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The dynamics of (dis)integrated risk management:

A comparative field study

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The dynamics of (dis)integrated risk management: A comparative field study

Abstract

Drawing on a comparative case study of enterprise risk management, and building on the literature on boundary objects, this study sheds light on the ‘dynamics of (dis)integrated risk management’. Our analysis of enterprise risk management in two large organisations reveals a set of pressures that undermine the ideals of enterprise risk management mobilised by practitioners and their promise for ‘integrated’ control practices. While the two cases show how enterprise risk management is shaped in different forms, in both cases the attempt to create a shared context for the identification and communication of enterprise-wide risks makes visible and active residual elements that contribute to generate dissatisfaction and calls for change to integrated risk management. The discussion of the dynamics of (dis)integrated risk management contributes to extending research that is critical of procedural forms of enterprise risk management, as well as recent work that draws attention to the role of ‘risk talk’ in enterprise risk management. We also suggest that our study of enterprise risk management sheds light on some key tensions of infrastructure formation, thus contributing to recent theory-building research that draws attention to the accretion of processes, roles, and governance structures into an infrastructure that enables the production of accounts of performance.

Keywords: Enterprise risk management, risk talk, integration, boundary objects, infrastructure

1. Introduction

Since the early 2000s, enterprise risk management has attracted increasing attention as an approach to the management of risk that is ‘integrated’, providing in aspiration a unitary and holistic view of the risks that an organisation as a whole is facing¹ (COSO, 2004; Hayne & Free, 2014; Power, 2007). Normative practitioner texts describe enterprise risk management as a process that is ‘integrated with all other aspects of the business’ (COSO, 2016: 4) and contributes to ‘a systematic and integrated approach to the management of the total risks that a company faces’ (Dickinson, 2001: 360).

A growing body of field-based studies challenges this promise of a unitary and systematic process (Arena, Arnaboldi, & Azzone, 2010; Jordan, Jørgensen, & Mitterhofer, 2013; Kaplan & Mikes, 2016; Mikes, 2009, 2011, Mikes & Kaplan, 2013, Palermo, 2014; Tekathen & Dechow, 2013). In contrast to many normative practitioner texts, enterprise risk management ‘in action’ is a collection of ideas, processes and tools that can be selectively used and assembled by internal organisational agents in search of areas to which they may contribute (Hall, Mikes, & Millo, 2015; Kaplan & Mikes, 2016; Mikes, 2016; Mikes & Kaplan, 2013).

Building on the contrast between the promise of ‘integration’ of enterprise risk management and its multifaceted field-level manifestations, in this paper we seek to examine whether and how a heterogeneous mix of tools, processes and networks of actors can give rise to something that, even if only temporarily, becomes a seemingly stable and coherent working ensemble.

¹ We use the terms ‘enterprise risk management’ and ‘integrated risk management’ synonymously to underscore the link between enterprise risk management and the aspiration to achieve a form of integrated risk management. In Sections 5 and 6, we will refer to company-specific terms for organisation-specific manifestations of enterprise risk management.

Our analysis draws on, and seeks to develop, the literature on boundary objects (see, for a recent overview, Bowker, Timmermans, Clarke, & Balka, 2015). This literature draws attention to the way in which certain physical objects, processes, tools and even theories can act as ‘integrating devices’ (Carlile, 2002: 453) across organisational boundaries, contributing to form a ‘shared context’ among dispersed groups of actors. On this basis, the literature on boundary objects encourages the exploration of how such a shared context is formed via the connecting role of heterogeneous ‘objects’², broadly defined to include processes, tools and ideas that people act toward and with (Star, 2010) and which span organisational boundaries.

Previous work on boundary objects also suggests that the formation of a shared context is characterised by tensions that problematise the ideal of integration, thereby providing relevant insights into the analysis of enterprise risk management which follows. Firstly, boundary objects should be ‘plastic’ enough to adapt to local contingencies, but also ‘robust’ enough to maintain a common identity across boundaries (Star & Griesemer, 1989). Yet it is far from clear how organisations can strike a balance between these two features of boundary objects. Secondly, the boundary spanning function of boundary objects is often contingent on the type of problems that they are meant to address. A body of literature in organisation studies (see Carlile, 2002, 2004; Spee & Jarzabkowski, 2009) shows how different boundary objects function only in relation to problems that arise at specific ‘knowledge’ boundaries, which make knowledge sharing and communication difficult. Thirdly, boundary objects may ‘scale up’ and form infrastructures which comprise stable, routinized and interlinked work arrangements (Bowker & Star, 1999; Power, 2015; Star, 2010). In so doing, however, they may lose their flexibility and ability to adapt to local needs (Star, 2010).

² In the rest of the article we refer to ‘objects’ with inverted commas to underscore our specific use of the term as ‘work arrangements that are at once material and processual’ (Star, 2010: 604).

Combining our empirical focus on enterprise risk management with these insights from the literature on boundary objects, we focus the analysis on the varied ‘objects’ (i.e. tools, processes, organisational arrangements, ideas etc.) that constitute an ‘enterprise risk management mix’ (Mikes & Kaplan, 2015: 29) and on how these ‘objects’ work across different organisational boundaries. On this basis, we formulate the following research questions: What is the role of the varied ‘objects’ that constitute enterprise risk management, and the boundaries within which they lie, in the formation of a shared context for risk management? And how do these varied components of enterprise risk management ‘scale up’ to form a set of interlinked work arrangements?

To address questions such as these, the paper is empirically based on qualitative data collected between 2004 and 2011 from two large organisations operating in Italy (anonymised as *Alpha* and *Omega*). Drawing on the literature on boundary objects, the comparative analysis of the case material sheds light on what we call *the dynamics of (dis)integrated risk management*. By using this expression, we seek to emphasise how the ideals of integrated risk management, mobilised by practitioners, seem to be subject to interrelated pressures that almost inevitably undermine their designers’ aspirations. While our case-based analysis cannot offer comprehensive generalisations, by iterating between the empirical material and the boundary objects literature, it is possible to outline two specific dynamics that might prove useful in exploring enterprise risk management as a lived organisational practice in other settings.

Firstly, the case analysis shows the difficulty of balancing the ‘plastic’ and the ‘robust’ components of enterprise risk management. When the first prevails (as in *Omega*), the ‘objects’ of enterprise risk management become an indistinguishable part of organisational control processes, undermining the production of visible evidence of risks and risk management. When the second prevails (as in *Alpha*), the ‘objects’ of enterprise risk management do not suit local needs, making visible residual risk categories that require ad hoc management processes. Secondly, the ‘objects’ of enterprise risk

management interact and accumulate around distinct problems that characterise the flow of information and knowledge sharing across organisational boundaries (Carlile, 2002, 2004; Spee & Jarzabkowski, 2009). In the two cases, these ‘knowledge’ boundaries focus the efforts of the champions of enterprise risk management, and facilitate the formation of a shared context around the problem of developing a common language for risk aggregation (*Alpha*) or translating different concerns into a common interest with the timely identification of performance variances (*Omega*). But, in so doing, they also separate what is bound, such as standardised templates (*Alpha*) and interactive practices (*Omega*), from other possible elements and focuses of enterprise risk management, thus generating dissatisfaction with, or calls for reform in, existing work arrangements.

Discussion of these dynamics contributes to extending previous risk management research in two ways. Firstly, this study shows how different approaches to realising the integration ideal of enterprise risk management, even interaction-rich approaches that have been proposed as an alternative to procedural forms of enterprise risk management (Power, 2009), are inherently unstable due to tensions that characterise the accretion of heterogeneous elements into what appears a seemingly coherent and stable set of interlinked tools, processes and organisational arrangements. Secondly, while recent work draws attention to risk functions that are able to balance compliance activities with a business partnering role (Kaplan & Mikes, 2016), this study suggests that these two dimensions may not coexist easily, as senior risk champions tend to specialise in a particular niche of risk tasks, in order to consolidate or extend their organisational footprint.

This study also has implications for work on boundary objects and infrastructure formation (Bowker & Star, 1999; Star, 2010). An analysis of enterprise risk management provides the opportunity to examine how heterogeneous elements, which can act as boundary objects on their own, form a seemingly stable and coherent working ensemble that presents infrastructural

properties (Star, 1999; Star & Ruhleder, 1996). Compared to previous accounting research (Power, 2015), this study goes beyond a view of infrastructure as a technical apparatus that materialises a vague boundary object. By relating interlinked boundary objects to distinct problems with information-processing and knowledge sharing, we suggest that an enterprise risk management infrastructure is animated by a ‘master narrative’ (Star, 1999: 384), which contributes to knitting together heterogeneous ‘objects’, as well as making visible and active residual elements that may re-impose themselves over time. On this basis, while previous accounting research emphasises the stability and materiality of infrastructure (Poon, 2009; Power, 2015), this paper provides insights on how infrastructure might always be ‘becoming or dissolving’ (Boland, 2015: 236).

The rest of the paper is organised in the following way: Section 2 reviews the enterprise risk management literature to identify the gaps to be addressed in this study. Section 3 explains how the boundary object literature is helpful in the analysis of the case study material. Section 4 describes research methods and the two organisational settings, including a brief overview of their enterprise risk management configurations. Sections 5-6 present the analysis of the two case studies. Section 7 discusses key findings and the implications of the study. Section 8 provides concluding comments and directions for future research.

2. Enterprise risk management ‘in action’

Practice articles and prescriptive frameworks suggest that enterprise risk management differs from traditional concepts of risk management because different types of risks are addressed in an ‘integrated’ way (COSO, 2004; DeLoach, 2004; Dickinson, 2001; ISO, 2009; Meulbroek, 2002). These aspirations run in parallel to the spread of increasingly codified and formalised risk management processes and roles in any organisation (Hopwood, 2009; Miller, Kurunmäki, &

O’Leary, 2008; Power, 2007). One example is the COSO 2004 Enterprise Risk Management (ERM) framework, which represents by means of a, now famous, cube how enterprise risk management integrates different activities (from objective setting to risk monitoring), includes a variety of risk types (e.g. strategic, operations, reporting, compliance), and is affected by people at every level of the organisation (see Hayne & Free, 2014).

The ideal of ‘integration’ through the inclusion of a wide range of activities, functions and risks under a common umbrella is often related to improvements in organisational ends, such as value creation and targets achievement (Beasley & Frigo, 2007; DeLoach, 2004; Dickinson, 2001; Meulbroek, 2002). But enterprise risk management can also encompass an increased emphasis on risk quantification, the use of tools that allow risk aggregation, and a risk-based view of internal control that encourages the inclusion of non-quantifiable risks (see, for a review of normative and technical texts, Mikes, 2009).

In the case-based analysis which follows, not only do we show how these different aspirations can be related to organisation-specific manifestations of enterprise risk management, but we also seek to explain how enterprise risk management is shaped through different assemblies of practices, adding to a growing body of field-based studies on enterprise risk management ‘in action’ (Arena et al., 2010; Jordan et al., 2013; Mikes, 2009; Palermo, 2014; Tekathen & Dechow, 2013; Woods, 2009). A common theme across these studies is that enterprise risk management is constituted of a variety of processes, tools and organisational roles and their interrelations with control practices, such as performance measures, planning and control cycles and project management (see, for a review, Mikes & Kaplan, 2013).

