From Compliance to Strategy: Using the Three Lines of Defense Model to Evaluate and Motivate Internal Audit Contributions to Accounting Research

Dereck Barr-Pulliam*
University of Wisconsin-Madison
975 University Avenue
Madison, WI 53706
dbarr2@wisc.edu

Porschia Nkansa
California State University, Los Angeles
5151 State University Dr., ST F517
Los Angeles, CA 90032-8126
pnkansa@calstatela.edu

Kimberly Walker
University of Wisconsin-Madison
975 University Avenue
Madison, WI 53706
kwalker23@wisc.edu

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*Corresponding Author
ABSTRACT: We synthesize the extant behavioral and archival literature examining the internal audit function’s (IAF’s) contribution to and association with research published in six broad and 13 subject-specific accounting journals since 2004. Rather than use the corporate governance cornerstone or mosaic frameworks used in comprehensive reviews of IAF-related literature published in 2004, we use the Institute of Internal Auditors’ Three Lines of Defense (3LOD) in Effective Risk Management and Control. We use the 3LOD model to both evaluate extant and to motivate additional research on internal audit. The prior syntheses focus on the IAF as a "cornerstone" of corporate governance and how the IAF can contribute to improved governance. More specifically, those syntheses adopt a perspective that the IAF serves as a resource to each of the other three parties responsible for corporate governance. The 3LOD framework is similar in that it encourages continued coordination but differs in that it suggests a clearer delineation of responsibilities for control ownership, monitoring, and evaluation. This framework suggests the IAF is the final line of defense against significant risk or internal control weakness rather than either the primary or an equal line of defense. After 2004, our review of the literature suggests a concentration around three themes: external auditor reliance, use of the IAF as a management training ground, and more recently the IAF’s use of technology to enhance the assurance process. Applying this prior research to the 3LOD model identifies many areas for future research that we discuss throughout the paper.

KEYWORDS: internal audit, internal control, three lines of defense, literature review
1. INTRODUCTION

The Internal Audit Function (IAF) is an “independent, objective, assurance and consulting activity designed to add value and improve an organization’s operations…by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes” [Institute of Internal Auditors (IIA) 2000]. The IAF uses its in-depth knowledge of its company and various analyses and examinations of data and business processes to provide insight and recommendations to management of the company at all levels. Thus, the IAF provides a window into the organization (Tapestry Networks 2004). In this study, we examine research in accounting through the Institute of Internal Auditors’ (IIA) Three Lines of Defense (3LOD) perspective. We also provide an update since the last comprehensive examinations of internal audit-related research in 2004 and identify opportunities for future research.

This paper is motivated by two factors. First, there has been a shift in focus from exploring the practice and related challenges of the IAF from its role as a key component of corporate governance (e.g., as in Gramling, Maletta, Schneider, and Church 2004 and Cohen, Krishnamoorthy, and Wright 2004) to the 3LOD\(^1\) approach (IIA 2013). The model provides a framework for companies to better define, coordinate and integrate its risk and control functions. Specifically, the 3LOD approach helps companies to define clear ownership and accountability for both monitoring and providing assurance on several types of risks and the related controls implemented to mitigate those risks [Ernst & Young (EY) 2017]. While no two organizations are alike, this framework focuses on risk and control functions common in most organizations.

\[^1\] The Three Lines of Defense model provides a simple and effective way to enhance communications on risk management and control by clarifying essential roles and duties. It provides a fresh look at operations, helping to assure the ongoing success of risk management initiatives, and it is appropriate for any organization (Source: IIA the three lines of defense in effective risk management and control January 2013).
irrespective of size, location, and or industry. Although internal audit (IA) is listed as the final line of defense against significant risk or internal control weakness, internal auditors (IAs) can play a key role by providing assurance throughout the organization which allows management, the board, and other stakeholders to focus on their primary roles in managing the business.

Second, research borne out of the two prior research syntheses focuses primarily on external auditor reliance on the IAF (Bame-Aldred, Brandon, Messier, Rittenberg, and Stefaniak 2013 reviews this research), use of the IAF as a management training ground (e.g., Messier, Reynolds, Simon, and Wood 2011; Rose, Rose, and Norman 2013; Barr-Pulliam 2016) and, more recently, the IAF’s use of data analytics (e.g., Brown, Wang, and Baldwin 2007; Brown-Liburd, Issa, and Lombardi 2015; Barr-Pulliam 2016, 2017). These studies provide important insights about the role of the IAF but ignore important roles and responsibilities that, where practical, should be segregated, such as risk management and compliance with regulatory requirements. Thus, despite being studied extensively in the accounting and auditing literature, the 3LOD model provides an excellent theoretical framework to organize extant research on the IAF and to identify areas for future research that could help move the internal audit practice forward.

To examine the contributions to the literature since 2004, we review 19 leading accounting journals to identify all research that relates to internal audit based on the 3LOD model (EY 2017). We identify a total of 34 studies across these journals. From this list, we hand collect the research question(s), methodology and findings of each study. Next, we assigned each study to one of the lines of defense. The 1st Line of Defense category includes studies that examine the effects of internal audit practices or characteristics that directly affect operational management. The 2nd Line of Defense includes studies that examine internal audit characteristics or practices that help bolster the support and control functions and processes that aid management in risk management such as
controllership, continuous monitoring, and environmental compliance. Further, the 3rd Line of Defense includes studies that focus on the IAF, such as factors that affect judgments and decision-making and audit quality. Lastly, we synthesize the literature within each category and find that research in the 1st and 3rd lines are the most robust. This finding suggests many opportunities for future research remain in the 2nd line of defense; however, many opportunities still exist in the other lines as well.

Our review and synthesis of the literature includes both quantitative and qualitative research. We highlight the strengths and opportunities in both methodologies to examine the extant literature and to develop new research questions. Quantitative research, especially archival methods, allows us to identify associations between and among various IAF characteristics. Qualitative research is typically exploratory and helps researchers 1) gain an understanding of underlying reasons, opinions, and motivations behind specific questions and generate hypotheses and 2) explore whether and to what extent the associations, identified in quantitative research, between and among various IAF exist. Currently, access to quantitative data that characterizes or measures activities of the IAF such as budget data or audit report opinions is limited. As a result, apart from a few studies that use the IIA’s GAIN data\(^2\), much of extant IAF research is experimental. Consistent with this notion, we find 11 archival studies versus 23 combined experimental, qualitative, and survey studies published in one of 19 accounting journals between 2004 and 2016. We note that 8 out of 19 journals did not publish IAF-related studies over our sample period.

\(^2\) The IIA conducts annual surveys of practitioners in part through its Internal Audit Foundation (IAF) and practitioners such as Protiviti. The GAIN (Global Audit Information Network) is a comprehensive annual benchmarking study with chief audit executives (CAEs) in 17 industries and 44 countries. It helps CAEs to benchmark their organizations against peers and others based on several qualitative and quantitative dimensions. The CBOK (Common Body of Knowledge) is a broader and the world’s largest ongoing study of the internal audit profession, consisting of two phases: The Practitioner Survey and the Stakeholder Survey. All IIA data are proprietary and access is granted through a successful request for proposal.
Our literature review shows that little research has been performed on the second line of defense (five studies covered in this review) compared to the first line of defense (nine studies covered in this review), and third line of defense (20 studies covered in this review). The literature on the first line of defense generally examines either the IAF as a management training ground or how the IAF adapts the internal control frameworks. The limited literature on the second line of defense focuses on the emerging use of continuous auditing by the IAF and continuous monitoring by management. Lastly, the literature on the third line of defense examines topics such as independence and objectivity, quality, contribution to the external audit fee, fraud risk assessments, and the relationship with information technology governance. Collectively, these findings reflect both inherent limitations as well as significant opportunities to conduct research on internal audit in top tier journals.

