

SHAREHOLDER VALUE IMPLICATIONS OF THE INTERNAL AUDIT FUNCTION

by

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by

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In 2013, NASDAQ Stock Market LLC (NASDAQ) issued a proposal to mandate the internal audit function (IAF) for all listed companies but later withdrew the proposal. In this study, I investigate whether a *mandatory* IAF adds shareholder value and how the value implications vary across companies. For companies that do not voluntarily adopt an IAF before the proposal, I document a positive (negative) price response to the NASDAQ IAF proposal filing (withdrawal). This evidence suggests that, on average, investors perceive a mandatory IAF as value enhancing. I also document that the market reactions are more positive for companies with more business segments or with lower institutional ownership. This evidence suggests that investors' perception of the mandatory IAF are more positive for companies with complex business or with weak corporate governance. In addition, I document the types of companies that are more likely to establish an IAF voluntarily.

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CHAPTER 1

INTRODUCTION

The fast-paced business environment and continually evolving financial regulations impose a higher standard on companies' internal control systems. Internal auditors, having built their reputation as control experts, are therefore in more need nowadays of providing managers and the audit committee with assurance and consulting services about the risk and control processes.¹ Not surprisingly, many companies voluntarily establish and maintain an internal audit function (IAF) to cope with the enhanced control pressure. For example, many internal audit functions are called on to provide compliance assurance services to management, following the enactment of the Sarbanes-Oxley Act (SOX) in 2002 that requires management's quarterly certification of and annual attestation to the effectiveness of internal control over financial reporting (Deloitte [2014]). Further, the Institute of Internal Auditors (IIA) believes that the current business environment is conducive for all publicly traded companies to establish an IAF (Chasan [2015]). However, the controversy remains over the shareholder value implications of an IAF.

On February 20, 2013, NASDAQ filed with the SEC a new listing requirement mandating the establishment of an IAF. However, on May 15, 2013, NASDAQ withdrew the proposed IAF requirement due to the objections from some listed companies.² In their objection to the IAF, companies cite the non-negligible costs of building and maintaining an IAF and their doubts about

¹ From a fraud perspective, the Association of Certified Fraud Examiners (ACFE) has consistently found in its fraud studies that internal audit testing is one of the most common methods of fraud detection (more than 4 times the detection rate of external auditors). Further, the ACFE's 2012 Report to the Nations on Occupational Fraud and Abuse notes that the median loss from fraud detected by internal audit was the lowest of any detection method evaluated.

² NASDAQ withdrew the IAF proposal with the intent to file a revised proposal after fully considering the comments.

its marginal benefits in an era replete with financial regulations designed to ensure proper functioning of the internal control system. In this study, I use this setting to shed light on the value implications of the IAF by examining two questions: First, whether a mandatory IAF increases shareholder value, and second, whether and how the value implications of a mandatory IAF vary across companies.³

In the presence of all the private benefits and costs of an IAF, the shareholder value impacts of a *mandated* IAF are not clear ex ante. In fact, one company expressed the uncertain shareholder value ramifications of a mandated IAF in its comment letter to the NASDAQ's proposal as follows: "There is no evidence provided in the release that demonstrates that the cost of adding an internal audit function will produce significant value in the form of improved controls over what exists today or that it would improve investor confidence."⁴

I manually collect data on whether a NASDAQ firm voluntarily established an IAF in 2012. In an exploratory analysis, I find that firms that voluntarily adopt an IAF are larger, have higher book-to-market ratio and more business segments. The evidence suggests that the net benefits of an IAF is greater for larger firms, firms with lower growth opportunities, and more complex firms. I also find that companies with higher institutional ownership and audited by Big 4 auditors are more likely to have an IAF, suggesting that better corporate governance increases the likelihood of voluntarily building an IAF.

³ Under the assumption that stock price is discounted future cash flows, an IAF could impact stock price in several ways. While the costs of an IAF mainly affect the numerator (cash flows), the benefits of an IAF could affect both the numerator (through improved governance efficiency) and the discount factor (through reducing the risk of a company).

⁴ See comment letter issued by Isis Pharmaceuticals, Inc.

I then examine the two-day stock returns of NASDAQ companies without an IAF (affected group) relative to the returns of NASDAQ companies with an IAF (benchmark group).⁵ I find that, after controlling for market-wide news reflected by returns of the benchmark group, the affected group experiences a positive two-day cumulative return during the proposal filing period and a negative two-day cumulative return during the proposal withdrawal period. Depending on the specific return definition, the magnitude of the returns ranges from 48 to 88 basis points. The evidence suggests that, on average, a mandatory IAF is perceived by investors to enhance value.

I also find, for companies without an IAF, a negative and statistically significant correlation between proposal filing returns and proposal withdrawal returns. This evidence further suggests that the documented price responses are due to the IAF proposal instead of other events and that the magnitude or even the direction of market reactions to a mandatory IAF varies across affected companies. In the cross-sectional return tests, I find that the more business segments a company has, the more positive the market reaction is. This evidence suggests investors perceive the mandatory IAF to be more valuable for companies with complex business, which prior literature have shown to be more likely to have internal control issues (Doyle, Ge, and McVay [2007]; Ashbaugh-Skaife, Collins, and Kinney [2007]). I also find that the lower the institutional ownership is, the more favorable the price response is. It is generally argued that institutional ownership improves the alignment of interests between shareholders and managers (Bushee

⁵ I do not examine the market reaction for the NYSE's IAF requirement filed in 2003 because the requirement was proposed in a package along with several other proposals designed to enhance the corporate governance practice for listed companies, reducing the interpretability of the documented market reaction.

[1998]; Hartzell and Starks [2003]; Roychowdhury [2006]). Thus, this evidence suggests that the perceived value implications of mandating the IAF increase with the degree of agency issues.

This study contributes to the growing IAF literature in several ways. While the extant IAF literature focuses on companies with an IAF and how the IAF's benefits vary with its attributes, my study examines the group of companies without an IAF and whether a mandatory IAF would increase shareholder value.⁶ Thus, this study acknowledges not only the marginal benefits of an IAF but also its marginal costs. To my knowledge, this study is the first to document the perceived net benefits of a mandatory IAF and the heterogeneity of the perceived value impacts.

My study also documents the types of public companies that are more likely to establish an IAF. While Wallace and Kreutzfeldt [1991] also examine this issue, their sample contains only 75 U.S. companies from 1983. Thus, their results are less generalizable and may not apply to my sample due to the extensive change of the business environment and securities regulation. Moreover, their sample contains both private and public companies. The difference of governance environment between private and public companies further reduces the applicability of their results on my sample.

My study also has policy implications. NASDAQ plans to revise and resubmit the rule to the U.S. Securities and Exchange Commission (SEC), and the evidence documented in this paper sheds light on the virtue of the proposal. First, the stock price reaction reflects investors' perception

⁶ One stream of IAF studies focuses on the relation between an IAF's characteristics and its monitoring effectiveness (e.g., Prawitt, Smith, and Wood [2009]; Lin, Pizzini, Vargus, and Bardhan [2011]; Ege [2015]; Abbott, Daugherty, Parker, and Peters [2016]). Another focus of the IAF literature is the association between an IAF's quality and external auditors' reliance on IAF's work (Felix, Gramling, and Maletta [2001]; Glover, Prawitt, and Wood [2008]; Messier, Reynolds, Simon, and Wood [2011]; Abbott, Parker, and Peters [2012]; Bame-Aldred, Brandon, Messier, Rittenberg, and Stefaniak [2013]).

of the net benefits of a mandatory IAF and thus provides policy makers a handy reference. Second, NASDAQ's initial IAF proposal applies to all listed companies, but some companies appeal for, through comment letters, the exemption of companies with certain characteristics from the rule. The cross-sectional return results of this study indicate that investors' perception regarding the value impacts of an IAF does depend on factors such as business complexity and agency issues in the company. This evidence could help policy makers tailor the original overarching requirement to better fulfill companies' and investors' needs.

Finally, my study contributes to the literature regarding the merits of regulation. While theoretical arguments and empirical evidence have been presented against regulation (Ball [2009]; Hart [2009]; Zhang [2007]), there has been studies arguing and documenting evidence in favor of regulation (Gao and Zhang [2016]; Jain and Rezaee [2006]; Hochberg, Sapienza, and Vissing-Jørgensen [2009]; Chhaochharia and Grinstein [2007]). To the extent that a mandatory IAF increases shareholder value, this study also suggests that agency issues could thwart the adoption of a value-enhancing corporate governance practice, a justification for using regulation to modify the suboptimal governance status quo.

The remaining part of this dissertation proceeds as follows. Chapter 2 presents the institutional background. Chapter 3 discusses sample and data. Chapter 4 explores the firm attributes that are associated with the voluntary establishment of the IAF. Chapter 5 examines the stock market reaction to NASDAQ's proposal to mandate an IAF. Chapter 6 concludes.

CHAPTER 2

BACKGROUND AND RESEARCH QUESTIONS

2.1. *The Internal Audit Function*

While the IAF is taking on a more and more prominent role in corporate governance, research on the IAF is still scant due to data limitations (DeFond and Zhang [2014]). Thus, we still know little about the relationship between internal and external auditing, internal auditors' interaction with people of all levels within the company, and the internal audit function's roles and responsibilities in the internal control system.⁷ Information concerning those aspects will help us to understand the IAF's uniqueness in the risk and control system and, thus, to better appreciate how the IAF adds value.

