zero otherwise.	Compustat
Time Trend$_t$	Time trend variable that equals one in 2003 and then increases by one each year until 2012, the final sample year.	N/A
Regulatory Period F.E.	Fixed effect variable that equals one during the SOX Section 302 Era (1.1.2003 – 6.14.2004), two during the SOX 404 Auditing Standard No. 2 Era (6.15.2004 – 11.14.2007) and three during the SOX 404 Auditing Standard No. 5 Era (11.15.2007 onward).	Compustat

Figure 1
Industry Merger Waves 2003-2012
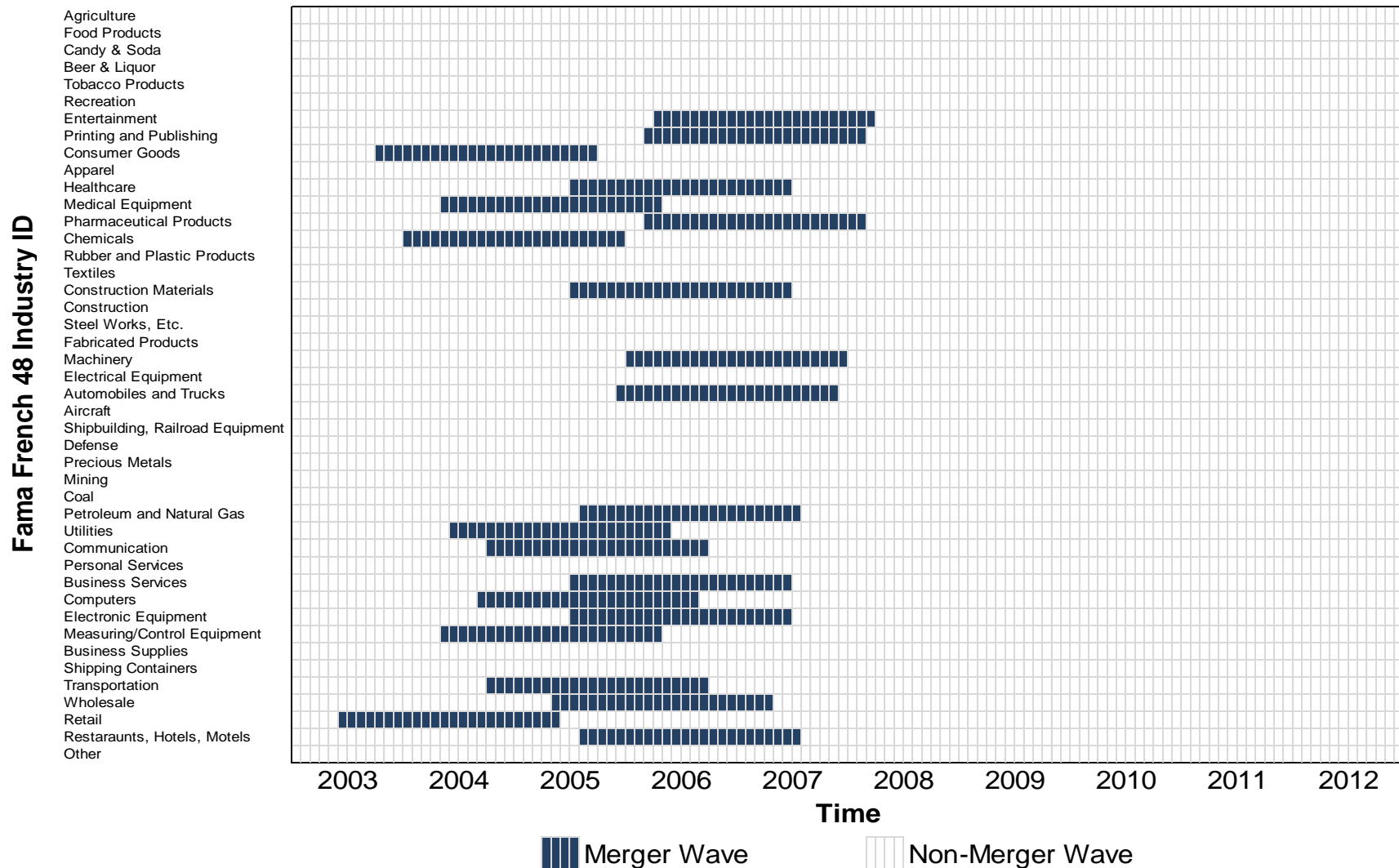
Figure 1 illustrates the timing of industry merger waves over the study's sample period (2003 to 2012). Each merger wave spans a 24-month period following the wave identification procedures in Harford (2005).