The remainder of the paper is organized into three sections. The first section briefly describes our approach and the research coverage of prior literature reviews. The second section is an overview of the 3LOD model as a unifying framework and a description of prior research categorized under each of the three lines of defense. Within each of the subsections, we provide future research questions within the discussions of these sections. In the last section, we present overall concluding remarks.

2. METHODOLOGY AND PRIOR COMPREHENSIVE RESEARCH SYNTHESSES

2.1 Methodology

For this review, we examine both experimental and archival studies published or in working paper format since 2004 following the EY 3LOD model (EY 2017). We include the top six accounting journals based on research excellence: Accounting, Organizations and Society (AOS); Contemporary Accounting Research (CAR); Journal of Accounting & Economics (JAE);
Journal of Accounting Research (JAR); The Accounting Review (TAR); and Review of Accounting Studies (RAST). In addition, we include 13 leading subject-matter journals that publish research on internal audit topics based on the 3LOD model: Accounting & Finance (A&F), Accounting Horizons (AH), AUDITING: A Journal of Practice & Theory (AJPT); Behavioral Research in Accounting (BRIA), Accounting and the Public Interest (A&PI), Current Issues in Auditing (CIIA), International Journal of Auditing (IIA), Issues in Accounting Education (IAE), Journal of Business Ethics (JBE), Journal of Emerging Technologies in Accounting (JETA), Journal of Information Systems (JIS), Journal of Management Accounting Research (JMAR), and Managerial Accounting Journal (MAJ). We summarize the count of cited papers by the journal of publication, methodology, and category (by line of defense) in Table 1. We focus our review on both quantitative and qualitative research. This approach allows us to take advantage of the strengths and address the limitations of each methodological approach. As a result, this approach allows us to triangulate interesting research questions. Quantitative research, especially archival methods, identifies associations between and among various IAF characteristics and other operational and financial firm outcomes. Alternatively, qualitative research answers whether and to what extent these associations hold in various contexts. However, we find that limitations in the breadth and depth of archival data available to examine specific characteristics of the IAF restricts the amount of archival research. Relatedly, we find 11 archival studies versus 23 combined experimental, qualitative, and survey studies published in one of the 19 journals between 2004 and 2016. We also note that 8 of the 19 journals had zero internal audit-related publications over our sample period. We recognize that the lack of research in the top 19 journals creates both a challenge and an opportunity for researchers interested in internal audit.
We categorize studies as examining the 1st Line of Defense if they examine effects on operational management as this line owns and manages risks within the firm. We categorize studies as examining the 2nd Line of Defense if they examine effects on support and control functions and processes that aid management in risk management such as controllership, continuous monitoring, and environmental compliance. Further, we categorize studies as examining the 3rd Line of Defense if they examine effects directly on the IAF. We find that most studies fall into the 1st and 3rd lines. However, as we note, many opportunities for future research exist in each of the other lines as well.

2.2 Prior Comprehensive Literature Reviews

Both Gramling et al. 2004 and Cohen et al. 2004 categorize research in progress or published prior to 2004 as it relates to the IAF serving in its corporate governance role in the context of the IAF as one of the four “cornerstones” of the governance framework or in the context of a corporate governance “mosaic”, respectively. Subsequent IA literature reviews take a more fragmented approach and examine specific topics such as factors that affect external auditor reliance on the IAF (Bame-Aldred et al. 2013) and use of advanced technology to enhance the efficiency and effectiveness of the IAF assurance processes (e.g., Brown-Liburd et al. 2015). Our approach provides a unifying framework 1) developed and endorsed by IA standards setters and 2) that reflects the status or shift in firms and the IAF towards the 3LOD model.

3. THE UNIFYING FRAMEWORK: THE THREE LINES OF DEFENSE (3LOD)

3.1 Overview

The 3LOD approach is instructive in that it demonstrates how organizations can holistically mitigate current and emerging risks and is adaptable to organizations irrespective of size or
maturity of the IAF and the organization’s risk management approach. The model identifies three distinct groups (or lines) charged with effectively managing risk. These groups include functions that 1) own and manage risks (e.g. management), 2) oversee risks (e.g. risk management, compliance, and controllership), and 3) provide independent assurance (e.g. internal audit).

Important for academic research, the 3LOD model sheds light on deficiencies in other corporate governance frameworks that describe how specific duties should be assigned and coordinated within the organization. Further, with its extensive experience identifying and assessing enterprise-wide risk as the third line of defense, the IAF leads the charge in evolving the audit process to answer management’s call for more assurance (e.g., AICPA 2012a; AICPA 2012b; PricewaterhouseCoopers (PwC) 2015; EY 2017) and additional means of adding value to the company by identifying key and emerging risks related to internal controls. However, working with management, who owns and is ultimately responsible for certifying the operating effectiveness of internal controls (IIA 2013), could also be an effective means of improving the overall internal control environment (COSO 2013; Balsam, Krishnan and Yang 2003; Barr-Pulliam 2016). Finally, over 20 recent reports generated from the Internal Audit Foundation’s 2015 Common Body of Knowledge (CBOK) practitioner survey provide a global perspective on the gap between stakeholders’ (i.e., executive management and the board) beliefs about the role of the IAF and the actual purpose, function, and performance of the IAF. The general tenor of these reports (e.g., Barr-Pulliam 2015) illuminates the scarcity of research on the IAF outside external audit reliance, use of the IAF as a management training ground, and the use of technology in the audit process. We develop avenues for research based on these reports and various links in the 3LOD model.
3.2 First Line of Defense: Operational Management

The first line of defense is operational management (IIA 2013). Operational management owns and manages risks. With this ownership is responsibility for designing controls and implementing corrective action based on weaknesses self-identified or those identified after examinations provided by either one of the other two lines of defense or an external body (e.g., external auditors or regulators). Adequate managerial and supervisory controls are tantamount to ensure compliance with established controls and to both prevent and detect control breakdowns, to assess the relevance of the processes over time, and to mitigate catastrophic events. Recent internal audit research related to operational management focuses on use of the IAF as a rotational management training program (often referred to in academic research as management training ground or MTG).

