

Auditing Interactive Complexity: Challenges for the Internal Audit Profession

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This paper contributes to the debate on the future of internal auditing in the context of emerging and intensifying societal, technological and organizational complexity. We apply a critical essay approach to combine the theoretical insights from the field of complexity science and the field of internal auditing. We explore how the condition of intensifying interactive complexity relates to the principles and methodologies of the internal audit profession, now and in the near future. After positioning our paper in the internal audit literature, we argue that interactive complexity poses new challenges and dilemmas to the internal audit profession. We argue that it is crucial for the profession to renew its repertoire to deal with interactive complexity, but also to remain true to the core principles of the profession. We indicate several promising routes for research and debate on the future of internal audit that may help the profession to adapt to intensifying interactive complexity.

Key words: Internal audit, interactive complexity, critical essay, adaptive auditing

INTRODUCTION

A study conducted by PwC in 2014 surveyed 1,920 chief audit executives, audit committee chairmen, CEOs, CFOs and chief risk officers around the world. The study presents some alarming findings for the internal audit profession. Fifty-five per cent of senior managers surveyed by PwC do not believe internal audit adds significant value to their businesses, while nearly 30 per cent of board members say internal audit adds less than significant value: 'Internal audit – long considered a must-have function within an organisation – is losing its value, with over half of senior managers around the world saying they feel it doesn't add much to their companies. This has much to do with the business environment evolving faster than internal audit services have, causing the needs and expectations of businesses to move beyond what traditional internal audits offer.' Moreover, worrying for the profession is the amount of attention the PwC study received in popular and professional media articles. These suggest that internal audit is considered to be ever less helpful for organizations (Quah, 2014). There is a possible danger that the methodology of internal auditing cannot keep track with the rapidly increasing *complexity* of organizations and their environment.

The word 'complexity' holds many meanings. Often, the term 'complexity' is used as a simple synonym of complicated, of something hard to grasp, difficult to understand, challenging to unravel and too varied and large to simply make sense of. However, the developments that cause worry exceed this simple version of complexity. The problem is not a quantitative expansion of the number of actors and factors; it is the apparent interaction between these different actors and factors that seems to fuel the concerns over the repertoire of internal auditing. Here, the complexity stems not from high numbers of actors and factors, but from the unforeseeable consequences of interactions between actors and factors and the possibility of emergence of new actors and factors in time. This type of complexity is

referred to in complexity literature as *interactive complexity* (White, 2001; Dennard, Richardson & Morçöl, 2008; Morçöl & Wachhaus, 2009; Merali & Allen, 2011). Complex systems are systems that consist of numerous components that interact with each other (Lansing, 2003; Collander & Kupers, 2014). Interactive complexity is a dynamic process in which the system and agents co-evolve in their mutual interactions. Actors and factors coproduce each other, change over time, respond to each other, and co-evolve into new relations and new characteristics. The 'problem' in knowing and predicting these systems is not that there are too many actors and factors to count, but that they continuously change as a result of mutual interactions.

Societal changes make interactive complexity an essential characteristic for today's organizations. In order to survive in this dynamic and networked context, organizations need to manoeuvre the co-evolving system. Developments in information technology and the rise of the networked society have become intertwined and are changing the nature of business risks and the paradigms that apply to the management of them. These changing risks and paradigms pose challenges for internal auditors that are worth exploring further. To deal better with the intensification of interactive complexity, it is interesting to explore the meaning of interactive complexity for the profession of internal audit.

Our contribution adds to the current base of internal audit research in three ways. Firstly, we add an angle to the recent overview of research opportunities in internal auditing made by Lenz and Hahn (2015). We start from the perspective of interactive complexity to critically reflect on the established practice of internal auditing. This adds to the approach suggested by Lenz and Hahn (2015), who propose routes for further research and the interaction between the academic (Bailey, Gramling & Ramamoorti, 2003) and the professional perspective (PwC, 2013). This outside-in approach that starts from the phenomenon of interactive complexity to study the practice of internal auditing opens new doors for theory development and professional development.

Secondly, putting interactive complexity forward as a defining context in which internal auditing takes place provides a different perspective for current debates within the profession. Adding the context of interactive

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complexity enriches existing studies on, for example, the relationship between the internal audit function and their stakeholders and the meaning of independence (Christopher, Sarens & Leung, 2009), management expectations (Sarens & De Beelde, 2006b), the importance and challenges for IA to follow a risk-based auditing approach (Allegrini & D'Onza, 2003; Sarens & De Beelde, 2006a; Burnaby & Hass, 2009; PwC, 2010; Ernst & Young, 2012), and studies on IA skills and competencies (Chambers, 2008; Mihret, James & Mula, 2010). In this paper, we take these issues as important topics for further development, but explore them further from within the context of interactive complexity.