TABLE 1
Sample Construction

	Observations
Acquisitions from 2003-2012 completed by U.S. public companies with requisite M&A transaction data available in the Security Data Corporation (SDC) Merger and Acquisitions database.	22,045
Less observations that do not meet the following criteria:	
- the company is subject to U.S. public company accelerated filer reporting requirements in the current year	(3,111)
- the company purchased majority ownership of the target (acquired > 50%)	(1,809)
- the target is material to the company (transaction value ≥ 1% of the company's prior year-end market cap and transaction value ≥ $10M)	(10,316)
- the company does not operate in the financial sector	(1,740)
- the company has requisite auditor, financial, and market data available in Audit Analytics, Compustat, IBES, and CRSP	(516)
Final Sample	4,553

TABLE 2

Sample Distribution

Panel A: Distribution of M&A Deal Effective Dates by Acquirer Fiscal Year

Fiscal Year	Observations	In-Wave	Out-Wave	In-Wave Percent	Total Percent
2003	295	2	293	1%	6%
2004	539	60	479	11%	12%
2005	542	212	330	39%	12%
2006	573	414	159	72%	13%
2007	615	309	306	50%	14%
2008	441	39	402	9%	10%
2009	265	1	264	0%	6%
2010	416	0	416	0%	9%
2011	408	0	408	0%	9%
2012	459	0	459	0%	10%
	4,553	1,037	3,516	23%	100%

Panel B: Distribution of M&A Deals by Acquirer Industry (Fama French 48)

Industry	Wave Start Date	Observations	In-Wave	Out-Wave	In-Wave Percent	Total Percent
Agriculture	-	4	0	4	0%	0%
Food Products	-	65	0	65	0%	1%
Candy & Soda	-	17	0	17	0%	0%
Beer & Liquor	-	12	0	12	0%	0%
Tobacco Products	-	2	0	2	0%	0%
Recreation	-	36	0	36	0%	1%
Entertainment	Apr-06	37	9	28	24%	1%
Printing and Publishing	Mar-06	35	17	18	49%	1%
Consumer Goods	Oct-03	47	15	32	32%	1%
Apparel	-	68	0	68	0%	1%
Healthcare	Jul-05	141	49	92	35%	3%
Medical Equipment	May-04	187	46	141	25%	4%
Pharmaceutical Products	Mar-06	235	54	181	23%	5%
Chemicals	Jan-04	75	21	54	28%	2%
Rubber and Plastic Products	-	28	0	28	0%	1%
Textiles	-	9	0	9	0%	0%
Construction Materials	Jul-05	98	41	57	42%	2%
Construction	-	53	0	53	0%	1%
Steel Works, Etc.	-	80	0	80	0%	2%
Fabricated Products	-	9	0	9	0%	0%
Machinery	Jan-06	220	62	158	28%	5%
Electrical Equipment	-	48	0	48	0%	1%
Automobiles and Trucks	Dec-05	60	14	46	23%	1%
Aircraft	-	50	0	50	0%	1%
Shipbuilding, Railroad Equipment	-	10	0	10	0%	0%
Defense	-	9	0	9	0%	0%
Precious Metals	-	6	0	6	0%	0%
Mining	-	15	0	15	0%	0%
Coal	-	40	0	40	0%	1%
Petroleum and Natural Gas	Aug-05	340	100	240	29%	7%

TABLE 2 (Continued)

Sample Distribution

Panel B: Distribution of M&A Deals by Acquirer Industry (Fama French 48)

Industry	Wave Start Date	Observations	In-Wave	Out-Wave	In-Wave Percent	Total Percent
Utilities	Jun-04	105	27	78	26%	2%
Communication	Oct-04	174	58	116	33%	4%
Personal Services	-	53	0	53	0%	1%
Business Services	Jul-05	962	221	741	23%	21%
Computers	Sep-04	172	43	129	25%	4%
Electronic Equipment	Jul-05	388	96	292	25%	9%
Measuring/Control Equipment	May-04	154	45	109	29%	3%
Business Supplies	-	35	0	35	0%	1%
Shipping Containers	-	15	0	15	0%	0%
Transportation	Oct-04	94	21	73	22%	2%
Wholesale	May-05	165	54	111	33%	4%
Retail	Jun-03	117	31	86	26%	3%
Restaraunts, Hotels, Motels	Aug-05	52	13	39	25%	1%
Banking	N/A	N/A	N/A	N/A	N/A	N/A
Insurance	N/A	N/A	N/A	N/A	N/A	N/A
Real Estate	N/A	N/A	N/A	N/A	N/A	N/A
Finance	N/A	N/A	N/A	N/A	N/A	N/A
Other	-	31	0	31	0%	1%
Total		4,553	1,037	3,516	23%	100%
Avg. # deals during a 24-month period			49.4	17.7		

TABLE 3
Descriptive Statistics

Panel A: Audit Responses

Variables	Full Sample (n = 4,553)					In-Wave (n=1,037)	Out-Wave (n=3,516)	Diff. in Means
	Mean	S.D.	25%	Median	75%			
Log Audit Fee$_t$	4.583	1.449	3.457	4.394	5.513	14.39	14.24	0.149 ***
Restatement$_t$	0.111	0.314	0.000	0.000	0.000	0.068	0.123	-0.055 ***
Timely Material Weakness$_t$	0.050	0.218	0.000	0.000	0.000	0.086	0.039	0.047 ***
Auditor Change$_{(M\&A\ Ann,\ M\&A\ Ann\ +\ 365)}$	0.036	0.186	0.000	0.000	0.000	0.058	0.030	0.028 ***