3.2.1 Rotational Management Programs

Companies, as early as 1990, report that using a MTG (PricewaterhouseCoopers 2000) can generally take one of three approaches: 1) hire externally but directly into the IAF—focusing on new college graduates, experienced hires—with the implicit intent to promote these individuals outside the IAF into operational management positions (including operations, accounting, and other corporate functions) after a predetermined amount of time (Oxner and Kusel 1996); 2) rotate existing non-IAF employees of the company into the IAF as a career path to a higher position (even senior management positions) after the IAF rotation (Chadwick 1995); or 3) cycling “career” auditors within the IAF into the operations of the company for a specified amount of time to experience specific processes (Christ et al. 2015; Burton, Starliper, Summers, and Wood 2015). Proponents of approaches 1 and 2 tout the benefits which include increased breadth and depth of knowledge of the company (Reeve 1990; Sawyer 1996; Pickett 1997) and better internal control
knowledge (Ridley 1997). This knowledge should improve the effectiveness of all corporate and operational functions as well as the effectiveness of the control environment. Opponents of these two methods exploit one specific detriment that affects the IAF rather than management, per se. These programs potentially harm the IAF in that participants could be less inclined to report issues they identify to ingratiate themselves to management for fear that it could jeopardize promotion, especially when management of the function under audit could become the participant’s boss (Wood and Wilson 1989; Chadwick 1995). Discussions related to the third method specifically relate to implications for hiring new auditors into the IAF (e.g., Burton et al. 2015).

The internal audit literature commonly examines the effect of using a MTG on the likelihood of management misconduct. Abbott, Parker, and Peters (2006) examine the relationship between external audit fees and earnings management for a sample of 429 public non-regulated companies who employ a Big N auditor. The study focuses on external audit fees but mentions implications for company-specific risk such as the use of the IAF as a MTG. The authors argue that specifically for income-increasing abnormal accruals, internal auditors (IAs) in a MTG setting may defer auditing these arguably more contentious, higher profile abnormal accruals to the external auditor. Anecdotal evidence suggests IAs may do so with the awareness that external auditors expend a significant amount of audit effort on this type of accrual-based earnings management.

Messier, Reynolds, Simon, and Wood (2011) is one of the first studies to directly examine the MTG phenomenon. The authors use archival data obtained from the 2000 to 2005 GAIN survey database to examine whether use of a MTG affects external audit fees and the external auditor’s perception of the IAF. However, they also supplement the archival data with an

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3 This assertion applies to the set of top research journals included in our review. We acknowledge that other journals, especially international journals, may contain studies that examine the MTG phenomenon.
experiment using 43 external auditors to understand the “why” in their archival results. The archival data suggest that external auditors indeed charge higher fees when companies use the IAF as a MTG. While the experimental data suggest that the pattern of archival results is a function of external auditors’ perceptions that the MTG phenomenon impairs objectivity but not competence.

Rose, Rose, and Norman (2013) test the assertion of decreased objectivity identified in Messier et al. (2011). They conduct an experiment with 74 IAs to assess IAs’ willingness to report identified aggressive behavior. As a potential mitigating factor, the study examines whether increasing the power of the board of directors has intended or unintended effects for IAF objectivity. The study hypothesizes and finds that IAs are more likely to side with management, thus be less objective, in a MTG relative to a no MTG setting. Further, the results suggest increasing the power of the audit committee of the board of directors has unintended consequences in that it further decreases the objectivity of IAs.

Christ, Masli, Sharp, and Wood (2015), like Messier et al. (2011), use multiple methods to examine their research questions. Their study extends Messier et al. (2011) and Rose et al. (2013) in two ways to examine the effect of use of a MTG on broadly-defined accounting risk. First, they conduct semi-structured interviews with 11 chief audit executives and two audit committee chairmen. In this first stage, the interviews help to develop a framework on how use of the IAF as a MTG affects financial reporting quality. Next, they examine the applicability of the framework using archival data (from the IIARF GAIN database). They predict and find that companies that use the IAF as a MTG have lower financial reporting quality relative to companies that do not use the IAF as a MTG. Like Rose et al. (2013), they explore several potential compensating controls identified from the interviews that could improve rather than further degrade the effect of IAF

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4 Throughout this paper, we use the terms independence and objectivity interchangeably.
quality on financial reporting quality. Compensating controls with positive effects include consistency of leadership within the IAF, the presence of audit committee oversight, and management’s oversight and direction.

Ege (2015) primarily focuses on the effect of IAF quality on management misconduct in the pre- and post-SOX eras; however, we discuss this study in the first LOD because it includes some implications of use of the IAF as a MTG. Following Messier et al. (2011), this study uses proprietary data from the IIARF to create a composite measure of IAF quality based on Statement of Accounting Standards No. 65 (also used in Prawitt, Smith, and Wood 2009). Results of the study suggest the IAF quality measure is negatively associated with several measures of the likelihood of management misconduct given controls for board, audit committee, and external auditor quality; internal control quality; and separate estimation in the pre- and post-SOX periods. Interestingly, the results also show that misconduct firms have low IAF quality and competence during misconduct years but identification of this misconduct such as by the SEC related to antibribery laws is instructive in that IAF quality improves in the post-misconduct years.

Abbott, Daugherty, Parker, and Peters (2016) also use the IIARF data; however, they take a different approach in that they examine IAF quality following the audit quality definition established by DeAngelo (1981). This definition suggests audit quality is the joint impact of auditor competence and independence. Their results suggest that when firms do not use the IAF as a MTG (a proxy for higher independence) and are more competent, firms are less likely to use income-decreasing abnormal accruals and are consistent with lower likelihoods of the IAF reporting inappropriate earnings management behavior when the IAF is used as a MTG. The results suggest IAs in a MTG may ingratiating themselves to management to improve or provide no negative effect related to their promotion likelihood.
Lastly, Barr-Pulliam (2016) builds on Abbott et al. (2016) and conducts an experiment with 213 corporate managers to examine the effects of internal audit quality—the joint effects of continuous auditing and not using the IAF as a MTG—and relative earnings management option complexity on managers’ use of discretion to achieve a specific earnings target. He predicts and finds that higher IAF quality lowers the likelihood of both types of earnings management. He also finds evidence of functional and dysfunctional effects. Specifically, when the real earnings management (REM) option is comparable in complexity to (more complex than) the accrual-based earnings management (AEM) option and IAF quality is high, managers in this setting use more REM (AEM) to achieve the earnings target.

3.2.2 First Line of Defense Summary and Opportunities for Future Research

Existing research on the first line of defense primarily focuses on either use of the IAF as a management training ground or the emergence of and adaptation to internal control frameworks. Related to rotational management programs, extant research provides mixed evidence to suggest that using the IAF as a MTG impairs IAs’ objectivity (independence). The prior literature focuses on how managers respond to IAs in a MTG and one study examines how rotational programs affect IAs’ decisions. While more research is necessary to understand the implications for the strategic interaction between auditors and managers, it is an open question whether and to what extent the internal control and operational knowledge gained in the IAF affects managers formerly in a MTG. Collectively, these studies suggest the following additional avenues of future research:

**RQ1:** Are managers who participated in a rotational management program better able to identify and improve internal controls?

**RQ2:** What is the relationship between internal (and external) auditors and managers who participated in a rotational management program?

**RQ3:** Do managers who participated in a rotational management program report more or less aggressively?
RQ4: Are firms better able to attract and retain managers by offering rotational management programs?
RQ5: What is the effect on firm value when the IAF is used as a MTG?

3.3 Second Line of Defense: Risk Management and Compliance Functions

The second line of defense includes the risk management and compliance functions. This line serves primarily as support and control functions for management (e.g., controllership, risk management, and environmental compliance) to ensure compliance with standards and regulations and to ensure effective management of emerging operational and financial risks. While management has oversight for this line of defense, the functions within should operate independently.