Previous studies have developed different explanations for the way in which such a varied mix of practices is shaped in different ways. Studies informed by a contingency perspective (Mikes &

Kaplan, 2013, 2015; Woods, 2009) evoke ideas of a ‘fit’ between the form of enterprise risk management and a number of contextual variables such as technology, regulatory requirements, and types of risks. Other studies (Arena et al., 2010; Mikes, 2009, 2011) suggest that risk managers search for areas of contribution and strategically shape the boundaries of their areas of work. Such strategies, and their outcomes, are contingent upon different views on the applicability of measurement tools (Mikes, 2009, 2011). For example, where ‘quantitative enthusiasm’ prevails, risk managers have a relatively narrow area of responsibility. Risk measurement and modelling are kept separate from strategic decision-making. In contrast, if ‘quantitative scepticism’ prevails, risk managers expand their areas of responsibility, guiding strategic decisions by means of their experience and intuitive sense of danger.

Recent studies have further developed our understanding of the work of risk experts. Hall and colleagues (2015) argue that some risk managers tend to focus on compliance activities and regulatory requirements, via formalised and standardised tools; others embrace a more business-oriented role through sustained interaction with front-line personnel, via simple tools rather than sophisticated risk models. Mikes (2016) shows how some senior risk champions tend to be sceptical about compliance roles and use ‘risk talk’, namely ‘an organizational discourse about risk issues ranging from task-related problems and perceived organizational weaknesses to concerns about resource planning’ (Mikes, 2016: 255), in order to facilitate risk management as part of day-to-day business activities. Finally, Kaplan and Mikes (2016) emphasise how risk functions consist of different layers of roles and work modes, carried out by different groups of risk managers. On this basis, some risk functions are able to balance compliance and business-oriented activities via a ‘dual risk management’ process.

In order to shed light on how enterprise risk management is shaped in different ways, previous work has focused mainly on the role of organisational change agents in search of areas which they may

contribute to. Less is known on the role of the design features and functionalities of the varied elements that constitute any particular enterprise risk management mix³. A notable exception is the study by Jordan and colleagues (2013), which shows that the ‘format and furniture’ of risk maps help to mediate different concerns and co-orient the work of different actors involved in inter-organisational project management. However, this study remains limited to the distinctive qualities of a single tool of enterprise risk management (risk maps) without addressing the relational effects of the different components of an enterprise risk management ‘mix’, i.e. how the functioning of risk maps is interrelated with risk identification processes, networks of risk champions, risk assessment templates, risk categorisation models etc.

In the analysis which follows we seek to address this gap in our knowledge about the way in which enterprise risk management is shaped in different ways, extending studies that focus on the role of internal change agents, as well as previous work focusing on single tools such as risk maps. This requires a discussion of how we can conceptualise the different components of an enterprise risk management mix, their functioning as a means for achieving integration and the way in which they may interact and accumulate over time to form a seemingly coherent and stable working ensemble. To this end, as discussed in the next section, the literature on boundary objects provides a useful reference point, which focuses the analysis on the ‘objects’ of enterprise risk management, the boundaries within which they lie, and the dynamics of infrastructure formation.

³ For example, the recent study of risk managers’ ‘tool-making’ by Hall and colleagues (2015) sheds light on the development of risk tools, but it is still premised on the assumption that experts can develop, adapt and use tools to expand their organisational footprint.

3. 'Objects', boundaries and infrastructure formation

The concept of boundary objects has been developed by Star and colleagues to explain cooperation in the absence of consensus among groups of heterogeneous actors (Bowker et al., 2015; Star, 1989, 2010; Star & Griesemer, 1989). This notion suggests that certain processes, events, physical objects, theories and ideas act as 'integrating devices' (Carlile, 2002: 453), creating a shared context among people who have 'different goals, time horizons and audiences to satisfy' (Star, 1989: 46).

For the purpose of this study, the boundary objects literature can be used to focus the analysis on the varied 'objects' that act as integrating devices and contribute to form a shared context for risk management. Specifically, the analysis that follows focuses on three dimensions. The first refers to the qualities of the objects that constitute enterprise risk management. The boundary objects literature draws attention to those 'objects', in Star's sense of work arrangements or 'workstreams'⁴, which are plastic yet robust enough to provide a common structure to enterprise risk management and, at the same time, respect local contingencies and uses. We expect such interplay between the plastic and the robust components of boundary objects to be central to the construction of a shared context for risk identification, communication and management, similar to the findings of previous studies of accounting practices (see Briers & Chua, 2001; Dechow & Mouritsen, 2005).

The second dimension refers to the relation between boundary objects and organisational boundaries. A body of literature in organisation studies (Bechky, 2003; Carlile, 2002, 2004; Spee & Jarzabkowski, 2009) shows how boundary objects help to overcome different problems that arise in

⁴ The concept of workstream has been developed in order to emphasise the dynamic and most likely unstable flows of organisational activities, that contribute to defining and addressing new areas of regulatory and managerial intervention, such as the risk cultures of financial sector organisations (Palermo et al., 2017). Like Star's notion of 'objects', the term workstream emphasises the processual nature of something that people act toward and with.

relation to information processing and knowledge sharing in organisations. In so doing, this literature draws attention to different ‘knowledge’ boundaries (Spee & Jarzabkowski, 2009: 226). A ‘syntactic’ boundary refers to the problem of developing a common language in order to transfer knowledge across different organisational functions and groups of people. A ‘semantic’ boundary refers to the problem of developing a common meaning in order to translate domain-specific information into a form that is accessible across different parts of an organisation. A ‘pragmatic’ boundary refers to the problem of developing a common interest among groups of people with opposing views, transforming existing knowledge in a way that reconciles conflicting perspectives.

Caution should be taken with the use of ‘knowledge’ boundaries as clear-cut and separate categories in the context of this study. Previous field studies have shown how enterprise risk management ‘in action’ is not simply a matter of implementing a neutral technique that transfers risk information, but it is also contingent upon situational politics, professional struggles, and conflicts over resource allocation (see Mikes & Kaplan, 2013). On this basis, problems that arise at so-called syntactic, semantic and pragmatic boundaries are likely to overlap, at least partially, in the assembling of enterprise risk management.

Bearing in mind these words of caution, the three categories of ‘knowledge’ boundaries can be used as a heuristic to track how a single boundary object or multiple boundary objects are connected to key problems that the champions of enterprise risk management focus on in their work activities (Star, 2010). In fact, as illustrated in Section 2, previous research (Hall et al., 2015; Mikes, 2009, 2011, 2016) shows how risk managers tend to focus on certain sets of problems in order to consolidate or extend their organisational footprint. Some focus their work activity mainly on the development of formal processes and models for risk categorisation and representation, thus reflecting concerns with syntactic boundaries. Others focus instead on the translation of risk information into something that is easily understood by business managers and develop processes

through which different actors come together and express their concerns (Mikes, 2016), thus reflecting concerns related mainly to semantic and pragmatic boundaries.

The third dimension of analysis refers to the dynamics of multiple boundary objects. Star and colleagues suggest that boundary objects may ‘scale up’ into a boundary infrastructure that brings into play ‘stable regimes of boundary objects’ (Bowker & Star, 1999: 313). Inspired by their work on classifications and standards, they emphasise how an infrastructure enables multiple sets of users and uses and becomes ‘real’ only in relation to organised practices⁵ (Star, 1999; Star & Ruhleder, 1996). But they also outline some key properties of infrastructure: embeddedness into other structures; visibility only upon breakdown; links with conventions of practice; and uses that reach beyond a single event or one-site practice.

The literature on infrastructure can enrich our analysis of enterprise risk management in two ways. Firstly, it provides an additional conceptual lens that helps to address a theoretically interesting (and problematic) aspect of enterprise risk management. Enterprise risk management could be theorised as a boundary object that connects the work practices of dispersed groups of actors. Yet, as discussed in Section 2, enterprise risk management ‘in action’ can also be seen as a collection of heterogeneous elements, such as risk maps, risk categorisation models and risk sheets, which could act as boundary objects on their own. Studying enterprise risk management as infrastructure, therefore, can help to capture how such heterogeneous elements may form relatively stabilised ‘regimes and networks of boundary objects’ (Bowker & Star, 1999: 313).

Secondly, the literature on infrastructure sheds light on a key point of tension that is likely to characterise the formation of enterprise risk management as a seemingly stable and coherent set of work arrangements. According to Star (2010) and others (Boland, 2015), infrastructure formation

⁵ For example, the cook sees the water system as a working infrastructure that helps prepare a meal, while the city planner considers the water system a variable in planning processes.

can be related to pressure to standardise the plastic aspects of boundary objects, in order to obtain work arrangements that function across different social worlds. This might mean that the resulting infrastructure loses the ability to respect and flexibly adapt to local contingencies. As shown in information systems research (Star, 1999; Star & Ruhleder, 1996), an infrastructure tends to embed a 'master narrative' that makes active recalcitrant objects and residual categories that do not fit seamlessly. This outcome might generate new attempts to seek closure via standardisation, leading to the continuous tacking back and forth between more or less 'robust' designs.

In turn, our study of enterprise risk management can contribute to recent accounting research that has started to use the notion of infrastructure (see Kornberger, Pflueger, & Mouritsen, 2017; Kurunmäki & Miller, 2013; Power, 2015). Specifically, building on Star's work, a recent study by Power (2015) on research impact provides further insights on the relation between boundary objects and infrastructure. Power emphasises the accretion of managerial roles, organisational processes and tools to explain how an ambiguous policy object, such as research impact, gets stabilised across different organisational sites. As stated by Power (2015: 50) 'for stability there needed to be what can be provisionally labelled as an "impact infrastructure"'. In line with earlier accounting research that alluded to infrastructure (Poon, 2009), the study by Power portrays infrastructure as a technical apparatus, gradually built up via the accumulation of roles, rules, routines and governance structures, which is essential for transforming ideational boundary objects into 'a new kind of routinized fact about the organization' (Power, 2015: 50). An analysis of enterprise risk management provides the opportunity to extend these insights, by shedding light on how stability may (or may not) be achieved when infrastructure formation entails the assembling of multiple, ideational and material, boundary objects, rather than the translation of a single boundary object into a technical apparatus.

To conclude, the boundary objects literature directs our inquiry in three ways. Firstly, it focuses attention on the formation of a shared context via plastic yet robust enough ‘objects’, which span organisational boundaries. Secondly, it helps to track different sets of problems that people act toward and with. Thirdly, it draws attention to the dynamics through which heterogeneous elements may (or may not) ‘scale up’ into a seemingly stable and coherent working ensemble. These three themes will inform our case-based analysis of enterprise risk management. Before moving to the empirics, the following section describes the research methods and the two research sites.