Thirdly, the *critical essay approach* is a methodological addition to the existing body of literature on internal audit effectiveness, which is dominated by descriptive, quantitative studies and retrospective methodologies (Sarens, 2014; Lenz & Hahn, 2015). If emerging complexity indeed shapes the nature of risks that organizations face and how risk management in those organizations is challenged (Smith & Fischbacher, 2009; Haldane & Madouros, 2012), then the critical essay approach helps to initiate a conversation about the challenges for internal audit. Interactive complexity not only challenges some of the current methods and tools, but also the more fundamental concepts, language, and underlying theories of the profession. This requires a repertoire beyond the retrospective research that relies on an empirical base that necessarily represents the (near) past (e.g., Gramling & Hermanson, 2009), and allows for a more prospective exploration along not yet clearly established conceptual and empirical lines.

INTERACTIVE COMPLEXITY IN THE INTERNAL AUDIT LITERATURE

We start with an analysis of the discussion of the phenomenon of interactive complexity in academic literature on internal auditing; in other words, is interactive complexity a topic in the academic debate in the internal audit literature? Our literature review is structured as follows. First, we performed a structured literature search on the use of the term 'complexity' in the internal audit literature. For this purpose we performed a search for papers in scholarly databases (*ProQuest*) that have 'internal audit' and 'complexity' listed as key word and/or noted in its abstracts. Key word and abstracts are elements in academic papers in which authors deliberately attempt to position themselves in the

field. They choose words that are typical for their research and that stress the value of their work.

Next, we selected all internal audit papers that use the term 'complex' in the full text of the 2010–14 editions of the internal audit-oriented academic journals *International Journal of Auditing (IJA)*, *Managerial Auditing Journal (MAJ)*, and the somewhat broader oriented academic journals *Accounting, Auditing & Accountability Journal (AAAJ)*, *Accounting, Organizations and Society (AOS)* and *Auditing: A Journal of Practice & Theory (AJPT)*. These journals do not represent the entire field, but the selection of these journals can be used to identify the level of attention for this issue. This second step in the research allows us to also take into account papers that do not particularly focus on complexity, but that do touch on the topic of complexity.

To make sense of this category, we take a third step in which we see how these papers defined and operationalized the complexity phenomenon they discuss, and whether or not these resemble the concept of interactive complexity. As a fourth step, we wanted to include academic work-in-progress in our sample. Therefore, we used the query 'complex' to search the digital conference proceedings of the 2011, 2012, and 2014 editions of the *European Academic Conference on Internal Audit and Corporate Governance (IACG)*.¹ Our purpose here is not to entirely map the upcoming research, but to cross-check findings from the published papers with papers that are still under review. The IACG conference serves that purpose nicely, as it is a conference that focuses on internal audit research, but with a broad orientation on topics and methodologies. The inclusion of these not yet finalized papers in our search helps to take into account possibly emerging lines in the academic debate about internal auditing.

All in all, this layered approach to explore the literature on internal auditing allows us to map the state of play of the discussion about interactive complexity in the internal audit literature. Our search is not complete and is not meant to be statistically representative for *all* of the literature on internal audit. However, it does represent a broad (a range of journals), deep (several years), and varied set of sources (journals, papers, conferences). This adds up to a conceivable source for a claim about the level of attention for interactive complexity in the field of internal auditing. Table 1 presents the results of our search. In the remainder of this section, we reflect on these findings and look at some more in-depth stats we acquired.

Table 1: The quantitative results of our literature search

How often was the term 'complex' mentioned in recently published IA papers (IJA, MAJ, AAAJ, AOS and AJPT) and in research in progress (European IACG Conference Proceedings)?

IJA 2010–2014	In key words/abstract:	None
	In full text:	80 instances in 23 papers
MAJ 2010–2014	In key words/abstract:	None
	In full text:	202 instances in 59 papers
AAAJ 2010–2014	In key words/abstract:	None
	In full text:	3 instances in 1 paper
AOS 2010–2014	In key words/abstract:	None
	In full text:	16 instances in 3 papers
AJPT 2010–2014	In key words/abstract:	None
	In full text:	8 instances in 4 papers
IACG 2011, 2012, 2014	In key words/abstract:	None
	In full text:	105 instances in 26 papers

Firstly, the literature review shows that complexity receives little focused attention in the academic literature we studied. Our search on the word 'complexity' in combination with 'internal audit' through scholarly databases – (*proQuest*) with the search criterion (SubjectTerms:(‘internal audit’) AND (SubjectTerms:(‘complexity’)) – provided 13 results that mentioned those terms in either key words or abstract. Seven of the resulting papers only discussed internal audit as a minor aspect in the research or used internal auditors as a source of information. Two contributions were not available online, but appeared not to be of interest to our study. One contribution (a dissertation) referred to the influence of task complexity on audit review judgements. We found a group of MAJ 2006 papers that provided an internal audit literature review in the European, American and Asian Pacific literature, respectively; these papers refer to auditor skills and competencies in order to deal with the complexity of business transactions and information systems. The second step of our search largely confirmed this impression. The 2010–14 editions of the journals *IJA*, *MAJ*, *AAAJ*, *AOS* and *AJPT* did not cover published papers on internal auditing that focus on complexity in key words or abstract. The same goes for the search in papers presented in the 2011, 2012 and 2014 editions of the *European Academic Conference on Internal Auditing and Corporate Governance*. This points at ample academic attention in the field of internal auditing for the phenomenon of interactive complexity.