Panel B: Control Variables

Variables	Full Sample					In-Wave	Out-Wave	Diff.
	Mean	S.D.	25%	Median	75%			
Deal Controls								
Target Size$_{i,t}$	4.583	1.449	3.457	4.394	5.513	4.622	4.572	0.050
Months Out$_{i,t}$	5.341	3.519	2.000	5.000	8.000	5.546	5.280	0.266 **
Private$_{i,t}$	0.843	0.364	1.000	1.000	1.000	0.839	0.844	-0.005
Domestic$_{i,t}$	0.807	0.395	1.000	1.000	1.000	0.830	0.800	0.031 **
Toehold$_{i,t}$	0.015	0.120	0.000	0.000	0.000	0.013	0.015	-0.003
Diversifying$_{i,t}$	0.373	0.484	0.000	0.000	1.000	0.365	0.376	-0.010
M&A CAR$_{i,t}$	0.008	0.062	-0.019	0.006	0.033	0.009	0.008	0.001
Stock Financing$_{i,t}$	0.094	0.292	0.000	0.000	0.000	0.099	0.093	0.006
Company Controls								
Size$_t$	6.987	1.562	5.903	6.934	7.957	6.928	7.005	-0.077
RecInv$_t$	0.216	0.147	0.098	0.194	0.303	0.215	0.217	-0.002
Current Ratio$_t$	2.281	1.592	1.293	1.846	2.721	2.186	2.309	-0.124 **
Leverage$_t$	0.500	0.206	0.355	0.508	0.626	0.496	0.501	-0.006
Loss$_t$	0.198	0.398	0.000	0.000	0.000	0.217	0.192	0.025 *
ROA$_t$	0.076	0.083	0.042	0.081	0.120	0.074	0.077	-0.003
Book to Market$_t$	0.502	0.332	0.290	0.442	0.633	0.463	0.513	-0.050 ***
Going Concern$_t$	0.004	0.064	0.000	0.000	0.000	0.005	0.004	0.001
Foreign Operations$_t$	0.332	0.471	0.000	0.000	1.000	0.307	0.339	-0.032 *
Segments$_t$	1.586	0.626	1.099	1.609	2.079	1.561	1.593	-0.032
Institution$_t$	1.777	1.456	0.020	1.943	3.074	1.954	1.725	0.229 ***
ICD$_t$	0.061	0.239	0.000	0.000	0.000	0.095	0.051	0.045 ***
Big 4$_t$	0.889	0.314	1.000	1.000	1.000	0.888	0.889	-0.001
Auditor Tenure$_t$	2.073	0.805	1.609	2.079	2.639	1.979	2.100	-0.122 ***
Busy Season$_t$	0.749	0.434	0.000	1.000	1.000	0.762	0.745	0.017
Mediation Measures								
Uncertainty$_{(t-1,t+1)}$	5.438	2.878	3.000	5.000	8.000	5.718	5.355	0.363 ***
BHAR$_{(t-1,t+1)}$	5.481	2.871	3.000	5.000	8.000	4.779	5.688	-0.909 ***

*, **, *** Indicate that the estimated coefficient is statistically significant at the 10 percent, 5 percent, and 1 percent levels, respectively, using two-tailed tests. All continuous variables have been winsorized at the 1% and 99% levels. See Appendix A for variable definitions.

TABLE 4

Audit Response to Merger Waves: Audit Fees

Model: Log Audit Fees$_t$ = β_0 + β_1Merger Wave$_{i,t}$ + $\sum\beta_j$Deal Controls$_{i,t}$ + $\sum\beta_k$Company Controls$_t$ + $\varepsilon_{i,t}$