4. Research approach and methods

This study is based on a comparative case-study research approach (Stake, 1994). We use qualitative data collected between 2004 and 2011 in two organisational settings, called *Alpha* and *Omega* for reasons of confidentiality. *Alpha* (with around 3,000 employees at the time the study was carried out) is an Italian company operating in the electricity and gas markets, overseen by an international group and a cluster of government-controlled utilities. *Omega* (with around 2,500 employees) is the Italian subsidiary of a large international group (hereafter referred to as the Parent Company), that operates in the fields of energy, transport and healthcare, providing a variety of electrical engineering and electronics-related products and services.

Data collection and analysis

Data collection took place within a period of significant change in Italian corporate governance requirements. In the early 2000s, new regulations and codes of conduct connected internal control and corporate governance to risk assessment and management, as had happened in the UK over the

preceding decade (Power, 2007). In 2004, from public documents and discussions between the researchers and senior managers, it appeared that both *Alpha* and *Omega* attempted to transform their risk management initiatives, embracing an ‘integrated’ approach. We were able to explore further changes to risk management and control processes by carrying out two sets of formal interviews. At *Alpha*, we met a range of people in 2008 and between 2010 and 2011. Similarly, at *Omega*, we met managers and members of staff from different departments and hierarchical levels, between 2006 and 2007 and between 2010 and 2011.

Table 1 summarises the number of interviews and their timing over the research period. Each interview took between fifty minutes and two and a half hours and, when permission was granted, was recorded and transcribed. Before carrying out the interviews, information on the two organisations was collected from a variety of sources, including financial reports, newspapers and practice journals. Our long-term involvement with the two organisations put us in a position of trust, giving us access to internal documents. We were also able to attend public presentations, given by company representatives, and then engage with them informally. Public presentations of our preliminary findings and informal discussions with experts in the field contributed to refining the empirical analysis.

[Please insert Table 1 here]

We operated at three levels in analysing the empirical material. Firstly, we set the context of the study, identifying influential events, actors and what appeared to be pivotal ‘objects’ in enterprise risk management. Drawing on previous studies (e.g. Mikes, 2009), we explored how the design of specific work arrangements could be related to different ways of conceptualising the meaning of ‘integrated’ forms of risk management. Secondly, we analysed what happens when enterprise risk management designs are put to work, with a particular focus on how the varied ‘objects’ of an

enterprise risk management mix engaged the users. At this stage, we also tried to search for evidence of different kinds of problems that arise at ‘knowledge’ boundaries (Carlile, 2002, 2004; Spee & Jarzabkowski, 2009). Thirdly, we focused on what appeared to become stable sets of work arrangements, collecting material on their configuration as well as interviewees’ perceptions of their role and use.

The two research sites

The two-case study settings went through relevant organisational and institutional transformations over the period of our study. From the late 1990s onwards, *Alpha* experienced changes in market conditions, business activity and organisational and governance structure. The transition from a state monopoly system to a liberalised market (under the impetus of European Union legislation), and strategic decisions, such as a greater involvement in exploration and production (E&P) activity abroad, implied an acceptance of greater volatility in economic results.

Moreover, in 2005, two entities (a large international company and a cluster of local government-controlled utility companies) acquired the joint control of *Alpha* and its organisational structure was re-organised around three top managers (the ‘top three’). Several corporate services functions (e.g. Legal Affairs, Human Resources, Regulation) reported directly to the Chief Executive Officer (CEO), who also had management responsibility for the organisation as a whole. Other corporate services, such as Strategy, Planning & Control (P&C) and Information Technology, reported to the Chief Financial Officer (CFO). The operating business units (BUs), which were organised around two ‘business lines’ (production and sale of electric power; production and sale of natural gas and crude oil), reported to the Chief Operating Officer (COO), a newly-created role.

Similarly, *Omega* was affected by a dynamic process of mergers and acquisitions, an expanding global presence and frequent involvement in large public-private projects. The company also went through two major re-structures, both of which related to corporate scandals. The first was in 2003: in response to a bribery scandal that led to significant media exposure, *Omega's* Parent Company mandated an extensive re-organisation. *Omega*, similar to other local subsidiaries worldwide, was re-structured into central corporate services functions (e.g. Finance and Control, Supply Chain, Logistics, Legal Affairs) and business units (BUs) responsible for key products. In doing so, the Parent Company established greater control over group-wide target settings and evaluation of the geographically dispersed subsidiaries.

In 2007, *Omega's* group faced a difficult legal dispute, whereby the acquisition of new contracts and bidding for public tenders became problematic. These problems ran in parallel to a perceived increasing heterogeneity in structures and processes at the subsidiary level. A new restructuring process was mandated by the Parent Company. This led to the current matrix configuration, composed of three broad business sectors (automation, energy and health), further divided into divisions and market segments, and geographical clusters, grouping local subsidiaries (e.g. *Omega* belongs to the South-West Europe cluster).

Risk management in the case-study organisations

In 2006, *Alpha* established a Risk Office, employing 20 people and coordinated by a senior manager (hereafter: Head of Risk Office) reporting to the CFO. The Risk Office had responsibility for two sets of activities. The first, energy risk management, contributed to centralising a set of activities previously dispersed across different business units, which aimed to protect economic results from fluctuations related to price and exchange rate risks. The second, called Enterprise Risk

Management (ERM), stemmed from an earlier attempt, coordinated by Planning & Control (P&C) and the Internal Audit (IA), to compile an enterprise-wide catalogue of key risks.

Responsibility for ERM was allocated to a manager with previous experience in the risk function of another energy company (hereafter this person will be referred to as the Risk Manager). Under the Risk Manager, a revision of the existing risk identification exercise was carried out, leading to a new risk identification and assessment process, which followed the COSO 2004 framework. Risk identification and assessment was based on an annual process, formally aligned to the timing and outputs of the financial planning and control cycle (e.g. strategic guidelines, performance targets, operational and financial plans), and its purpose was to identify and assess the risks that could prevent the achievement of BU objectives. Risk identification and assessment was based on the use of a range of tools (e.g. a risk categorisation model, risk maps) that reflected an overall ambition to be comprehensive and to increase the number of connections between different organisational processes and functions. A network of actors at focal points, who had no professional qualifications in risk management, were supposed to act as a conduit between BU managers and Risk Office personnel, in order to support risk identification and assessment. There were around twenty-five focal points, one for each business unit and corporate services function. Focal points formally reported to senior managers (e.g. BU Directors and Heads of corporate services functions) with a dotted reporting line to the Risk Office.

Moving to *Omega*, as part of the first extensive structural re-organisation, which happened in 2003, the Parent Company mandated the appointment of a new person (hereafter: the Controller), with responsibility for the Accounting Finance & Control Unit (AFCU). Under the Controller, an annual budgeting process became the central tool within the planning and control cycle. A risk management function, headed by a newly-appointed manager with prior experience in the planning and control area (hereafter: Chief Risk Officer, CRO), was placed under the Controller's

responsibility. The AFCU became formally responsible for a process known as Opportunity & Risk Management (O&RM). O&RM aimed to support BU managers in the identification of the risks affecting the achievement of their objectives. Similar to the case of *Alpha*, O&RM was supported by different tools, such as a risk model and risk maps, as well as a network of local risk champions called Opportunity and Risk (O&R) managers. O&R managers acted as facilitators during risk workshops that supported periodic risk reviews within the business units.

To summarise, this overview of the two case-study organisations suggests that both *Alpha* and *Omega* tried to make two forms of risk management operable, ERM and O&RM respectively. These can be related to the concept of enterprise risk management, although in different ways. The next sections present our detailed analysis of these two forms of enterprise risk management. In line with our discussion of the boundary objects literature, following an illustration of the designers' ambitions for a form of integrated risk management, we focus on the 'objects' that constitute ERM and O&RM, the boundaries being spanned by them, and the dynamics through which these 'objects' form an infrastructure for the identification and management of key risks.

5. *Alpha*: A standard process for holistic risk management

ERM in *Alpha* can be related to ambitions to achieve a form of holistic risk management and a risk-based internal control imperative (Mikes, 2009). The Risk Manager emphasised the presence of a 'common framework' for risk-related communication that ensures ownership and accountability for a broad range of enterprise risks. Drawing on the COSO 2004 framework, which was explicitly acknowledged as the key reference point in ERM design, ERM encompassed 'all risks to the achievement of corporate objectives' (corporate presentation), even those elements that could not be readily quantified and aggregated (e.g. strategic failure, environmental risks, reputational risks).

The 'objects' of ERM: A 'library' of categories

The constitutive elements of ERM reflected an ambition to make it comprehensive and increase the number of connections between different organisational processes and functions. Corporate documents and interviews reveal four core 'objects' of ERM: a group risk model (hereafter: risk model), risk sheets, risk maps and focal points.

The risk model provided a broad list of risk categories that, in the view of the Risk Manager and his staff, could affect corporate objectives. In 2010, it included approximately 80 items, ranging from political and regulatory risks to commercial and industrial partnerships, as well as climatic events (see Figure 1). A corporate webpage emphasised the centrality of the risk model in ERM, suggesting that 'the risk model provides a reference framework and a *common language* for the process of identifying, assessing, controlling and reporting priority corporate risks' (emphasis added).

[Please insert Figure 1 here]

'Risk sheets' were excel spreadsheets that supported the estimation of the impact, likelihood and level of control (e.g. mitigating actions put in place) for each risk. A separate box specifically supported the calculation of impact, outlining dimensions such as financial, reputational, environmental, and temporal effects. Each risk sheet contained additional boxes that could be filled in with information about the causal mechanisms that might contribute to the materialisation of a risk, the hypotheses used to define likelihood, impact and level of control, the name of the risk owner, a synthetic risk description, and a more detailed explanation of why the risk should be identified as a priority. A box on the top right of the spreadsheet also asked the respondent to state which category of the risk model had been used as a reference point. In so doing, the risk model acts as a communication device that sits in the middle across organisational areas, supporting

information-processing and transferring (Carlile, 2002) via categorisation and standardisation (Bowker & Star, 1999).

Risk maps summarised key risks, both at the business unit level and at the corporate level. The BU risk map was the key output of the risk identification and assessment process within business units, usually showing the 7-8 risks identified as a 'priority' by BU Directors and Heads of corporate services functions. At the corporate level, two maps synthesised 'priority' risks for *Alpha* in relation to budgetary targets and business plans' strategic objectives respectively. The corporate risk maps were included in the financial planning package approved by the Board of Directors. Regardless of the organisational level, the maps were based on the same design. The vertical axis conflated impact and likelihood into a single dimension called the 'level of risk'. The horizontal axis represented the 'level of control', which referred to the extent to which mitigating factors had already been put in place (see Figure 2). The Risk Manager argued that this design helped to capture more information, compared to maps based on impact and likelihood only, contributing to the reinforcement of the links between the Risk Office, business units and other staff functions, such as Internal Audit⁶.

[Please insert Figure 2 here]

Finally, a network of focal points assisted senior managers (e.g. BU Directors and the Heads of corporate services functions) to fill in ERM paperwork. Focal points were chosen by the Risk Office, with the help of senior managers, among those already acting as referents for other processes related to planning, compliance, and health and safety, in order to increase collaboration across different organisational areas. Indeed, one focal point mentioned how he liaised with the Risk Office in relation to ERM, but he also acted as referent for compliance processes related to

⁶ A note on internal risk management guidelines outlined how results of audits performed by the audit department were the main source of information for the control dimension.

anti-fraud legislation as well as for the coordination of planning activities at the BU level. On this basis, he worked with the Risk Office, Internal Audit and the central P&C unit.