However, in contrast to that finding is that the terms 'complex' and 'complexity' are used frequently in the full text of recently published academic internal audit literature and work-in-progress. When we looked at the full-text level, we found 309 instances of the term 'complex' in 90 papers that were recently published in the 2010–14 editions of *MAJ*, *IJA*, *AAAJ*, *AOS* and *AJPT*. We identified 26 papers with 105 instances of the term 'complex' across the selected digital proceedings of the European Academic Conference *IACG* covering work-in-progress academic research on internal audit. That begs the question what the word means in these articles and what types of content the use of the term 'complexity' refers to. A first scan of the content behind the term shows that complexity is used in a variety of meanings, as illustrated in Figure 1.

As Figure 1 shows, the term complexity is used in various forms. Fifteen papers refer to the complexity of the internal audit *role*, as in the complex relationship between internal audit and the audit committee (Lary & Taylor, 2012) and complex interpersonal relationships (Zaman & Sarens, 2013). Twenty-four papers referred to the complexity of the internal audit *tasks* (Iskandar *et al.*, 2012; Vasarhelyi & Romero, 2014), as in task complexity, analytical complexity, methodological complexity and procedural complexities that internal auditors face. Other authors (Ahmi & Kent, 2013; Shin, Lee & Park, 2013) refer to the complexity of *information technology* (e.g., ERP systems, IT projects, and IT complexity). Another category of papers refers to complexity related to *reporting requirements* that internal audit functions are dealing with (Iyer, Bamber & Griffin, 2012; Darus *et al.*, 2014), covering financial complexity, account complexity, complexity of sustainability reporting, and reporting regulations. These categories use the word complexity, but in the meaning of numerical complications – 'many actors and factors' – rather than interactive complexity that stems from interaction between actors and factors.

These are important topics that require academic and professional attention, but they do not resemble the interactive complexity we are interested in. 'Complexity' is used mainly as a signifier of *difficulty*; something that is hard to understand, difficult to oversee and that requires expertise and knowledge to do. However, we found two categories that more closely resemble interactive complexity. We will discuss these categories below.

In our review, 45 papers refer to complexity of the *internal organization*, also referred to as 'firm complexity', 'client complexity', 'business complexity', or 'operating complexity' (Ika & Ghazali, 2012; Pridgen & Wang, 2012; Sun, Wei & Xu, 2012; Bradbury & Redmayne, 2014; Khlif & Samaha, 2014). This category of complexity was used in many recent empirical studies, but is defined in largely numerical and static terms (e.g., the number of subsidiaries, the number of business segments and the number of locations). This properly defined though simplified view on organizational complexity is of course useful in empirical studies, but does not reflect the phenomenon of interactive complexity that poses challenges to organisations and internal audit functions and which is the focus of our study.

Seven papers referred to complexity of the *business environment*. Othman and Melville (2014) mention business environment complexity as a reason why current corporate governance models fail, but they do not elaborate the concept of complexity itself. Chambers (2014a) argues that the common three lines of defence model is challenged by emerging complexity of the business environment, but does not elaborate the phenomenon of complexity itself. However, Chambers (2014b) cites the UK head of accounting, audit, and regulatory reporting policy at the Financial Services Authority (FSA) who describes the challenge to internal audit functions in the highly complex financial services domain as follows: 'I can't point to the internal audit function of a single bank or insurer and say, with hand on heart, that is how we envision it being done in the future', and 'There exist generic industry standards and practices [for internal auditing], but none are sufficiently robust to address the complex world of financial services firms.' These papers refer to complexity in a more interactive meaning, especially in Chambers (2014b); as a more unpredictable and less understandable external environment in which organizations and auditors operate.

Our literature search does not cover the entire breadth and depth of the field. However, it seems safe to conclude that the academic attention in the field of internal auditing is predominantly a matter of numerical complicatedness, an issue of many actors and factors that make it hard to oversee the entire problem in all of its properties. Moreover, 'complexity' is primarily used as a superlative degree of *difficulty*. We found few papers that address interactive complexity with the sense of urgency we found in the study by PwC we mentioned in our opening section. There may be ground covered in areas of the field we did not examine, in terms that circle around the concept of interactive complexity, but the predominant image remains that the internal audit literature is mainly focused on numerical difficulty of problems, issues or contextual factors. The dimension of interaction is understudied, even though it is put to the fore as an important challenge for the field in critical reports about the future of the field. Therefore, this paper further explores the concept of 'interactive complexity'. We will do that by further elaborating on the concept of