	Pred. Sign	OLS Coeff.	t-stat	OLS w/ Decile Ranks Coeff.	t-stat	OLS w/ Firm F.E. Coeff.	t-stat
Merger Wave$_{i,t}$	(+)	**0.063** ***	**(4.11)**	**0.057** ***	**(2.86)**	**0.066** ***	**(4.17)**
Deal Controls							
Target Size$_{i,t}$		0.071 ***	(8.18)	0.035 ***	(9.70)	0.056 ***	(10.57)
Months Out$_{i,t}$		0.005 ***	(3.25)	0.007 ***	(3.23)	0.003 ***	(2.96)
Private$_{i,t}$		-0.096 ***	(-3.94)	-0.173 ***	(-5.12)	-0.034 **	(-2.16)
Domestic$_{i,t}$		-0.055 ***	(-3.24)	-0.034 **	(-2.04)	-0.016	(-1.04)
Toehold$_{i,t}$		0.079	(1.30)	0.097	(1.34)	0.013	(0.28)
Diversifying$_{i,t}$		0.059 **	(2.61)	0.052 **	(2.25)	-0.002	(-0.18)
M&A CAR$_{i,t}$		-0.023	(-0.18)	-0.004	(-1.44)	0.022	(0.24)
Stock Financing$_{i,t}$		0.008	(0.34)	-0.014	(-0.55)	0.008	(0.45)
Company Controls							
Size$_t$		0.416 ***	(28.10)	0.211 ***	(26.13)	0.268 ***	(15.69)
RecInv$_t$		0.760 ***	(4.31)	0.051 ***	(5.03)	0.500 **	(2.62)
Current Ratio$_t$		-0.021 *	(-1.89)	-0.013 **	(-2.03)	-0.052 ***	(-8.83)
Leverage$_t$		0.069	(0.98)	0.001	(0.21)	-0.049	(-0.67)
Loss$_t$		0.092 ***	(2.83)	0.052	(1.51)	0.032 *	(1.76)
ROA$_t$		-0.942 ***	(-4.67)	-0.025 ***	(-5.21)	-0.442 *	(-1.72)
Book to Market$_t$		-0.081 *	(-1.89)	-0.009 *	(-1.92)	0.103 ***	(3.46)
Going Concern$_t$		0.253 *	(1.72)	0.258	(1.63)	0.308	(1.05)
Foreign Operations$_t$		0.085 ***	(3.13)	0.083 ***	(3.22)	-0.013	(-0.45)
Segments$_t$		0.200 ***	(7.35)	0.227 ***	(7.34)	0.087 ***	(2.95)
Institution$_t$		-0.009	(-1.31)	-0.005	(-1.42)	-0.003	(-0.37)
ICD$_t$		0.439 ***	(20.16)	0.428 ***	(18.35)	0.218 ***	(6.69)
Big 4$_t$		0.215 ***	(7.27)	0.261 ***	(10.37)	0.128 **	(2.02)
Auditor Tenure$_t$		0.011	(0.77)	0.004	(0.65)	0.009	(0.39)
Busy Season$_t$		0.095 ***	(3.26)	0.097 **	(2.68)	0.300 *	(1.77)
Constant		9.918 ***	(81.62)	11.653 ***	(87.18)	11.080 ***	(67.24)
Firm F.E.		No		No		Yes	
Industry F.E.		Yes		Yes		No	
Regulatory Period F.E.		Yes		Yes		Yes	
Year Trend		Yes		Yes		Yes	
Cluster by Firm		Yes		Yes		Yes	
Adjusted R^2		0.754		0.720		0.932	
N		4,553		4,553		4,553	

*, **, *** Indicate that the estimated coefficient is statistically significant at the 10 percent, 5 percent, and 1 percent levels, respectively, using a one-tailed test when a prediction is indicated and a two-tailed test otherwise. All continuous variables have been winsorized at the 1% and 99% levels. See appendix A for variable definitions.

TABLE 5

Audit Response to Merger Waves: Financial Statement Restatements

Model: $\text{Restatement}_t = \beta_0 + \beta_1 \text{Merger Wave}_{i,t} + \sum \beta_j \text{Deal Controls}_{i,t} + \sum \beta_k \text{Company Controls}_t + \varepsilon_{i,t}$

	Pred. Sign	Probit Marginal Effect	z-stat	OLS w/ Decile Ranks Coeff.	t-stat	OLS w/ Firm F.E. Coeff.	t-stat
Merger Wave$_{i,t}$	(+)	**-0.059 *****	**(-4.07)**	**-0.053 *****	**(-3.78)**	**-0.065 *****	**(-3.47)**
Deal Controls							
Target Size$_{i,t}$		-0.012 ***	(-3.20)	-0.005 **	(-2.30)	0.003	(0.54)
Months Out$_{i,t}$		0.000	(0.21)	0.001	(0.55)	0.000	(0.20)
Private$_{i,t}$		-0.013	(-0.88)	-0.010	(-0.66)	-0.002	(-0.14)
Domestic$_{i,t}$		-0.007	(-0.64)	-0.006	(-0.58)	-0.007	(-0.45)
Toehold$_{i,t}$		-0.066 *	(-1.91)	-0.050 **	(-2.19)	-0.047 *	(-1.74)
Diversifying$_{i,t}$		-0.004	(-0.38)	-0.004	(-0.38)	0.003	(0.22)
M&A CAR$_{i,t}$		0.028	(0.44)	0.001	(0.41)	-0.016	(-0.22)
Stock Financing$_{i,t}$		-0.011	(-0.84)	-0.012	(-0.92)	0.002	(0.15)
Company Controls							
Size$_t$		-0.006	(-0.99)	-0.002	(-0.79)	-0.008	(-0.45)
RecInv$_t$		-0.017	(-0.37)	-0.000	(-0.12)	-0.062	(-0.25)
Current Ratio$_t$		-0.009 **	(-2.39)	-0.004 *	(-1.86)	0.005	(0.55)
Leverage$_t$		0.033	(0.82)	0.002	(0.67)	0.028	(0.33)
Loss$_t$		-0.023	(-1.26)	-0.027	(-1.49)	-0.045	(-1.61)
ROA$_t$		-0.175	(-1.54)	-0.008 ***	(-2.82)	-0.121	(-0.93)
Book to Market$_t$		0.054 ***	(2.70)	0.003 **	(2.18)	0.048	(1.36)
Going Concern$_t$		-0.116	(-1.52)	-0.092 **	(-2.22)	0.067	(1.53)
Foreign Operations$_t$		0.012	(0.82)	0.014	(0.86)	0.053	(1.34)
Segments$_t$		-0.006	(-0.45)	-0.005	(-0.35)	-0.023	(-0.79)
Institution$_t$		-0.006	(-1.62)	-0.002	(-1.19)	-0.016 *	(-1.83)
ICD$_t$		0.052 **	(2.49)	0.062 **	(2.32)	-0.031	(-0.81)
Big 4$_t$		0.024	(0.93)	0.023	(1.00)	0.075	(1.14)
Auditor Tenure$_t$		0.012	(1.14)	0.003	(0.87)	0.024	(1.10)
Busy Season$_t$		0.007	(0.63)	0.004	(0.36)	-0.232 *	(-1.93)
Constant				0.197 ***	(3.48)	0.376 *	(1.72)
Firm F.E.		No		No		Yes	
Industry F.E.		Yes		Yes		No	
Regulatory Period F.E.		Yes		Yes		Yes	
Year Trend		Yes		Yes		Yes	
Cluster by Firm		Yes		Yes		Yes	
Adjusted R^2				0.032		0.381	
Pseudo R^2		0.070					
Area under ROC curve		0.693					
N		4,553		4,553		4,553	