To summarise, drawing on the seminal paper on boundary objects (Star & Griesemer, 1989), the ambition to form a shared context for risk identification and communication in *Alpha* is supported by the design of ‘a complex of objects from which things necessary for each world can be physically extracted or configured for local purposes, *as from a library*’ (Star & Griesemer, 1989: 404, emphasis added). The risk model provides a comprehensive ‘library’ of categories that should cover many, if not all, aspects of *Alpha*’s business activity. The risk sheets allow for the inclusion of quantifiable and non-quantifiable risks, and provide a standardised template that aims to address the different local needs and contingencies of organisational units. The risk maps can be related to not only business concerns with the level of risk (impact multiplied by likelihood), but also concerns with internal controls, auditing and compliance activities. Finally, focal points contribute to enhancing the number of connections between ERM and organisational functions, thanks to their pre-existing boundary spanning roles.

The boundaries of ERM: Filtering and aggregating risks

The previous section’s description of the design of the risk model, risk sheets, risk maps and a network of focal points suggests that different information requirements are specified in advance of the risk identification and assessment process through a ‘library’ of categories such as the risk model and standardised templates such as risk sheets, which should cover local specificities while maintaining a ‘robust’ framework for information-processing (Star & Griesemer, 1989). On this basis, ERM can be related to concerns with syntactic boundaries, whereby the development of a

‘shared syntax’ helps to transfer risk information across the organisation (Carlile, 2002, 2004; Spee & Jarzabkowski, 2009).

When asked about the role of ERM, BU managers stressed the use of standardised templates and an overarching ambition to aggregate local risk information. One senior manager stated that ERM was about answering the Risk Office’s questions via risk sheets. In doing so, they were reminded to use the risk model to categorise each risk sheet and to use risk maps to filter out non-relevant risk information:

‘Only those that are part of the top right quadrant are reported to the executive committee. There is a map, something like a matrix, which is something like this [sketching a risk map], and the ones here [pointing to the top right quadrant of the map] will be reported.’

Local interactions and discussions about specific issues were not central concerns. One interviewee, with work experience as ERM’s focal point, emphasised how they used to spend time on documents’ format and structure to improve readability and comparability:

‘We try to represent our data in the best possible way, even using colours. You may think this is silly, but it is not. This is [name BU omitted], shown as light blue. This is the institutional colour of [name BU omitted]. This helps top management, when they look at the reports, to have a clear idea of what they are looking at.’

At the Risk Office level, the Risk Manager also emphasised the problem of risk aggregation. Their main task consisted of filtering BU risk information to delineate a set of ‘priority corporate risks’ that could be included in risk maps related to the business plan and budget. At the time the field work was carried out, *Alpha* had around 25 organisational units (including both business units and corporate services functions) involved in the annual risk identification and assessment process. This

meant that the Risk Office received several risk sheets (around 200 in 2010), posing the challenge of identifying ‘priority’ risks at the corporate level⁷.

To address this problem, central ERM staff benefited from the use of standardised documents. As the templates were the same, risk maps and risk sheets could be used as ‘syntactical “processing” tools’ (Carlile, 2002: 453) to transfer BU information in a master document that contained all items considered a ‘priority’ by business units⁸. In order to select key risk information, the Risk Manager stressed the availability of a set of interlinked documents containing detailed information about the local risk assessment process. Firstly, thanks to the work of focal points, each risk could be easily related to the unit that flagged it in the risk identification process. On this basis, the Risk Office could identify and aggregate similar issues that affected different business areas. Secondly, since each risk could be related to a category of the risk model, the Risk Office could identify items that referred to the same category. The following quote emphasises the importance of the links between the risk model and risk sheets in addressing the challenges posed by risk aggregation:

‘When it is time to assess a risk, we always ask to outline the risk model’s risk category ... and this helps to aggregate data. Since we receive more than 200 risk sheets, and perhaps at a first sight they might look like very different things, it might appear a really complex task to aggregate all these risks. And in fact it is a complex task. But [the risk model] provides a key support in doing this exercise [...] by filtering [risks] according to each category of the risk model, I will immediately see the ones that can be potentially aggregated. Then, following further analyses and reclassifications, we obtain the risk map.’ (Risk Manager)

Thirdly, when the drafts of the budget and business plan were available, the Risk Office could assist top managers (CEO, CFO and COO) to select the final list of ‘priority corporate risks’, drawing on the ‘impact’ section of the risk sheets. For example, at this stage, risks with higher short-term

⁷ In 2010, the business plan’s corporate risk map included 17 items.

⁸ In 2010, this process was carried out manually, and the Risk Manager emphasised how it consumed most of his staff’s time.

financial impact could be selected for the corporate map related to the budget, while items with long term and non-readily quantifiable effects could be selected for the business plan's risk map.

This use of the 'objects' of ERM suggests a strong focus on the standardisation of the inputs and outputs of the risk identification and assessment process. By processing business knowledge through a common set of interlinked templates, local risk information could be aggregated, becoming part of wider systems of accountability. For example, since 2008, key risk factors have been publicly made available in annual reports, using the headings of the risk model: 'external environment' risks (e.g. legislative and regulatory risks), 'process' risks (e.g. project management, commercial activities), and 'strategy and planning' risks (e.g. development and acquisitions).

Moreover, the use of interlinked sources of information contributed to generating new data for the Risk Office. The Risk Manager emphasised how 'backstage' (his words) documents helped to create aggregated statistics about ERM. This data provided an abstract overview of changes in the ERM process rather than information about specific risks, providing reassurance that ERM was an ongoing process within the business:

'For example this [pointing to a slide of a Risk Office's document] shows the trends in risk assessment in the past four years, with 114 risks in the first year, then 156, 204, 202, so it looks like the number of risks became stable in the last years. But there is always a percentage of new risks while others have been closed compared to previous years. There is a reasonable turnover. Then we have the risks identified by the different business units, the percentage compared to the [categories of the] risk model, the map itself with trends compared to the previous year, and then the detailed risk sheets.' (Risk Manager)

Overall, this discussion of ERM in *Alpha* suggests that elements such as risk maps, risk sheets, the risk model, and networks of organisational actors such as focal points came to be seen and used as a

unitary working ensemble. When asked about risk identification and assessment in his area of responsibility, in 2010, one BU manager indicated ERM as the ‘standard process’, which has been used for several years to summarise key corporate risks. This type of response is suggestive of a degree of stability and standardisation of ERM, something that recalls the notion of infrastructure used in recent accounting research to indicate stable sets of managerial processes and roles that contribute periodically to the production of (performance) data (Power, 2015). As suggested by Star and colleagues (Bowker et al., 2015; Star, 1999; Star & Ruhleder, 1996), such an infrastructure is relational and generative, being used to account for BU risks, to generate synthetic risk information for external stakeholders, and also to develop statistics internally used by the Risk Office. However, as explained in the following section, the formation of such infrastructure runs in parallel with scepticism about what ERM, as a ‘standard process’, can do for managers and also makes visible ‘residual categories’ (Star, 2010) that do not fit seamlessly.

The residual in ERM and the problem of managerial relevance

While ERM works as a framework for risk aggregation, providing a common language to transfer risk information across different functions and levels of the organisation, interviewees were more sceptical about its ‘managerial’ relevance. As put by one senior manager, ERM had little implications for ‘enterprise risk *management*’ (emphasis put by the interviewee). Another manager stated that he did not use ERM at all and had nothing to say about the topic⁹. In 2010, even the Risk Manager expressed doubts about the role of ERM in dealing with operational problems at the BU level. The Risk Manager juxtaposed the ‘integrative’ nature of ERM with its potential ‘managerial’ use, by stating that ERM was an ‘integrative methodology, but not a managerial tool’.

⁹ E-mail communication, September 2010.

Similar to one of the case-study organisations analysed by Hall and colleagues (2015), the volume of required documentation and the focus on lengthy procedures were central in critiques of ERM. One interviewee emphasised how ERM was a long process ‘which does not happen overnight’, while another sarcastically referred to ERM and risk maps as the thick documents ‘with the balls’¹⁰. Others expressed concerns with ERM outputs. One interviewee suggested that senior managers might live well without ERM, given that the ERM’s key risks tended to be ‘obvious’:

‘When [name of Risk Manager] provides this set of information about business units, he says something rather obvious. We know that [omitted] are about to expire and therefore this is our first risk. It would be strange otherwise, right? [Omitted] is our second risk ... we talk about that all day at the coffee machine.’ (Senior manager – Strategy & planning, specific risk information omitted)

In addition to uncovering these perceived limitations of ERM outputs, our final set of interviews provided insights as to how the design features that contributed to make ERM a comprehensive risk information processing infrastructure, made of a set of interlinked work arrangements, delimited in a narrow way what kind of risks could be included in the risk identification and assessment cycle. For example, despite their inclusion in the risk model, interviewees pointed out how ‘energy risks’ and ‘extreme events’ were managed through specific ad hoc processes and reporting lines. In both cases, specific design choices, that contributed to making ERM a comprehensive process that addressed problems of risk aggregation and communication, contributed to making visible energy risks and extreme events into ‘residual categories’ (Star, 2010).

Interviewees contrasted the quantifiable nature of energy risks with the presence in ERM of assessment criteria that were perceived to be based on ‘sentiment’ (senior manager) rather than measurement. A BU manager also pointed out the contrast between the need for frequent reporting on energy risks and the lengthy ERM reporting cycle. In the case of extreme events, during a

¹⁰ In Italian, ‘balls’ is used in an expression that could be translated as ‘what a bore’ in English.

discussion of risk map design with the Risk Manager, it was highlighted how risk maps conflated impact and likelihood into a single dimension. This meant that high impact and low likelihood risks were treated in a similar way to medium impact and medium likelihood risks. Therefore, as put by the Risk Manager, ‘from this map we tend to lose sight of extreme risks’. Despite an aspiration to achieve a holistic risk management process, he pragmatically recognised how ‘extreme events’ had to be managed locally via ad hoc processes:

‘These phenomena are not managed through ERM’s risk map. The company has fairly advanced and sophisticated structures and safety operational procedures. These are placed at a more local level, for instance within each single plant. These are risks that, by their nature, need to be managed at the level of operations.’

To conclude, ERM in *Alpha* contributes to establishing a ‘shared syntax’ to aggregate risks, and standardising the collection and processing of risk information. Risk tools and local risk champions represent local risk information in a way that can be aggregated and visually represented at different levels of the organisation and at different stages of the planning and control process. But the way in which the ‘objects’ of ERM are enacted as a set of interlinked elements contributed to making visible ‘residual categories’ (Star, 2010), that did not fit seamlessly in ERM. The following section illustrates how an enterprise risk management assembly is formed in another large company operating in Italy. Despite differences in the two settings and their specific manifestations of enterprise risk management, it will be shown that, like *Alpha*, this second case also shows how attempts to create a shared context for risk identification and communication end with the formation of new boundaries.