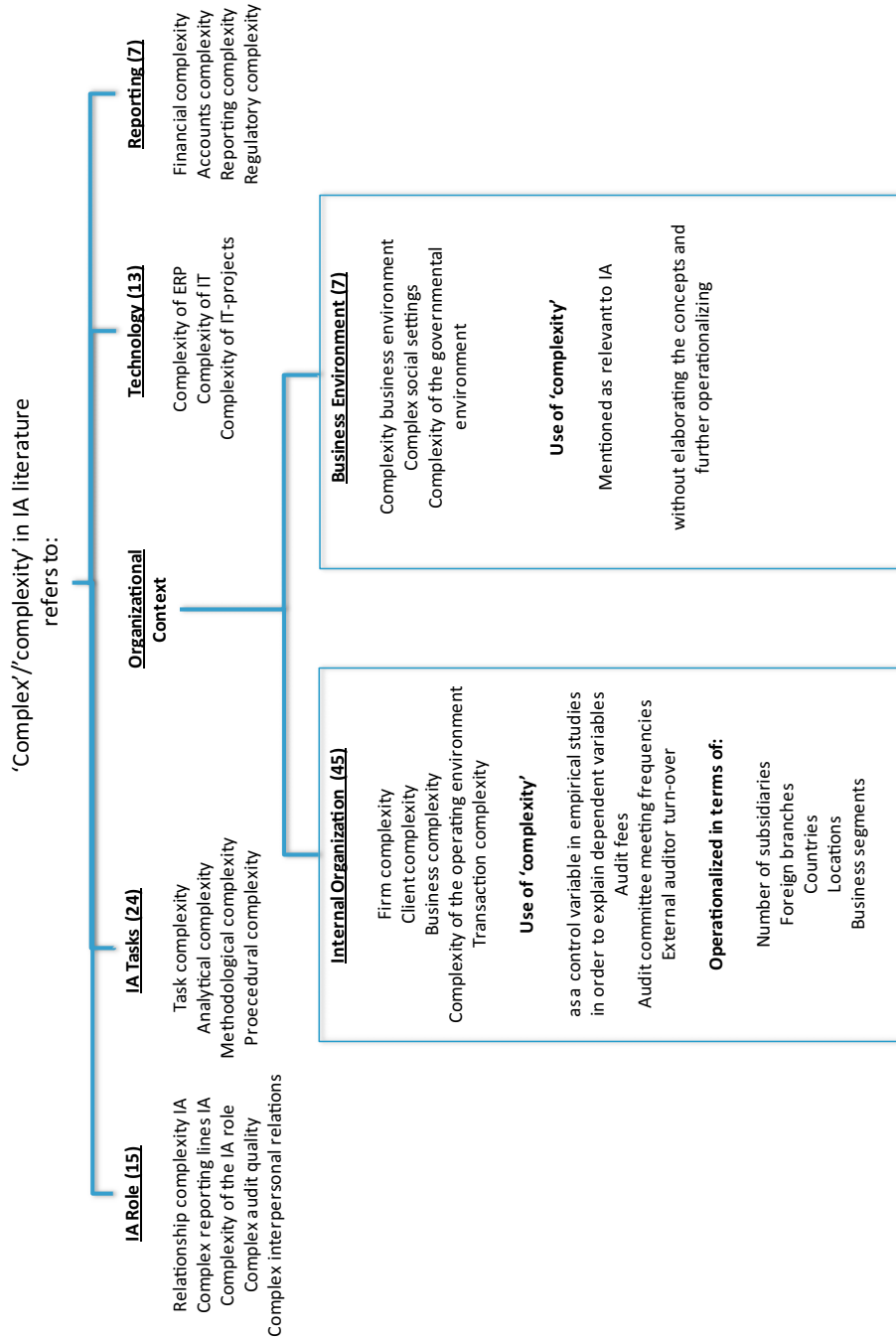


Figure 1: Categorization of ‘complexity’ from recent research on internal audit.

interactive complexity and its consequences for internal auditing.

THE STRUCTURE IN INTERACTIVE COMPLEXITY

Interactive complexity versus complicatedness

Interactively complex systems are systems that consist of numerous components that interact with each other (White, 2001; Lansing, 2003; Dennard *et al.*, 2008; Morçöl & Wachhaus, 2009; Merali & Allen, 2011; De Roo, Van Wezemaal & Hillier, 2012; Morçöl, 2012; Collander & Kupers, 2014). Components are part of the whole, but they are neither guided nor bounded by the whole (Maruyama, 1963); there is no single set of rules that defines the systems and explains the behavior of its parts. Systems are the result of the interaction between different parts of the system, including the ability of parts to produce behavior and interaction that was not predetermined in the current rules of the system. Furthermore, the interaction of parts can change the rules and the system as a whole as well. Not only are parts of the system not defined or determined by the whole, interactions of agents also change the system and produce new rules. Interactive complexity is a dynamic process in which the system and agents co-evolve in their mutual interactions.

Interactive dynamics distinguishes *complexity* from *complicatedness* (Heifetz, Linsky & Grashow, 2009; Gerrits, 2012; Morçöl, 2012; Byrne & Callaghan, 2013; Collander & Kupers, 2014). Complicated systems consist of many parts that are difficult to grasp in full. However, in the end they can be understood and predicted, as they follow from a stable structure. Many organizations or production processes involve many parts and require specific expertise; however, although components are manifold, they remain stable and can be mapped in full. Complicated systems can be known, as long as sufficient time, resources and expertise are assigned. Moreover, understanding of a complicated system allows for a prospective theory about what the system will do given the circumstances (Ashmos, Duchon & McDaniel, 2000). This is what Weick (1995) and Haraldsson (2000) refer to as *uncertainty*, which they contrast with *ambiguity*. Uncertainty is resolved by acquiring information about the system; closing the information gap will produce the certainty needed to understand and control the system; or to provide assurance over the quality of processes, outputs and the control of the management over the organization. This is what has constituted the internal audit profession; auditors acquire objective, systematic information about complicated systems, in order to reduce uncertainty and allow for managerial system control (Fadzil, Haran & Jantan, 2005).