The demand for *professional* internal auditors first emerged after the SEC required listed companies to provide audited financial statements in the 1930s. This requirement increased the workload of external audit firms and, in order to complete the detailed verification activities of transactions, companies started to establish an in-house audit function (Swinkels [2012]). With the objective of professionalizing the field of internal auditing, the IIA was established in the United States in 1941 (Gupta and Ray [1992]). Although the internal audit was first viewed as an extension of the external audit, the internal audit's role and responsibilities have evolved constantly to reflect

⁷ The internal control system permeates the entire organization and is affected by people at every level of the company. While the degree of importance CEO attaches to internal controls affects the whole internal control environment of the company, the daily operation of the control system is passed on to managers of different departments. Controls are policies or procedures that are designed by department managers based on their assessment of risks in the process to mitigate those risks. While some employees perform those controls, others produce information that will be used in the control process. One of the main roles of the internal audit team in the internal control system is to test controls performed within each single department and evaluate whether controls are executed following procedures. Failure to follow procedures could spell a higher likelihood of errors or even fraud.

the changing business environment and stakeholders' demand. The newest definition of internal audit by IIA is as follows:

Internal auditing is an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It helps an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control and governance processes. (IIA, 1999)

This definition of internal audit from IIA is mainly a reflection of internal audit practice in corporate governance (Nagy and Cenker [2002]); that is, in contrast to external audit, which focuses on the inspection of a company's financial statements, internal audit nowadays has a broader scope of audits across the financial and operational activities of an organization.⁸ Besides, the advisory role of the IAF is becoming more prominent, which increases the efficiency of the risk management and internal control processes (Sarens and De Beelde [2006]). Due to the passage of regulations such as the SOX and the Dodd-Frank Act, the demand for the internal audit function now also includes more compliance assurance services to management.⁹

In practice, the IAF reports functionally to the audit committee (AC) in most public companies (Christopher, Sarens, and Leung [2009]; IIA [2003]), and the presence of an IAF also provides leverage to the audit committee in fulfilling its duties.¹⁰ As one audit committee chair put it, "The IAF is very important to the AC. The AC by itself cannot do much given that it meets

⁸ The financial and accounting matters were viewed as a part of the operations and, therefore, did not need to be made explicit, according to the IIA (Swinkels [2012]).

⁹ SOX also shifts the internal audit focus back to financial audits because SOX requires management's quarterly certification of and annual attestation to the effectiveness of internal control over *financial reporting* (Deloitte [2014]).

¹⁰ Examples of functional reporting include approving the internal audit charter, audit plan, appointment, and removal of the CAE (IIA [2011]).

infrequently, six times a year for two to three hours, working out to 18 hours annually” (Soh and Martinov-Bennie [2011]). The audit committee’s reliance on IAF could be particularly prevalent for companies listed on NYSE and NASDAQ, whose audit committees now comprise, exclusively, independent directors and so are facing information asymmetries from management (Raghunandan, Rama, and Read [2001]).

Internal auditors also need to interact with people in the field of various levels in the organization. For example, senior management can identify high-risk areas in which audits are warranted, and thus the internal audit function is recommended to solicit input from senior management when determining the audit planning (Christopher et al. [2009]). Also, internal auditors need to work closely with line managers to derive an effective and plausible plan to implement the internal audit’s recommendations (Nagy and Cenker [2002]). The intimate knowledge of the organization thus acquired is necessary to garner a sufficient degree of acceptance and appreciation toward the IAF within the organization, allowing the internal auditors’ findings and recommendations to have an impact. Besides, through those interactions, the IAF also helps enhance the level of risk and control awareness, fostering a culture that is important to the company but is hard to establish without a dedicated function (Sarens and De Beelde [2006]).¹¹

In sum, internal auditors at the present time are expected to both detect errors and fraud and take on a proactive consultative role. The IAF serves as a vital tool both to fulfill the audit committee’s governance duties and to assist management in developing the adequate control

¹¹ According to Sarens and De Beelde [2006], another way an IAF could enhance the corporate governance culture is through companies rotating the internal auditor to different departments. The rotated employee will take the initial audit philosophy and contribute to improving the processes and internal controls within the new department.

mechanisms and enhancing the efficiency of operations. Under this expectation, it is reasonable to believe that an IAF brings benefits. However, the establishment and maintenance of an internal audit function (IAF) are costly conducts, and it is not obvious whether the IAF is able to produce significant marginal benefits to justify its costs. This issue is the main controversy over NASDAQ's mandatory IAF proposal.

2.2. NASDAQ's Mandatory IAF Proposal

Several corporate and accounting scandals surfaced in the early 2000s, triggering the passage of the Sarbanes-Oxley Act in 2002, which was designed to increase investors' protection by enhancing the corporate governance system. The emergence of those corporate failures and SOX passage also pushed major stock exchanges to propose new listing requirements to strengthen listed companies' governance standards. One of the new provisions proposed by NYSE and approved by the SEC in 2003 was to require companies listed on the NYSE to establish an internal audit function. NASDAQ, however, has not adopted an IAF requirement so far.

Ten years after NYSE adopted this requirement, NASDAQ proposed a similar rule. On February 20, 2013, NASDAQ filed with the SEC the new listing requirement mandating the establishment of an IAF (SR-NASDAQ-2013-032). The rule would require that all companies listed on the NASDAQ on or before June 30, 2013, must establish an internal audit function no later than December 31, 2013, and that a company listed after June 30, 2013, must establish an internal audit function prior to listing. The rule was approved by the Board of Directors of the NASDAQ on October 10, 2012, which authorized the filing of the rule change with the SEC (SR-NASDAQ-2013-032).

On March 4, 2013, the SEC published a request to solicit comments regarding NASDAQ's proposed rule.¹² The SEC received 38 comments for the proposal during the initial 45-day comment period, most of which expressed opposition to the rule (Federal Register, 2013). On April 18, 2013, the SEC decided to extend the comment period to 90 days so that it would have sufficient time to consider the proposal.¹³ However, on May 7, 2013, NASDAQ withdrew the proposed IAF requirement with the intent to file a revised proposal after fully considering the comments (SR-NASDAQ-2013-032).

Although the IAF is taking on an increasingly prominent role in corporate governance, the controversy remains over mandating an IAF. This controversy is partly a reflection of the debate over the merits of regulations over corporate governance practices. Market force has been argued to be able to push companies to adopt the optimal governance practices (Ball [2009]). Hart [2009] also points out that regulation restricts the feasible set of contracts available to the parties, which cannot make the parties better off. On the other hand, several studies have documented favorable investors' reaction toward regulations.¹⁴ For example, Chhaochharia and Grinstein [2007] find that companies that are affected more by SOX or U.S. stock exchanges' governance rules earn positive abnormal return compared with returns of less affected companies during the rules' announcement period. In addition, Hochberg et al. [2009] find that investors lobby in favor of strict implementation of SOX.

¹² See notice published in the Federal Register (Vol. 78, No. 46), March 8, 2013.

¹³ See notice published in the Federal Register (Vol. 78, No. 79), April 24, 2013.

¹⁴ See Zingales [2009] for a review of the justification for regulation.

Except for the uncertain economic outcomes of security regulations, the unique corporate control environment in which NASDAQ's mandatory IAF rule was proposed and the unique features of an IAF further obscure the shareholder value impacts of a mandatory IAF. Opponents believe that a mandatory IAF will only add limited control value for companies without an IAF in the wake of various recently issued regulations designed to improve corporate governance standards. For example, SOX already mandates an annual assessment of the internal control over financial reporting and quarterly certification over disclosure controls. Furthermore, within specific industries, there are newly issued regulatory requirements, such as reporting for conflict minerals associated with the Dodd-Frank Act, which should further strengthen companies' corporate governance structures. The requirement of an IAF is like requiring a belt and suspenders. In contrast to the limited benefits of an IAF, the costs of installing and maintaining an IAF is non-negligible. Companies should expect to pay between .03% and .2% of annual revenues for an effective internal audit function that also fulfills SOX requirements (Cynthia [2004]).¹⁵ More importantly, a company would have to divert budgetary resources from existing or future business undertakings to what is considered to be another layer of corporate compliance, which potentially will put U.S. public companies at a competitive disadvantage relative to their private and international counterparts.

On the other hand, advocates of a mandatory IAF have confidence in its ability to contribute to considerable shareholder value increase arising from its benefits mentioned in Section 2.1. Advocates also believe that spending on an IAF, which can prevent problems from happening, is

¹⁵ For the mean revenue reported by a NASDAQ company in my sample, those percentages transfer to \$.428 million to \$2.85 million.

much lower than expenditures on problems after they occur. An IAF plays a significant role in not only detecting but also curbing fraud. While internal auditors' fraud detection rate is four times that of external auditors, the mere presence of an IAF enhances the risk and control awareness of a company and helps prevent fraud in the first place (Ege [2015]). Moreover, advocates believe that an IAF helps reduce the costs of other compliance activities. For example, prior IAF studies (Felix, Gramling, and Maletta [2001]; Abbott, Parker, and Peters [2012]) have provided empirical evidence based on survey data consistent with the notion that contribution from an effective IAF could reduce external audit fees.