*, **, *** Indicate that the estimated coefficient is statistically significant at the 10 percent, 5 percent, and 1 percent levels, respectively, using a one-tailed test when a prediction is indicated and a two-tailed test otherwise. All continuous variables have been winsorized at the 1% and 99% levels. See appendix A for variable definitions.

TABLE 6

Audit Response to Merger Waves: Timely Material Weaknesses

Model: Timely Material Weakness$_t$ = β_0 + β_1Merger Wave$_{i,t}$ + $\sum\beta_j$Deal Controls$_{i,t}$ + $\sum\beta_k$Company Controls$_t$ + $\varepsilon_{i,t}$

	Pred. Sign	Probit Marginal Effect	z-stat	OLS w/ Decile Ranks Coeff.	t-stat	OLS w/ Firm F.E. Coeff.	t-stat
Merger Wave$_{i,t}$	(+)	**0.024** ***	**(3.64)**	**0.025** **	**(2.20)**	**0.046** ***	**(3.60)**
Deal Controls							
Target Size$_{i,t}$		-0.007 ***	(-2.62)	-0.002	(-1.47)	-0.003	(-0.76)
Months Out$_{i,t}$		0.001	(1.31)	0.002	(1.22)	0.001	(0.82)
Private$_{i,t}$		-0.005	(-0.79)	0.004	(0.61)	-0.007	(-1.02)
Domestic$_{i,t}$		-0.004	(-1.01)	-0.008 *	(-1.98)	-0.007	(-0.83)
Toehold$_{i,t}$		-0.008	(-0.35)	-0.010	(-0.44)	-0.026	(-0.71)
Diversifying$_{i,t}$		0.009	(1.16)	0.009	(1.30)	0.007	(0.65)
M&A CAR$_{i,t}$		-0.037	(-1.12)	0.000	(0.10)	-0.112 **	(-2.36)
Stock Financing$_{i,t}$		0.007	(0.63)	0.020	(1.09)	0.017	(1.13)
Company Controls							
Size$_t$		-0.008 **	(-2.30)	-0.004 **	(-2.42)	0.005	(0.26)
RecInv$_t$		0.015	(0.57)	0.003 *	(1.78)	0.074	(0.62)
Current Ratio$_t$		-0.009 *	(-1.95)	-0.006 **	(-2.28)	-0.017 ***	(-3.77)
Leverage$_t$		-0.019	(-0.76)	-0.004	(-1.65)	-0.053	(-0.64)
Loss$_t$		0.015	(1.29)	0.018	(1.41)	0.026	(1.16)
ROA$_t$		-0.092	(-1.52)	-0.007 ***	(-3.90)	-0.174	(-1.10)
Book to Market$_t$		0.029 *	(1.95)	-0.001	(-0.30)	0.002	(0.12)
Going Concern$_t$		0.036	(1.09)	0.148	(1.27)	-0.093	(-1.15)
Foreign Operations$_t$		0.024 ***	(2.81)	0.025 **	(2.49)	0.029	(1.27)
Segments$_t$		0.006	(0.64)	0.006	(0.56)	0.025	(1.11)
Institution$_t$		-0.007	(-1.56)	-0.004 *	(-1.70)	-0.015 **	(-2.17)
Big 4$_t$		0.004	(0.27)	-0.004	(-0.21)	0.120 **	(2.32)
Auditor Tenure$_t$		-0.019 ***	(-3.18)	-0.004 **	(-2.07)	-0.043 ***	(-3.00)
Busy Season$_t$		-0.007	(-0.94)	-0.007	(-0.67)	-0.227 ***	(-2.85)
Constant				0.183 ***	(3.29)	0.189	(0.89)
Firm F.E.		No		No		Yes	
Industry F.E.		Yes		Yes		No	
Regulatory Period F.E.		Yes		Yes		Yes	
Year Trend		Yes		Yes		Yes	
Cluster by Firm		Yes		Yes		Yes	
Adjusted R^2				0.060		0.383	
Pseudo R^2		0.189					
Area under ROC curve		0.825					
N		4,553		4,553		4,553	

