Constructing risk objects and their controllability in the insurance industry

This study examines the interrelationship between the social construction of a risk object and the associated means of controlling it within organizations. Drawing on data from 35 insurance organizations, we develop a framework that theorizes how organizations construct risk objects along different dimensions of proximity/distance and tangibility/abstraction, which shapes and is shaped by how they construct their ability to control those risk objects as a matter of protection or capital efficiency. We show that organizations vary in these constructions of risk, developing three categories of Risk Protector, Risk Optimizer and Risk Jugglers. We explain this variation and offer an expanded conceptualization of the construction of the risk object and its controllability through three explanatory organizational features of centralizing, modelling and diversifying. Our findings are drawn together into a conceptual framework that illuminates two types pathways that organizations follow in constructing and controlling risk: coherent pathways (with consistent either/or choices) or composite pathways (individual both/and approaches). In doing so, we theoretically extend the notion of the risk object within organizational studies and provide a platform for additional studies into this important but nascent area of organizational research.

Keywords: risk object, controllability of risk, social construction of risk, insurance, risk transfer, risk management

INTRODUCTION

Uncertainty and risk are argued to have increased in the new global risk landscape, becoming extremely difficult for organizations to understand and control (Beck, 1992; Gephart, Van Maanen, & Oberlechner, 2009; Giddens, 1999, 2002). Yet, despite organizations being the critical agents for managing risk and this task becoming increasingly difficult (Hutter & Power, 2005; Scheytt, Soin, Sahlin, Andersson, & Power, 2006), organizational scholars have paid infrequent attention to how organizations construct and control risk (Gephart et al., 2009; Maguire & Hardy, 2013). We know little about the association between, and dynamics of, different constructions of risk and their control (Hilgartner, 1992). We address this issue by drawing from the "risk object" framework (Hilgartner, 1992) which outlines how harm caused by hazards or danger "is articulated as a social fact, as a 'risk object'" by organizations (Power, Scheytt, Soin, & Sahlin, 2009: 304) and what this means for how those organizations construct the controllability of that risk object. Our focus is thus not on the "first-order 'thing'" (Garland, 2003: 52) - such as an earthquake - but the meanings attached to those objects as organizations construct them as risky (Maguire & Hardy, 2013).

Empirically we focus on a particular type of risk and industry – financial risk transfer in the insurance industry (Collier, 2008; Ericson & Doyle, 2004a). This industry trades in events associated with high uncertainty; that is things that cannot easily be measured (Knight, 1921; Sullivan-Taylor & Wilson, 2009), such as the likelihood and magnitude of an earthquake or hurricane (Ericson & Doyle, 2004b). Our qualitative study combines interviews, observations and secondary data to explore how 35 insurance organizations construct risk and the associated means of control as they transfer it to the reinsurance industry. Theorizing about insurance risk portfolios as risk objects, we develop a framework that highlights the entangled interplay

between organizational constructions of the risk object and its controllability (Hilgartner, 1992). We show that the risk object can be constructed as proximate to or distant from the insurer and as abstract or tangible, which influences and is influenced by, how the insurer constructs the controllability of that object as a matter of either capital efficiency or organizational protection. We show the variation in constructing the risk object and its associated controllability by different insurance organizations and explain this variation by highlighting three underlying organizational features: centralizing decision making, belief in modelling of risk, and belief in diversifying the risk portfolio as a means to contain exposure to risk. Finally, we bring these concepts together to show how some organizations, that we label 'Risk Optimizers' and 'Risk Protectors', enact contrasting but similarly coherent pathways through these organizational features. We also show how other organizations, that we label 'Risk Jugglers', enact composite pathways, mixing the various organizational features in individualized ways. Rather than judge the "correctness" or otherwise of these enactments, we point out their usefulness (Millo & MacKenzie, 2009) in providing insurance organizations with sufficient confidence to manage and trade their risk; a critical expectation of many organizations in complex risk societies (Beck, 1992; Gephart et al., 2009; Miller, 2009).

Our conceptual framework makes a number of contributions to the nascent organizational literature on the social construction of risk (Gephart et al., 2009). First, we provide a rare exploration and extension of the risk object framework (Hilgartner, 1992; Maguire & Hardy, 2013). In particular, we establish this as a useful theoretical lens within organization studies, advancing understanding through a systematic framework that explores varied patterns of entanglement in the construction of a risk object and its controllability. Second, we advance insight into the role of organizational structuring, modelling and diversification, and how they

interrelate to explain variation in the construction of the risk object and its associated controllability. Finally, we develop new understanding of how organizations gain confidence to transact under the extreme uncertainty of risk (Sullivan-Taylor & Wilson, 2009). We show how these constructions are *necessary* (aside from any assessments of accuracy), in order to enable organizations to trade in risks and operate amidst such uncertainty (Beck, 1992).

THEORETICAL FRAMING

It is ever more difficult for organizations and individuals within them to calculate and control risk (Gephart et al., 2009; Giddens, 1999; Tsoukas, 1999). Risks have "become more global, less readily identifiable, more problematic, less easily managed, and more anxiety-provoking" (Beck, 1992: 26; 1999; Beck & Holzer, 2007; Gephart et al., 2009). Financial markets in particular illustrate how globalization has decreased control and increased risk for society, as demonstrated by the 2007 financial crisis. A local event associated with U.S. sub-prime mortgages developed, and spread into a global crisis with the failure of several large financial institutions, the bailout of banks by national governments, and dramatic falls in the values of stock markets, with far reaching global consequences (MacKenzie, 2011).

Within this context there is growing interest in risk within organizational studies (Gephart et al., 2009). In particular, how organizations construct and conceive of risk matters. For instance Sullivan-Taylor and Wilson (2009) show that the way travel organizations constructed the threat of terrorism directly impacted whether they were proactive or reactive (or not active at all) to such threat. Further, organizations are increasingly required and expected to manage the risk to which they are exposed (Power, 2007) and are "the critical agents of risk society" because they are the "centres for processing and handling risk" (Hutter & Power, 2005: 1). In particular, a danger or hazard "is transformed into a risk when it is articulated as a social fact, as a 'risk

object', to be managed and made into the responsibility of an *organization or organizations*" (Power et al., 2009: 304; Hilgartner, 1992). As organizations and society are part of an interdependent system, as complexity increases in a globalized world, so do the resulting challenges associated with risk assessment and management for organizations (Miller, 2009). Hence, it is increasingly hard for organizations to control and manage risks; yet increasingly important and expected that they do so (Maguire & Hardy, 2013; Power et al., 2009). There has consequently been a call for more research into how organizations construct and manage risk (Maguire & Hardy, 2013), with scholars pointing out that there has been surprisingly little research into the social construction of risk within organizational studies (Gephart et al., 2009).

In seeking to address this gap, we draw from the sociological tradition that has conceptualized risk as socially constructed (Gephart et al., 2009; Hilgartner, 1992; Lupton, 1999; Maguire & Hardy, 2013; Miller, 2009; Tierney, 1999). Specifically, we draw on the concept of 'risk objects' (Hilgartner, 1992), which focuses scholarship on how particular objects are variously constructed as risky through being causally linked to a particular harm or danger. Hilgartner (1992) thus focuses on the dynamic meanings attached to objects as they *become* risky in varied ways (Maguire & Hardy, 2013). This variability is related to differences in how various actors conceptualize objects as a source of risk (Samsonova-Taddei & Humphrey, 2015) and engage in struggles over its control (Hilgartner, 1992). For instance, Samsonova-Taddei and Humphrey (2015) explored how the policy-making process of establishing European transnational audit was characterized, and indeed frustrated, by competing conceptualizations of the risk object at the state level. In essence, objects are not "simply waiting in the world to be perceived or defined as risky" (Hilgartner, 1992: 40) and risks objects are "never fully objective or knowledgeable outside of belief systems" (Gephart et al., 2009: 144).