While this LOD focuses on risk management and compliance, it is important to note the importance of the IAF (in the 3rd LOD) in strengthening this line. For example, Coram, Ferguson, and Moroney (2008) examine whether companies with an IAF are 1) more likely to detect and 2) self-report fraud than those without an IAF. They also explore whether differing internal audit structures moderate the effect. The study employs a mixed-method approach whereby it uses a self-reported measure of misappropriation of assets (or fraud) extracted from the 2004 KPMG Fraud Survey. The survey includes reported frauds from 491 companies in both the private and public sectors within Australia and New Zealand. The internal audit data are from a separately mailed survey sent to the respondents of the original KPMG Fraud Survey. The authors find that mere presence of an IAF increases the likelihood of both detecting and self-reporting fraud. Further, they find that companies that fully outsource the IAF are less likely to both detect and to report fraud than those with at least a partial in-house IAF. These findings suggest that IAF is a value-added activity that helps to improve the control and monitoring environment as it relates to fraud detection and subsequent reporting, especially when the IAF is in-house. A dearth of research
in our sample of journals related to the 2nd LOD exists. The limited number of working papers and published studies focus on how technology can create real-time monitoring of controls.

3.3.1 Continuous Controls Monitoring, Continuous Auditing, and Data Analytics

Continuous monitoring and the closely-related continuous auditing are not new phenomena. Vasarhelyi and Halper (1991) introduced the notion of continuous auditing but the literature following this study stymied until the early 2000s. To date, much of this research resides in the information systems area and focuses on the feasibility of implementation of continuous auditing/monitoring (e.g., Kuhn and Sutton 2010) and the more recent phenomenon of data analytics (Schneider, Dai, Janvrin, Ajayi, and Raschke 2015). Cangemi (2010) suggests the IAF plays an influential role in continuous monitoring by helping to promote its use by operations, as well as, internal audit. What differentiates continuous monitoring from continuous auditing is the focus on business operational and compliance issues versus assurance. The two are integrated, however, such that tools to monitor controls can also add to the internal control system. When controls improve because of this monitoring, internal and external audit coverage lessens through scope reductions. However, Congemi (2010, 1) argues this is “the tail—not the dog! First, you have to have a business function and then you need internal control.” This logic follows the intent of the 3LOD model in that each should be clearly defined and operating independently, the synergies among the lines should help to improve the company overall. We discuss two studies that illuminate this viewpoint.

First, Jans, Alles, and Vasarhelyi (2014) demonstrate how the use of technology and data can enable a dual-purpose test—process mining of event logs—and how it can improve internal controls. Process mining differs from traditional approaches to evidence gathering and analysis because it focuses on the transactional process rather than the value and or aggregation of the
transactions. Tools such as this highlight the supposition in Congemi (2010) and the 3LOD model that firms should focus on the synergies in its functions rather than thinking of them in isolation. To illustrate this point, Jans et al. (2014) focus on process mining as an analytical procedure in auditing, but the study’s implications extend to risk management and compliance functions in the 2nd LOD. Using procurement data from a bank, the authors explain how process mining helps to identify numerous transactions that do not meet established controls such as payments made without approval or violation of segregation of duties. Importantly, they note the superiority of process mining in that the control expectations they identified were not detected by the bank's IAF in its review of the same data conventional audit procedures.

Davidson, Desai, and Gerard (2013) examine whether the use of continuous auditing moderates the relationship between IAF sourcing arrangement (in-house versus outsourced) and external auditor reliance. In a 2x2 between-subjects experiment, 142 external auditors indicate the extent they would rely on the IAF. Results of the study suggest that when the IAF uses periodic (continuous) auditing, external auditors rely more (do not differ in reliance) on an outsourced function than an in-house function. Alternatively, Malaescu and Sutton (2015) also examine whether external auditors rely more on the IAF when they use continuous auditing techniques. The authors conduct an experiment with 87 experienced external auditors that manipulates the frequency of the internal audit (traditional versus continuous audit) but differs in that they manipulate whether the firm had a material weakness in internal control in the prior year (absent versus present). Results of the study indicate that auditors rely more on the work of the IAF when the IAF uses continuous relative to traditional (periodic) auditing and allocate fewer hours to valuation of a complex account. This effect is magnified in the absence of a prior year material weakness in internal control. When the firm has a prior material weakness, external
auditors allocate more hours to the valuation of a complex account. Frakas and Hirsch (2016) build on Malaescu and Sutton (2015) and other prior research and examine how the IAF’s failure to identify an internal control deficiency affects external auditor reliance on the IAF. In the first stage of the experiment, the authors find that failure to identify the control deficiency decreases external auditor reliance. In the second stage of the experiment, they conduct an experiment to understand how and why. Specifically, the experiment investigates how the implementation of three different internal control testing remediation strategies (continuous controls monitoring (CCM), audit command language (ACL), and periodic manual testing), which vary in the amount of automation and frequency, affect external auditors’ perceptions of the quality of the IAF and planned reliance. Results of the experiment suggest that automated (manual) remediation strategies increase (partially increase) both perceptions of IAF quality and planned reliance. Alternatively, less frequent remediation strategies appear more effective in improving both perceptions of quality and reliance on the IAF, relative to continuous remediation strategies.

Lastly, Barr-Pulliam (2017) examines whether (1) internal audit frequency (namely continuous auditing), (2) functionally separating the dual roles of the internal auditor as provider of both assurance and consulting, and (3) type of earnings management affect auditors’ perceptions of the likelihood of management opportunism and the likelihood IAs will report evidence of earnings management. While this study uses IAs as participants, it emphasizes key factors important to the second LOD. When companies develop continuous monitoring and continuous auditing technology in-house, they often use multi-disciplinary teams that include accounting, operations, information technology, and IAs serving in a consulting role. The focus of the resulting technology only differs based on the user—continuous monitoring of compliance with controls for management or its surrogates versus continuous auditing for the IAF in its
assurance role (Coderre, Verver, and Warren 2005). In his study, Barr-Pulliam (2017) conducts an experiment with 188 practicing IAs who assess the likelihood of management opportunism in financial reporting and the likelihood the internal auditor would report implications of opportunism identified in the assurance role. Among other important findings, this study suggests that opportunism in the form of earnings management is less likely when the IAF uses continuous auditing. Like Jans et al. (2014), this study illustrates how the use of technology can improve compliance and mitigate opportunistic reporting by management. Though a surrogate of management, this is a key role for the risk and compliance functions within the 2nd LOD.

3.3.2 Second Line of Defense Summary and Opportunities for Future Research

Existing research related to the 2nd LOD is limited. However, the primary role of this line is risk management and compliance. Prior research in management and managerial accounting uses agency theory to explain the functional and dysfunctional effects of investments in monitoring of an agent such as management. This research suggests that increased monitoring reduces willingness to undertake risky investment projects (e.g., Baiman 1990; Lambert 2001) and decreases opportunism (Wiseman and Gomez-Mejia 1998; Nagin, Rebitzer, Sanders, and Taylor 2002; Campbell, Epstein, and Martinez-Jerez 2011). These findings support Jans et al. (2014) and Barr-Pulliam (2017) and suggest the following avenues for future research:

**RQ6**: Does continuous controls monitoring improve operational and financial controls similarly? Does management respond to monitoring by the 2nd LOD similar to more frequent assurance by the IAF? Which is more effective?