*, **, *** Indicate that the estimated coefficient is statistically significant at the 10 percent, 5 percent, and 1 percent levels, respectively, using a one-tailed test when a prediction is indicated and a two-tailed test otherwise. All continuous variables have been winsorized at the 1% and 99% levels. See appendix A for variable definitions.

TABLE 7

Audit Response to Merger Waves: Auditor Turnover

Model: $\text{Auditor Change}_{(M\&A\ Ann,\ M\&A\ Ann + 365)} = \beta_0 + \beta_1 \text{Merger Wave}_{i,t} + \sum \beta_j \text{Deal Controls}_{i,t} + \sum \beta_k \text{Company Controls}_t + \varepsilon_{i,t}$

	Pred. Sign	Probit Marginal Effect	z-stat	OLS w/ Decile Ranks Coeff.	t-stat	OLS w/ Firm F.E. Coeff.	t-stat
Merger Wave$_{i,t}$	(+)	**0.015** ***	**(2.92)**	**0.021** ***	**(2.60)**	**0.025** ***	**(2.41)**
Deal Controls							
Target Size$_{i,t}$		-0.004	(-1.39)	-0.001	(-0.51)	0.001	(0.19)
Months Out$_{i,t}$		-0.000	(-0.57)	0.000	(0.41)	0.001	(1.06)
Private$_{i,t}$		0.011	(1.15)	0.009	(1.49)	0.019 **	(2.09)
Domestic$_{i,t}$		0.007	(1.23)	0.003	(0.56)	0.002	(0.28)
Toehold$_{i,t}$		0.005	(0.25)	0.008	(0.47)	-0.000	(-0.02)
Diversifying$_{i,t}$		0.003	(0.48)	0.005	(0.68)	0.011	(1.25)
M&A CAR$_{i,t}$		0.040	(1.17)	0.003 **	(2.65)	0.019	(0.38)
Stock Financing$_{i,t}$		-0.011	(-1.03)	-0.006	(-0.55)	-0.010	(-1.18)
Company Controls							
Size$_t$		-0.007 ***	(-2.65)	-0.003 *	(-1.75)	-0.001	(-0.07)
RecInv$_t$		-0.045 **	(-1.97)	-0.003 *	(-1.75)	-0.156	(-1.48)
Current Ratio$_t$		0.003 **	(2.21)	0.002 **	(2.08)	0.003	(0.60)
Leverage$_t$		0.043 ***	(3.04)	0.004 **	(2.50)	0.080 *	(1.90)
Loss$_t$		-0.007	(-1.08)	-0.008	(-0.89)	-0.016	(-1.62)
ROA$_t$		-0.030	(-1.13)	-0.002	(-0.98)	-0.075	(-1.40)
Book to Market$_t$		0.020 ***	(3.43)	0.001	(0.66)	-0.017	(-0.92)
Going Concern$_t$		0.017	(0.47)	0.065	(0.68)	0.265 **	(2.04)
Foreign Operations$_t$		-0.006	(-1.51)	-0.008	(-1.52)	-0.012	(-1.10)
Segments$_t$		0.007 **	(1.96)	0.004	(0.69)	0.004	(0.21)
Institution$_t$		0.000	(0.22)	-0.001	(-0.76)	-0.002	(-0.50)
ICD$_t$		0.049 ***	(7.36)	0.122 ***	(4.67)	0.119 ***	(4.78)
Big 4$_t$		-0.013 **	(-2.31)	-0.034 ***	(-3.52)	-0.013	(-0.23)
Auditor Tenure$_t$		-0.028 ***	(-8.76)	-0.005 ***	(-4.30)	-0.011	(-0.69)
Busy Season$_t$		-0.003	(-0.45)	-0.002	(-0.19)	0.057 **	(2.69)
Constant				0.084 ***	(2.85)	0.038	(0.30)
Firm F.E.		No		No		Yes	
Industry F.E.		Yes		Yes		No	
Regulatory Period F.E.		Yes		Yes		Yes	
Year Trend		Yes		Yes		Yes	
Cluster by Firm		Yes		Yes		Yes	
Adjusted R^2				0.057		0.247	
Pseudo R^2		0.222					
Area under ROC curve		0.843					
N		4,553		4,553		4,553	

*, **, *** Indicate that the estimated coefficient is statistically significant at the 10 percent, 5 percent, and 1 percent levels, respectively, using a one-tailed test when a prediction is indicated and a two-tailed test otherwise. All continuous variables have been winsorized at the 1% and 99% levels. See appendix A for variable definitions.