Studies have collectively developed a constructivist foundation to risk in organizational theory (Brown, 2000, 2004; Gephart, 1993; Topal, 2009). While approaching the question of the construction of risk within organizational settings in different ways, these approaches all similarly reject notions that risk is objective, "out there" (Maguire & Hardy, 2013) and able to be uniformly interpreted. Rather, they assert fundamental ambiguity and diversity in the construction of risk and resultant organizational responses to it (Clarke & Short Jr., 1993). However, we still have little specific insight into how the process of constructing risk by organizational actors can shape, or is shaped by, organizational attempts to *control* risk; a central tenant of the risk object framework (Hilgartner, 1992). Controlling risk involves organizational attempts to minimize its unpredictability and variability (Lane & Quack, 1999). Risk can be controlled by weakening the linkages between the constructed risk object and the existent danger or hazard, a process Hilgartner (1992) labels 'displacing' risk. Given that defining risk is an "inherently ambiguous and subjective process" (Tsoukas, 1999: 523), controlling risk is similarly complex and open to social interpretations. Studies suggest that the very notion of controllability as well as risk is a social construction. Holt (2004) advocates for risk management *without* assumptions regarding the ability to control the activity but instead an awareness of its limitations. Further, Maguire and Hardy (2013) point out that organizations can display very different assumptions around the controllability of risk, suggesting risk management can be premised on certainties that are known and accepted (normalizing) but also by invoking uncertainties and thus the need to manage risk in a "precautious" manner (problematizing). Despite these important foundations regarding the question of how the construction and control of risk objects can be entangled, explanations of the interplay between the two remain vague. However, a number of lessons are apparent and can be built from in the existing literature.

First, constructing and controlling risk is said to be entangled within organizational structures and their organizing processes. Focusing on micro-organizing practices, Maguire and Hardy (2013) investigate the construction of risk objects through the organizing processes used to assess and manage risk, as well as the discursive work of actors to change the meanings of risk objects. They focus on micro, often discursive, organizing practices such as instances where scientific knowledge, past decisions and experiences (continuity), timelines, and involvement of scientific or organizational stakeholders are emphasized. The importance of organizing is similarly apparent in recent work within the accounting literature on risk management. Mikes (2011) sheds light on how different cultures of risk management were reflected in organizational structure, and particularly different boundary work by risk officers to claim relevance in the control and management of risk. This work shows that the organizational processes of managing and controlling risk objects manifests in different organizational structures.

Second, risk objects and the "definitions of risk get *built into* technology" and their associated systems of control are *technical* as much as they are social (Hilgartner, 1992: 39). Indeed, quantification though metrics/models is the most pervasive way that the literature has examined organizational attempts to control and manage risk (see Beunza & Stark, 2004; Beunza et al., 2006; MacKenzie, 2012; Mikes, 2009, 2011; Millo & MacKenzie, 2009). While Mikes (2011) suggests that some organizations find ways to resist this quantification of risk management, variation in approaches to quantification of risk has not been fully explored. Rather, the literature argues that metrics are creeping into areas of risk assessment that more properly involve human judgement, leading to excessive and dysfunctional quantification in risk management (Power, 2004; Power et al., 2009; Taleb, 2007; Scheytt et al., 2006). For example, Holzer and Millo (2005) outline that the quantification of risk management in financial markets

can create side-effects – or second-order dangers - through the use of risk assessment and management systems. Further, the availability of information is central, playing an important role in the ability to quantify, measure and monitor risk and thus control it (Clarke & Short Jr., 1993). Yet, a problem for organizations is that both framing and managing risks is nearly always made in the context of incomplete information (Gephart et al., 2009). Sullivan-Taylor and Wilson (2009) build on this argument, outlining that organizational actors nearly always try to make incomplete information sufficient either by ignoring information that does not fit or by framing their own interpretations of incomplete data.

In summary, existing research that has pointed to organizational structures, organizing practices, and quantitative metrics provides only partial insights into the social construction of risk and its controllability. There is considerable scope to explore what social construction of risk means for organizations and how this is entangled with their attempts to control it (Gephart et al., 2009; Maguire & Hardy, 2013). Our study builds on the concept of risk objects (Hilgartner, 1992) to ask: *how is the organizational construction of risk objects entangled with constructions of risk object controllability, and what might explain variation in such entangled constructions?* We address this question in the particular context of risk-transfer, a setting we now explain.

RESEARCH DESIGN AND METHODS

Research context and sample

We conducted a qualitative study of the transfer of financial risk from insurance organizations to the reinsurance industry. Insurance organizations seek protection from these particularly large losses that might arise from events such as hurricanes, floods, and terrorism, by transferring risk to the reinsurance industry; essentially buying their own insurance. This is a particularly salient context to explore the social construction of risk as these organizations actively trade in the risk of these highly uncertain and unpredictable events. In particular, insurance organizations have to

make decisions about how much risk from their insurance portfolio they transfer to the reinsurance industry and how much they are willing to carry themselves. To do so they construct their own risk portfolios as risk objects (Hilgartner, 1992) that might present potential hazards to their organization in the unpredictable event of a large loss. Our study focuses on this risk-transfer process, exploring how insurance organizations construct these risk objects and their organizational attempts to control them.

Based on our desire to explore variability in risk conceptualizations (Maguire & Hardy, 2013; Mikes, 2011) our sample of 35 insurers encompasses a wide range of different organizations in terms of size and geographic scope (see Table 1; column 2). The selected organizations span seventeen countries from more developed insurance markets like the United States to countries where the insurance sector was developing such as the Philippines. They include the largest insurers in the world with turnover as high as US$ 50 billion and global reach[1] as well as some of the smallest with a turnover of around US$ 100 million focused on a single smaller territory. However, consistent with the objective of this study, all these organizations transfer risk to the reinsurance industry to 'insure' their risk portfolio against large-scale losses.

[Insert Table 1]

Data collection

We collected multiple sources of qualitative data, namely interviews, observations and secondary data. First, during 2011-2012 we conducted 48 interviews with 52 individuals across the 35 insurance organizations. In each case we interviewed those most involved in the risk-transfer process for the organization (e.g., whether that was the CEO and/or chief reinsurance buyer). The interviews were semi-structured and mainly focused on four general areas: (1) Risk transfer in general; (2) Organizing risk transfer; (3) Relationships with reinsurers and brokers during risk

[1] AM Best (2012) Top insurers ranked by assets, net premiums. *Best Week*. January.

transfer; (4) Specific details related to transferring their particular risk portfolio. Each interview lasted at least 60 minutes and in some cases as long as three hours and were all audio recorded and fully transcribed. Second, we accessed further reflections through 16 supplementary background interviews with a reinsurer or reinsurance broker focused specifically on the risk transfer process of one of our case organizations. Third, we also conducted 17 observations across 12 of our insurance organizations. These were usually meetings between insurers, brokers and reinsurers in which they discussed the risk transfer process. Finally, we collected numerous documentary secondary data including annual reports, media articles and reports. This included 85 annual reports for our organizations (2011-2013; not available for two cases). Our aim in this regard was to advance our understating of these organizations and their risk transfer process and extract information about their size and geographic scope.

Data analysis

We engaged in several phases (Langley, 1999) of thematic analysis (Miles & Huberman, 1994), moving from intra-case analysis to cross-cases comparison that surfaced patterns (Eisenhardt, 1989). First, having uploaded the data in NVivo10, we coded the interview data around the four areas covered in our interview schedule to capture the data as a whole. We discovered six major themes under which we clustered the data: (1) conceptualization of risk; (2) purpose of risk transfer; (3) organizational internal structure and decision making; (4) data and information quality; (5) risk portfolio composition; (6) risk transfer practices such as pricing and quoting. This preliminary coding became the basis for all our following layers of analysis. Having coded each case in NVivo, we created summary tables that allowed us to compare the coding across cases; for example, the various ways they described risk transfer.

Second, to assist in our cross-case comparison we initially drew on extreme cases that emerged as particularly different and compared them (Eisenhardt, 1989). Two central themes emerged. First, we observed central differences in how these organizations talked about the risk they carry. They discussed it in either rather tangible terms (e.g., describing the type of cars and

drivers they insure) or abstract terms (e.g., describing their insurance portfolio in terms of figures and numbers). We also noticed differences in how "close" they positioned themselves in relation to that risk, either as proximate (e.g., an insurer might spend much of the interview describing the social and cultural norms as well as the geography of insurance in Pakistan) or distant (e.g., an insurer might not mention a particular or shared social-cultural or geographic locality). Second, we observed that these organizations articulated different primary reasons for risk transfer; namely for protection (to cover them for loss) or capital efficiency (as part of a broader drive to make the most efficient use of their capital). We clustered the cases based on this variation using data tables, with a pattern emerging between how they describe the risk (in terms of its 'tangibility' and 'proximity') and what they prioritized in risk transfer ('protection' and 'efficiency'). Turning to the wider dataset we started clustering our organizations into groups to see if these categories remained explanatory. We identified three main clusters which insurance organizations form when they construct their risk objects (see different colours in Table 1). We labelled these: Risk Optimizers (one extreme cluster of six organizations that emphasized efficiency and discussed risk as abstract and distant), Risk Protectors (the second extreme cluster of eleven organizations that, by contrast, emphasised protection and discussed risk as tangible and proximate) and Risk Jugglers (a cluster of eighteen organizations that were oscillated between these two extremes, attempting to balance a degree of both efficiency and protection).