**RQ7**: What is the level of coordination between the IAF and the 2nd line of defense that achieves the highest level of compliance with internal controls? To what extent should the IAF rely on the work of the 2nd LOD in its own risk assessment?

**RQ8**: How do cognitive biases impact users’ information acquisition and information integration when using various analytic tools to increase controls monitoring and controls compliance (as suggested by Brown-Liburd, Issa, and Lombardi 2015)?

**RQ9**: Will more frequent controls monitoring using technology cause information overload? If so, what impact will information load have on the effectiveness of this monitoring approach (as suggested by Brown-Liburd, Issa, and Lombardi 2015)?
RQ10: How can the 2nd LOD help the company to transform the structure and operations of the firm; to improve the firm’s comparative advantage; and to decrease information asymmetry using technology to enable data analytics and continuous controls monitoring?

RQ11: What organizational factors and or structures affect a company’s willingness and ability to adopt higher reliance on technology to improve risk management and controls compliance?

3.4 Third Line of Defense: Internal Audit

The third line of defense is the internal audit function (IAF) (IIA 2013). This line of defense provides independent assurance and is expected to perform its duties with the highest level of independence and objectivity. The IAF provides assurance on the effectiveness of governance, risk management, and internal controls and ensures that the first (operational management) and second (risk management and compliance functions) lines of defense realize their risk management and internal control objectives (IIA 2013). Internal auditors mostly report administratively to senior management and functionally to the organization’s governing body (e.g., the audit committee). Extant research related to the IAF focuses on auditor objectivity, audit quality, the effect of the IAF on the external audit fee, fraud risk assessments, and the use of information technology.

3.4.1 Internal Auditor Independence and Objectivity

Ahlawat and Lowe (2004) conduct one of the first studies focusing on the notion of internal audit (IA) independence and/or objectivity. In their study, the authors examine whether sourcing the IAF as in-house versus outsourced affects whether auditors are more susceptible to employer versus client advocacy, respectively. Using an experiment with 35 in-house and 31 outsourced (from Big 4 firms) IAs, they operationalize advocacy by asking participants to assume the role of internal auditor for either the buyer or the seller in an acquisition setting. The results suggest significant advocacy behavior for both types of IAs; however, advocacy was less
severe for outsourced auditors. This suggests outsourced IAs are more objective. Relatedly, Bartlett, Kremin, Saunders, and Wood (2016) conduct two experiments examining external auditors’ perceptions of in-house versus outsourced IA positions. Their findings suggest external auditors are twice as likely to apply for a position labeled as “accounting” relative to either an in-house or outsourced IA position. The results further suggest that external auditors have a negative perception of the IA profession and the associated work environment. These findings highlight additional reasons why external auditor reliance on the IAF may be low, especially when the IAF is in-house.

Abbott, Parker, and Peters (2010), do not specifically examine IA independence or objectivity, but their emphasis on the sourcing arrangement of the IAF and the extent of audit committee oversight contribute to the stream within the IA literature. Their study investigates the relationship between audit committee oversight of the IAF and the focus of IAF assurance activities. The study relies on data collected from a survey of 134 chief audit executives in Fortune 1000 companies who indicate the amount of IA resources allocated across a number of internal audit activities such as financial reporting, consulting projects, internal controls testing and risk management; the sourcing arrangement; and Likert-type scale questions that form the basis of a composite measure of audit committee oversight contingent on the relative control that the audit committee has over the IAF. Results suggest a positive association between audit committee oversight and the portion of the IAF budget allocated to internal-controls-related assurance activities.

Stewart and Subramaniam (2010) follow with a review of IA independence and objectivity that includes mostly international research. The literature review explores various operationalizations of independence and objectivity such as the IAF’s organizational status, the
IA’s role as both a provider of assurance and consulting services, the IAF’s involvement in risk management, use of the IAF as a management training ground, and the sourcing arrangement of the IAF. Their review identifies many gaps in the literature and suggests several opportunities for future research. Stefaniak, Houston, and Cornell (2012) answer the call of Stewart and Subramaniam (2010) and extend two studies by Bamber and Iyer (2002, 2007) that develop measures of external auditors’ professional and client identification. In a post-SOX experimental setting, Stefaniak et al. (2012) examine whether internal control evaluations of internal (external) auditors differ based on whether they identify more with their employer (client). They present two primary findings. First, they replicate the findings of Bamber and Iyer (2007) who suggest that external auditors who identify more with their clients are more lenient in their control evaluations. However, contrary to prior literature suggesting IAs are less independent and/or objective, they find that IAs who identify more with their employer (perceived as less objective) in fact are less lenient than external auditors in that they side less with management’s preferred position on internal controls. Second, their initial findings notwithstanding, they suggest that the audit efficiencies gained when external auditors rely more on the IAF’s work could also extend to more objective internal control evaluations due to differences in client and employer identification, respectively.

Roussy (2015) uses qualitative data to examine factors that contribute to IAs’ lack of independence. Interviews with 42 IAs describe how they experience role conflicts in their day-to-day practice and the way they perceive, manage, and resolve these conflicts. This study extends and challenges current perceptions of internal audit objectivity and independence by illuminating the complexity and magnitude of the role conflicts and specific coping mechanisms IAs use to center themselves on their primary role as providers of independent assurance. The
study suggests that while IAs tend to lack independence, the audit committee is less effective in exerting power over the IAF than top management. Taken together, these findings highlight the difficulty in applying conceptual theories of governance and the practical governance principles mentioned by Gramling et al. (2004) and Cohen et al. (2004).

3.4.2 Internal Audit Quality

Studies focusing on IA quality have a broad topic range. Carcello, Hermanson, and Raghunandan (2005) examine the factors contributing to U.S. public companies’ investment in internal auditing. On the one hand, they find that internal audit budgets are positively related to company size, leverage, companies operating in certain industries (financial, service, and utility), relative amount of inventory, operating cash flows, and audit committee review of the IAF budget. On the other hand, internal audit budgets are negatively related to the percentage of internal auditing that is outsourced. The authors conclude that internal audit investment, and thus quality, is related to public companies’ risks, ability to pay for monitoring, and other auditing characteristics. Kaplan and Schultz (2007) contribute to this stream within the IA literature by examining whether high relative to low quality IAFs or a separate entity are a better internal channel for reporting questionable acts by employees or business consultants. Results of the study show that the mere presence of an anonymous channel reduces the likelihood of reporting to non-anonymous channels; however, IAF quality does not impact the likelihood of reporting to non-anonymous channels.

In an examination of internal control deficiencies related to tax reporting using archival data, Graham and Bedard (2015) control for IAF quality in their analyses. They measure quality on a Likert-type scale anchored on 1 (very low quality) and 5 (very high quality). Companies without an IAF have a value of zero. Interestingly, the final empirical models exclude the IAF
quality variable because the data suggest that companies with high quality IAFs have very few severe internal control deficiencies or material weaknesses. This finding contributes to suppositions by prior auditing literature and IA standards setters, at least from a tax perspective, that companies with high quality IAFs also have high quality control environments (see e.g., Gramling et al. 2004). Lastly, Pizzini, Lin, and Ziegenfuss (2015), also using a proprietary data set provided by the IIA’s Research Foundation (IIARF)\(^5\), explore whether aspects of IAF quality such as competence, objectivity, and fieldwork rigor and the IAF’s contribution to financial statement audits in the form of either independently performed work or direct assistance have an impact on external audit delay. Results of the study suggest that high quality IAFs, specifically those assessed as more competent and that have higher fieldwork quality, are associated with shorter delays. The results also suggest that external auditors rely on independent work performed by high quality IAFs, while they use low quality IAFs as direct assistants in their audit testing.