6. Omega: Enterprising risk and opportunity management

An internal document (shown to the researchers in 2006) stated that O&RM sought to develop a ‘management-oriented’ approach that addresses both ‘risks and opportunities’ with the ultimate goal of ‘creating economic value’. The CRO stressed that O&RM was shaped around their needs and that ‘risk management starts from our processes and problems’.

Compared to *Alpha*’s ‘holistic’ ambition, risk management guidelines explicitly excluded certain domains, such as internal controls and compliance activities from the enterprise risk management ‘perimeter’. O&RM revealed a narrow focus on value creation and performance measurement, therefore reflecting the ‘enterprising’ aspect of integrated risk management: a managerial tool that is ‘positive, entrepreneurial and explicitly in the service of wealth creation’ (Power, 2009: 850). A conceptualisation of risks as performance variances contributed to reinforcing this aspiration of O&RM. The first page of the risk management guidelines for business units started by asking managers about the EBIT they were expecting to achieve, and continued by asking how ‘solid’ their forecast was to potential variations.

The ‘objects’ of O&RM: A ‘common denominator’ for ‘risk talk’

Similar to previous studies on enterprise risk management (see Mikes & Kaplan, 2013), different organisational arrangements, processes and tools constituted O&RM. All together, they provided a basic structure for sustaining organisational conversations that can be related to the notion of ‘risk talk’, since risk management problems are framed as business problems around performance variances, through a language that is familiar to BU managers (Mikes, 2016). Interviews and

corporate documents reveal four core ‘objects’ of O&RM: a risk categorisation model, risk workshops, risk maps and a network of local risk champions.

The risk model provided a shared format for solving a specific problem: how can business managers identify potential performance variances? The risk model outlined a limited number of broad areas of possible concern (see Figure 3), ranging from operations to human resource management. These were used as the basis for discussing factors with a positive or negative effect on expected performance during workshops, which took place at least on a quarterly basis, although additional sessions could be held to address specific issues, such as the acquisition of a new client or the change in scope of an ongoing project.

[Please insert Figure 3 here]

The risk model aimed to structure risk workshop discussions by focusing attention on three elements. A risk could be considered a risk if (1) it led to performance variances; (2) it had an explicit cause; (3) and it had explicit effects. Corporate guidelines emphasised the importance of defining the triggering event of the risk (cause) and the outcome if the risk materialised (effect). Corporate documents provided concrete examples of what could work or not as a risk description. For instance, ‘global competition’ had to be specified, indicating where the new competitors might come from (e.g. emerging markets), which market they were likely to enter (e.g. lighting), what could make them competitive (e.g. lower price and cost structure) and what the consequences could be (e.g. loss of market share). This and other examples contributed to making risk a concrete focus of discussion.

Conversations that took place during risk workshops were captured through risk maps, which represented the impact and the likelihood of each risk. The owners of the O&RM process were sceptical about the possibility of producing an accurate snapshot of risks in a given moment of time.

Corporate documents suggested that the risk map(s) were a means of charting risk trends over time. Graphically, risk maps had specific inscriptions indicating the movement of risks from one period to another and capturing the effects of mitigating actions (see, for one example, Figure 4).

[Please insert Figure 4 here]

A network of O&R managers supported the use of the risk model, risk maps and the running of risk workshops. O&R managers were considered a part of the wider ‘accounting, finance and control’ community of practice. Rather than sitting in the middle between different groups of people (e.g. risk managers, line managers), they were ‘plugged’ into the existing network of business controllers (Mikes & Kaplan, 2013). They were chosen by the CRO (jointly with the Controller) within the staff reporting to the Controller. Corporate documents showed that they received specific training in order to be able to sustain a conversation about ‘risk management’ with BU managers. Side notes on a risk management presentation emphasised where they had to dedicate greater attention. For instance, they had to ‘set the scene by giving the interviewee a brief overview of what we mean by risk and risk management’ before entering into the details of risk handling strategies.

To summarise, this overview of the ‘objects’ of O&RM suggests that the ambition to form a shared context for risk identification and communication is supported ‘via a *lowest common denominator* which satisfies the minimal demands of each world by capturing properties that fall within the minimum acceptable range of all concerned worlds’ (Star & Griesemer, 1989: 404, emphasis added). In contrast to *Alpha*’s comprehensive ‘library’ of risk categories and tools, risk champions focus on carving out a space for interaction between risk management and business unit managers, by bringing about ‘risk talk’ that focuses on a specific and yet common concern for managers: performance variance problems (Mikes, 2016).

The boundaries of O&RM: Debating and contextualising risks

The Controller and the CRO were not concerned about variation in the tools used locally to collect and store risk information, although they emphasised the pivotal role of the concept of risk as performance variance. As put by the CRO:

‘Each business unit has its own way to see risks and opportunities ... this led to a situation in which one enters on the intranet and finds different tools. Then it is up to me and them [O&R managers] to choose the ones that we prefer. But the method in theory is the same. All risks should be codified in a given way based on their impact on profits.’

Like ‘quantitative sceptics’ (Mikes, 2009, 2011), senior risk champions and O&R managers were wary of the limitations of risk tools. In their view, simply transferring risk information through standardised tools that create a common language would not help to cope with the frequently changing conditions surrounding risk identification and the potentially conflicting concerns of managers from different units. Risk trends, highlighted for instance via specific inscriptions on risk maps, could be understood only through ‘risk talk’ (Mikes, 2016), and the ensuing additional information collected from business units during informal exchanges and formal meetings, such as risk workshops. In other words, the combination of different work arrangements and tools such as risk workshops and risk maps contributed to forming new knowledge about risks, thus reflecting a focus on addressing problems that arise at semantic and pragmatic ‘knowledge’ boundaries (Carlile, 2002).

It is possible to further elaborate this point by focusing on risk identification and mapping at both the BU and central office level. At the BU level, risk mapping via risk workshops provided an opportunity to contextualise and specify the meaning of risk information. The combination of risk mapping, risk workshops and templates such as the risk model increased the number of issues that could be discussed. The risk model and semi-structured follow-up interviews were used by O&R

managers to support risk identification and the discussion of risk exposure and mitigating actions. In this context, the simplicity of the risk model helped O&R managers to focus discussion on management problems, rather than on a pre-defined list of risks. The meetings often ended up as 'brainstorming' sessions, where risk knowledge generated in different functional domains could be shared, and even altered:

'Risk workshops provide an opportunity for debate. I see them as places where we can discuss business threats with other people and think about possible mitigating actions. It's more like a brainstorming session. [...] Sometimes, listening to other people, you start seeing the problem from a different point of view and you can think about issues that may not have seemed significant in the beginning.' (Manager)

Besides flexibility in the input of risk mapping (i.e. issues to be discussed), the rules for defining the output of risk mapping were also applied flexibly. According to one O&R manager, if probability increased to more than 75% or more than 50% with a corresponding 'significant' impact, then business units were encouraged to insert that item in their budget forecast to explain possible variations in expected profits. But the insertion of a risk into the budget forecast was also based on contextual information about the specific risk, which could be debated during risk workshops:

'What I insert into the reporting is not the expected value [impact x likelihood] ... when we might lose an order that is worth 100 with 30% probability, if we win [the order] we have +100, if we lose it, we have -100. Therefore, the impact helps to define the best and worst scenario and it is more significant in order to think about possible profit variances.' (O&R manager)

Such an approach led to constant uncertainty about whether something could turn into a 'significant' risk or not. Frequent reviews of risk information helped to address such uncertainty about the output of the risk identification process. Within business units, opportunities and risks were reviewed at least monthly with the support of O&R managers:

‘There is a quarterly reporting of any variation in risks and opportunities to the central risk office. This is mandatory [...] but then there are all the monthly updates ... if there are variations in the portfolio of risks and opportunities. As mentioned before, the O&RM process is something porous that can become part of the budget forecast and this is the reason why this instrument is converging towards budgeting. In fact, risks and opportunities that are in our portfolio but are not significant enough to be inserted in the forecast can turn during the year into variation in our expected profits.’ (O&R manager)

At the central office level, risk mapping information was combined with other sources of data in what the Controller and the CRO called the ‘performance barometer’. This ‘barometer’ consisted of the illustration of ‘major exposure’ risks, together with information stemming from performance-related instruments, such as the quarterly forecasts that are part of the budgeting process, which were continually (even daily) monitored by the Controller, the CRO and O&R managers. The barometer contributed to what was defined as a ‘holistic knowledge basis’ (Controller) that helped to monitor progress against the performance expectations of the Parent Company.

The work of O&R managers fed this ‘barometer’. Daily interaction with BU managers helped O&R managers to develop knowledge of BU processes, which was used to stimulate the discussion with and among BU managers and build common knowledge about key risks, risk exposure and possible mitigation initiatives. This knowledge served the purpose of ensuring that the central accounting and finance function was able to capture and interpret relevant business dynamics in a timely manner, and then support decision-making processes at both corporate and BU level. Just as reviews of risk mapping at the BU level helped to refine understanding of significant events for budget forecasts, the central office’s barometer helped to anticipate expected changes in the feasibility of achieving year-end performance targets.

At the central office level, the Controller and the CRO used the information collected by O&R managers to uncover potential opportunities for acquiring additional revenue streams or avoiding

losses. If successful, additional revenues were placed in a reserve at the corporate level and could be used to compensate for organisational areas where results were not in line with the Parent Company's expectations. The use of the management reserve was relevant, as a large part of the managers' incentives was linked to achieving the targets set by the Parent Company. O&RM thus helped performance targets to be reached across *Omega* as a whole, making the 'enterprising' ideal of integrated risk management operational (Power, 2009).

The management reserve is also indicative of the flexible rationales for risk identification and mapping (Jordan et al., 2013). In the hands of the Controller and the CRO, together with other sources of information, risk mapping became a tool for coping with the challenging objectives imposed by the Parent Company (as put by the Controller, 'we give them "nice" surprises'), but also a means of interrogating and challenging business units. Risk mapping became a way to deal with pragmatic boundaries and address the potentially negative consequences of knowledge generated in one domain for another domain (Carlile, 2004):

'Here we have a tool where we put all our risks. When we do our planning, we understand that either there are things that not everybody knows or that business units are telling a lie, or that we do not really believe in all the projects put in place ... we recognise that these projects can have some risks and will not lead to expected performances.' (CRO)

To summarise, this discussion of the uses of the 'objects' of O&RM suggests the formation of a stable working ensemble, which extends the functionalities of what its constitutive tools can do individually. For example, within O&RM, risk maps do not only represent risks but they also help to make sense of specific business problems, through a process where context is constantly added via the discussion of different information sources. In such a context, the boundaries between risk identification and assessment and other control processes blur, as shown in the following quote:

‘O&RM is a budgeting tool. We use it to identify risks related to the BU targets. We are always required to think about targets and risks as two related aspects.’ (BU Director)

The residual in O&RM and the problem of visibility

The previous section has shown how senior risk champions can contribute to developing an interactive-rich form of enterprise risk management, by bringing about ‘risk talk’ that focuses on key managerial concerns, such as resource planning and target achievement (Mikes, 2016). O&RM reveals some infrastructural qualities (Bowker & Star, 1999; Star, 1999). O&RM becomes an almost invisible and taken-for-granted conduit for the discussion of business problems. It is also generative of new information and work practices that serve different goals, as shown by the use of O&RM by the Controller and the CRO as a way to ‘give nice surprises’ to the Parent Company but also to monitor and challenge BU managers.