Third, we sought to explain this variation, seeking to understand how organizations that essentially do the same thing, transfer insurance risk to the reinsurance industry, understand and perform this process very differently. We used secondary data to classify the 35 insurers according to size (scale 1, largest, to 5, smallest) and geographical scope (global, regional and local) (see Table 1). However, these two variables only partially explained the variation in terms of how these organizations transferred risk to the reinsurance market and thus we decide to delve further into the risk transfer process of each organization. The organizations did not cluster neatly by size. For example, of the six Risk Optimizers, only three were in the largest category by size. As we analysed, clustered and searched for patterns across our data and the themes we

had surfaced, three additional explanatory features emerged as particularly influential: structure in terms of whether they centralized or decentralized the risk transfer decision (*centralizing*), whether they exhibited a strong belief in the ability to model risk *(modelling)*, and finally, their belief in diversification as a way to manage their exposure to risk (*diversifying)*. These explanatory-underlying organizational features, in addition to general tendencies related to size and geographic scope, explained the variation we observed. On a case-by-case basis, we examined and re-examined the links between these three different themes and the patterns that were emerging, primarily using data-summary tables (Miles & Huberman, 1994), further confirming our understanding of these as an explanatory framework for our findings.

Fourth, we engaged in a final more interpretive layer of analysis (Wolcott, 1994) to conceptualize the patterns in our data. First, we theorized the dynamic in the data that we were observing. Hilgartner's (1992) concept of "risk objects" proved illuminating. This framework that explains why organizations perceive and construct the same risks differently, helped us understand how organizations construct their risk portfolios as risk objects in different ways, according to whether they define the object and associated hazard as abstract or tangible and proximate or distant. Hilgartner's framework also enabled us to explain an emerging dynamic in our data around the entanglement of constructing and controlling the risk object. This provided the theoretical scaffolding for the pattern we had observed: how insurers constructed the risk object was entangled with their constructions of its controllability. Second, we interpreted the patterns that had emerged and made sense of them in the following ways. In particular, we found coherent patterns whereby organizational features reinforced each other (e.g., high in centralizing, modelling, and diversifying) and a consistent construction of the risk object (e.g., either abstract and distant or tangible and proximate) and its control (e.g., either efficiency or protection). We observed that Risk Optimizers and Risk Protectors applied different patterns but followed the same coherent pathway in constructing the risk object, which was consistent with their specific constructions of control. By contrast, we showed how Risk Jugglers enacted individualized *composite* pathways, whereby organizational features did not neatly reinforce

each other (e.g., low in modelling and high in diversifying) or a consistent construction of the risk object (e.g., seeing the risk object as both abstract and tangible) or its controllability (e.g., attempting to balance protection and efficiency). Such organizations were embracing some of the contradictions inherent our framework via a both/and approach to seemingly contradictory enactments of risk (Lewis, 2000). We discuss these layers of our findings below and bring them together in a theoretical model.

FINDINGS

Constructing the risk object

We define the insurance portfolio as the 'risk object' for insurance firms; the 'object' to which harmful consequences (for the insurer) are attached (Hilgartner, 1992). Our findings show considerable variation in the way that insurance organizations describe their portfolio and construct it as risky by linking it to potential harm to their firms.

Proximity of risk. The insurance portfolios and the potential harm associated with them were constructed as *proximate* or *distant* to the specific geographic and sociocultural context of the insurance firm. On the one hand, risk objects were constructed as *proximate* when insurance organizations conceptualize their insurance portfolios (i.e. risk object) as situated within a specific and shared geographic and socio-cultural context. For instance, below a Pakistani insurer describes the specific Pakistan context to a reinsurer:

> Insurance manager (Amid) states his is a country that are making a war on terrorism and therefore they would like their reinsurer (Scott) to visit and see what they are doing. Scott says that they will be coming to Pakistan this year, and Amid says that that would be good; he will show them some of the properties and the efforts they are taking to protect them. Amid takes out some documents to further put the Pakistani market in context. (Organization 34. Observation)

In this meeting, the insurer is emphasizing that understanding of their risk object is intrinsically entwined with understanding the local Pakistani context in which is situated.

On the other hand, the risk object can be constructed as distant, dissociated from any particular geographic and sociocultural context and instead conceptualized as a nexus of multiple localities, contexts and events. For instance, in the following illustrative example the risk object

is part of a global balance, distant from any specific local context or event: “We don't have a specific property division in Japan. But we can add some margins to our global risk profile, so we can basically write Japanese business at zero capital cost” (Organization 2, Interview). In this case any notion of the insurer being close to or sharing the local Japanese context is absent; rather a little bit of Japanese risk is added to the (more important) global portfolio. As this shows, even though the actual harm, such as disasters caused by earthquakes, occurs in specific regions, some insurers construct the risk object as distant from, rather than proximate to, any specific geography or sociocultural context.

Tangibility of risk. Insurance organizations also construct the risk object by emphasizing the *tangible* or *abstract* nature of the object and its potential harm. First, some insurance organizations construct the risk object by highlighting the actual tangible and physical implications of harmful events. Interviewees might talk about risk in terms of the “build quality” of particular properties or the “likelihood of an earthquake”. For instance, in the indicative quote below descriptions of specific high-value cars are used to describe the risk object:

> With motor risks the most expensive motor loss would be maybe say $1.5 million, if you buy a Rolls Royce maybe about $1.5 million. Most of the cars are in the range of $100,000, maybe $2-300,000 if you're buying a Continental. So if you look at per risk level then we can absorb this (Organization 28, Interview)

In such an example, insurers articulate damage to a particular type of car as a tangible risk, in a way that is at least partly relatable to how we ourselves might be aware of an open fire as a physical ‘risk’ when a toddler is in the room.

Second, other insurance organizations construct the risk object as *abstract.* The risk object is defined in terms of a carefully balanced and modelled numerical portfolio rather than as actual earthquakes or floods. For example:

> All our risks are graded between 1 and 10; 1 being the best, 10 being bankruptcy. So we have an average grade of the portfolio, that today it is 4.2, and we can see the evolution of this grade on a quarterly basis or a monthly basis. (Organization 5, Interview)

Within this example, the focus is on the numbers associated with risks and then the overall average grade of the portfolio. These variations from abstract to tangible emerged as the second critical dimension explaining how insurance organizations variably construct risk objects.

Risk Transfer: constructing the risk object and its controllability

Insurance organizations transfer risk as a financial product to the reinsurance industry in order to minimize the harm that is associated with the insurance portfolio that is their risk object. Transferring risk to the reinsurance industry is a means of controlling the risk object by weakening the linkage between them and the source of harm (a large scale catastrophe) (Hilgartner, 1992). Consider an insurance portfolio – the risk object – that includes large-scale catastrophes such as Japanese earthquake risk. Insurance organizations attempt to control this risk object by transferring the risk of claims from a Japanese earthquake from their own portfolio to the reinsurance industry, for which they will pay a premium.

How insurance organizations understand the controllability of the risk object varies, according to whether they construct it as a matter of protection or capital efficiency. The way they do so is associated with how they construct the risk object. In this regard, we identified three main clusters of insurance organizations that we labelled 'Risk Protectors', 'Risk Optimizers' and 'Risk Jugglers' according to variation in how they construct the risk object and their understanding of its controllability (see table 2). We explain each of these clusters below.

[Insert Table 2]

Risk Protectors. The first group that emerged from our data consists of eleven insurance organizations that constructed the risk object as proximate and tangible. They also understood risk transfer as a process for protecting their risk portfolio, thus constructing the controllability of their risk object as a matter of *protection.* In articulating the proximate and tangible nature of the risk object these organizations construct themselves as vulnerable to harm, effectively 'bringing the risk to life'. This has implications for how they conceptualize the control of the risk object through the risk transfer process; that is, they emphasize the need for protection.