With arguments both favoring and disapproving financial regulations, and with the presence of all the private benefits and costs of an IAF, the shareholder value impacts of a mandated IAF is indeed not ex ante clear. I investigate the value implications of a mandatory IAF in Chapter 4.

CHAPTER 3

SAMPLE AND DATA

To document the market reaction to the IAF proposal key events in Chapter 4, I need to identify the presence of IAF for NASDAQ companies during the year the key events occurred. Since no existing data set provides such information, the IAF indicator must be manually collected. To reduce the workload of data collection, I apply several data restrictions to the pool of NASDAQ companies to get an initial sample for which I collect the IAF indicator.

I first obtain the pool of NASDAQ U.S. companies from the CRSP/Compustat Merged (CCM) data set. Since the proposal related events happened in late 2012 and in early 2013, I require the companies to be present on CCM in year 2012. Because CCM also contains 2012 data for companies that went public in later years, I delete those firms with the year of initial public offering later than 2012. This ensures that firms with 2012 data are also those that were listed on the NASDAQ in 2012. These requirements generate a total of 1,952 unique firms. I also require companies to have non-missing information on net income, total assets, book value, market value, and CIK number on CCM, which reduces the sample to 1,862 companies. I then merge the 1,862 companies with CCM-Historical Segments to get a sample of 1,497 companies. Finally, the restriction of data availability from Audit Analytics reduces the sample to 1,449 companies. Table 3.1, Panel A, summarizes the sample selection process.

I collect information about the presence of an IAF for those 1,449 companies. I read the 2012 proxy statement to identify those companies that disclose internal audit-related phrases and code those companies as having an IAF. Beasley, Carcello, Hermanson, and Lapides [2000] adopt a similar approach to identify the presence of an internal audit function. In addition, I read the proxy statement to make sure that the disclosure of internal audit phrases is related to the company

having an IAF. If companies mention internal audit phrases that are only related to managers or board members having prior internal audit working experience, those companies are not coded as having an internal audit function. The disclosure typically appears in the Risk Oversight or Audit Committee section of the proxy statement (see Appendix C for sample disclosures). The indicator variable *IAF* is equal to one if internal audit phrases are reported and equal to zero otherwise. For ease of interpretation of evidence of the return tests, I also create another indicator, *NOIAF*, which is equal to one if internal audit phrases are not mentioned and equal to zero otherwise.¹⁶ Proxy statement is a valid source to get information about the IAF because of its comprehensive disclosure of corporate governance practices. The availability of the 2012 proxy statement reduces the final sample to 1,423 companies.

One potential issue of this approach is that, due to the lack of disclosure requirement for the IAF, nondisclosure of the IAF in the proxy statement does not necessarily mean that the company lacks an IAF. However, because NYSE has already established a prototype of good corporate governance practice by mandating the IAF for all NYSE-listed companies, it seems reasonable to assume that all public firms should disclose the IAF if they have one. Moreover, establishing and maintaining such a function are costly practices and so the presence of an IAF can be considered as a costly signal for good corporate governance that companies should have incentives to disclose.¹⁷ By all means, all those arguments do not guarantee an IAF indicator without measure error, which renders the empirical tests more prone to Type 2 error (the failure to

¹⁶ Although the study uses 2012 disclosure of IAF to define the key variable *IAF* and *NOIAF*, I also checked the 2014 disclosure of IAF and found the presence of IAF is very sticky for the same company across those two different years.

¹⁷ I randomly select 20 NYSE companies and find they all disclose internal audit phrases in their proxy statements. Since all NYSE companies have the IAF, the fact that they all disclose it increases the validity of my data collection method.

find statistically significant association between a company's attributes and its decision to establish an IAF).¹⁸

From Table 3.1, Panel B, we can see that 709 out of 1,423 sample companies do not have an internal audit function, comprising almost 50% of the sample.¹⁹ In Panel B (C), I also create five (ten) different firm-size groups, based on the capitalization of all the companies on CRSP in 2012, and assign each of the sample companies to a size group. The sample is fairly distributed across different size groups, with an adequate number of companies within each size group. Further, the presence of an IAF is increasing with the company size.²⁰ In Panel B, for example, 24.8% of companies in the smallest size group have an IAF, while 79.0% of the companies with the largest size maintain an IAF. The presence of IAF is almost fairly balanced for companies in the middle size group, with 45.5% of them having an IAF. Table 3.1, Panel D, shows the distribution of sample companies across Fama-French 12 industries. Business equipment and health care industries represent the largest Fama-French 12 industries. Those two industries, together with the utilities, chemical and allied products, and consumer durables industries, also have most firms without an IAF.

¹⁸ Another concern using this method is whether companies misleadingly disclose internal audit-related phrases while not actually having such a function. To alleviate this concern, I read the 2012 proxy statement of 26 companies that filed objections to NASDAQ's proposed rule during the comment-letter periods. I found that one of those companies mentions internal audit-related phrases in its 2012 proxy statement. This type of error can be analogized to a type 1 error in statistical hypothesis testing—that is, incorrectly rejecting a null of no IAF when the null is true. However, the probability of conducting a type 1 error is only .04.

¹⁹ This is a high percentage if one believes that most companies should already have an IAF. When creating the initial data set for IAF indicator, I dropped 376 firms due to their lack of coverage by the CCM-Historical Segments data set, most of which were from the financial industry. Most companies within the financial industry should have an IAF. Therefore, 50% firms not having an IAF is an overstated ratio for the whole NASDAQ population.

²⁰ The distribution of IAF across different size groups enhances the validity of my method of classifying companies based on their proxy's mentioning of internal audit phrases if one believes that small firms are less likely to have an IAF.

Table 3.1 Sample Description

This table presents a description of the sample. Panel A is the sample selection process. Panel B to Panel D present the sample composition based on market capitalization cutoffs and Fama-French 12 Industry classification. *IAF*, the internal audit function presence indicator, is equal to one if internal audit-related phrases do not appear in a company's proxy statement filed in year 2012 and zero otherwise. The quintile size cutoffs in Panel B are based on the capitalization of all the companies on CRSP in 2012. The Fama-French 12 Industry classification is from Fama-French Data Library. Row percentages are shown in parentheses.

Panel A: Sample Selection

U.S. companies that are listed on the NASDAQ in 2012 per CRSP/Compustat Merged Dataset (CCM)	1,952
Require non-missing return, net income, total assets, book value, market value, and CIK number on CCM	1,862
Require information available on CCM-Historical Segments	1,497
Require information available on Audit Analytics	1,449
Require 2012 Proxy Statement Available	1,423

Panel B: The Distribution of IAF Presence within Different Market Capitalization Groups

Size Group	<i>IAF</i> = 0	<i>IAF</i> = 1	Total
1	173 (75.2)	57 (24.8)	230
2	192 (57)	145 (43)	337
3	177 (54.5)	148 (45.5)	325
4	125 (37.8)	206 (62.2)	331
5	42 (21.0)	158 (79.0)	200
Total	709 (49.8)	714 (50.2)	1423

Table 3.1 Continued

Panel C: The Distribution of IAF Presence within Different Market Capitalization Groups

Size Group	<i>IAF</i> = 0	<i>IAF</i> = 1	Total
1	77 (78.6)	21 (21.4)	98
2	95 (72)	37 (28)	132
3	102 (58.6)	72 (41.4)	174
4	90 (55.2)	73 (44.8)	163
5	104 (59.4)	71 (40.6)	175
6	74 (49.3)	76 (50.7)	150
7	70 (41.7)	98 (58.3)	168
8	55 (34)	107 (66)	162
9	26 (24.8)	79 (75.2)	105
10	16 (16.7)	80 (83.3)	96
Total	709 (49.8)	714 (50.2)	1,423

Table 3.1 Continued

Panel D: The Distribution of IAF Presence by Fama-French 12 Industries			
Industries	<i>IAF</i> = 0	<i>IAF</i> = 1	Total
1 Consumer Nondurables	28 (45.9)	33 (54.1)	61
2 Consumer Durables	24 (60)	16 (40)	40
3 Manufacturing	49 (40.5)	72 (59.5)	121
4 Oil Gas Coal	14 (43.8)	18 (56.3)	32
5 Chemicals and Allied Products	15 (75)	5 (25)	20
6 Business Equipment	217 (52.9)	193 (47.1)	410
7 Telephone and Television	23 (44.2)	29 (55.8)	52
8 Utilities	5 (62.5)	3 (37.5)	8
9 Wholesale Retail Service	49 (33.1)	99 (66.7)	147
10 Healthcare MedEquip Drugs	190 (66.7)	95 (33.3)	285
11 Finance	32 (39.0)	50 (61.0)	82
12 Other	63 (38.2)	102 (61.8)	165
Total	709 (49.8)	714 (50.2)	1,423

CHAPTER 4

FIRM CHARACTERISTICS ASSOCIATED WITH

VOLUNTARY ADOPTION OF AN IAF

Before examining the main research questions, I also conduct an exploratory analysis on what factors are associated with companies' decisions to voluntarily establish an IAF. Since there is limited guideline from prior literature, the study could be viewed as a first step in examining the determinants of voluntary IAF adoption. I estimate the following logit model:

$$\begin{aligned}
 IAF_i = & \beta_0 + \beta_1 MktCap_i + \beta_2 Salegrow_i + \beta_3 BM_i + \beta_4 N_BSEG_i + \beta_5 Foreign_i + \\
 & \beta_6 INSOWN_i + \beta_7 Big4_i + \beta_8 Loss_i + \beta_9 Zscore_i + \beta_{10} Age_i + \\
 & \beta_{11} BIOTECH_i + \beta_{12} LEV_i + \beta_{13} REV_i + \beta_{14} ROA_i + \beta_{15} CASH_i + \\
 & \beta_{16} EMPLEE_i + \beta_{17} PPE_i + \beta_{18} R\&D_i + \beta_{19} INTANG_i + Industry FE + u_i
 \end{aligned} \tag{1}$$

IAF is the indicator for the presence of an IAF. The variable *MktCap* is equal to the average market value of equity in years 2012 and 2011. *Salegrow* is the sales growth from year 2011 to 2012, and *BM* is the average book-to-market ratio of years 2011 and 2012. *N_BSEG* is the number of business segments a company has in year 2012, and *Foreign* is an indicator variable for the presence of foreign operation in year 2012. *INSOWN* is the average percentage of stocks outstanding owned by institutional investors in years 2011 and 2012.