Our final set of interviews in *Omega* suggested a radical change in the risk management landscape, with the inclusion of what had been previously left separate, internal controls and compliance activities, in the perimeter of what became known as ‘Risk & Internal Control’ (RIC). Corporate documents graphically emphasised how RIC housed *both* enterprise risk management and the internal control system, and that their functioning was mutually interrelated. As put in a corporate presentation, risk identification via enterprise risk management can highlight gaps in internal controls and support the identification of control requirements; in turn, the monitoring of control requirements may help to identify unmitigated risks.

This shift in the focus of risk management happened in parallel to significant organisational changes that followed a new corporate scandal¹¹. While our case-based analysis does not allow us to account for all the complex interventions that occurred at the Group level following the corporate crisis, two changes can be related to our specific interest in the dynamics of O&RM within *Omega*.

Firstly, the Parent Company started to set up a wide-ranging governance and compliance system, with the explicit aim of making the connections between compliance, internal controls and risk management processes more visible for the whole Group and for external stakeholders. The effects of this corporate change programme can be traced by the appearance, in risk management documents, of descriptions of new ‘objects’ such as a ‘Policy & Control Masterbook’ that illustrates the ‘global control requirements’ that *Omega* had to comply with.

Secondly, the Parent Company mandated a comprehensive organisational restructure with the aim of ‘increasing transparency’ (presentation to financial analysts) within its varied business and geographical areas. As anticipated in Section 4, the structure of the group was re-organised according to key business areas and geographical clusters. Such organisational change had important implications for the two senior managers who coordinated O&RM – the Controller and the CRO.

The Controller became responsible for planning and control activities for the south-west European region. In 2011, he reflected bitterly on the effects of this change for him and his staff (downsized to two people), suggesting that they became ‘ectoplasms’ who ‘do not really exist’ given their limited engagement with business activities¹². A document illustrating his area of responsibility showed clearly how data collection and aggregation took most of his time. The Controller and his staff had to keep track and homogenise information relating to different countries, businesses and

¹¹ See Section 4.

¹² The Controller eventually left the company a few months later.

market segments. In addition, they also had responsibility for cluster level analyses of market trends and competitors. When asked about O&RM, the Controller suggested that the only remaining trace was a ‘blank sheet’, included in a monthly performance report, where BU managers could describe factors affecting performance variances. However, in the absence of a network of local risk champions and dedicated discussion fora, the Controller and his staff could not really follow up on the use of these documents. He described their role as ‘maieutic’, with the hope of stimulating reflection without actively engaging with BU managers in ‘risk talk’ (Mikes, 2016).

In contrast, the CRO redefined the boundaries of his professional autonomy and organisational role, becoming the Head of *Omega*’s Risk & Internal Control (RIC) department. This shift suggests that the work of risk experts is interrelated with situational politics and the opportunity to ‘plug’ in control gaps left unaddressed (Mikes & Kaplan, 2013). The CRO repositioned himself in a role closer to the ‘compliance expert’ illustrated by Mikes and colleagues (Hall et al., 2015; Kaplan & Mikes, 2016), given the emphasis on the standardisation of risk tools and the acknowledgement that the Parent Company and external stakeholders were the main beneficiaries of aggregated risk information. By using the COSO-ERM framework as a point of reference, the CRO emphasised the standardisation and external orientation of enterprise risk management as follows:

‘We now have a more *standard approach*, where the aim is to provide objective assurance over the risks of business processes. In this way, there is an alignment between our internal and *external risk reporting*.’ (Emphasis added)

Corporate documents portray the new approach as an ‘enhanced’ version of enterprise risk management compared to the past, and reveal an aspiration to address syntactic boundaries, which may prevent the escalation of risk information through the organisational hierarchy (Carlile, 2002, 2004; Spee & Jarzabkowski, 2009). For example, as shown in a slide illustrating the revised risk model, risk identification is now based on a categorisation model that ‘establishes a common risk

language for [Omega]', and 'provides the foundation for risk aggregation'. A side note of the same presentation stressed how the new approach replaced O&RM, by stating that:

'The categories of the current [Omega] Risk Categorization Model do not correspond one-to-one to the previous risk categories of the former Opportunity and Risk Management. The extended Risk Categorization Model allows a broader view on potential risk sources.'

The underlying aspiration to make the monitoring of internal control requirements and compliance activities more visible and traceable was further reinforced by two key features of the revised approach to enterprise risk management. The first refers to the design of explicit links between the risk model and the 'Policy & Control Masterbook'. The use of the same categories as headings (and sub-headings) in both the risk model and the Policy & Control Masterbook contributed to aligning enterprise risk management information with the monitoring of control requirements. The second feature refers to the use of standardised questionnaires, operated by central RIC personnel and made available via the corporate intranet, as a replacement for the face-to-face interaction of risk workshops. The CRO considered this change crucial for maintaining a visible audit trail of the risks flagged by business units and related control requirements.

To conclude, the case of *Omega* shows a different dynamic compared to *Alpha*, whereby an initial minimal design is extended and flexibly adapted to the discussion of a variety of performance issues. Drawing on the literature on boundary objects (Carlile, 2002, 2004; Spee & Jarzabkowski, 2009), the emphasis on solving common concerns and scepticism about the possibility of representing risks accurately are indicative of work done on pragmatic rather than syntactic boundaries. But similar to *Alpha*, the development of a specific form of enterprise risk management makes visible gaps in the landscape of risk management controls. In the case of *Omega*, internal controls and compliance activities, something that was initially placed outside the enterprise risk management 'perimeter', had to be made more visible. On this basis, similar to *Alpha*, the case of

Omega suggests that the construction of a shared context for enterprise risk management makes visible residual categories that eventually re-impose themselves.

7. Discussion

This paper began from the tension between integrated risk management aspirations for a unitary working ensemble and the mix of varied elements that constitute enterprise risk management ‘in action’. To explore this tension, our theoretical background draws attention to the way in which heterogeneous elements contribute to form a shared context for risk management. In this section, we first summarise the dynamics that characterise the formation of such a shared context. Then, we discuss these dynamics in relation to our theory-driven focus on ‘objects’, boundaries and infrastructure formation. In so doing, we illustrate the study’s implications for research on risk management ‘in action’ and boundary objects.

Forming a shared context

In both cases, we initially observe the design of a form of enterprise risk management with specific functionalities and features. In *Alpha*, ERM provides a shared context as a comprehensive ‘library’ of categories (Star & Griesemer, 1989: 404) from which people in different parts of the organisation can borrow what best suits their needs. BU managers can relate their own work to some of the risks that constitute the risk model, some of the criteria used for risk assessment and some of the pre-existing boundary spanning roles of focal points. In *Omega*, O&RM provides a ‘lowest common denominator’ (Star & Griesemer, 1989: 404) across different organisational functions and levels.

Risk workshops, concrete examples and a network of risk champions reinforce a common concern with performance variances, but also elicit connections with local information and processes.

Drawing on the comparative analysis of the two cases, it is possible to further discuss the qualities of these different ‘objects’ of enterprise risk management and how they work in relation to different boundaries (Carlile, 2002, 2004). As famously stated by Star and colleagues, boundary objects are plastic enough to adapt to local needs and yet robust enough to maintain a common identity across sites (Bowker & Star, 1999; Star, 1989; Star & Griesemer, 1989). But what does it mean to be robust and plastic enough in the two case studies of enterprise risk management? In *Omega*, we observe a central concern with a concept of risk as financial performance variance, but flexibility in the use of risk identification and assessment tools. O&RM provides a (minimal) common ground that elicits corporate actors to add context to risk conversations. Risk workshops, risk maps, and the possibility of adding sources of information from other processes suggest that the context of enterprise risk management is uncharted and needs to be filled in by O&RM’s users.

In *Alpha*, there is greater flexibility in conceptualising what constitutes risk, with the inclusion of both qualitative and quantitative elements in ERM. But ERM is premised on people in different parts of the organisation filling out the same forms and categorising risks under the same labels. The ‘objects’ of ERM are designed to reproduce a context that has been mapped by the Risk Manager and his network of focal points. We have a set of pre-defined risk categories and a set of pre-defined templates to be used to register some of those risk categories as ‘priority’ risks. Compared to *Omega*, we observe ‘robustness’ both in terms of how the same templates are used across sites and also how they relate to a context that is centrally pre-defined by ERM’s designers.

When such abstract designs are put to work, the original assembly is adjusted over time. In *Alpha*, a number of residual categories (e.g. energy risks, extreme events), which cannot be fitted into the

context envisaged by ERM designers, are made visible and active through the enactment of ERM's 'objects'. In *Omega*, in contrast, things are added to make enterprise risk management work, as shown by examples such as the performance barometer at the central office level. There are efforts to add context to risk information so that it acquires a common meaning in relation to specific problem areas. These two dynamics of enterprise risk management produce counterintuitive outcomes. The narrowing down of ERM in *Alpha* can be related to greater visibility in various parts of the organisation of what is seen (with scepticism by many) as a 'standard process'. The expansion of O&RM in *Omega* can be related to less visibility of risk identification and assessment specifically and the blurring of the boundaries between risk management and budgeting.

This characterisation of the two case studies draws attention to the unfolding of enterprise risk management as an assembly of 'objects' that work jointly to identify and communicate enterprise risks. But it also provides insights into elements that are excluded or that do not fit seamlessly in O&RM and ERM. In order to explain what holds the various 'objects' of O&RM and ERM together, our analysis foregrounds the role of 'knowledge' boundaries (Carlile, 2002, 2004; Spee & Jarzabkowski, 2009). Drawing on Carlile's terminology, we suggest that ERM in *Alpha* mainly supports work on syntactic or information-processing boundaries and the creation of a common language for individuals to represent and transfer their domain-specific risk knowledge. O&RM in *Omega* instead mainly supports work on semantic and pragmatic boundaries and the translation of different concerns into a common problem (i.e. understanding risks as performance variances).

Compared to previous work (Carlile, 2002, 2004; Spee & Jarzabkowski, 2009), our analysis suggests that problems that arise at syntactic, semantic and pragmatic boundaries may overlap. In *Alpha*, the Risk Manager seems to concede that, despite the ambition to provide a comprehensive 'library' of categories for risk identification, knowledge about certain risks needs to remain localised. This suggests that the building up of a common language for risk identification and

assessment is intertwined with the pragmatic development of a ‘common interest’ between the Risk Office and other parts of the organisation: ERM provides a standard language to cater for some risks, while others are managed more operationally. In *Omega*, the Controller and the CRO explicitly acknowledge that the use of different types of risk identification and representation tools within the business units is not a major issue. And yet they still rely on a minimal risk categorisation model in order to ensure consistency and comparability in the discussion of risks across different areas, thus reflecting, at least partially, concerns with syntactic boundaries.