However, amidst interactive complexity, more information is not the solution; interactively complex systems produce *ambiguity* instead of uncertainty (Weick, 1995). The problem is not that the information is not available, but that the interaction itself is dynamic, and that patterns and structures continuously evolve (Teisman & Klijn, 2008; Teisman, Van Buuren & Gerrits, 2009; Gerrits, 2010, 2012; Juarrero, 2011; Morçöl, 2012). Interactions do not happen within a stable structure, but interactions change the patterns, relations and structures of the system itself. People learn, circumstances are affected, new patterns emerge, relations become activated by others' actions. Interactive complexity is about

dynamics. Systems are continuously co-evolving; co-evolution means that the systems and parts do not evolve within the given rules and bounds of the system, but that rules, bounds and structures are part of the evolution in the system as well. The system is in a state of permanent development, and cannot be predicted or known permanently (Pierson, 1993; Ashmos *et al.*, 2000; Haraldsson, 2000; Teisman & Klijn, 2008; Teisman *et al.*, 2009; Gerrits, 2012).

The contrast between interactive complexity and complicatedness is important for the field of internal auditing, because it implies that it is not possible to generate *assurance* about the quality, output or management control over an interactively complex system. Acquiring information to resolve the informational uncertainty of a system is viable under the presumptions of *complicatedness*, but it does not produce the expected outcomes under conditions of interactive complexity – not because the methods are wrong, but because they apply less well to the conditions of interactive complexity. That calls into question what can be done to fill the demand for assurance and control in systems of interactive complexity; in that way, this important subset of issues can also be addressed by the profession.

Interactive complexity as circular causality

Interactive complexity is not a random process (Snowden, 2002; Collander & Kupers, 2014). Interactive complexity still involves causality, which distinguishes it from a *chaotic system* (Snowden, 2002; Lansing, 2003; Collander & Kupers, 2014). Interactive complexity calls for a different notion of causation. The study of causality mechanisms in interactive complexity suggests that causality should be understood in circular and cyclical rather than in linear terms (e.g., Perrow, 1986; Senge, 1990; Clarke & Perrow, 1996; Lansing, 2003; Cavana & Mares, 2004; Van der Steen *et al.*, 2015). Central to this concept of causality is the interconnectedness of elements of a system and the feedback mechanisms that shape the interactions between them; actions generate feedback that either reinforces or balances out the primary action. The feedback in interactions produces the dynamics in interactively complex systems (Gerrits, 2012).

Loops can have a self-balancing effect, for instance when an effect ignites a dynamic to compensate for it; such loops are referred to as equilibrating system (Maruyama, 1963) or self-balancing systems (Senge, 1990). Other loops strengthen their own dynamics; effects trigger new interactions that further enhance the original effects. These are referred to as deviation-amplifying loops (Maruyama, 1963), self-reinforcing systems (Senge, 1990) or positive loops (Richardson, 1986; Sterman, 2000). Systems characterized by self-reinforcing loops will be more volatile and prone to rapid downward or upward spirals (Sterman, 2000) because small and seemingly insignificant changes will set spirals in motion that can lead to highly magnified outcomes. Systems with many self-balancing loops are more stable, because the system itself bounces back after initial disruptions. Systems cannot be predicted or known, but studies suggest that it is possible to recognize recurring loops and other circular patterns in interactive complexity (Morçöl, 2005; Teisman *et al.*, 2009; Gerrits, 2012).

Circular causality structures the dynamics in interactively complex systems; amidst interactive

complexity, circular patterns are anchors to understand, assess and, to some degree, foresee developments (Morçöl, 2005; Gerrits, 2012; Van der Steen *et al.*, 2015). This opens the door for professional methods and tools – such as from the internal auditor – to assess and control the risks and challenges interactive complexity sets for organizations. That is highly important, because organizations and society rely heavily on these systems; they are needed to control for risks, secure safety, increase resilience, preserve value or prevent accidents from occurring.

ADAPTING THE REPERTOIRE OF COMPLICATEDNESS TO A CONTEXT OF INTERACTIVE COMPLEXITY

An answer to challenges of interactive complexity

In our time, organizations, technological systems, financial systems and society seem to be developing more towards interactive complexity. This process was described early in seminal works such as *The Rise of the Network Society* (Castells, 1996) and *Liquid Modernity* (Bauman, 2000). In networks, processes and systems are intermingled and interact with each other. The essence of a postmodern and networked society (Castells, 1996; Bauman, 2000) is the emergence of co-evolving interactions, in contrast to the numerical complicatedness of earlier industrial and modern systems. Over the last decade this process has accelerated. Production processes changed, boundaries of organizations became fluid, and in fundamental systems, such as the financial system, markets and financial institutions became deeply interconnected. This constitutes a context that is characterized by *interactive complexity*, where actions at one point in the system set dynamics in motion that spreads towards unexpected parts of the system. Interactive complexity can produce new risks; bio-hazards, the collapse of the financial system, pandemic flu, international terrorism, but also more individual incidents such as Enron and a series of other corporate or semi-public failures. It was described in the early emergence of networks (e.g., Beck, 1992; Castells, 1996) and has become an often tragic and painful empirical reality since. Interactive complexity can be dangerous, for individuals and organizations, that are viable to dynamics from far beyond their direct sight and the obvious angles. The paradox of interactive complexity is that it raises the demand for assurance, but puts new and different demands on the ability to deliver it.