I also include a set of other variables in the logit model. Some of those variables have been argued in the comment letters to the NASDAQ mandatory IAF proposal to be identifying characteristics of companies without an IAF, such as operating in a biotech industry and assets comprising mainly cash. See Appendix A for the definition of those variables. Table 4.1 presents the summary statistics on the attributes of companies with and without an IAF separately, and

Table 4.2 reports the estimation results of the logistic model. The marginal effect in Table 4.2 is obtained by averaging the marginal effects based on the actual values of all observations.

Before establishing an IAF, companies need to go through several procedures to design and implement the function.²¹ The initial fixed costs thus incurred are applicable to companies of all sizes, resulting in a heavier financial burden for small companies.²² Therefore, small companies are less likely to have an IAF, which could explain the negative association between market cap and the presence of an IAF.

Companies might need to divert financial resources from other undertakings to the IAF, and the opportunities cost could be especially high for companies with fast growth. Moreover, companies with rapid growth might try to stay clear of the IAF for fear that the IAF might create too much risk awareness that might temper the company's growth (Sarens and De Beelde [2006]). The opportunity costs could explain the positive association between the likelihood of having an IAF and book-to-market ratio, a proxy for lower growth prospects. However, I do not find *Salegrow*, a measure of past growth, significantly predicts the presence of an IAF.

Prior literature has shown that companies with complex operations are more likely to have material control weaknesses (Doyle, Ge, and McVay [2007]; Ashbaugh-Skaife, Collins, and Kinney [2007]). Since the IAF evaluates and improves system of internal controls, companies with more

²¹ Those steps include collection of shareholders' expectation for an IAF, hammering out a mission statement, and developing a formal strategic plan, audit plan, risk assessments, and budget plan. For more detail, see PRICEWATERHOUSECOOPERS LLP (PWC), 2003, Building a Strategic Internal Audit Function.

²² The most relevant benchmark to evaluate the costs of an IAF is the function's cost as a percentage of sales (Dennis [1998]). Although there is no direct estimate of this metric for big and small companies' IAF, we can indirectly infer the benchmark from a SOX-related report. According to the Final Report of the Advisory Committee on Smaller Public Companies to the SEC (2006), U.S. companies with revenues exceeding \$5 billion spent 0.06% of revenue on SOX compliance, while companies with less than \$100 million in revenue spent 2.55%.

complex business could benefit more from the IAF, which could explain the findings that the likelihood of having an IAF increases with the number of business segments, a proxy for business complexity. However, I do not find business complexity reflected by the presence of foreign operation affects the presence of an IAF.

When the benefits of an IAF surpass its costs, it would be in the shareholders' best interest for a company to establish and maintain an IAF. However, due to the separation of ownership and control, the interests of managers and shareholders might be misaligned (Hochberg, Sapienza, and Vissing-Jørgensen [2009]). Installing and maintaining an effective IAF requires senior managers' effort and support, and agency issues predict that management might simply want to shirk the effort to initiate and maintain an IAF.²³ Institutional ownership is generally argued in prior literature to be able to push for better corporate governance (Bushee [1998]; Hartzell and Starks [2003]; Roychowdhury [2006]). Thus, the positive association between institutional investors and the presence of an IAF suggests that reduced agency issues increase the likelihood of voluntarily building an IAF. In addition, the presence of a high-quality auditor has been claimed to be associated with reduced agency issues (Francis, Maydew, and Sparks [1999]). Thus, the positive association between IAF and Big4 is another evidence supporting the role agency issues play in the voluntary IAF establishment.²⁴

²³ The head of an IAF in most public companies reports administratively to senior management (IIA [2003]). Administrative reporting facilitates day-to-day operations of the internal audit activity, which includes budget approval and performance evaluation. In addition to bearing administrative responsibility to IAF, senior management also must make an effort to change the mentality of the whole company to a positive view toward the IAF (Sarens and De Beelde [2006]).

²⁴ This argument might also be able to explain the significant relation for leverage ratio (LEV). leverage has been demonstrated analytically and shown empirically in the ownership structure and agency costs literature to be able to enhance the alignment of incentives of management and shareholders (Grossman and Hart [1982]; Ang, Cole, and Lin [2000]; Berger and Di Patti [2006]). Thus, higher leverage ratio could be another proxy for the reduced agency issues, which explains its positive association with higher likelihood of having an IAF.

In summary, the empirical results indicate that senior management in general makes the decision about building an IAF based on its costs and benefits. However, the conflict of interests between managers and shareholders might be hindering companies from establishing an IAF voluntarily. In next chapter, I examine the value implications of a mandatory IAF.

Next Page: Table 4.1 Descriptive Statistics

This table presents the summary statistics of companies' attributes separately for companies without an IAF ($IAF = 0$) and companies with an IAF ($IAF = 1$). The sample is based on the Table 3.1 sample with information available on all variables. Two-sample tests are based on t tests for means and Wilcoxon rank-sum tests for medians. All continuous variables are winsorized at levels 1% and 99%. The significance levels at 1%, 5%, and 10% are indicated with ***, **, and *, respectively, based on two-tailed tests. See Appendix A for variable definitions.

Table 4.1 Continued

Variable	<i>IAF=0</i>				<i>IAF=1</i>			
	N	Mean	Median	STD	N	Mean	Median	STD
<i>MktCap</i>	604	0.725***	0.212***	2.369	632	2.782	0.587	6.338
<i>Salegrow</i>	604	0.159	0.064	0.672	632	0.108	0.066	0.433
<i>BM</i>	604	0.619	0.484	0.552	632	0.633	0.482	0.582
<i>INSOWN</i>	604	0.461***	0.446***	0.314	632	0.607	0.712	0.313
<i>N_BSEG</i>	604	1.778***	1***	1.282	632	2.274	1	1.606
<i>Foreign</i>	604	0.325	0.000	0.469	632	0.351	0	0.478
<i>Big4</i>	604	0.573***	1***	0.495	632	0.782	1	0.413
<i>Loss</i>	604	0.404***	0***	0.491	632	0.272	0	0.445
<i>Zscore</i>	604	5.498	6***	3.003	632	5.516	5	2.601
<i>Age</i>	604	17.078**	16*	9.960	632	18.272	17	10.827
<i>BIOTECH</i>	604	0.172***	0***	0.378	632	0.078	0	0.268
<i>LEV</i>	604	0.401***	0.345***	0.249	632	0.477	0.453	0.233
<i>REV</i>	604	0.996***	0.809***	0.736	632	1.130	0.905	0.777
<i>ROA</i>	604	-0.077***	0.022***	0.288	632	0.013	0.044	0.175
<i>Cash</i>	604	0.226***	0.178***	0.193	632	0.167	0.134	0.149
<i>EMPLEE</i>	604	0.005***	0.003***	0.007	632	0.006	0.003	0.008
<i>PPE</i>	604	0.417**	0.289***	0.394	632	0.463	0.346	0.381
<i>R&D</i>	604	0.113***	0.051***	0.170	632	0.057	0.006	0.115
<i>INTANG</i>	604	0.151***	0.071***	0.182	632	0.198	0.134	0.200

Table 4.2 Determinants of Having an IAF

This table reports the analysis results of a multivariate logit model where the outcome variable is whether a company lacks an IAF and the predictor variables are firm characteristics. *IAF*, the internal audit function presence indicator, is equal to one if internal audit-related phrases appear in a company's proxy statement filed in year 2012 and zero otherwise. The sample is based on the Table 3.1 sample with necessary information available to estimate specific models. The *p* values, in parentheses, are based on robust standard errors clustered by Fama-French 12 industries. The marginal effect is obtained by averaging the marginal effects based on the actual values of all observations. All continuous variables are winsorized at levels 1% and 99%. The significance levels at 1%, 5%, and 10% are indicated with ***, **, and *, respectively, based on two-tailed tests.