Insurance organizations are exposed to uncertainty over whether their risk portfolios will sustain a major loss. Protection from such loss is fundamental and achieved through risk transfer to the reinsurance industry. Organizations that are Risk Protectors transfer a significant degree of the potential for major loss to the reinsurance industry. For instance, in the quote below, the insurer articulates threat from the risk object and thus constructs it as controllable through risk-transfer of the volatile (most exposed to loss) elements of the portfolio to the reinsurance industry to mitigate the degree of harm to the organization.

> It [risk transfer] is more an issue of transferring volatility. I think that's the main thing... So if it was up to me as a reinsurance manager, we would have brought reinsurance on everything (Organization 31, Interview)

The emphasis is on ensuring adequate protection across the entire portfolio – "reinsurance on everything" even if this costs more due to the need to cover even small risks: "We tend to buy at a fairly low attachment point to keep a lot of the volatility out of our portfolio and use reinsurance to cover fairly low levels of risk" (Organization 32, Observation, Meeting with Reinsurer). Risk Protectors thus construct the controllability of the risk object as protection through transferring a significant portion of risk to the reinsurance industry to ensure they are covered; so retaining less risk themselves (see Table 2).

Risk Optimizers. We also found a second group of six insurance organizations[2] that constructed the risk object as distant and abstract. Their risk object was an abstracted portfolio of numbers that is not situated in any specific geographical or sociocultural context. These organizations emphasize risk transfer as a means of developing capital efficiency in their risk portfolio, thus constructing the risk object as controllable through capital efficiency (see Table 2).

A focus on efficiency is about using capital wisely, for example ensuring that the diversification benefits of a large portfolio are fully maximized. This efficiency, which is attained internally, drives the risk-transfer process and control over the risk object:

[2] These Risk Optimizers included some of the largest firms in the world, but also firms that were a third in size of these and by no means among the largest in our wider sample.

> It's about the way you utilise your capital, your investment strategy, you know, it's a whole package. You know, and [CEO's] a very clever guy and he looks at reinsurance as one of our largest expenses, what I can do to make it more efficient, you know (Organization 1, Interview).

Capital efficiency underlies the risk-transfer decision, with these insurance organizations configuring and calculating their portfolio internally in order to buy the *least* reinsurance they can to ensure capital is not wasted. They only purchase more reinsurance when it comes at a *cheaper* cost of capital than using their own capital to cover the risk, for instance because of interest rates or market prices. Rather than focus on the need for protection they focus on what they *can* cover or retain internally, as one CEO explained, snapping his fingers dismissively: "100m loss does not make a difference, not even to the profit forecast" (Organization 2, Interview). In this group, the way organizations understand the control of the risk object moves from risk transfer as an external means for protection, to being part of an internally focused view of their risk portfolio and use of capital, which they seek to maximize. For these organizations the construction of their risk object was a matter of *risk optimization* whereby optimizing capital deployment is critical to risk-transfer.

Risk Jugglers. The first two groups provided contrasting constructions of the risk object and its controllability when transferring risk. However, eighteen organizations within our sample clustered within the middle of these two extremes. We labelled these organizations "Risk Jugglers" because they wrestle with the tensions between the dimensions of risk proximity and risk tangibility in their construction of the risk object. Some of these insurance organizations described the risk object as simultaneously proximate and distant and/or abstract and tangible, as shown in the following indicative example from a single organization:

> Tangible and proximate: We have engineers that will go out to individual locations and do an onsite inspection so we can determine what the fire risk is, what the wind risk is, what the quake risk is, what the flood risk is…we do not depend on the model to say here's what our exposure is, we know from our engineering report and from the onsite visits what our exposure is (Organization 19, Interview)

> Abstract and Distant: Quake is quake, wind is wind, right? It doesn't matter where it happens in the world, it's all the same. But yet they, like you said, they do different capital, so the real question is can you make money? (Organization 19, Interview)

In this example, the firm constructs the risk object as something tangible that needs to be determined by 'engineers' though 'onsite inspections' to 'individual locations', but at the same time it is an abstract portfolio of risks that are 'all the same' regardless of the fact that the tangible attributes of 'quake' and 'wind' vary.

Risk Jugglers also oscillated between competing constructions of the controllability of the risk object:

> [Reinsurance] is a capital management tool [efficiency], but also a volatility tool on behalf of the group [protection]." (Organization 16, Interview).
>
> [Reinsurance is] not only to protect the balance sheet, but also to be capital-efficient. (Organization 10, Interview)

This meant that an active tension was apparent in *how* to control the risk object through risk transfer. For example, the very question of how much reinsurance to buy was fraught, involving juggling the protection impulse to buy a substantial reinsurance protection with the efficiency impulse to manage capital carefully by buying the *minimum essential* reinsurance.

As this suggests, Risk Jugglers construct the controllability of the risk object in varied and individual ways, oscillating between the two polarised concepts of risk-transfer for capital efficiency and risk-transfer for protection.

Underlying organizational features

Attempting to explain the variation we observed between the construction of the risk object and its controllability we surfaced three organizational features that underlie this interrelationship: centralizing, modelling and diversifying. We explain these in turn, before our final section relates these more closely to the clusters above.

Centralizing risk. Centralization concerns the organizational structure for making decisions about risk transfer, and thus who controls that process inside the organization. This organizational feature represents how far away the risk-transfer decisions are made from the actual people who trade in the insurance risk for the organization. In insurance organizations, the

underwriters and managers in business divisions or subsidiaries where the actual policies are held that make up the insurance portfolio are the people close to the risk. The CEO, other chief executives and managers at the corporate headquarters are the people far away from the risk. Some organizations had highly centralized decision-making with decisions about risk-transfer for the organization as a whole at the corporate headquarters:

> Compared to some of the other insurance firms, they give far more autonomy, especially in the far-reaching areas of the world than we would ever allow. We have a standard reporting… a strict 'they [underwriters] must do as we ask', and we deliberately do that in all our decisions. (Organization 1, Interview)

By contrast, other organizations demonstrated de-centralized decision making structures regarding risk transfer decisions. In these instances high autonomy was given to underwriters and managers in subsidiaries and business divisions:

> My underwriters can handle it [reinsurance buying], I leave it to them…small to medium, within our capacity, I let my underwriter decide. (Organization 30, Interview)

As this shows, organizations vary in the degree of centralization of the decision-making structures associated with risk-transfer (also see table 1 above).

Modelling risk. A second feature involved the belief in calculative models as a means to understand the risk object. Modelling risk via standardized industry tools has become ubiquitous in the insurance industry. Information on risk exposures, such as geocoded data, physical characteristics and other financial data, is the input into these standardized models and enables mathematical calculations to predict loss estimates associated with potential catastrophic events. Here, we explore the articulated belief of insurance organizations in the ability of these models to help them understand and control their risk portfolios. Some organizations articulated a strong belief in the modelability of the risk object:

> We believe that what we believe is correct through those numbers. It's the more transparent, the more easy, straightforward you make these things, the better. [Organization 10, Interview]

Organizations that articulate a strong belief in the accurate comprehension of risk through models also regard their access to information, which they use as input to these models, as high quality: "The data quality is good, we have virtually no real issues" [Organization 2, Interview].

Confidence that risk can be accurately understood and calculated was therefore evident. Conversely, other insurance organizations explicitly prioritize contextual judgement over numerical models. For instance: “we do not depend on the model to say here's what our exposure is” (Organization 19, Interview). These organizations emphasize that models are simply numerical representations of risks that can never accurately be defined, highlighting instead the inherent uncertainty of risk. This articulated belief that risk cannot be known or modelled in turn drives the risk-transfer process for such organizations:

> I keep on seeing unmodelled events. And, you know, Rumsfeld put it well, the unknown unknowns, and that's what we have to think about. You know, we're buying, we’re buying out what we don't know, we’re buying out what we don't understand, we're buying out the tail. (Organization 9, Interview)

These organizations also often highlighted the imperfect nature of information they received about risk to explain the incompetence of numerical models to make risk knowable: “we don't get good information” (Organization 35, Interview). In summary, some insurance organizations believe that they have access to all the information they needed to model and thus to accurately understand risk and define risk exposure and potential losses. Others are sceptical about the accuracy of numerical representations of risk and favour human judgement over models.