TABLE 8

Mediation Analysis: Merger Waves and Audit Effort

Model A: Log Audit Fees$_t$ = β_0 + β_1Merger Wave$_{i,t}$ + β_2Uncertainty$_{(t-1,t+1)}$ + β_3BHAR$_{(t-1,t+1)}$ + $\sum\beta_k$Controls +

Model B: Uncertainty$_{(t-1,t+1)}$ = α_0 + α_1Merger Wave$_{i,t}$ + $\sum\alpha_k$Controls + $\varepsilon_{i,t}$

Model C: BHAR$_{(t-1,t+1)}$ = γ_0 + γ_1Merger Wave$_{i,t}$ + $\sum\gamma_k$Controls + $\varepsilon_{i,t}$

	Pred. Sign	OLS Coeff.	z-stat
Direct Path			
I. Merger Wave$_{i,t}$ → Log Audit Fees$_t$ (β_1)	(+)	0.039 **	(1.91)
Mediated Path for Uncertainty			
Merger Wave$_{i,t}$ → Uncertainty$_{(t-1,t+1)}$ (α_1)	(+)	0.945 ***	(12.73)
Uncertainty$_{(t-1,t+1)}$ → Log Audit Fees$_t$ (β_2)	(+)	0.008 ***	(2.37)
II. Indirect Effect (α_1 * β_2)	(+)	0.007 ***	(2.33)
Mediated Path for Deal Performance			
Merger Wave$_{i,t}$ → BHAR$_{(t-1,t+1)}$ (γ_1)	(-)	-1.476 ***	(-17.19)
BHAR$_{(t-1,t+1)}$ → Log Audit Fees$_t$ (β_3)	(-)	-0.011 ***	(-3.67)
III. Indirect Effect (γ_1 * β_3)	(+)	0.017 ***	(3.52)
Total Effect (I + II + III)	(+)	0.063 ***	(3.30)
Industry F.E.		Yes	
Regulatory Period F.E.		Yes	
Year Trend		Yes	
Cluster by Firm		Yes	
N		4,553	

*, **, *** Indicate that the estimated coefficient is statistically significant at the 10 percent, 5 percent, and 1 percent levels, respectively, using a one-tailed test based on the indicated prediction. Z-statistics are based on bootstrapped, industry-clustered standard errors (5,000 replications). All continuous variables have been winsorized at the 1% and 99% levels. See appendix A for variable definitions.

TABLE 9

Robustness Test: 2004-2008 Ongoing Trend Analysis

Panel A - 2004-2008 Fixed Effect Analysis

Model: Audit Response = $\beta_0 + \beta_1$Merger Wave$_{i,t}$ + $\sum\beta_j$Deal Controls$_{i,t}$ + $\sum\beta_k$Company Controls$_t$ + 2004-2008 F.E. + $\varepsilon_{i,t}$

	Audit Fees		Restatement		Timely Material Weakness		Auditor Change	
	Pred. Sign	OLS Coeff.	Pred. Sign	Probit Marginal Effect	Pred. Sign	Probit Marginal Effect	Pred. Sign	Probit Marginal Effect
Merger Wave$_{i,t}$	(+)	**0.041** ***	(-)	**-0.046** ***	(+)	**0.017** ***	(+)	**0.012** **
		(2.58)		**(-2.92)**		**(2.52)**		**(1.74)**
2004-2008 F.E.		Yes		Yes		Yes		Yes
Industry F.E.		Yes		Yes		Yes		Yes
Regulatory Period F.E.		Yes		Yes		Yes		Yes
Year Trend		Yes		Yes		Yes		Yes
Cluster by Firm		Yes		Yes		Yes		Yes
Adjusted R^2		0.755						
Pseudo R^2				0.073		0.193		0.224
Area under ROC curve				0.696		0.830		0.844
N		4,553		4,553		4,553		4,553

Panel B - Placebo Test: Audit Response to Concurrent Non-Merger Waves

Model: Audit Response = $\beta_0 + \beta_1$Non-Merger Wave$_{i,t}$ + $\sum\beta_j$Deal Controls$_{i,t}$ + $\sum\beta_k$Company Controls$_t$ + $\varepsilon_{i,t}$

	Audit Fees	Restatement	Timely Material Weakness	Auditor Change
	OLS Coeff.	Probit Marginal Effect	Probit Marginal Effect	Probit Marginal Effect
Non-Merger Wave$_{i,t}$	**-0.001**	**0.014**	**-0.011** *	**-0.007**
	(-0.07)	**(0.86)**	**(-1.45)**	**(-0.82)**
Industry F.E.	Yes	Yes	Yes	Yes
Regulatory Period F.E.	Yes	Yes	Yes	Yes
Year Trend	Yes	Yes	Yes	Yes
Cluster by Firm	Yes	Yes	Yes	Yes
Adjusted R^2	0.755			
Pseudo R^2		0.064	0.184	0.219
Area under ROC curve		0.683	0.821	0.842
N	4,553	4,553	4,553	4,553
<u>Equality of Coeficients Test</u>				
Merger Wave$_{i,t}$ [Tables 4-7]	0.063	-0.059	0.024	0.015
Non-Merger Wave$_{i,t}$ [Table 9]	-0.001	0.014	-0.011	-0.007
Diff: $\beta_{\text{Merger Wave}} > \beta_{\text{Non-Merger Wave}}$	**0.064** **		**0.035** ***	**0.022** **
Diff: $\beta_{\text{Merger Wave}} < \beta_{\text{Non-Merger Wave}}$		**-0.073** ***		