Different practices for issues of interactive complexity

Over the last decade, the field of internal auditing has made important steps in the professionalization of the practice (Brody & Lowe, 2000; Clarke, Dean & Egan, 2014; Sarens, 2014); auditors have worked relentlessly to professionalize, structure and systematize their repertoire. In doing so, auditing became a highly standardized profession; carried out by trained professionals, by means of the application of very precise and elaborate models and frameworks, that assess real-life situations according to carefully articulated and centrally controlled norms (Fadzil *et al.*, 2005; Madsen, 2011). Doing that requires professional excellence, the ability to know and use these models and frameworks in the often-turbulent context of modern organizations

(Allegrini & D'Onza, 2003; Sarens, 2009). This can be characterized as an attempt to design models, standards and control methods based on well-documented best practices, in line with the widely used model of the Committee of Sponsoring Organizations of the Treadway Commission (COSO) (Spira & Page, 2003). The internal audit profession primarily sought to further master the art and craft of assessing and controlling complicatedness.

However, the study quoted at the beginning of this article (PwC, 2014) suggests that the repertoire is overstretched. Organizations face many issues that do not match the characteristics of complicatedness but are cases of interactive complexity instead. Therefore, a next step for the internal audit profession is to further develop its repertoire for interactive complexity. Moreover, the key is, on the one hand, to answer the specific challenges of interactive complexity while, on the other, to remain true to the fundamentals of the field. There remain many cases of complicatedness, for which the original repertoire is well suited; for the many other cases that are better characterized as interactive complexity, we suggest that the field develops a repertoire that is specifically designed for that task. Seen from the perspective of interactive complexity, the profession should find answers for four sets of issues: how to deal with the fluidity and blurring boundaries; how to assess and handle disproportionate effects of circular causality; how to deal with couplings across time and space; and how to deal with behavioral logic, bias and heuristics; and balance that with the use of models, instruments and standards.

AUDITING INTERACTIVE COMPLEXITY

Interactive complexity: blurred boundaries and interrelated risks

Interactive complexity means that risks are highly interrelated. The risks of the organization are not limited to internal processes and exposure to external risks; organizations are affected by what happens in other organizations, by means of 'spillovers' or cascading risks, but also by the interaction between organizations. In the global financial crisis, most organizations were only marginally exposed to financial risks, but they were extremely exposed to the interaction that broke loose when foreclosures came up and banks started to fall over. These are not an extra category of risk added to the 'normal' internal affairs of the organization (Ramamoorti, Bailey & Traver, 1999). Networked interactions affect the internal processes and risks of the organization, from the ongoing interaction between internal and external factors (Koppejan & Klijn, 2004). These can hardly be mapped prospectively, because the interactions are emergent and co-evolving. What happens when one bank files bankruptcy becomes clear only after it is done; in the real-time response by others, the reactions to that by others, and the internal consequences that become clear in that process. Networked risks implies what Perrow (1986) calls 'inevitable surprises'; the organization is exposed to yet unknown risks from interactions elsewhere in the system. Preparation, prevention and control of such risks require preparation for the unknown. Risks are not unknown because of a lack of prospective intelligence, but because the real risk has not evolved yet. In the context of emerging interactive

complexity, organizations face risk from yet unknown factors rather than from known hazards.

Interactive complexity: disproportionate effects

In complex systems consequences do not directly emerge from direct causes, but typically cascade along long lines of feedback and evolving interactions. Small and perhaps even seemingly insignificant events instigate a chain of events that causes crises that were never imagined before; or cause effects on a scale that is *disproportionate* to the original intervention (Morçöl, 2005). Effects go far beyond the original cause, in terms of temporality, scope or domain (Maruyama, 1963; Morçöl, 2005). Therefore, networked risks challenge traditional methods for analysis and control. Traditional methods use knowledge about historical patterns to project future risks; knowledge about the past informs decisions about the future. That works well in stable systems, in which the patterns of today are also the patterns of tomorrow. This method points at the 'known knowns' (we know that some processes come with a certain level of risk) and to the 'known unknowns' (we know that we do not know some things and that this poses a certain risk). However, as Taleb (2010) argues, what really disrupts systems are usually events that were not foreseen – not even as 'impossible risks', the 'unknown unknowns'. They are not seen not because of a lack of analytical skills, but because retrospective models do not take into account what is not yet there.