Diversifying risk. Diversification is the concept that risk can be made more managed by bringing together uncorrelated types of risks and geographies. Namely, when insurance organizations build portfolios of uncorrelated risks of different types and geographic locations, the probability of experiencing losses in several parts of the portfolio at the same time reduces significantly. That is, diversification implies that risk of losses in one part of the portfolio – such as earthquake in Japan – will be paid for by other parts of the portfolio that are not correlating – such as bushfire in California – as these parts of their portfolio will not experience loss at the same time from the same event. While some diversification is fundamental to the notion of all insurance, insurance organizations nonetheless believe in or rely on diversification to different degrees.

Some insurance organizations believe strongly in diversification as a way to feel in control of their risk portfolios: “We [have] this huge diversification as one of our main assets to moderate

the risks we are facing" [Organization 10, Interview]. Such belief in the ability to diversify creates confidence, with organizations feeling increasingly protected, even as they take on more risk: "We believe that in some areas we can add a new component [risk] to the portfolio which just gives diversification" [Organization 2, Interview]. By taking on more risk they believe that they have better internally diversified protection and, hence, need proportionally to transfer less to the reinsurance industry. By contrast, others insurance organizations demonstrate a weak belief in diversification as a means of controlling their portfolio. Such organizations might highlight the unpredictable nature of risk, including the fact that different types of events, such as floods in Thailand and earthquakes in Chile, can occur simultaneously, meaning diversification cannot be relied upon. For example, one insurer discussed how multiple events in 2011 reinforced their belief that they could not rely on supposedly non-correlating risk:

> You had New Zealand 1, New Zealand 2, Japan and New Zealand 3. You had two huge tornadoes in the States in excess of 5 billion on each one of them, the Copenhagen floods, there were so many losses in that period of time. So you had frequency and severity of losses from October 2010 right until probably that whole calendar year period. [Organization 11, Interview]

Similarly, one manager queried whether his competitors were as "secure" as their highly-diversified portfolios might suggest: "Firm A and Firm B have got the [security] ratings and all that kind of things but, you know, they've got monstrous exposures everywhere" [Organization 22, Interview]. Indeed, these organizations believe more strongly in a close association to a bounded portfolio of risks that they know well:

> We can break that [portfolio] down into very small component parts to say "this type of risk is really good, this one isn't", and then we work with the clients to do risk improvement" (Organization 19, Interview).

Thus, beliefs in the amount of protection afforded by diversification varied widely.

Constructing the risk object and its associated controllability

Different configurations of these organizational features – centralizing, modelling, diversifying – underpin the different ways that organizations construct the risk object and its controllability.

Risk Optimizers and Risk Protectors: coherence amidst uncertainty. We observed two groups of insurance organization that enact contrasting constructions of the risk object and its controllability. First, as detailed above, Risk Optimizers construct the risk object as abstract and distant and their ability to control the risk object as a means for capital efficiency. This is supported by high centralizing, modelling and diversifying. That is, centralizing enables the whole portfolio to be viewed and modelled according to consistent views about the benefits of high diversification in enabling capital efficiency, as illustrated in the following examples:

> Centralizing and diversifying linked to efficiency (retaining more risk): "It's the beauty of being part of a big group because you contribute from that part of the world and other people contribute from a completely different part of the world and you get that diversification and jointly we have the power actually to retain more" (Organization 3, Interview)#

> Modelling linked to confidence to prioritize efficiency rather than protection: "These are all the outputs from models, here's what the exposure looks like, so this is why you don't need to worry about it" (Organization 1, Interview)

As evident in these quotes, a focus on modelling and centralizing decision-making is entwined with the risk object being constructed as abstract (the risk is seen through the modelled outputs) and distant (the centralized decision makers are further away from the risk). Similarly, a belief in diversifying is tied in with a distant view of risk as part of an abstract construction of the risk portfolio. Thus, consistent high prioritization of the three organizational features explains construction of the risk object (as abstract and distant) and construction of the ability to control this risk object (in terms of capital efficiency).

Second, Risk Protectors construct the risk object as tangible and proximate and their ability to control the risk object as a means for protection. These specific constructions are aligned with prioritization of local judgement and decision-making (low centralizing), rather than focus on models (low modelling) and the benefit of diversification (low diversifying). They construct the controllability of the risk object through their intimate local knowledge of it as an object with tangible dimensions, to which they are proximate:

> I can't say there is no Cat [risk of natural catastrophe disaster]: after what happened in Thailand no one dares to say that! So it's a matter of how remote the thing is. So as far as Cat is concerned our concern is purely restricted perhaps to a bit of localised flooding. (Organization 29, Interview)

Risk Protectors accept the inherent 'wildness' of risk and thus attempt to weaken the link between harm and the risk object by constructing risk transfer as a means of protection that gives them control over the risk object. Due to assumptions about the bounded nature of the risk, localized in-depth knowledge of underwriters is understood as the best means to trade in risk, amidst uncertainty.

For Risk Optimizers and Risk Protectors the organizational features are themselves intertwined and reinforcing. For example, in the case of the Risk Optimizers centralizing decision-making about risk transfer enabled diversification benefits to be attained, as decisions about the different risks within the risk portfolio were brought together centrally and their diversification benefits considered. Meanwhile, a belief in modelling negated the need for localized underwriting judgement and thus aligned with centralizing the decision-making process. By contrast, for Risk Protectors, a belief in underwriting judgement, rather than models, is associated with a belief in prioritizing the localized decision making of those underwriters over centralizing.

Juggling in the 'middle': fragmentation in a world of tensions. Many organizations do not construct a coherent pattern in their approach to risk but rather enact individualized, often tension-filled, approaches. Building on their constructions of the risk object, which iterate between proximate/distant and tangible/abstract, they wrestle with the tension of emphasizing both protection and capital efficiency when it comes to constructing their ability to control the risk object. This struggle is in turn reflected in their iteration between or mix of the underlying organizational features (see Table 1). There was no single way that Risk Jugglers mixed the various features, so that they sat in varied positions between the patterns of "Risk Optimizer" or "Risk Protector". We illustrate this through three indicative cases.

First, Organization 7 was an example of a Risk Juggler positioned close to the Risk Optimizers, yet somewhat deviating from this pattern (see Table 3, Case 1). They constructed the risk object as distant and abstract, but with some evidence of proximity and tangibility. Stemming from this they constructed the controllability of the risk object as an act that was performed mainly through risk transfer for capital efficiency (i.e., as per the Risk Optimizers). However they also attempted not to neglect the importance of protection, in particular to enable their underwriters the confidence to trade by ensuring that they knew they had adequate cover to smooth the profit and loss of their individual portfolios (see Table 3). This in turn manifests through a particular configuration of the underlying organizational features of Organization 7. While they had a high belief in modelling and diversifying, they did not prioritize centralizing, explicitly differentiating themselves from well-known, highly-centralised competitors who they believed to have reduced the decision-making autonomy of underwriters and managers within their local contexts. This mixed configuration with two out of three features marked as 'high' positions this organization as being close to a Risk Optimizer. However, their moderate degree of centralizing decision making means Organization 7 was instead a Risk Juggler that even as they prioritized efficiency, wrestled with also constructing controllability for protection, based on their belief in localised judgement over risk (i.e., low in centralizing).

Second, other Risk Jugglers were more balanced in their approach, enacting moderation in the organizational features, instead of necessarily being 'high' or 'low' in any of them. These Risk Jugglers oscillated between constructing the risk object as proximate and distant as well as abstract and tangible and understood controlling the risk object as an act that is performed through transferring risk for both protection and capital efficiency, without apparently prioritizing either. An example is Organization 15 depicted in Table 3 (Case 2) whose struggle to balance the different ways of constructing the risk object and its associated controllability manifests in moderate centralizing, modelling and diversifying. For example, Organization 15 organized risk transfer decisions centrally while at the same time providing some autonomy to subsidiary managers to transfer risk locally where they believe it is needed. They believed in

numerical modelability to understand risk, while emphasizing the uncertainty of 'unmodelled' events. Finally, they believed in geographical diversification but this did not completely drive their risk transfer process, as they still kept much of their reinsurance purchasing separate rather than bundling it to model diversification benefits. We can see therefore how some reinsurance organizations existed "in the middle", balancing moderate manifestations elements of the phenomena we observed even when these appeared contradictory.