Bearing in mind these words of caution, the use of the categories of ‘knowledge’ boundaries in our analysis is useful in two ways. Firstly, it sheds light on different sets of problems, which organisational actors seem to consider their main focus of action when using the varied ‘objects’ of enterprise risk management, thus reinforcing the view that boundary objects are something that people act toward and with (Star, 2010) rather than things. Secondly, the ‘knowledge’ boundaries categories help to reveal how a focus on different problems that arise at ‘knowledge’ boundaries can be related to the accumulation and interaction of ‘objects’ with similar characteristics. In *Alpha*, the ambition to develop a ‘common language’ for risk aggregation is made operable via standardised templates and taxonomies (e.g. the risk model, risk sheets, risk maps), which provide comprehensive and ‘robust’ classification and categorisation rules. In *Omega*, the ambition to create new cross-functional risk knowledge is realised through concrete examples and problem-solving methods that can be used flexibly in different parts of the organisation. As shown in both case studies, these elements of enterprise risk management are enacted as interlinked sets of ‘objects’ that organisational actors work with, in order to aggregate risk information (*Alpha*) or identify performance variances (*Omega*). For instance, in *Alpha*, the risk model helps to use risk sheets as a categorisation tool; the combination of information from the risk model and risk sheets contributes to select a limited number of ‘priority corporate risks’ in corporate risk maps.

To summarise, this section has shown how empirical material can be theorised in the light of core concerns in the boundary objects literature such as the balance between plasticity and robustness, and the relationship between boundary objects and organisational boundaries (Carlile, 2002, 2004; Spee & Jarzabkowski, 2009; Star, 1989, 2010; Star & Griesemer, 1989). The sections that follow build on this characterisation of the case material to discuss the study's contributions to research on risk management 'in action', boundary objects and infrastructure formation.

The dynamics of (dis)integrated risk management

Our analysis of the formation of a shared context contributes to previous literature on enterprise risk management. We observe one form of integrated risk management which strives to develop an ambition to develop a 'standard process' (*Alpha*). This reminds us of attempts to deploy the standardised set of tools and processes that are commonly regarded as risk management good practices (Miller et al., 2008; Power, 2007). We also observe another form of integrated risk management which strives to connect people and problems via 'risk talk' (*Omega*). This can be related to recent work on risk management as a sustained organisational conversation (Mikes, 2016). The case of *Omega* suggests that risk champions can carve out a space for interaction between risk management and BU managers, by bringing about inconspicuous 'risk talk' that focuses on task-related problems, organisational weaknesses, resource planning and target achievement (Mikes, 2016).

Previous work shows how these forms of enterprise risk management can be subject to conceptual critiques and organisational challenges. A procedural focus in risk management has been heavily criticised for being disconnected from the 'real' management of risk (Hopwood, 2009; Power, 2009). Recent work on 'risk talk' shows how this approach requires a specific type of mentality,

open to experimentation and failure (Mikes, 2016). Our theoretical background helps to further extend the discussion of the workings and challenges of enterprise risk management, shedding light on what we call the *dynamics of (dis)integrated risk management*. By using this expression, we seek to emphasise how the two ideals of integrated risk management, mobilised by practitioners in *Alpha* and *Omega*, are both subject to self-undermining pressures. While a case-based analysis cannot offer comprehensive generalisations, by iterating between the comparative case analysis and insights from the literature on boundary objects, it is possible to outline two dynamics that might explain the workings of enterprise risk management as a lived organisational practice in other settings.

Firstly, both cases provide evidence of the difficulty in balancing ‘plasticity’ and ‘robustness’ in enterprise risk management (Star, 1989; Star & Griesemer, 1989). *Alpha* shows a predominance of the ‘robust’ component of a boundary object. The different work arrangements are kept relatively rigid so that they maintain a common identity across organisational functions and the aggregation of local risk information might become possible. However, this increases resistance and criticism from the users of ERM as the rigid risk assessment templates and processes do not suit their local needs. *Omega* shows instead a predominance of the ‘plastic’ component of a boundary object, at the level of single tools (e.g. flexible application of risk mapping rules), in the building up of the whole assembly of practices (e.g. things are added to O&RM) and their relation to a context that is unchartered. But this makes risk assessment indistinguishable from other control practices. The lack of visibility in risk identification and assessment processes, a key feature of O&RM that facilitates unobtrusive ‘risk talk’, becomes something that needs to be fixed as a new scandal hits the company.

These observations suggest that the enactment of enterprise risk management in the two organisations can be related to a central problem in the boundary objects literature, namely the

balance between the ‘robust’ and the ‘plastic’ aspects of work arrangements that enable cooperation (Star, 2010). If the ‘robust’ component prevails, local users tend to recognise the relevance of ad hoc processes that better suit their needs, as occurred in *Alpha* for energy risks and extreme events. If the ‘plastic’ component prevails, enterprise risk management tends to become indistinguishable from other control processes, making it difficult to produce visible evidence of risk identification and assessment, something that became a problem towards the end of our research engagement with *Omega*. In both cases, regardless of the original design emphasis on ‘robustness’ or ‘plasticity’, the ideals of integrated risk management mobilised by practitioners become subject to a self-undermining pressure towards (dis)integration.

Secondly, our case analysis reveals how an enterprise risk management assembly is formed around different kinds of problems that arise at ‘knowledge’ boundaries (Carlile, 2002, 2004; Spee & Jarzabkowski, 2009). The comparative analysis of the two cases sheds light on the problematic relation between these different focuses. For example, an emphasis on building a common language and standardised approaches to risk identification and assessment is related to shortcomings in making enterprise risk management an aid to decision-making (*Alpha*). In contrast, when efforts to overcome semantic boundaries and accommodate different functional interests are present, the building up of a common language is not a primary concern (*Omega*). In short, problems that characterise different ‘knowledge’ boundaries cannot be satisfied simultaneously by the same set of interlinked ‘objects’.

This observation suggests that the boundaries of enterprise risk management play an ambivalent role. While they facilitate the formation of a shared context, they also create competing visibilities that cannot be satisfied simultaneously, potentially generating dissatisfaction or calls for reform within the current set of work arrangements. In *Alpha*, this outcome is exemplified by scepticism about the ‘managerial’ relevance of ERM; in *Omega* this can be seen in the shift towards a new

configuration, where the link with compliance and internal control is made more visible. On this basis, the boundaries of enterprise risk management constitute a second source of pressure towards (dis)integrated risk management. They separate what is bound, such as shared taxonomies and interactive practices in *Alpha* and *Omega* respectively, from other elements and possible focuses of enterprise risk management.

It is possible to outline two implications for risk management research of these two (dis)integration dynamics. The first refers to critical commentaries of standardised blueprints for enterprise risk management, such as COSO-ERM (Hopwood, 2009; Miller et al., 2008; Power, 2009). This body of literature highlights the inherently failing nature of procedural forms of risk management that emphasise the production of auditable evidence, limiting instead more conversational approaches to the management of risk (Palermo, Power, & Ashby, 2017; Power, 2007). This critique echoes managers' scepticism about a 'lengthy bandwagon' with scarce 'managerial relevance' in *Alpha*. However, this study suggests that more interactive approaches such as O&RM in *Omega* are also inherently unstable due to tensions that characterise the accretion of heterogeneous work arrangements into a seemingly coherent and stable working ensemble. Regardless of their underlying management styles (e.g. procedural vs. interactive), both *Alpha*'s ERM and *Omega*'s O&RM make visible and active residual categories and practices that contribute to generating dissatisfaction with, or calls for change in, integrated risk management. In other words, the source of 'success' in creating a relatively stable and coherent set of work arrangements ends up being a source of instability. Failure attributed to over-reliance on procedures, which may end up in the 'risk management of nothing' (Power, 2009), might well be one manifestation of a more general pattern, whereby any form of integrated control practices is inevitably subject to (dis)integration pressures.

The second implication refers to recent work that shows evidence of ‘dual risk management’ processes (Kaplan & Mikes, 2016), whereby a risk function is able to balance compliance activities with a business partnering role, by deploying groups of risk managers who advise business decision-makers about their risk exposures, and other groups of risk managers who provide independent scrutiny on compliance activities. While the notion and practices of ‘dual risk management’ deserve further scrutiny and empirical investigation, our analysis suggests that the two dimensions may not coexist so easily. This is because senior risk champions tend to specialise in a particular niche of risk management-related tasks in order to maintain or consolidate their organisational footprint. An indicative example is the radical shift made by the CRO in *Omega* as Head of RIC, at the expense of the Controller and his remaining staff. As outlined in Section 6, the Controller bluntly stated that they became ‘ectoplasms’.

So far, we have discussed enterprise risk management as an assembly of processes, tools and networks of people. This paper’s theoretical background suggests examining more closely whether such assemblies have unique properties. As put by Star, the issue at stake is how ‘*multiple boundary objects and systems of boundary objects* grow to become what we called “*boundary infrastructures*”’ (Star, 2010: 602, emphasis added). The section that follows illustrates the implications of our study of enterprise risk management for our understanding of infrastructure formation.

Boundary objects and infrastructure

Our analysis of enterprise risk management ‘in action’ suggests that O&RM and ERM are more than a single (boundary) object, i.e. a process, a map, a risk register, a network of risk champions, which may support cross-functional communication on enterprise risks. O&RM and ERM are rather

two assemblies of work arrangements, which contribute to redefining the functionalities and properties of their constitutive components. For example, in *Alpha*, the combination of risk model's categories with risk sheets and the work of focal points contribute to enriching the information conveyed through risk sheets only, and increase visibility on how risks can be aggregated. In *Omega*, when risk maps are combined with risk workshops and information from the performance barometer, they offer a platform for the discussion of task-related problems, organisational weaknesses and concerns with target achievement.

O&RM and ERM present some of the features that Star and colleagues ascribe to infrastructure (Bowker & Star, 1999; Star, 1999, 2010; Star & Ruhleder, 1996). ERM in *Alpha* is built on and aligned to the financial planning process; it embodies world-level standards such as the COSO framework; it reaches beyond a single site or event, being repeated annually across different organisational functions. O&RM in *Omega* is embedded in social arrangements and aspirations that go beyond specific risk identification and assessment processes. We observe a web of actions, and talk about actions, oriented towards the identification of expected performance variations in which various actors (senior risk champions, BU managers) became enmeshed.

Moreover, the literature on infrastructure helps to highlight key dynamics that characterise the formation of enterprise risk management as a seemingly stable and coherent working ensemble. As stressed by Star and colleagues, an infrastructure is not a thing stripped of use. Something becomes an infrastructure only in relation to work practices that can be connected to a more or less visible 'master narrative' (Star, 1999). Our discussion of O&RM and ERM in relation to work done to address problems that arise at different 'knowledge' boundaries helps to uncover two distinct narratives, namely risk aggregation (*Alpha*) and performance variation (*Omega*), which contribute to knitting together different 'objects'. We also show how such 'master narratives' are inherently problematic. Star's work warns against 'incompatible platforms, recalcitrant local computing

centres, and bottlenecked resources' that do not fit comprehensive and standardised information systems (Star, 1999: 380). In our study, we observe how the enactment of ERM and O&RM in specific kinds of interlinked work arrangements for risk identification and assessment makes visible elements that are excluded (e.g. compliance and internal control in O&RM) or 'residual categories' that do not fit (e.g. extreme events and energy risks in ERM).