Interactive complexity: coupled in time and space

Auditors tend to look at control and risks within the boundaries of the organizational goals, responsibilities and the standards and norms that currently apply (Ramamoorti *et al.*, 1999). They apply 'the latest' to the current situation, and make a claim that is assured for a particular set period of time; 'this year, the organization is in control', or 'over the past year this process is in compliance with the current standards'. As part of the professional standards, auditors are clear about the time horizon they use; what time period they studied, which standards they used (the latest), and what the horizon of their conclusions and assurance is. Auditors define very carefully what they report about and are clear about the choices about time and place that they have made (Sarens & De Beelde, 2006a). However, complexity compresses time and place; what seemed far away (in place or time) may be close, because of quick causal loops in the network that cascade effects into the organizational space. Small risks can escalate rapidly and control measures can fade away much faster than imagined. The auditors' findings can also lose value because of developments in the network, or should be adapted half way. The ability to deal with fast changing, accelerating development in the network should become a part of the methodology for audits. Complexity is essentially about dynamics. Time and space are the locus of these dynamics. The more we think about dynamic interactions as the drivers of developments (and risk), the more logical it becomes to not think of them as fixed categories, but as moving parts that are part of the dynamic the auditor wants to assess. They are not context, but full-fledged elements of the dynamics. To take them into account as such is a first step to master the complexity in methods for

auditing and to better prepare the leadership of the organization to deal with them.

Interactive complexity: biases and heuristics

Furthermore, interactive complexity is essentially about behavior; how do actors respond to dynamics in the system? Behavioral logic seems to be extremely important for understanding how and why actors behave the way they do. Concepts such as goal substitution, self-confirmation, completion effect, casino behavior and illusion of control are important for understanding how and why dynamics follow certain patterns. In order to assess and analyse looming risk or failure, it is important to understand how actors respond to incentives. Heuristics and biases drive interactions, and provide valuable anchors for better understanding how dynamics evolve through the system. Auditors should take those behavioral aspects into account when thinking about risks and assurance, not only to better estimate risks and the level of control, but also in how auditees will respond to reports and to findings (Nuijten, Keil & Commandeur, 2014).

Consequences for the profession: adaptive models, methods and standards

Increasing interactive complexity poses challenges for internal auditing tools. Without standards it is impossible to come to judgements and assurance, at least not in the traditional sense of the word (Power, 1999; Humphrey & Owen, 2000). However, what is an adequate standard for an unpredictable world that can only be known in real time and in co-evolving dynamics? The solution may be found in flexible and adaptive systems for assessment and control; standards should probably lean towards an organization's readiness to deal with the unexpected rather than currently known risks (Bou-Raad, 2000; Selim, Woodward & Allegrini, 2009). That calls for adaptive methods that can deal with complexity (Geyer, 2012). The analysis of interactions can be a fruitful addition to risk analysis, through systematic analysis of the interdependencies and relations that comprise the relevant network of the organization. Auditing will always be a systematic profession, but the challenge will be to find systematic ways of working that go beyond the mechanistic models for complicatedness.

Consequences for the profession: adding 'what if' to the assessment of 'what is'

For auditors this means that they should move from looking at 'preventable risks' – that can be monitored individually – to external risks and strategic risks (Van der Ven, 2014). The latter come from network dynamics that cannot be monitored by looking back but by looking forward in intelligent ways. Foresight, risk assessments and early warning systems are possible methods for the auditor to look beyond the present-day or recent historical problems. The analysis turns from retrospective coherence towards a prospective of the possible and plausible dynamics in and around the organization. This remains an analytical process, in which the expertise of the auditor is crucial. However, the purpose of such an assessment is not to map and present the possible risks as the given contextual factors of the organization, but to inform and encourage the strategic conversation about risks (Brody & Lowe, 2000; Spira & Page, 2003). The auditor does not present final insights into the risks for

the organization, but informs the management about possible dynamics to raise awareness.

The foundation of the position of the internal auditor lies primarily in a depersonalized trust based on the objectivity of methods, rather than personalized style and skills of auditors (Sarens, 2009). Skill and competency are approached as the mastery over objectified and depersonalized methods, not the ability to communicate about them, interpret signals or engage in a meaningful debate about it with managers. Interpretation and intuition may be crucial for auditors to act as trusted advisors to the management (Bou-Raad, 2000; Gibbins, 2000). Still, auditors will have to master the available tools and methods and should be experts in their field, but personal skills are added to that mix. As a 'trusted advisor', an auditor is asked not only to report about the control of current risks, but also to look ahead and signal possible future risks. That hardly sounds problematic; why not use the data from assurance audits to look ahead? However, the core of the profession is that the auditor should base each finding on factual data. Auditors have evidence for each claim and without proof there is no claim (Fadzil *et al.*, 2005). Looking ahead and reporting risks beyond the evidence runs contrary to that. Applying the current methods is not sufficient, but still auditors need some sort of systematic or professional ground for their efforts (Spira & Page, 2003). Therefore, an important challenge for the profession is to help build the capacity and capability to conduct this type of work. As Sarens and Lamboglia (2014) put it, to create adaptive capacity in the audit function so that it can move along with emergent issues in the organization and adapt to what is required there. In this process, new criteria for quality emerge. Adaptability, flexibility, resilience; words that express the quality of an organization to recognize disturbances and change the processes accordingly, while holding some stability in the pursuit of its mission and strategic goals. Weick and Sutcliffe (2007) mention 'resilience audits'; systematic assessments of the organization's ability to build resilience capacity. Amidst interactive complexity, the essence of assurance audits is no longer primarily about what *is*, but also about *what if*.