VARIABLES	<i>IAF</i>	Marginal Effect	<i>IAF</i>	Marginal Effect
<i>MktCap</i>	0.143*** (0.000)	0.031	0.122*** (0.000)	0.025
<i>Salegrow</i>	-0.08 (0.194)	-0.017	-0.093 (0.310)	-0.019
<i>BM</i>	0.146*** (0.006)	0.031	0.417*** (0.000)	0.085
<i>N_BSEG</i>	0.172*** (0.002)	0.037	0.111* (0.091)	0.023
<i>Foreign</i>	0.092 (0.688)	0.02	0.031 (0.893)	0.006
<i>INSOWN</i>	1.118*** (0.000)	0.241	0.864*** (0.002)	0.176
<i>Big4</i>			0.696*** (0.000)	0.142
<i>Loss</i>			0.02 (0.948)	0.004
<i>Zscore</i>			-0.01 (0.786)	-0.002
<i>Age</i>			0.005 (0.404)	0.001
<i>BIOTECH</i>			-0.192 (0.378)	-0.039
<i>LEV</i>			1.271* (0.085)	0.259
<i>REV</i>			-0.014 (0.939)	-0.003
<i>ROA</i>			0.743 (0.121)	0.151
<i>Cash</i>			0.242 (0.557)	0.049
<i>EMPLEE</i>			21.254* (0.074)	4.329
<i>PPE</i>			0.041 (0.881)	0.008
<i>R&D</i>			-0.282 (0.663)	-0.057
<i>INTANG</i>			0.698 (0.260)	0.142
Constant	-1.096*** (0.000)		-2.323*** (0.004)	
Observations	1,373	1,373	1,236	1,236
Industry FE	YES		YES	
Pseudo R-squared	0.108		0.147	

CHAPTER 5

MARKET REACTION TO THE MANDATORY IAF

In this chapter, I investigate how investors perceive the value impacts of a mandatory IAF. First, I examine the market reaction to each of the two key events separately. The stock returns of companies without an IAF (affected group) are compared with the returns of companies already having an IAF (benchmark group) to gauge the market reaction to the rule. Second, I examine whether the stock returns of the benchmark group serve as valid counterfactuals of stock returns of the affected group. Third, I estimate the correlation coefficients of two events' stock returns and the multivariate regression of firm attributes on price responses to two events.

5.1. Separate Market Reaction to Key Events

The sequence of the events is summarized in Appendix B. Out of the five events related to NASDAQ's IAF requirement proposal, key events are events through which the market, for the first time, becomes aware of the proposal filing and withdrawal. I used Google search to find articles related to each event to gauge market awareness of the event. This procedure also helped me to determine when the proposal filing and withdrawal were first known by the market. Among all five events, event 5 (proposal withdrawal) was covered most by internal audit service organizations and practitioner journals.²⁵ In addition, NASDAQ also published an issuer alert to announce the withdrawal of the proposal on May 7, 2013 (NASDAQ [2013]). Since event 5 is also

²⁵ Among those organizations and journals are the Institute of Internal Auditors, Protiviti, Bridge Point Consulting, BDO USA, and Compliance Week.

the first event regarding the proposal withdrawal, it is treated as the key event for the proposal withdrawal.

The first two events, the approval of the proposal by the NASDAQ board on Oct 10, 2012, and the filing of the proposal to the SEC on Feb 20, 2013, could all increase public awareness of the rule. However, the search results do not yield any publicly available document for event 1 (the proposal's board approval), which casts doubt on the validity of event 1 as the key event. In fact, the NASDAQ's proposal, filed with the SEC on Feb 20, 2013, is the only publicly available document that mentions the board approval date of the proposal. On the other hand, event 2 (the proposal filing by NASDAQ to the SEC on Feb 20, 2013) was publicly revealed through several channels, which increases the validity of this event to constitute the proposal filing key event.²⁶ The other two events (events 3 and 4) are related to the solicitation of comments. Thus, those two events did not affect the market expectation of the passage of the proposal and should not be considered to be the key events (Hochberg, Sapienza, and Vissing-Jørgensen [2009]). In Appendix B, the two key events (events 2 and 5) are highlighted in bold.

To measure the stock price response of the affected group to key events of NASDAQ's IAF proposal, it is necessary to know the group's returns absent of the proposal (counterfactual returns). I use the returns of NASDAQ companies with an IAF (the benchmark group) as the counterfactual returns of the affected group.²⁷ To formally test the market reactions to the two events, I run the following univariate regression:

²⁶ Documents include the public filing itself, the NASDAQ announcement of the event, and report by Bridgepoint Consulting and Lexology.

²⁷ Since all NYSE companies have IAF as a result of the mandatory requirement in 2003, I also perform the same analysis using NYSE companies as benchmark group and find similar and slightly stronger results. The advantage of NYSE benchmark group over NASDAQ benchmark group is that the former contains more observations than

$$2\text{-day } CR(CAR)_{i,k} = \beta_0 + \beta_1 NOIAF_i + u_{i,k} \quad (2)$$

NOIAF is equal to one if internal audit–related phrases do not appear in a company's proxy statement filed in year 2012 and zero otherwise. The coefficient β_1 captures the investors' reaction to the proposal. It stands for the differential returns of companies in the affected group compared with the returns of companies in the benchmark group captured by the intercept β_0 . Two-day cumulative raw (abnormal) return of the event day plus the day after is 2-day CR (CAR).²⁸ This univariate regression is run for each of the two events separately ($k = 2, 5$). In addition, it is also estimated on a pooled sample, where the stock returns of each firm i for both events are pooled together and the stock returns for the proposal withdrawal ($k = 5$) are multiplied by -1 .²⁹

Figure 1 plots two groups' two-day cumulative abnormal return differences around the event day (day 0). The cumulative return differences are based on non-rolling windows, where return differences of day 0 and day 1 are added together and return differences of day 2 and day 3 are added together. Panel A (B) demonstrates the return difference pattern around proposal filing (proposal withdrawal) event, and Panel C presents two events' average return differences that are obtained by averaging the sum of the return differences for proposal filing and the negative return differences for proposal withdrawal. Return difference is defined as affected group return minus

the latter and hence yields more powerful tests. However, I find that the characteristics NASDAQ affected group, such as size and industry distribution, is more similar to NASDAQ benchmark group than to NYSE benchmark group. Thus, the NASDAQ benchmark group is considered as a more valid and conservative control group.

²⁸ The two-day event window is commonly used in event study literature (Li [2014] and Kim [2016]) and accommodates the uncertainty regarding the specific time that the two events happened. If the event happened after trading hours, investors' reaction to the event will be captured on the day after. I also run this analysis using three-day event window (-1, 0, +1) and four-day window (-1, 0, +1, +2). The results are similar for those alternative event windows.

²⁹ Pooled regression offers several advantages over event-by-event analysis and is widely used in empirical analysis. First, it increases the power of the tests. Second, it increases the generalizability of the results since the results are obtained when looking at multiple events and not just one event. For a summary of the pooled regression method, see Kim [2016].

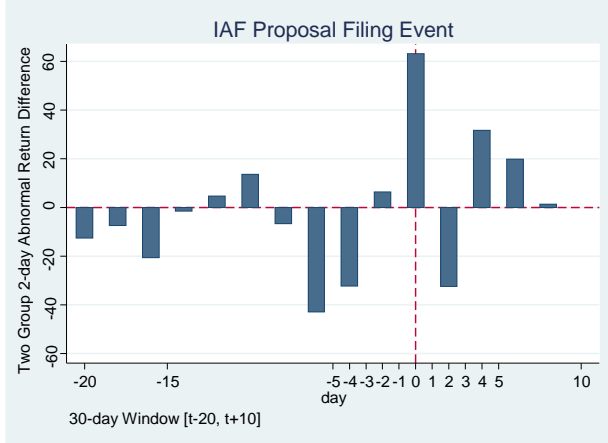
benchmark group return. A 31-day period is presented starting with 20 days before the event day. The pattern is based on size- and industry-adjusted abnormal return measures. For the proposal filing event, the two-day cumulative abnormal return differences lie within the range of 30 and -40 basis points during the pre- and post-event days and spike on day 0 and day 1 by reaching beyond 60 basis points. For the proposal withdrawal event, the return differences decline sharply from 2 basis points to -60 basis points two days before the event date, and this decline persists until two days after the event. This pattern suggests possible information leakage before the event day. The pattern of combined return difference reveals that two groups' return differences spike on event day. Overall, the patterns presented in Figure 5.1 are consistent with market reacting positively to the proposal filing and negatively to the proposal withdrawal.

Next Page: Figure 5.1 Pattern of Two-Day Abnormal Return Differences

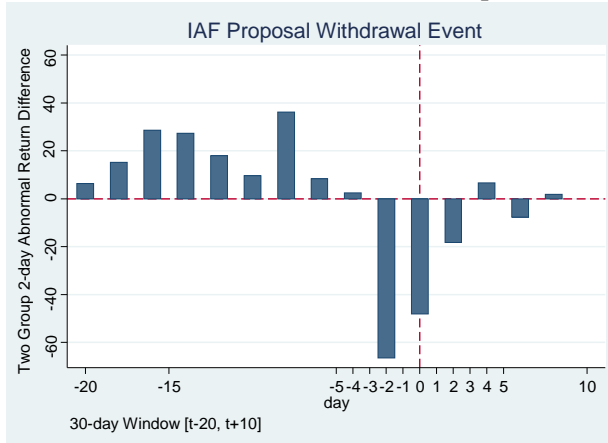
This figure shows two-day cumulative abnormal return differences around key event day between companies without an IAF (the affected group) and companies with an IAF (the benchmark group). Day 0 is the event day. The cumulative return differences are based on non-rolling windows, where return differences of day 0 and day 1 are added together and return differences of day 2 and day 3 are added together. Panel A (B) demonstrates the return difference pattern around proposal filing (proposal withdrawal) event, and Panel C presents two events' average return differences that are obtained by averaging the sum of the return differences for proposal filing and the negative return differences for proposal withdrawal. The return measure is the size- and industry-adjusted abnormal return, defined as a company's raw return minus its corresponding size and industry portfolio return. For each day of interest, value-weighted size and industry portfolio returns are calculated based on all companies on CRSP on that day, with the weight being a stock's market value on the prior day.