Third, another example of individualized mixing of the features was Organization 23, a firm that was similar but not identical to the Risk Protectors (Table 3, Case 3). They emphasized tangibility and proximity in construction of the risk object, but also at times described it as abstract and distant. Similarly, while they prioritized protection, they also demonstrated capital efficiency considerations in constructing the controllability of the risk object. For instance, saying the main reason they needed to transfer risk was to reduce volatility, providing the capital protection to enable them to trade, but also that cost/benefit analysis of the magnitude of reinsurance spend was important to their process. Underlying this was a particular individual mix of the features; moderately high centralization, but low belief in modelling and diversifying. This configuration with two out of three features being 'low' explains the 'close to a Risk Protector' position of this organization and why certain elements were prioritized in the construction of the risk object and its controllability. However, the fact that they were 'high' in centralizing explains this organization's attempts to incorporate capital efficiency by centralizing risk transfer decisions rather than focus solely on protection

To summarize, we found that the construction of the risk object, the construction of its controllability and the organizational features are strongly intertwined. This is summarized in Table 4, which is underpinned by the case specific analyses outlined Table 1. That is, we observed three groups of insurance organization – Risk Protectors, Risk Optimizers and Risk Jugglers (see Table 4) – that enact different constructions of the risk object (see Table 4; A-i, ii, iii) and its controllability (see Table 4; B-i, ii, iii), and different configurations of the organizational features (see Table 4; C-I, ii, iii).

[Insert Table 4 here]

DISCUSSION

We now bring these empirical findings together into a conceptual framework (Figure 1 below) that explains the entangled interrelation between the social construction of a risk object and its control in the risk transfer process (Hilgartner, 1992). We also highlight and explain the inherent variation we found in how these constructions unfold (Huault & Rainelli-Weiss, 2011; Samsonova-Taddei & Humphrey, 2015; Sullivan-Taylor & Wilson, 2009).

[Insert Figure 1 here]

Our framework builds on Hilgartner's (1992) call for further explanation of the interplay between the construction and control of the risk object. It highlights how particular constructions of the risk object are entangled with particular constructions of its controllability as depicted by the insurance organizations studied. First, we showed how insurance organizations construct their risk portfolio in terms of its proximity (proximate vs. distant) and its tangibility (tangible vs. abstract) (Figure 1, A). We call this the process of constructing the risk object, as the risk portfolio as a mere object is variably constructed to become a social fact, namely a risk object, by associating the portfolio with the actual harm or danger. For instance, as our findings show Risk Protectors construct the risk object as tangible/proximate (A-i), Risk Optimizers construct the risk object as abstract/distant (A-ii), and Risk Jugglers variably mix these dimensions (A-iii). Second, we showed how this construction of the risk object is entangled with the construction of its controllability (Figure 1, B), namely the variable understanding of the organizational attempt to control risk. Risk Protectors describe how they control the risk object primarily through buying protection (B-i), Risk Optimizers through emphasizing capital efficiency of their portfolio (B-ii), and Risk Jugglers as a mix of the two (B-iii). We therefore show how the degree to which the risk object (i.e., the insurance portfolio linked to the potential harm associated with it) is constructed as tangible and proximate or abstract and distant is related to organizational construction of control over that risk object through a focus on risk transfer as protection or

efficiency. The foundation to our framework is this dynamic, recursive loop between the construction of the risk object and its associated controllability.

The second aspect of our framework is the organizational features of centralizing, modelling and diversifying (Figure 1, C) that explain the variation we observed in the interrelationship between the constructions of the risk object and its controllability. The concept of centralizing (C1) highlights the importance of structure and organizing in constructing the risk object and its controllability (Maguire & Hardy, 2013; Mikes, 2011). Our specific finding signifies that where the decision-making authority in relation to risk transfer is located in an organization impacts the construction process of the risk object and its controllability. For example, low centralizing of decision-making (C1-i) was entwined with the risk object being constructed as tangible and proximate and its controllability being constructed through a focus on protection (Risk Protectors; also see table 4). Two, the organizational relationship to risk modelling (C2), defined on a spectrum from a high belief in risk modelability to scepticism about models, also informs how an organization constructs its risk objects and its associated ability to control them (Power, 2004). Our findings and framework show how variation in the belief in modelling is associated with how the risk object and its controllability are constructed. For instance, a high belief in the ability to model risk (C2-ii) was associated with a conceptualization of risk as distant/abstract and a construction of it as controllable through capital efficiency (Risk Optimizers; also see table 4). Three, variation in the beliefs in diversification (C3) – that is a belief in the ability to reduce risk through a portfolio constituted by varied and uncorrelated risk (Markowitz, 1952) – was also central to explaining the construction of risk objects and their controllability in financial organizations. In essence, some firms had a high belief in diversification (C3-ii): the more diverse and globalized their portfolio the better. Other firms, by contrast, exhibited scepticism about the merits of diversification (C3-i), instead favouring local portfolios that they could control through targeted protection. This low belief in diversification was entangled with constructing the risk object as local and tangible (the risk of flooding to a specific territory such as Singapore) and its controllability through buying adequate protection.

The third aspect of our framework brings the above elements together to describe the pathways organizations follow in constructing risk objects and their controllability (Figure 1, D). Having introduced three explanatory organizational features, we now outline two pathways – coherent and composite – that further explain the relationship between the construction of the risk object and its controllability. Two manifestations of a *coherent pathway* are depicted in our model (Figure 1, D1) and explain the dynamics of the Risk Protectors (i) and Risk Optimizers (ii). This coherent pathway represents consistently applied either/or choices with regards to the construction of the risk object (e.g., A-i: tangible/proximate - Risk Protectors - or A-ii: abstract/distance - Risk Optimizers) and construction of the controllability of that risk object (e.g., B-i: protection - Risk Protectors – or B-ii: efficiency - Risk Optimizers). This is entangled with a reinforcing loop of *high* centralizing, modelability, and diversification (Risk Optimizer, C1-3, ii) or *low* centralizing, modelability, and diversification (Risk Protector, C1-3, i).

A different pathway was, however, also evident. The majority of organizations appear to seek a both/and position (Lewis, 2000; Smith & Lewis, 2011) in relation to the dimensions outlined in our framework through a *composite pathway* (Figure 1, D2). This pathway deviates from the consistent either/or patterns inherent within the coherent pathway outlined above. These organizations combine dimensions of proximity and tangibility and efficiency/protection as well as mixing the underlying features in varying, individual, and sometimes contradictory ways (Lewis, 2000; Scherer, Palazzo, & Seidl, 2013). Our findings show that, with risk being ultimately uncontrollable and uncertain (Gephart et al., 2009), many organizations navigate the complexity of this through individual pathways, living with the tensions involved rather than seeking either/or positions. Thus, for Risk Jugglers the various organizational features do not manifest in a particular or similar way. Nonetheless, the individual ways a Risk Juggler navigates these tensions still reinforces the relationship we observed between particular constructions of the risk object and its controllability and how this is reinforced by the three underlying organization features we identified (also see Tables 1 and the mini-cases of different risk jugglers above). For example a Risk Juggler that prioritizes efficiency will similarly talk about the risk

object largely in abstract and distant terms (than the reverse) and be moderately high rather than moderately low on the majority of organizational features. This composite pathway therefore supports the dynamic co-constitutive relationships inherent in our model but demonstrates the flexibility inherent in both the framework and the construction of risk objects (Figure 1, A-B-C).

Drawing on the concept of risk objects (Hilgartner, 1992; Maguire & Hardy, 2013) we have taken seriously the notion of organizational risk and its controllability by organizations as a social construction (Gephart et al., 2009; Power et al., 2009). The way centralizing, modelling and diversification are enacted in relation to the risk object and controllability gives each organization involved the necessary confidence to transfer risk; a confidence that is central to the marketization of risk by and amongst organizations (Callon & Muniesa, 2005; Huault & Rainelli-Weiss, 2011). Our framework shows that while there is no way to fully control something as uncertain and unpredictable as catastrophic risk (Beck, 1992, 2002; Ericson & Doyle, 2004b; Huault & Rainelli-Weiss, 2011), there are pathways in which organizations work through such complexity. Working through risk is, after all, the job of many organizations and especially those in the insurance industry. Our framework explains this process.

CONTRIBUTION AND CONCLUSION

Our paper contributes to the growing interest in organizational theory in the social construction of risk (e.g., Huault & Rainelli-Weiss, 2011; Maguire & Hardy, 2013; Power et al., 2009; Sullivan-Taylor & Wilson, 2009; Tsoukas, 1999), which has rarely been explored in the organization studies literature (Gephart et al., 2009; Maguire & Hardy, 2013). Our framework seeks to address this lack of understanding by developing a conceptual framework that explains the relationship between the construction and control of risk and how variation in this relationship is underpinned by different combinations of organizational features.