CONCLUSIONS AND DISCUSSION

This critical essay explores the challenges that follow from interactive complexity for the internal audit profession. Our objective is to add to the academic and professional debate, by drawing attention to the burning questions that emerge. By following the critical essay approach (see Perrow, 1986; Senge, 1990; Miller, 1993; Stacey, 1995; Ashmos *et al.*, 2000), our study adds the logic of interactive complexity as a background for the interpretation of findings and challenges to internal audit profession and research. We draw three conclusions from our exploration.

Firstly, we suggest that the difference between complicatedness and interactive complexity should not be treated as a dichotomy, but rather as a goodness of fit. Are we applying the repertoire that best fits the conditions it is applied to? We simply argue that most of the professional repertoire is very well suited for conditions of complicatedness, whereas the repertoire for interactive complexity is until now less well developed. Amidst increasing interactive complexity, it is important to further develop the professional repertoire for interactive complexity, and to further support that with

academic research. That is an evolutionary process, but our discussion of the features of interactive complexity suggests that further stretching the repertoire for complicatedness does not suffice. It requires rethinking the principles, models and repertoire of internal auditing, to re-align them to the conditions and features of interactive complexity; not to re-invent the profession as a whole, but to translate the values of assurance and control into a context of emerging and intensifying interactive complexity for the cases for which interactive complexity is the dominant condition.

Secondly, we redefine the perceived 'crossroads' the internal audit field is at. Our conclusion deviates from that of Lenz and Hahn (2015), who argue that the internal audit profession is at a crossroads to become either marginalized between a variety of other assurance, compliance and risk management functions, or to emerge as a recognized and stronger profession (IIA, 2013; PwC, 2013). For us, the crossroad is not the *competition* with other fields, but lies in the ability to enrich the repertoire built on the presumption of complicatedness with that of interactive complexity. We agree with Lenz and Hahn (2015) that other functions are competitive to the internal auditing profession, but the real crossroad is whether or not the field is able to *adopt* a new angle to deal with interactive complexity. We argue that if it does, the issue of relevance will be largely resolved. The competition is not which of the risk-, control- and assurance-related fields is best, but how organizations can deal with intensifying interactive complexity. If the internal audit profession can develop repertoire for interactive complexity, we expect the profession to retain relevance, regardless of what other professional disciplines do.

Thirdly, we show that dealing with interactive complexity requires a rethinking of some of the core principles of the profession and translation of those into new repertoire for internal auditors. That is not to say that the principles ought to be changed; we argue for a re-alignment of them to the emerging conditions of interactive complexity. In order to do so, the repertoire ought to be dynamic but also systematic. Auditing will always be a systematic profession, but the challenge is to find systematic ways of working with co-evolving circular dynamics. That goes for the *inside* of the models, what they measure, but also for how they work *outside*, how the reports of auditors play out in the organization. The profession should remain systematic, but not become mechanistic. Furthermore, there is need to deal with spaces in-between organizations. In a networked society, strict borders between organizations blur and are replaced by intertwined processes between entities, often even on a temporary basis. Risks reside in the grey areas in between organizations that are not fully covered by any of them, or by both. How to deal with those 'outside' risks that should be part of the debate with management 'inside' because they can greatly affect the organization. How should internal auditors whose organizations are engaged in networks interpret 'internal'? Organizations still have statutory or practical boundaries, but these boundaries are at the same time permeable.

Already some interesting steps are being taken, for instance by Weick and Sutcliffe (2007) who talk about resilience audits, which assess the organizations' ability to manage mindfully and to build a resilient organization. The challenge for the audit profession will be to find new parameters for quality, to act as new categories for assurance. While at the same time, the challenge is to

integrate those into the existing and established range of quality criteria of the field. To do so, new metaphors and concepts could open the door for integrating interactive dynamics into the repertoire of internal auditing. Amidst a context of rapidly growing interactive complexity, internal auditors will increasingly face these dilemmas and challenges in future engagements with management. Academic research into these dilemmas is needed to understand them better and to properly take into account network dynamics. Partly by looking at longitudinal empirical cases to study the effectiveness of earlier dealings with complexity, partly by designing new empirical case studies that study 'real-time' application of new repertoire for auditing interactive complexity. Important research questions include: 'to what extent are internal auditors loyal to their organization and the relationship with management and to what extent are they loyal to the profession of internal auditors?'; 'How do professional bodies such as IIA provide guidance to individual auditors with regard to these dilemmas?'; 'Do cultural differences across countries allow differences in how internal auditors deal with these dilemmas?'

We hope that our critical essay will help the internal audit community to reflect on the current state of play of the field and on where the profession is going. The internal audit community has been highly successful in securing its place in organizations; we hope that our essay contributes to the debate on how to shape the future of internal auditing and what routes for research are most relevant to tackle the complexity challenge we are all facing.

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NOTE

1. The IACG 2013 Proceedings were not available in digital form and as such did not support a full-text search.

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