Figure 5.1 Continued

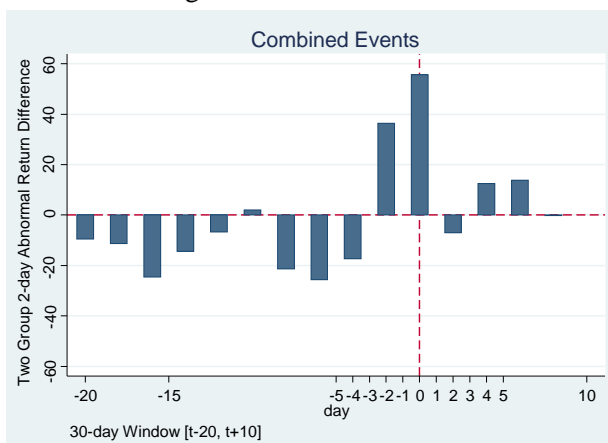
Panel A: Return Differences for IAF Proposal Filing



Panel B: Return Differences for IAF Proposal Withdrawal



Panel C: Average Return Differences for Two Events



The estimation results of model (2) are presented in Table 5.1. Panel A presents two groups' differential two-day cumulative raw returns. Panel B (C) presents differential two-day cumulative abnormal returns, defined as a company's raw return minus its corresponding size (size and industry) portfolio returns. In each panel, the results for the proposal filing, the proposal withdrawal, and the pooled events are presented. As shown in Table 5.1, stock returns for proposal filing are positive and statistically significant at the .10 significance level based on two of three return measures.³⁰ The magnitude of the two-day market reaction to this event varies from 59 to 88 basis points, depending on the specific return measure. Since the rule filing increases the probability of a mandatory IAF, we can infer that investors perceive a mandatory IAF as enhancing shareholder value. Investors' positive perception to a mandatory IAF is confirmed by the negative and statistically significant market reaction to the proposal withdrawal, which reduces the probability of a mandatory IAF to 0. The magnitude of the two-day return ranges from 48 to 70 basis points. The pooled regression results confirm the results of separate event analysis, with the magnitude of return ranging from 56 to 80 basis points.³¹ With the mean market size of \$725 million in my sample, the market reaction could be translated to \$4.06 million to \$5.80 million. Overall, the evidence indicates that, on average, the market expects a mandatory IAF to increase shareholder value. That is, investors consider the lack of an IAF as a suboptimal governance practice.

³⁰ In untabulated results, I find similar and slightly stronger results for a propensity score matched sample with the matching variables being all the variables in table 4.2. Since the characteristics of the benchmark and the control group are different, the confounding news on the events days that might impact companies with different characteristics differently could have triggered the documented differential returns between the two groups. The propensity score matched sample could, to some extent, address this concern.

³¹ I also run this analysis using the sample in table 4.2 and the sample after excluding Finance, Utilities, Telephone and Television, and Oil and Gas industries. The results are similar.

Table 5.1 Separate and Pooled Return Analysis

This table reports the results of the separate return analysis for two events (2 and 5). Two-day *CR* (*CAR*) is the 2-day cumulative raw (abnormal) returns of the event day plus the day after. The proposal filing (event 2) and proposal withdrawal (event 5) column stands for the corresponding event's 2-day cumulative returns. The pooled events column stands for two events' pooled returns, with the returns of event 5 multiplied by -1 . The affected group's differential returns over benchmark group are indicated by *NOIAF*, the internal audit function absence indicator, which is equal to one if internal audit-related phrases do not appear in a company's proxy statement filed in year 2012 and zero otherwise. Panel A presents two groups' differential 2-day cumulative raw returns. Panel B (C) presents differential abnormal returns, defined as a company's raw return minus its corresponding size (size and industry) portfolio return. For each day of interest, value-weighted size (size and industry) portfolio returns are calculated based on all companies on CRSP on that day, with the weight being a stock's market value on the prior day. The sample is based on the Table 3.1 sample with necessary return information available to estimate the specific model. The p values in parentheses are based on robust standard errors. The significance levels at 1%, 5%, and 10% are indicated with ***, **, and *, respectively, based on two-tailed tests. Returns are reported in percentage points. See Appendix A for variable definitions and Appendix V for event descriptions.

Panel A: Raw Returns

Event	2-day CR		
	Proposal Filing	Proposal Withdrawal	Pooled Events
<i>NOIAF</i>	0.875** (0.021)	-0.703*** (0.003)	0.789*** (0.000)
<i>Constant</i>	-2.551*** (0.000)	1.086*** (0.000)	-1.818*** (0.000)
Observations	1,423	1,423	2,846
R-squared	0.004	0.006	0.004

Panel B: Size-Adjusted Abnormal Returns

Event	2-day CAR (Size Adjusted)		
	Proposal Filing	Proposal Withdrawal	Pooled Events
<i>NOIAF</i>	0.587 (0.117)	-0.574** (0.017)	0.581*** (0.009)
<i>Constant</i>	-0.366*** (0.005)	0.225 (0.144)	-0.295*** (0.003)
Observations	1,423	1,423	2,846
R-squared	0.002	0.004	0.003

Panel C: Size- and Industry-Adjusted Abnormal Returns

Event	2-day CAR (Size and Industry Adjusted)		
	Proposal Filing	Proposal Withdrawal	Pooled Events
<i>NOIAF</i>	0.631* (0.089)	-0.481** (0.045)	0.556** (0.012)
<i>Constant</i>	-0.079 (0.548)	0.257* (0.094)	-0.168* (0.096)
Observations	1,423	1,423	2,846
R-squared	0.002	0.003	0.002

5.2. Validity of the Return Counterfactuals Provided by Benchmark Group

The differential returns of the affected group over the benchmark group are interpreted as the market reaction to the NASDAQ's proposal filing and withdrawal. The assumption behind this interpretation is that the two groups' returns are similar absent of the proposal filing and withdrawal. That is, the benchmark group returns provide return counterfactuals for the affected group returns during event periods. However, the benchmark companies are not randomly selected from the same population as the affected group, and the company's self-selection into the benchmark and affected group may be associated with characteristics that could lead to different return patterns across the two groups. As the descriptive statistics in Table 4.1 show, the affected group differs from the benchmark group across several dimensions. The imbalance between the benchmark and affected group casts doubt on the validity of the counterfactual assumption, which I conduct one more test in this section to justify.

Essentially, this test examines how extreme the two groups' return differences in the event periods are compared with the distribution of their return differences in the non-event periods. It is more valid to conclude that it is the two events that cause the two groups' returns to diverge if the event periods' return differences are extreme observations based on the return difference distribution. That is, without a significant event that shifts the two groups' return differences, two groups' return differences of the event period should not differ in a statistically significant way from their return differences of non-event periods.

The non-event period is a 6-month pretest period ending 30 days before event 1. That is, the non-event period is from March 10, 2012, to September 10, 2012. The return window for each day during the non-event period is defined as day 0 plus day 1, the same way the event period's

return window is defined. Furthermore, three versions of return are calculated: raw return, size-adjusted abnormal return, and size- and industry-adjusted abnormal return.

For each return window of the non-event period (127 trading days yields 64 non-rolling return windows), I subtract the mean return of the benchmark group from the mean return of the affected group. I then calculate the mean (μ) and standard deviation (σ) of the 64 return differences. Those two statistics form the distribution of the two groups' return difference. Finally, based on the return difference distribution, I calculate the z value using the formula below to see how likely each of the two event return differences is. x is the magnitude of the return difference for each of the two events.

$$z = (x - \mu) / \sigma$$

The test results are demonstrated in Table 5.2. Since the results are similar across three return definitions, I based the interpretation on the size- and industry-adjusted abnormal returns. The mean return difference during the non-event period is 3.6 basis points, with a standard deviation of 27 basis points. The two groups' return differences of event periods (63 basis points for event 1 and 48 basis points for event 4) are statistically different from their average during non-event periods. The probability to observe a return difference of 63 basis points (48 basis points) is so marked that the likelihood of its being attributable to chance is approximately three (five) in one hundred. This evidence indicates that the proposal filing and withdrawal cause the two groups' return to divert in a statistically significant fashion from what we would expect without the two events. Thus, the usage of the benchmark group returns as affected group return counterfactuals is justified.

Table 5.2 Significance of Event-Period Differential Return Compared with Distribution of Non-Event Period Differential Returns

This table compares the two groups' event-period differential return with their non-event period differential returns. A six-month period ending one month before event 1 constitutes the non-event period, for which the mean (μ) and standard deviation (σ) of two groups' 2-day cumulative return differences are presented. The proposal filing and proposal withdrawal rows contain the magnitude (x) and test statistics of two groups' differential 2-day cumulative return of the corresponding event. *Z value* is computed based on the following formula, $z = (x - \mu)/\sigma$. The significance levels at 1%, 5%, and 10% are indicated with ***, **, and * respectively, based on two-tailed tests. Panel A (B, C) presents two groups' differential 2-day cumulative raw (abnormal) returns of the event day plus the day after. Return differences are reported in percentage points. See note of Table 5.1 for abnormal return definition.