*, **, *** Indicate that the estimated coefficient is statistically significant at the 10 percent, 5 percent, and 1 percent levels, respectively, using a one-tailed test when a prediction is indicated and a two-tailed test otherwise. Equality of coeficient tests are based on bootstrapped, industry-clustered standard errors (5,000 replications). All continuous variables have been winsorized at the 1% and 99% levels. See appendix A for variable definitions.

TABLE 10

Audit Response to Merger Waves: Non-M&A Sample

Model: Audit Response $= \beta_0 + \beta_1$ Merger Wave$_{\text{Non-M\&A Sample}} + \sum \beta_k$ Company Controls$_t + \varepsilon_t$

	Audit Fees		Restatement		Timley Material Weakness		Auditor Change	
	Pred. Sign	OLS Coeff.	Pred. Sign	Probit Marginal Effect	Pred. Sign	Probit Marginal Effect	Pred. Sign	Probit Marginal Effect
Merger Wave$_{\text{Non-M\&A Sample}}$	(+)	**0.033** *	(-)	**-0.007**	(+)	**0.007**	(+)	**0.002**
		(1.38)		**(-0.35)**		**(1.15)**		**(0.52)**
Industry F.E.		Yes		Yes		Yes		Yes
Regulatory Period F.E.		Yes		Yes		Yes		Yes
Year Trend		Yes		Yes		Yes		Yes
Cluster by Firm		Yes		Yes		Yes		Yes
Adjusted R^2		0.747						
Pseudo R^2				0.057		0.139		0.427
Area under ROC curve				0.673		0.782		0.915
N		14,651		14,651		14,651		14,651
<u>Equality of Coeficients Test</u>								
Merger Wave$_{\text{M\&A Sample [Tables 4-7]}}$		0.063		-0.059		0.024		0.015
Merger Wave$_{\text{Non-M\&A Sample [Table 10]}}$		0.033		-0.007		0.007		0.002
Diff: $\beta_{\text{M\&A Sample}} > \beta_{\text{Non-M\&A Sample}}$		**0.030** *				**0.017** **		**0.013** *
Diff: $\beta_{\text{M\&A Sample}} < \beta_{\text{Non-M\&A Sample}}$				**-0.052** ***				

*, **, *** Indicate that the estimated coefficient is statistically significant at the 10 percent, 5 percent, and 1 percent levels, respectively, using a one-tailed test when a prediction is indicated and a two-tailed test otherwise. Equality of coeficient tests are based on bootstrapped, industry-clustered standard errors (5,000 replications). All continuous variables have been winsorized at the 1% and 99% levels. See appendix A for variable definitions.

VITA

Robert Carnes

Pennsylvania State University   Phone: (814) 865-0573
Smeal College of Business   Email: carnes@psu.edu
371B Business Building
University Park, PA 16802

EDUCATION & CERTIFICATIONS

- The Pennsylvania State University
  - Ph.D. Business Administration   2018 (expected)

- University of Notre Dame
  - M.S. Accounting, *Summa Cum Laude*   2006

- University of California, Santa Barbara
  - B.A. Business Economics with an Emphasis in Accounting, *Highest Honors*   2005

- Certified Public Accountant, California (License #102782)   2008 – Present

PUBLICATIONS

- "Investor Demand for Internal Control Audits of Large U.S. Companies: Evidence from a Regulatory Exemption for M&A Transactions"
  - with Dane Christensen and Phillip Lamoreaux
  - *The Accounting Review*, forthcoming

PROFESSIONAL EXPERIENCE

- Interval Leisure Group (NASDAQ: ILG)
  - Manager – Internal Audit   Honolulu, HI 2009 – 2013

- The University of Hawaii at Manoa
  - Lecturer   Honolulu, HI Spring 2012

- Ernst & Young
  - Senior – Advisory Services   Los Angeles, CA 2005 - 2009

SCHOLARSHIPS & AWARDS

- W. Edward and Kay M. Hastings Graduate Scholarship   2017-2018
- J. Kenneth and Nancy N. Jones Graduate Scholarship   2014-2015 and 2016-2017
- Ossian R. MacKenzie Teaching Award   2016-2017
- G. Kenneth Nelson Scholarship   2015-2016
- Jane O. Burns Graduate Scholarship   2014-2015
- Ernst & Young "Your Master Plan" Program Participant   2005-2006