### 3.4.3 Contribution to the External Audit Fee

Another stream of the IA literature examines the impact that internal auditing has on external audit fees. Hay, Knechel, and Wong (2006) conduct a meta-analysis of 11 empirical studies to examine the combined effect of commonly used independent variables that affect external audit fees. The analysis suggests that prior studies investigating the relationship between internal control (operationalized as the presence of an IAF) and the external audit fee produce mixed results and an insignificant overall meta-result. After this analysis, future studies rely on more refined measures and address limitations of the studies included in Hay et al. 2006.

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\(^5\) Several studies use this data as it is one of the few sources of archival data to conduct IA research. Researchers, with the permission of the IIARF, typically match the anonymous firm in this database based on characteristics such as total revenue, size, number of employees, and region to match this data with other sources of financial statement information such as Compustat. Data are available, upon approval, from the GAIN and CBOK surveys.
Prawitt, Sharp, and Wood (2011) attempt to further reconcile findings of prior research on contributions of the IAF to the external audit fee. This study differs from Hay et al. (2006) in that it examines both experimental and survey research. The authors note that archival research in this area generally finds either no relationship or a positive relationship between proxies for IAF contribution and external audit fees (like Hay et al. 2006). This study also extends Hay et al. (2006) in that it offers new evidence on IAF contribution using the previously mentioned data provided by the IIARF to develop new proxies of IAF contribution. They find that the lack of high-quality proxies for IAF contribution precludes researchers from identifying positive associations between IAF contribution and audit fees. The lack of a high-quality proxy also provides at least one explanation for the divergence in findings between experimental (where proxies can be created and manipulated) and survey-based studies in relation to archival studies (where sufficient data must exist) in this area. Unlike Pizzini et al. (2006), this study suggests direct assistance rather than reliance on the IAF is associated with significant fee reductions.

3.4.4 Fraud Risk Assessments

A third line of research focusing on the third LOD examines how IAs react to fraud risk. Fullerton and Durtschi (2004) investigate whether IAs’ level of trait professional skepticism is a predictor of fraud detection behavior. The authors first administer the Hurtt Professional Skepticism scale (Hurtt 2010) to fifty-seven IAs to classify them as either high or low skeptics. Each participant reviews a list of fraud symptoms and indicates their desire to or not to search for additional facts related to each symptom. As a baseline test, the authors predict and find that auditors with higher levels of skepticism have a greater desire to search for information. Next, they test an intervention by collecting data on information search after a one-day fraud awareness training session. Results of the study demonstrate that the differences between high and low
skeptics narrow along several of the Hurtt scale personality characteristics after the fraud training.

Rather than inherent personal traits, DeZoort and Harrison (2008) gather survey data from 783 IAs attending both U.S. and global IIA meetings to determine whether fraud type and accountability pressure (an external force) influence IAs’ perceived fraud detection responsibility and their brainstorming procedures. Specifically, the study examines whether IAs perceive differential responsibility for detecting fraudulent financial reporting, misappropriation of assets, and corruption. Also, the study manipulates accountability by examining whether IAs are asked to identify themselves for subsequent performance review versus IAs who could remain anonymous. The results of the study suggest that both fraud type and accountability pressure are significant predictors of fraud detection responsibility and brainstorming. Interestingly, the results also suggest that in general IAs feel moderately responsible for fraud detection irrespective of the type.

Carpenter, Reimers, and Fretwell (2011) also examine fraud brainstorming, but take a different approach. The authors use psychology theory on cognitive load to explore whether group interaction during brainstorming improves IAs’ fraud judgments by reducing the response mode bias exhibited by auditors when assessing risk. The results indicate several important findings. First, consistent with research on external auditors, IAs identify fewer fraud risks when they brainstorm in groups relative to IAs who brainstorm alone. However, while identifying fewer in number, the brainstorming groups identify higher quality risks relative to nominal groups of individuals. Further, a focus on qualitative versus quantitative risks improves the quality of risks identified. Lastly, response mode bias lessens when IAs brainstorm in groups.
Boyle, DeZoort, and Hermanson (2015) contribute to this line of research by examining the effects of internal audit report type (descriptive or assurance) and internal audit reporting line (to management versus to the audit committee) on IAs’ control and fraud risk judgments. This study is motivated by prior research on corporate governance which suggests an appetite for a publicly-available IA report. The study manipulates report type as descriptive, which delineates the IAF’s composition, responsibilities, accountability, activities, and resources; versus assurance, which details the IAF’s conclusion about internal control effectiveness. Participants were 108 practicing IAs who assess fraud and control risk assessments. Results of the study suggest providing an assurance-focused IA report or reporting primarily to the audit committee increases fraud risk assessment, suggesting IAs are more conservative in their assessments. Results also suggest a significant interaction which indicates higher control risk assessments when IAs issue assurance-focused reports and when IAs primarily report to the audit committee. Descriptive IA reports provide no significant benefit to external stakeholders related to either fraud or control risk. In supplemental analyses, the study finds moderate but varied support among IAs for a descriptive IA report but significantly less support for an assurance-focused report.

Lastly, Nkansa (2016) contributes to this line of research by experimentally examining how the level of coordination with the external auditor influences IAs’ fraud-related actions. The study manipulates both fraud risk and external auditor coordination as either low or high. Using a sample of 112 IAs, the results of the study suggest that IAs increase planned audit hours when fraud risk is high and that coordination with external auditors moderates the relationship between fraud risk and planned auditor effort measured as internal audit hours. The study’s results
illustrate that although high external auditor coordination decreases IAs’ hours suggesting higher audit efficiency, IAs’ sensitivity to fraud risk increases accountability.

3.4.5 Information Technology

A final line of research focuses on information technology. Héroux and Fortin (2013) take a holistic but exploratory approach to investigating how the IAF is involved in the structures and processes of information technology (IT) governance and what IAF characteristics affect this involvement. This study is motivated by evidence of a shift in the IAF’s role from traditional (focusing on accounting and financial control) to strategic (focusing more on governance). The study surveys 130 chief audit executives of Canadian firms and measures IAF characteristics such as IT competence and resources and controls for factors such as organization size, industry, and IAF budget. Results of the study suggest 1) IAF involvement in IT governance structures, processes, and relational capabilities is in its infancy; 2) IAF resources and IT audit experience, IT personnel and IT training/certification, and the interaction between the IAF and board of directors influence the extent of IAF involvement in IT governance. The authors’ examination from this novel holistic perspective offers much needed insight into the internal audit and IT dynamic.