Panel A: Raw Returns

A1: Distribution of two groups' return differences from non-event period

Statistic	μ	σ	Observations
	0.025	0.359	64

A2: Value and test statistics of two groups' return difference of two events

Statistic	x	z	Probability (Two-Way)
Proposal Filing	0.875**	2.367	0.018
Proposal Withdrawal	-0.703**	-2.033	0.042

Panel B: Size-Adjusted Abnormal Returns

B1: Distribution of two groups' return differences from non-event period

Statistic	μ	σ	Observations
	0.026	0.283	64

B2: Value and test statistics of two groups' return difference of two events

Statistic	x	z	Probability (Two-Way)
Proposal Filing	0.587**	1.977	0.048
Proposal Withdrawal	-0.574**	-2.12	0.034

Panel C: Size- and Industry-Adjusted Abnormal Returns

C1: Distribution of two groups' return differences from non-event period

Statistic	μ	σ	Observations
	0.036	0.269	64

C2: Value and test statistics of two groups' return difference of two events

Statistic	x	z	Probability (Two-Way)
Proposal Filing	0.631**	2.208	0.028
Proposal Withdrawal	-0.481*	-1.921	0.054

5.3. *Cross-Sectional Variation in the Market Reaction to Key Events*

The probability for the proposal passage was completely reversed when the proposal was withdrawn, and Smith [1981] offers a way to take advantage of the reversal phenomenon by examining the correlation of the two events' returns.³² Although the rule applies to all companies of the affected group, the magnitude, or even the direction, of the market reaction for the proposal filing could vary within the affected group. Moreover, similar heterogeneity of the market reactions will also be observed for the proposal's withdrawal but with the opposite sign. Hence, the reversal phenomenon plus the heterogeneity of stock price responses predict a negative correlation between the two event periods' returns if the stock price is responding to the IAF proposal filing and withdrawal instead of other events.

Since an affected company's return upon the proposal's withdrawal is compared with its own return upon the proposal's filing, the correlation coefficients are estimated based only on companies without an IAF. Table 5.3 reports the Pearson correlation coefficients of the two price responses. It also presents a one-tailed statistical significance test on the correlation coefficient, reported in parenthesis. All three return measures are negative and statistically significant at the .10 level. The results of Table 5.3 indicate the prices responding to the IAF proposal and the presence of heterogeneous market reactions.

³² Several later studies have also used the reversal feature of the rule process. For example, Ali and Kallapur [2001] take advantage of the return reversal phenomenon during the legislative process of the Private Securities Litigation Reform Act (PSLRA) to help identify the sign of the market reaction on a day with two events having opposite implications for the passage of the PSLRA.

Table 5.3 Correlation Analysis between Price Response to the Proposal Filing and Price Response to the Proposal Withdrawal

This table reports the Pearson correlation coefficient between proposal filing's (event 2) returns and proposal withdrawal's (event 5) returns. The returns are 2-day cumulative returns of the event day plus the day after. Panel A presents Pearson correlation coefficients of two events' raw returns. Panel B (C) presents Pearson correlation coefficient of two events' abnormal returns, defined as a company's raw return minus its corresponding size (size and industry) portfolio return. For each day of interest, value-weighted size (size and industry) portfolio returns are calculated based on all companies on CRSP on that day, with the weight being a stock's market value on the prior day. The sample comprises companies with the value of *NOIAF* equal to one. The significance levels at 1%, 5%, and 10% are indicated with ***, **, and *, respectively, based on one-tailed tests.

Panel A: Raw Returns

Pearson Correlation Coefficient	p-value	Observation
-0.050*	0.090	709

Panel B: Size-Adjusted Abnormal Returns

Pearson Correlation Coefficient	p-value	Observation
-0.053*	0.079	709

Panel C: Size- and Industry-Adjusted Abnormal Returns

Pearson Correlation Coefficient	p-value	Observation
-0.052*	0.085	709

To see how the market reaction varies with the company characteristics, I estimate the following multivariate regression for companies without an IAF:

$$2\text{-day } CAR_{i,k} = \beta_0 + \beta_1 MktCap_i + \beta_2 BM_i + \beta_3 N_BSEG_i + \beta_4 INSOWN_i + \beta_5 Big4_i + \beta_6 EMPLEE_i + \beta_7 LEV_i + Controls_i + u_{i,k} \quad (3)$$

The definitions of return and attribute variables are discussed in Sections 3.3 and 4.1, respectively. The main independent variables include those shown in Table 4.2 to be associated with the likelihood of having an IAF. Controls represent the remaining variables in model (1). The estimation results of model (3) are reported in Table 5.4. The regression is estimated based on the pooled sample. The coefficient on *N_BSEG* is positive and statistically significant, suggesting that investors are more receptive of a mandatory IAF when a company has more business segments, which prior literature has shown to be more likely to have internal control issues (Doyle, Ge, and McVay [2007]; Ashbaugh-Skaife, Collins, and Kinney [2007]). The coefficients on *INSOWN* are negative and statistically significant, and the coefficients on *Big4* are also negative but mixed with respect to statistical significance level. In general, the results for *INSOWN* and *Big4* suggest that investors view the mandatory IAF more favorably for companies with more acute agency problems (lower institutional ownership and the absence of a Big 4 auditor). Together with the evidence in Section 3 that misalignment of interests between shareholders and managers might be blocking the companies from voluntarily building an IAF, the evidence further suggests that the *unfulfilled* investor demand for an IAF is greater (more positive returns) for companies with weaker corporate governance (lower institutional ownership and the absence of a Big 4 auditor) and is finally met by NASDAQ mandating the function.

Table 5.4 Cross-Sectional Return Analysis

This table reports the results of the cross-sectional analysis of pooled event period (2 and 5) returns. The firm observations of two events are pooled together, with the returns of event 5 multiplied by -1 . Two-day CR (CAR) is the 2-day cumulative raw (abnormal) return of the event day plus the day after. The sample comprises companies with the value of *NOIAF* equal to one with necessary information available to estimate the specific model. Control variables include all the other variables included in Table 4.2. The p values in parentheses are based on robust standard errors clustered by date and company. All continuous independent variables are winsorized at levels 1% and 99%. The significance levels at 1%, 5%, and 10% are indicated with ***, **, and *, respectively, based on two-tailed tests. See note of Table 5.1 for abnormal return calculation and Appendix A for variable definitions. Returns are reported in percentage points.

VARIABLES	Size-Adjusted	Size- and Industry-Adjusted
	<i>2-day CAR</i>	<i>2-day CAR</i>
<i>MktCap</i>	0.043 (0.283)	0.016 (0.430)
<i>BM</i>	-0.025 (0.951)	-0.030 (0.944)
<i>N_BSEG</i>	-1.000 (0.126)	-1.136 (0.159)
<i>INSOWN</i>	0.163** (0.010)	0.185** (0.024)
<i>Big4</i>	-0.189 (0.754)	-0.204 (0.679)
<i>EMPLEE</i>	-0.711** (0.015)	-0.851*** (0.009)
<i>LEV</i>	-0.283* (0.059)	-0.229 (0.292)
Constant	6.816 (0.235)	1.662 (0.921)
Controls	-1.161 (0.163)	-1.161 (0.262)
Observations		
R-squared	0.013	1.454

In summary, the separate event analysis shows that the market reacts favorably to the mandatory IAF proposal, and the cross-sectional tests reveal the market reaction heterogeneity and how the price responses vary with the companies' attributes. The results in this section suggest that, on average, a mandatory IAF increases shareholder value and the IAF underinvestment problem is particularly acute for companies with greater agency issues and for companies for whom the net benefits of the IAF are expected to be higher.

CHAPTER 6

CONCLUSION

The study investigates whether a mandatory IAF increases shareholder value and the cross-sectional variation of the value implications. For the group of NASDAQ companies without an IAF, this study documents a positive (negative) price response to the filing (withdrawal) of a NASDAQ proposal that would require them to institute an IAF. The results indicate that investors, on average, perceive the private benefits of a mandated IAF surpassing its private costs. The results also suggest that companies underinvest in their internal control system. Cross-sectional tests reveal that investors react more positively to companies with multiple business segments, consistent with the notion that companies with more complex business benefit more from an IAF. At the same time, companies with lower institutional ownership receive more positive price response to the rule. It is generally argued that institutional ownership improves the alignment of interests between shareholders and managers (Bushee [1998]; Hartzell and Starks [2003]; Roychowdhury [2006]). Thus, this evidence suggests that the perceived value implications of mandating the IAF increase with the degree of agency issues.

For a sample of NASDAQ companies, the study shows that companies that have smaller market cap, lower book-to-market ratio, and fewer business segments are less likely to have an IAF. The evidence is consistent with an IAF being a more costly undertaking for small and rapidly growing companies but bringing more benefits for companies with more complex operations. The study also finds that the companies with lower institutional ownership are less likely to have an IAF, suggesting that agency issues thwart the voluntary establishment of an IAF.