First, our study depicts the fundamental dynamic between construction and control of the risk object in organizations (Hilgartner, 1992). We provide a rare exploration of the notion of risk object which extends, and further establishes, this constructivist perspective within

organizational studies (Maguire & Hardy, 2013; Samsonova-Taddei & Humphrey, 2015). This is important as a means to address the current disconnect between the critical role organization plays vis-à-vis risk in our society (both its generation and management) and the current lack of organizational research regarding risk (Gephart et al., 2009; Maguire & Hardy, 2013; Scheytt et al., 2006). In doing so, we unpack the central puzzle in the risk-object literature (Hilgartner, 1992): the recursive and entangled relationship between constructing the risk object and its associated controllability within the everyday work of organization. Although research on this interplay was Hilgartner's (1992) central call, it has rarely been taken up. Indeed, in taking the notion of the construction of the controllability of the risk object seriously, we contrast with the dominant focus in organization research that has instead painted risk management as being about how to reduce and control some external and objectively measurable risk (Ruefli et al., 1999; Winch & Maytorena, 2009) by the likes of high reliability organizations who achieve exemplary safety records (Roberts, 1990). Further, we extend the adjacent accounting literature, which largely examines risk control through the risk management function (Mikes, 2009; Power, 2009), by showing how the construction of risk control permeates multiple organizational features, from the centralization of decision making structures to beliefs in modelling and diversification. In general, our framework thus extends understanding of the dynamic relationship between the construction of risk and its controllability.

Second, our paper adds to the discussion about the social construction of risk within organizational studies by uncovering the organizational features of *centralizing, modelling,* and *diversifying* within which social constructions occur. We show how these three organizational features form a mutually constitutive relationship with the construction of the risk object and its controllability, and are thus critical for understanding how organizations transfer and manage risk. Specifically, we extend previous research that has acknowledged the importance of micro-organizing processes (Maguire & Hardy, 2013) and the structural position of the risk management function (Mikes, 2011) by unpacking the implications of more or less centralized decision-making upon constructions of risk and its controllability. Further, by unpacking the

organizational feature of 'modelling' we contribute to discussions about the increasing use of models and pervasiveness of quantification in risk management (e.g., Power, 2009; Taleb, 2007). Warnings abound about how models and quantification (Daniel Beunza & Stark, 2012; Holzer & Millo, 2005; Millo & MacKenzie, 2009) create potentially dangerous myths of control over risk (Power, 2004). Our study adds to this debate by showing that organizations in the same industry have widely varying beliefs in the modelability of risk (also see: Mikes, 2011) and that many organizations base their relationship to risk on deep scepticism over the available calculative devices (Callon & Muniesa, 2005) and maintain as their central focus not only the things they can measure but also what they believe they *cannot* (Maguire & Hardy, 2013). Finally, each organizational feature – centralizing, modelling and diversifying – are only part of the explanation and must be examined as a bundle. Our framework emphasizes the need to study constructions of risk and control as they relate to a complex bundle of organizational features.

In summary, our paper develops further understandings of how organizations cope with the extreme uncertainty of risk. We have painted managers as active *constructors* of risk, who negotiate different pathways through the complexities of managing and trading in risk. We argue the necessity of these pathways in giving managers the confidence to transact for their organizations amidst the extreme uncertainty of catastrophic risk (Beck, 1992; Sullivan-Taylor & Wilson, 2009). While there is no uniform approach, these pathways, and the confidence that they engender to transfer risk, are central to the very possibility of having financial markets for trading in risk (Çalışkan & Callon, 2009, 2010). We believe therefore that this paper sheds new light for managers regarding their role in actively constructing productive pathways in relation to risk that allow their organizations to function despite immense uncertainty.

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Figure 1. Risk transfer: Constructing the risk object and its controllability

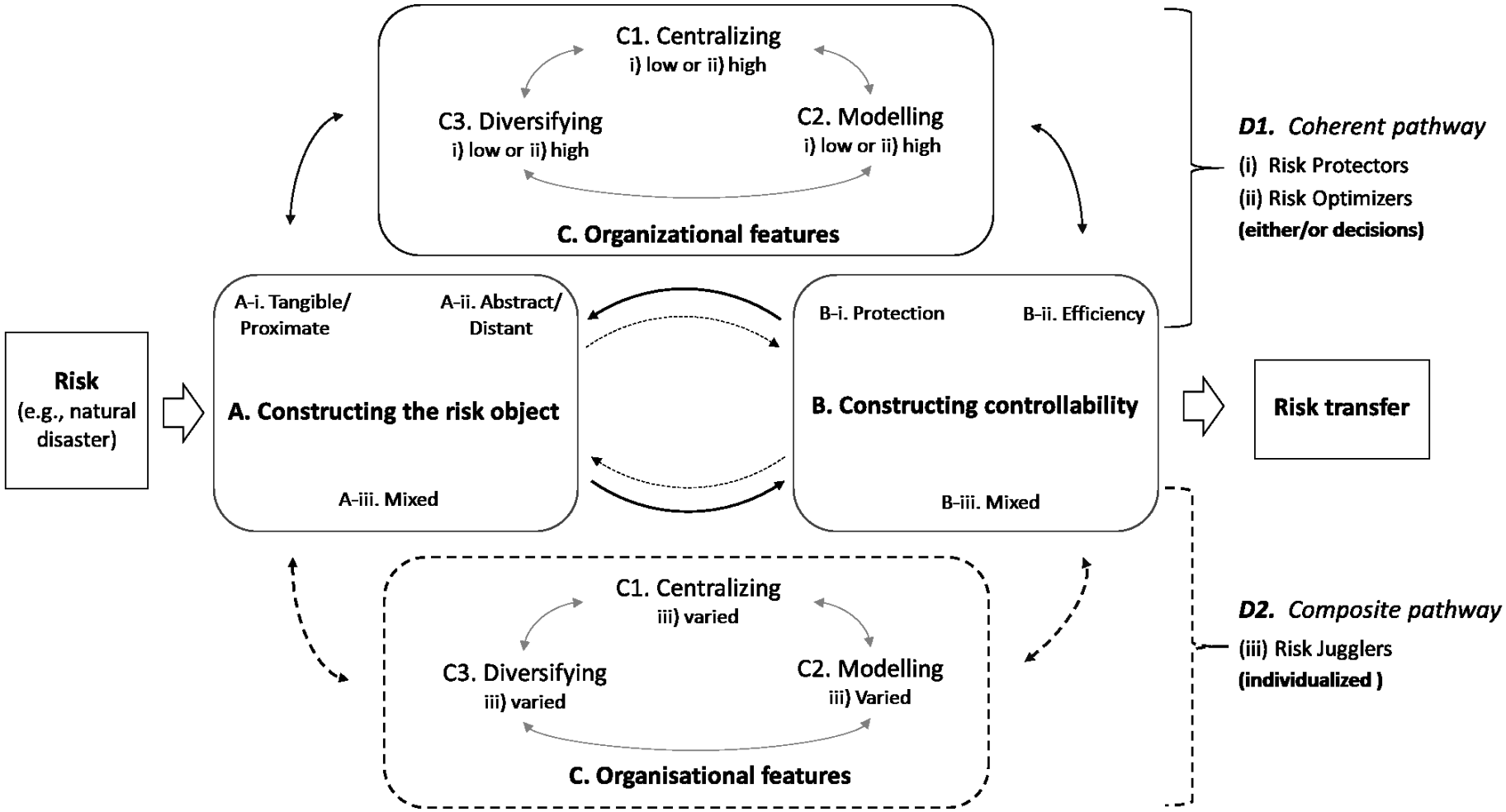

Table 1. Case analysis[3]