Steinbart, Raschke, Gal, and Dilla (2013) also focus on IT governance, but hone in on the behavioral aspects of the sometimes-dysfunctional relationship between information security (IS) and IA professionals who both contribute to this governance. Specifically, the study describes perceptions that 36 IS professionals have about the nature of their relationship with the IAF in their organization. Findings of the study suggest IS professionals’ perceptions of their relationship with the IAF are 1) positively related to the level of IAs’ technical expertise; 2) positively associated with the extent of review of IT performed by the IAF; 3) positively related
to the assessed value provided by the IAF; and 4) a function of the overall effectiveness of the organization's IS endeavors.

3.4.6 Third Line of Defense Summary and Opportunities for Future Research

The existing research on the third LOD examines topics including IA objectivity, IA quality, contribution to the external audit fee, fraud risk assessments, and the relationship with information technology governance. This research suggests factors such as employer identification, role conflicts, sourcing arrangements, and the strength of the audit committee affect actual and or perceived IA objectivity. While previous research identifies examples of factors that impair IA objectivity, we contend that the following research questions will provide additional avenues for future research:

**RQ12:** Does managerial pressure affect the objectivity of IAs?

**RQ13:** Is there a relationship between professional identification and IA objectivity?

Related to internal audit quality, prior research suggests that initial investments in an IAF are driven by many factors such as firm size and that internal firm stakeholders consider the quality of the IAF quality when making decisions. Consistently, this research provides evidence that the quality of the IAF enhances IAs’ interactions with audit committees, management, and tax reporting and the external auditor’s reliance decision (lessening external audit delays). While this line of research makes significant contributions to knowledge, we argue that this limited focus suggests future research should investigate whether IAF quality has an influence on the decision-making of other stakeholder groups. Accordingly, we propose the following research questions:

**RQ14:** Do financial institutions consider IAF quality before making lending decisions?

**RQ15:** Does the quality of the IAF affect external auditors’ ability to identify internal control weaknesses related to the valuation of complex financial instruments in firms with a sizable portion of their balance sheet measured at fair value?

**RQ16:** Does the quality of the IAF affect the communication between the external auditor and internal auditors during the annual audit?

**RQ17:** What IAF quality characteristics are most important to investors?
Related specifically to external audit fees, previous literature reviews and meta-analyses of IA research find mixed results regarding the contribution of the IAF to these fees. However, one recent study does find that archival proxies of IAF contribution based on a specific auditing standard (SAS No. 65) are negatively associated with external audit fees and that experimental measures of quality are better predictors of this relationship (Prawitt et al. 2011). We acknowledge the significant limitation on IA data but argue that more creative approaches to and specificity in measures could contribute to this line of research and help to further tease out the inconsistencies of prior research. Thus, we propose the following research questions:

**RQ18:** Does the IAF contribute to the external audit fees of small and midsize CPA firms?

**RQ19:** Are there certain characteristics of an external auditing firm that contribute to external audit fee reductions when the auditors rely on the IAF for direct assistance as opposed to reliance on IAs’ previous work?

Extant research indicates personality traits (e.g. professional skepticism) and environmental and organizational factors (fraud type, accountability pressure, brainstorming, IAR type, and reporting to the audit committee) influence IAs’ fraud risk assessments and procedures. This research suggests IAs are more likely to identify fraud based on their insider view of their organizations. However, this is one of the least explored areas of IA research and we offer the following directions for future research on the relationship between characteristics of either IAs or the IAF and fraud detection:

**RQ20:** Does the heightened professional skepticism of IAs cause a tradeoff between audit efficiency and audit effectiveness?

**RQ21:** Do threats to objectivity such as self-review, management pressure, and accountability pressure influence IAs’ fraud risk assessment procedures?

**RQ22:** Does industry appetite for more disclosure affect the perceived need for an internal audit report (whether assurance or descriptive focused) when the balance sheet has a considerable number of assets and or liabilities measured at fair value?
Lastly, previous research on information technology suggests more coordination between the IAF and information technology and security functions is beneficial for corporate governance. We propose the following as additional avenues for future research in IT:

**RQ23:** What impact will Big Data have on the IAF?  
**RQ24:** How does the IAF combat cyber risk?  
**RQ25:** What factors influence IAF cybersecurity assessments?  
**RQ26:** What level of coordination between the IAF and information security professionals is essential to reduce cybersecurity risks?

### 4. CONCLUDING REMARKS

Internal auditing improves an organization’s governance, risk management, and management controls by providing consultation and recommendations based on analyses and assessments of data and organizational processes (IIA 2000). In our review of the internal auditing literature spanning from 2004 to 2017, we summarize research that discusses many aspects of how the IAF serves as a change agent in organizations. Unlike previous literature reviews (Gramling et al. 2004; Cohen et al. 2004), we organize our synthesis based on the IIA’s Three Lines of Defense model (IIA 2013; EY 2017). The first LOD is operational management. The second LOD represents risk management and compliance functions, while the third LOD is internal audit. External monitors (specifically external auditors and regulators) are also included in the IIA 3LOD model due to their vital role in the governance and control structure of organizations (Barr-Pulliam, Nkansa, and Williams 2017), however, we exclude these stakeholders in our study because we focus on internal governance. Accordingly, we follow the more concise EY model in this review because it specifically demonstrates how to segregate the 3LOD and to demonstrate the importance of the IAF to the other two lines of defense.

Overall, the 3LOD supports the notion that the IAF has evolved from simply having a compliance role to being a strategic player and our review of the literature illustrates this growth.
We propose future research questions for each LOD with hopes of continuing the exploration of this evolution. Our summary of the literature related to the first LOD delineates the effect that rotational management programs has on organizational processes (internally) and external stakeholders. Internally, when an IAF serves as a management training ground it influences the likelihood of management misconduct, IAs’ objectivity, accounting risk, financial reporting quality, and earnings management. Externally, if an IAF is also a MTG, it affects external audit fees and external auditor perceptions of the IAF. However, the results are mixed as to whether having an IAF as a MTG negatively influences IAs’ objectivity. We propose that future research examines the relation between MTGs and managerial skills, manager reporting behavior and retention, the internal-external auditor relationship, and firm value.

Our in-depth review of the literature addressing the second LOD illustrates how companies benefit from having effective risk management and compliance functions. In relation to risk management, one study provides evidence that the presence of an IAF has a positive effect on fraud detection and self-reporting. Studies investigating continuous auditing find that it improves internal controls, increases external auditor reliance on the IAF, and decreases the use of earnings management. Our proposed research questions highlight the following unaddressed issues concerning how continuous controls monitoring relates to operational and financial controls, cognitive biases, and information overload. We also suggest that future studies explore the effect of the second LOD on IAF coordination and reliance, firms’ competitive advantages, information asymmetry, and the degree of technology reliance.

Our survey of the literature regarding the third LOD covers topical areas that include IA objectivity, IA quality, contribution to the external audit fee, fraud risk assessments, and information technology. First, results indicate that employer identification, client advocacy, audit
committee oversight, and role conflicts have sway over IA objectivity. Second, auditing research on IA quality demonstrates that it influences employees’ reporting of questionable acts, internal control deficiencies, material weaknesses, external audit fees, and external audit delay. Third, one study examining the contribution of the IAF to the external audit fee specifically documents that the fee is reduced when IAs serve in a direct assistance role. Fourth, fraud risk assessment findings highlight the intersection of the auditing and psychology research streams by showing that personality traits, accountability pressure, cognitive load, response mode types, IA reporting lines, IA report types, and external auditor coordination have an impact on IAs’ fraud judgments. Finally, information technology studies acknowledge that many factors influence IAF involvement in IT governance and relationships with information security professionals. Our proposed research questions for this LOD call for future research to delve into unexamined topics of managerial influence, fair value, firm characteristics, Big Data, and cybersecurity risk.