One caveat is in order in interpreting the evidence of the study. The price response patterns reveal that investors expect a mandatory IAF to produce significant value in the form of improved controls and risk assessments. However, those return patterns cannot speak to whether a mandatory IAF is indeed able to deliver to that expectation, which is an interesting question for future research. Despite this unanswered question, the study provides a crucial first step toward understanding the shareholder value implications of the IAF.

The internal audit function is a unique and intriguing presence in the corporate governance system. Like an external auditor, it detects errors in a company's financial reporting. At the same time, it also operates as a function within a company that improves the efficiency of financial reporting and operational process. The combination of those two attributes determines that the IAF's role should be less of a ruthless corporate watchdog and more of a benign consultant. According to Ball [2009], the United States adopts an inefficient ex post regulatory model, which allocates too many resources to law enforcement and detection and the punishment of securities fraud. He advocates more ex ante regulations that prevent inappropriate behaviors from happening in the first place through consultation. Although it is a question how much the IAF can achieve in this regard, establishing an IAF within a corporation could be a step toward Ball's recommendation.

APPENDIX A

VARIABLE DEFINITIONS

Variable	Definition
<i>IAF</i>	equal to one if internal audit–related phrases appear in a company's proxy statement filed in year 2012 and zero otherwise
<i>NOIAF</i>	equal to one if internal audit–related phrases do not appear in a company's proxy statement filed in year 2012 and zero otherwise
<i>MktCap</i>	average market value of equity in years 2012 and 2011
<i>Salegrow</i>	sales growth from years 2011 to 2012
<i>BM</i>	average book to market ratio in years 2012 and 2011, defined as book value of equity divided by market value of equity
<i>Big4</i>	an indicator variable equal to one if the company was audited by a Big 4 external auditor in year 2012 and zero otherwise
<i>INSOWN</i>	average institutional ownership of years 2011 and 2012
<i>N_BSEG</i>	total number of business segments in 2012
<i>Foreign</i>	an indicator variable equal to one if a company has foreign operation in 2012 and zero otherwise
<i>Loss</i>	an indicator variable equal to one if a company's average net income in years 2011 and 2012 is negative and zero otherwise
<i>Zscore</i>	Decile rank of Altman [1968] Z-Score
<i>Age</i>	number of years a company has on CRSP
<i>BIOTECH</i>	an indicator variable equal to one if the company is in the biotech industry, as defined in Guo, Lev, and Zhou [2004], and zero otherwise
<i>LEV</i>	average ratio of total liabilities divided by total assets in years 2011 and 2012
<i>REV</i>	average ratio of total sales divided by total assets in years 2011 and 2012
<i>ROA</i>	average ratio of net income divided by total assets in years 2011 and 2012
<i>Cash</i>	average ratio of total cash divided by total assets in years 2011 and 2012
<i>EMPLEE</i>	average ratio of total number of employees divided by total assets in years 2011 and 2012
<i>PPE</i>	average ratio of total property, plant, and equipment divided by total assets in years 2011 and 2012
<i>R&D</i>	average ratio of research and development expense divided by total assets in years 2011 and 2012
<i>INTANG</i>	average ratio of total intangible assets divided by total assets in years 2011 and 2012
<i>2-day CR</i>	two-day cumulative raw return starting from event day
<i>2-day CAR</i>	two-day cumulative abnormal return starting from event day, where the abnormal return is calculated based on value-weighted CRSP size (size and industry) portfolios

APPENDIX B
EVENT DESCRIPTIONS

Date	Event	Description of Event
October 10, 2012	1	The Board of Directors of NASDAQ approved the proposed rule change, which authorized the filing of the rule change with the SEC.
February 20, 2013	2	NASDAQ filed the proposal to SEC requiring all NASDAQ-traded companies to have an internal audit function.
March 4, 2013	3	NASDAQ-proposed rule was available for comments.
April 18, 2013	4	SEC extended comment period on NASDAQ's proposed internal audit function rule.
May 7, 2013	5	NASDAQ withdrew the proposed rule change.

APPENDIX C

SAMPLE DISCLOSURE OF INTERNAL AUDIT IN PROXY STATEMENT

2012 Proxy Statement by Hudson Highland Group, Inc.

RISK OVERSIGHT

The Audit Committee of our Board of Directors oversees our risk management process. Our Risk Committee, which consists of certain members of our senior management, has day-to-day responsibility for our risk management process. The members of the Risk Committee are our Chief Executive Officer, Executive Vice President and Chief Financial Officer, Senior Vice President, Legal Affairs and Administration, Vice President, **Internal Audit**, and Vice President, Operations. Our Vice President, **Internal Audit** serves as the liaison between the Risk Committee and our Board of Directors. Our Vice President, **Internal Audit** provides periodic updates to our Board of Directors on behalf of the Risk Committee regarding, among other things, risk assessments and actions taken to mitigate risks. In addition, our Vice President, **Internal Audit** reports directly to the Chairman of the Audit Committee and, accordingly, also provides periodic updates to the Audit Committee regarding risk management issues, particularly those regarding accounting and finance related risks. Also, our Senior Vice President, Legal Affairs and Administration provides periodic updates to our Board of Directors regarding claims against our company.

2012 Proxy Statement by Apogee Enterprises, Inc.

Audit Committee

Our Audit Committee is governed by a Board-approved charter, which was last amended in June 2011. Under its charter, our Audit Committee oversees our financial reporting process (including our system of financial controls, internal audit procedures and independent registered public accounting firm); oversees our program to ensure compliance with legal and regulatory requirements and ethical business practices; assesses and establishes policies and procedures to manage our financial reporting and internal control risk; is directly responsible for the appointment, compensation, retention and oversight of the work of our independent registered public accounting firm; establishes policies and procedures for the pre-approval of all services provided by our independent registered public accounting firm; and oversees our **internal audit function** and has established procedures for the receipt, retention and treatment of complaints regarding accounting, internal controls and auditing matters.

2012 Proxy Statement by UFP TECHNOLOGIES, Inc.

Risk Oversight

The Company's management is responsible for day-to-day risk management. Our Treasury, Finance, and Internal Audit functions serve as the primary monitoring and testing function for company-wide policies and procedures, and manage the day-to-day oversight of the risk management strategy for the ongoing business. This oversight includes identifying, evaluating, and addressing potential risks that may exist at the enterprise, strategic, financial, operational, and compliance and reporting levels.

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BIOGRAPHICAL SKETCH

Bo Liu was born in China. After completing high school at Pinggu No. 1 High School at Beijing, China, in 2005, he entered Southwestern University of Finance and Economics, Chengdu, Sichuan Province, China, for undergraduate studies. He obtained his Bachelor degree in Business English in 2009. He joined the Naveen Jindal School of Management at The University of Texas at Dallas in 2010 and obtained his Master of Science in Accounting program in 2010. In August 2012, he entered the Ph.D. program in Management Science with the concentration in Accounting in the Naveen Jindal School of Management at The University of Texas at Dallas.

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RESEARCH INTERESTS

Auditing, Disclosure, Capital Market, and Financial Regulation

WORKING PAPERS

“Shareholder Value Implications of the Internal Audit Function” (Job Market Paper)

- Committee: William M. Cready (Chair), Rebecca Files, Ningzhong Li, Jieying Zhang, and Yuan Zhang
- Presented at 2017 Lone Star Conference, The University of Texas at Dallas

“Non-GAAP Measure Disclosures by IPO Firms” with Yuan Zhang

- Presented at The University of Texas at Dallas

“Market Responses to the New Revenue Recognition Standard” with Nathan Goldman and Yuan Zhang

WORKS IN PROGRESS

“The Predictability of Aggregate Earnings” with William M. Cready

- Data analysis in progress

“The Effects of Non-GAAP Measure Disclosures on Analyst Forecasts: Evidence from Non-GAAP Reporting by IPO firms”

- Data analysis in progress

“The Effects of the Internal Audit Function on Financial Reporting Quality”

- Data collection in progress

TEACHING INTERESTS

Accounting Information System, Auditing, Financial Accounting, Financial Statement Analysis, and Managerial Accounting

TEACHING EXPERIENCE

The University of Texas at Dallas

- Instructor: Introduction to Financial Accounting (Instructor Rating: 4.96 out of 5.00) Fall 2015
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- Teaching Assistant: 2012 – present
Cost Accounting, Intermediate Accounting I & II, and Financial Statement Analysis

CONFERENCE PARTICIPATION

- Lone Star Accounting Research Conference, UT Arlington, TX (Presenter) 2017
- 2016 AAA Doctoral Consortium, Dallas, TX 2016
- FARS Midyear Meeting, Newport Beach, CA 2016
- AAA 2015 Annual Meeting, Chicago, IL 2015
- Lone Star Accounting Research Conference, UT Dallas, TX 2015
- FARS Midyear Meeting, Nashville, TN 2015

PROFESSIONAL AFFILIATION

- Member of American Accounting Association 2014 – present

ACADEMIC HONORS AND AWARDS

The University of Texas at Dallas

- 2016 AAA Doctoral Consortium Fellow 2016
- Graduate Studies Scholarship 2012 – present
- Dean's Excellence Scholarship 2010 – 2012

Southwestern University of Finance and Economics

- China National Scholarship (Top 2% undergraduate students) 2008

ACADEMIC SERVICES

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- Reviewer for Asia-Pacific Journal of Accounting & Economics
- Reviewer for Journal of Accounting, Auditing and Finance