This discussion of the case material, in the light of previous work on boundary objects and infrastructure, has implications for recent accounting literature. For example, in the work by Power (2015) on research impact, infrastructure formation is linked to practice routinization, repetition and the 'stabilisation' of ambiguous boundary objects in material organisational arrangements. This study provides two points of contrast, which may elicit further work in accounting research. The first refers to the *materiality of infrastructure*. By stressing how infrastructures can be understood in relation to work practices that seek to address problems that arise at 'knowledge' boundaries, we suggest that caution should be taken in treating an infrastructure as a technical apparatus that materialises ideational (boundary) objects such as research impact. We show how O&RM and ERM depend on the accretion of organisational processes, risk tools and managerial roles. But they are also animated by a 'master narrative' that becomes the primary source for organising abstraction (e.g. what is a risk) and defining patterns of action (e.g. what should be included or excluded in risk identification and management).

The second concerns *infrastructure and stability*. While infrastructure goes hand in hand with 'practice stabilisation' in Power's (2015) work, we provide insights as to how 'neither boundary objects nor infrastructures are ever stable, and are always becoming or dissolving' (Boland, 2015: 236). While the two case studies show different dynamics, they also reveal a common pattern in relation to what happens once an infrastructure for enterprise risk management is established. A stable shared context itself becomes a boundary, which makes visible and active residual categories

(e.g. energy risks or extreme events in *Alpha*; internal controls and compliance activities in *Omega*). Such residual categories over time challenge the existing infrastructure, which is considered as having little managerial relevance (*Alpha*) or lacking in terms of evidence of how risks are addressed (*Omega*).

8. Conclusions and further directions for research

In this paper, we have combined the literature on enterprise risk management with research on boundary objects in order to examine how heterogeneous tools, processes and networks of organisational actors can give rise to a seemingly coherent and stable working ensemble, which provides a shared context for risk identification and management in two large organisations.

Drawing on the comparative analysis of the two cases, we shed light on what we call the *dynamics of (dis)integrated risk management* to stress how the ideals of integrated risk management, mobilised by practitioners in the two case-study organisations, are both subject to self-undermining pressures. By uncovering these dynamics, we extend previous work that is critical of standardised forms of enterprise risk management (Hopwood, 2009; Miller et al., 2008; Power, 2007), as well as more recent work on ‘risk talk’ (Mikes, 2016) and ‘dual risk management’ processes (Kaplan & Mikes, 2016). We also contribute to recent studies in the accounting literature that use the notion of infrastructure to explain how vague policy objects become tractable across different organisational sites and institutional arenas (Power, 2015).

This paper offers a theoretically-informed analysis of the context-specific development of enterprise risk management in two large organisations. In doing so, this paper may prompt further academic research in at least two areas. Firstly, further work might explore the conditions under which ‘risk

talk' can be sustained over time as an unobtrusive form of risk management that is seamlessly linked to the work of business managers. Compared to previous work (Mikes, 2016), we document potential sources of instability for 'risk talk'. The commonalities and points of contrast between this study and previous research could help future work to produce cumulative and generalisable insights into the functioning of interactive-rich forms of risk management in different settings. Secondly, further work could be done to examine the dynamics of infrastructure formation. While recent accounting research seems to emphasise the enabling, generative role of infrastructure (Kornberger et al., 2017; Power, 2015), this study suggests that infrastructure is more ambivalent, serving as both an engine and a barrier to integrated control practices. Future work might further explore this apparent tension in the functioning of infrastructure.

This study also has implications for the ways in which integrated risk management can be mobilised by practitioners as a resource for action. In particular, managers need to be wary of the tensions involved in the construction of integrated control processes. Our results indicate that the dimensions that are excluded, rather than the dimensions that are included, are likely to trigger relevant organisational changes, resulting in modifications to existing configurations and power spheres. Moreover, regulators need to be wary of the multiple and emerging manifestations of risk management. Our study suggests that lengthy risk identification and aggregation processes, which make 'key' risks visible on a periodic basis, providing a 'canopy-like' view of an organisation, have little relevance for line managers. In contrast, the forms of risk management that take place through inconspicuous 'risk talk' may be highly relevant for addressing key managerial concerns. And yet, by their very nature, they may go unnoticed, as the boundaries between risk management and other control and managerial processes blur.

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Figures and tables

Case	Interviewees	2004-2005	2006-08	2010-11
<i>Alpha</i>	Head of Internal Audit	X		X
	Head of Risk Office			X
	Risk Manager (responsible for ERM)		X	X
	Senior Manager, Strategy & Planning			X
	BU Director			X
	Manager, BU			X
	Manager, Strategy		X	
	Manager, Business Development	X		X
	Senior Manager, Planning & Control, central staff	X	X	X
	Controller, Planning & Control, central staff			X
	Controller, Planning & Control, central staff			X
	Controller, BU			X
<i>Omega</i>	Chief Risk Officer (CRO)		X	X
	Chief Financial Officer (CFO)	X	X	
	Controller, Head of Accounting & Finance	X	X	X
	BU Director		X	
	Manager, BU		X	X
	Opportunity & Risk (O&R) Manager		X	
	Head of Internal Audit	X	X	
	Internal Auditor	X		
	Internal Auditor		X	
	Controller, central staff		X	X
	Controller, central staff			X
	Controller, BU		X	

Table 1: Interviewees

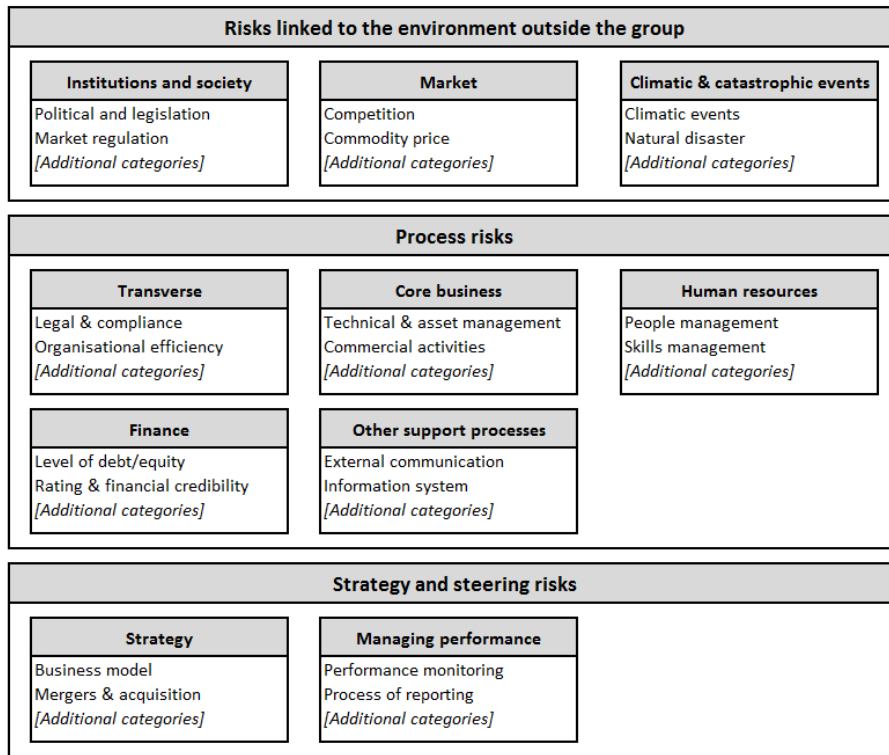


Figure 1: Alpha's risk model (adapted from corporate documents and simplified for readability)

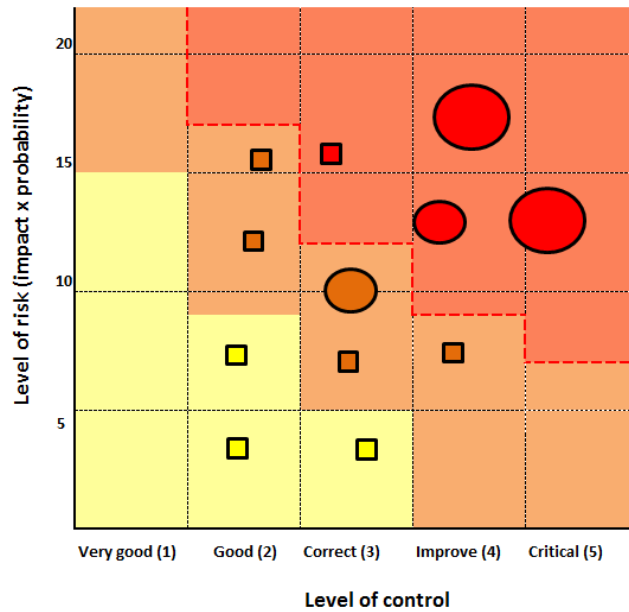


Figure 2: Alpha's risk map (adapted from corporate documents): the size of the bubbles represents economic impact, if quantifiable

Opportunity and risk categories	Market/industry	Management	Operations management	Finance	Purchasing	Human resources	Legal and compliance
Opportunity and risk areas	e.g.: Business cycle Competitor behaviour Technology and innovation	e.g.: Market position Market-product definition Capacity/locations	e.g.: Product development Production strategy Marketing/sales	e.g.: Currency Credit Interest Countries	e.g.: Supplier structure Supplier market Purchase prices	e.g.: Key personnel Reward systems Head count reduction	e.g.: Legal and accounting Environment Contracts
'Event' opportunities and risks	Opportunity and risk events which impact on more than one category/area						
	Substitution	Cost management M&A activities	Organization IT External communication				Patents Competition law

Figure 3: Omega's risk categorisation model (adapted from corporate documents)

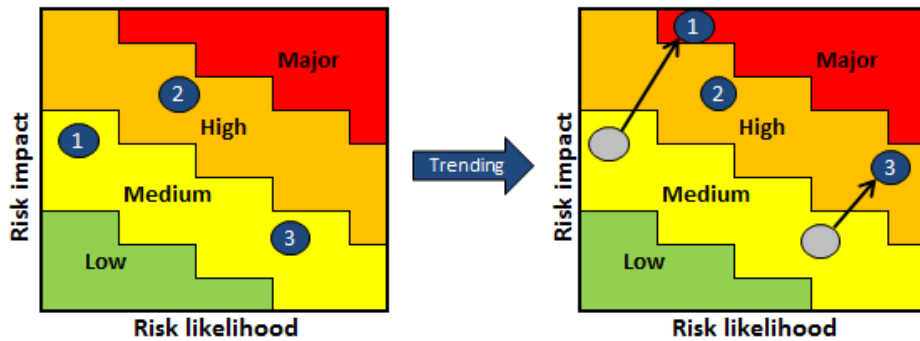


Figure 4: Omega's risk maps (adapted from corporate documents)