The results of our review have implications for researchers, regulators, and practitioners. We provide 26 research questions that we hope will lead to fruitful avenues for other academics to explore and to expand the existing IA literature. Our synthesis shows regulators the specific ways that standard-setting has improved the professional practice of IA and exactly which factors contribute to this progression. Further, our review details empirical evidence supporting each LOD for the IIA model. Internal audit practitioners can see the various aspects of how their efforts contribute to the overall corporate governance process. While our synthesis suggests significant advances and contributions to internal audit research, we posit that more work is necessary to reflect the evolving role of the IAF.

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FIGURE 1: Unifying Framework (EY 2017)

Three Lines of Defense: An Integrated Risk and Control Model

- **Board of directors and executive management**
  - Enhance risk strategy
- **Business drivers and initiatives**
  - Business strategy
  - Risk tolerance
- **Risks**
  - Strategic
  - Operational
  - Financial
  - Compliance
- **Lines of defense**
  - **First line**
    - Operations and business units
    - (design and operation of controls)
  - **Second line**
    - Risk Management & Compliance
    - (ongoing control monitoring)
  - **Third line**
    - Internal audit
      - [independent assurance]
      - (over risk management)
- **Combined reporting for each risk**
  - Improve controls and processes
  - Optimize management functions
  - Embed and enable risk management functions
  - Communicate risk coverage
  - Leading practice and risk agenda components
### Table 1: Paper Summary

**Panel A: Journal Citation Count (By Line of Defense)**

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**Mixed and Experimental methodologies also include surveys.**

Panel C: Papers Organized by Line of Defense and Methodology

**First Line of Defense (1st LOD)**

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<td>2013</td>
<td>1st/3rd</td>
<td>A&amp;F</td>
<td>Experimental</td>
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**Second Line of Defense (2nd LOD)**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Line of Defense</th>
<th>Journal</th>
<th>Methodology</th>
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<tr>
<td>Jans, Alles and Vasarhelyi (2014)</td>
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<td>TAR</td>
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<td>Malaescu and Sutton (2015)</td>
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<td>2nd</td>
<td>JIS</td>
<td>Experimental</td>
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<td>Frakas and Hirsch (2016)</td>
<td>2016</td>
<td>2nd</td>
<td>JIS</td>
<td>Experimental</td>
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</table>

*All journal titles as previously defined in Panel A of Table 1.*
<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
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<th>Journal</th>
<th>Methodology</th>
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<tr>
<td>Carcello, Hermanson, and Raghunandan (2005)</td>
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<td>Kaplan and Schultz (2007)</td>
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<td>Stewart and Subramaniam (2010)</td>
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<td>3rd</td>
<td>MAJ</td>
<td>Archival</td>
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<tr>
<td>Carpenter, Reimers, and Fretwell (2011)</td>
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<td>Stefaniak, Houston, and Cornell (2012)</td>
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<td>Héroux and Fortin (2013)</td>
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<td>Steinbart, Raschke, Gal, and Dilla (2013)</td>
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<td>Pizzini, Lin, and Ziegenfuss (2015)</td>
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<td>Roussy (2015)</td>
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</table>

*All journal titles as previously defined in Panel A of Table 1.*
### TABLE 2: Summary of Future Research Questions

#### FIRST LINE OF DEFENSE
- **RQ1:** Are managers who participated in a rotational management program better able to identify and improve internal controls?
- **RQ2:** What is the relationship between internal (and external) auditors and managers who participated in a rotational management program?
- **RQ3:** Do managers who participated in a rotational management program report more or less aggressively?
- **RQ4:** Are firms better able to attract and retain managers by offering rotational management programs?
- **RQ5:** What is the effect on firm value when the IAF is used as a MTG?

#### SECOND LINE OF DEFENSE
- **RQ6:** Does continuous controls monitoring improve operational and financial controls similarly? Does management respond to monitoring by the 2nd LOD similar to more frequent assurance by the IAF? Which is more effective?
- **RQ7:** What is the level of coordination between the IAF and the 2nd line of defense that achieves the highest level of compliance with internal controls? To what extent should the IAF rely on the work of the 2nd LOD in its own risk assessment?
- **RQ8:** How do cognitive biases impact users’ information acquisition and information integration when using various analytic tools to increase controls monitoring and controls compliance?
- **RQ9:** Will more frequent controls monitoring using technology cause information overload? If so, what impact will information load have on the effectiveness of this monitoring approach?
- **RQ10:** How can the 2nd LOD help the company to transform the structure and operations of the firm; to improve the firm’s comparative advantage; and to decrease information asymmetry using technology to enable data analytics and continuous controls monitoring?
- **RQ11:** What organizational factors and or structures affect a company’s willingness and ability to adopt higher reliance on technology to improve risk management and controls compliance?

#### THIRD LINE OF DEFENSE
- **RQ12:** Does managerial pressure affect the objectivity of IAs?
- **RQ13:** Is there a relationship between professional identification and IA objectivity?
- **RQ14:** Do financial institutions consider IAF quality before making lending decisions?
- **RQ15:** Does the quality of the IAF affect external auditors’ ability to identify internal control weaknesses related to the valuation of complex financial instruments in firms with a sizable portion of their balance sheet measured at fair value?
- **RQ16:** Does the quality of the IAF affect the communication between the external auditor and internal experts during the annual audit?
- **RQ17:** What IAF quality characteristics are most important to investors?
**TABLE 2: Summary of Future Research Questions (Continued)**

<table>
<thead>
<tr>
<th>RQ18</th>
<th>Does the IAF contribute to the external audit fees of small and midsize CPA firms?</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ19</td>
<td>Are there certain characteristics of an external auditing firm that contribute to external audit fee reductions when the auditors rely on the IAF for direct assistance as opposed to reliance on IAs’ previous work?</td>
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<tr>
<td>RQ20</td>
<td>Does the heightened professional skepticism of IAs cause a tradeoff between audit efficiency and audit effectiveness?</td>
</tr>
<tr>
<td>RQ21</td>
<td>Do threats to objectivity such as self-review, management pressure, and accountability pressure influence IAs’ fraud risk assessment procedures?</td>
</tr>
<tr>
<td>RQ22</td>
<td>Does industry appetite for more disclosure affect the perceived need for an internal audit report (whether assurance or descriptive focused) when the balance sheet has a substantial number of assets and or liabilities measured at fair value?</td>
</tr>
<tr>
<td>RQ23</td>
<td>What impact will Big Data have on the IAF?</td>
</tr>
<tr>
<td>RQ24</td>
<td>How does the IAF combat cyber risk?</td>
</tr>
<tr>
<td>RQ25</td>
<td>What factors influence IAF cybersecurity assessments?</td>
</tr>
<tr>
<td>RQ26</td>
<td>What level of coordination between the IAF and information security professionals is essential to reduce cyber security risks?</td>
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