Firm	Size / Geo scope	Constructing the risk object				Risk transfer		Organizational Features		
		Proximity		Tangibility		Efficiency	Protection	Central.	Model	Diversifi-cation
		Proximate	Distant	Tangible	Abstract					
1	3 / G		●		●	●		H	H	H
2	1 / G		●		●	●		H	H	H
3	1 / G		●		●	●		H	H	H
4	1 / G		●		●	●		H	H	H
5	4 / G		●		●	●		H	H	H
6	2 / G		●		●	●		H	H	H
7	1 / G	○	●	○	●	●	○	M	H	H
8	1 / G	○				●	○	M		H
9	2 / G	●	●			●	○	M	M	
10	4 / G	●	●	●	●	●	○	M	M	H
11	4 / R	●	●	●	●	●	●	L	H	H
12	5 / G	●	●	●	●	●	●	M	H	L
13	3 /R	●	●	●	●	●	●	L	M	H
14	3/ L	●	●	●	●	●	●	H	M	H
15	4 / R	●	●	●	●	●	●	M	M	M
16	3 / R	○	●	○	●	●	○	M	H	M
17	4 / R	●	●	●	●	●	●	M	H	L
18	3 / R	●	○	●	○	○	●	H	L	L
19	3 / G	●	●	●	●	○	●	M	M	L
20	3 / L	●	●	●	●	●	●	L	M	H
21	5 / R	●						M	M	M
22	5 / R	○		●	●	○	●	H	M	L
23	4 / G	●	○	●	○	○	●	H	L	L
24	5 / L	●	○	●	○	○	●	M	L	L
25	3 / G	●		●			●	L	L	L
26	3 / G	●		●			●	L	L	L
27	5 / L	●		●			●	L	L	L
28	5 / L	●		●			●	L	L	L
29	5 / L	●		●			●	L	L	L
30	5 / L	●		●			●	L	L	L
31	5 / L	●		●			●	L	L	L
32	5 / R	●		●			●	L	L	L
33	5 / R	●		●			●	L	L	L
34	5 / L	●		●			●	L	L	L
35	3 / R	●		●			●	L	L	L

[3] Size = revenue; firms put into 5 quadrants (1 = largest; 5 = smallest); Geographic span = global (G); regional (R) and local (L).

● Strong existence ○ Weak existence ○

H = high M = moderate L = low

Table 2. Constructing the risk object and its controllability

	Risk Protectors: Proximate & tangible	**Risk-Jugglers: Mix**	**Risk Optimizers: Distant & abstract**
Constructing the risk object	Ben highlights that with DNO the main concern in [Country A, the country where the organization is domiciled in] is to print holding companies, Bad things happened and they lost a key holding account, and so they now look at them very, very carefully. Ben goes on to keep talking about their DNO portfolio and how they're now focusing on high-tech young companies and to catch them at their early stage of development and grow with them and that they're increasingly stronger on this high-tech and will be again next year. (Organization 31, Observation, meeting with reinsurer) These are what we call speciality crops or for some part permanent crops. Wine is usually always in the same place, so no crop rotation with vegetables (…) and also with fruit. In Germany itself there are approximately 4.37 million hectares of angular land, you must know, in Germany we have about twelve million hectares arable land. (Organization 27, Interview)	**Example 1:** Abstract & Distant: "it's more statistics about our underwriting so that, yes, reinsurance can post [publish] the quality of our risks and our underwriting…. The globe on the shoulder, and this is really what we are thinking about, is that if we just don't have the whole risk well centralised, we are in troubles." (Organization 10, Interview); Tangible & Proximate: "[we'd like] information on, I don't know, the milk factory loss somewhere in Kent" (Organization 10, Interview) **Example 2:** Moderate proximity: We not only worried about the result at the top [global level], but we worry about how that result at the top gets built up. And so the programmes are designed to provide that feedback, not all the way down to what I'd call the grass level branch, but certainly down to a regional level, so a product within a region. (Organization 8, Interview)	Patrick then also responds to Ben, saying that at the moment they write 100 million property risks but they've got about 120 risks that drive it down, so the numbers get skewed a bit from these 120 policies and they will be walking away from at least 100 very soon if their rates don't increase (Organization 3, Fieldnote, observation) Well first is understanding what the exposure is, and in that sense we have a Cat data, a Cat risk exercise on one had for the Cat exposure and we call it a risk data call for the non-Cat programmes. So that's the information we need to gather from all the operations which buy centrally the reinsurance protection. So we have standardised formats as regards the premiums, standardised formats as regards the risk profiles, the claims profiles, then so that enables us to consolidate it at the group level and that's where we, as I said, when we start to do the slicing and dicing part of that exercise (Organization 2, Interview)
	Risk Protectors: Protection	**Risk-Jugglers: Mix**	**Risk Optimizers: Efficiency**
Constructing controllability	We don't mind to pay more to get a reinsurance backup (Organization 30, Interview) It's generally for protection, a number of, there are several lines where the risks aren't that big but because of the volume we're concerned about accumulation, so it's really mainly for protection for this unknown accumulation. And yes, there is that element of evening out the risks, cutting the volatility, and also increasing the capacity, being able to write big chunks of business in the market. (Organization 34, Interview),	At one level it's about economic value added: trying to create economic value by ceding risk for less than the cost of holding it **[efficiency]**...However, what we [also] endeavour to do, is…focus on relatively small parts of our portfolio in terms of performance. When I say relatively, you know, we're a $[X]0 billion company, our CEO would be interested in a $100 million portfolio and expect it to perform. So one of the ways in which we can ensure that happens , is by reinsuring perhaps more heavily than a typical $[x]0 billion company **[protection]** (Organization 9, Interview)	When you look at the group picture you could just see underwriters buying huge amounts of unnecessary cover. (Organization 1, Interview) It (risk-transfer) is driven by the financial dep the level of which is much higher than the level of the insurance and volatility (Organization 2, Interview)

Table 3. Representative case studies of variation in Risk Jugglers

	Case 1: Organization 7	Case 2: Organization 15	Case 3: Organization 23
Constructing the risk object	**Emphasis on distant/abstract; but also incorporates proximity/tangibility:** *Example - distant & tangible:* we just want the basic level of information and that allows us to parameterise our group risk profile as we build it up. So if you have all the casualty lines, all the first party lines together and actually build up a probably more informed view of what a loss to the group would be from a, I don't know, a massive train crash in North America, and we can actually create links and lines between the various global enterprises that may be exposed to it, for example, or an Aussie quake, for example, would be another one (interview)	**Mix of abstract/tangible and distant/proximate** *Example - abstract & tangible:* In the meeting with reinsurers Paul outlines the quality of the data with points including; with the following outlined on the slide: 1) 99% of premium data is now modelled (up from 90% and it's this last 9-10% that's the hardest to get to; 1% almost); 2) 83% of data set is now at street or individual building level; 3) 31% of portfolio is post 1995 construction; 4) 28% of portfolio has masonry or better construction; 5) 65% of portfolio is single family dwellings (Organization fieldnote) *Example - abstract & tangible:* we bought a whole raft of risk excess reinsurances where, you know, we might have fine art, you might have household, you might have major property […] each one of them, we had it all modelled and we got a third party [broker] to look at it as well each one of them independently made good and sound sense (Interview)	**Emphasis on proximate/tangible; but also incorporates distant/abstract:** *Example – mainly proximate & tangible:* The piece that we do in the US is we have some property business that's earthquake-focused. It's designed to cover really just earthquakes, mainly California but also elsewhere in the US. (interview) *Example – but also some distant and abstract:* Life is just easier if you can combine things, but typically it's not worked out. So we've got, depending on how you count things, let's say 10 to 12 various placements and, they'll cover an entire unit and you can write all across the country but it'll typically match with each underwriting unit. (Interview)
Constructing the controllability of the risk object	**Primary emphasis on Efficiency:** We know that reinsurance is one of the best capital management functions around for insurance companies and one of the challenges always is to manage it, to make sure that we utilise reinsurance when it's above our risk appetite and we do that at a corporate level (interview) **Additional emphasis on protection:** Our job is not to change the behaviour of the original underwriters and if you take [reinsurance] protection way from them, guess what? Behaviour changes…[reinsurance] gives them an enormous amount of comfort that they can actually deploy [for example] $10 million worth. (interview)	**Protection and Efficiency (balanced):** But it just made no sense because we bought probably about six or eight of these covers, so we dropped just a whole raft of it. So it sounds like it's a much more risky business because you're retaining more per risk, but we're saving so much on cost, we saved about 40 million bucks in that year. And the interesting thing, it was good protection for the individual areas but actually it made no real difference to our tail risk…But the key driver for the CEO and the Board, is that we've got to be able to move forward. Now all this risk excess had virtually no difference on our real big volatility.... without it we couldn't write the line sizes in some of the areas because we'd be too volatile, it's what reduced our volatility (Interview)	**Emphasis on protection; BUT efficiency also emphasized:** And to be taken seriously in that business you need to put out and offer limits of 25 million or more. So when you're dealing with that you, you can solve your issue with reinsurance, you know, if you're putting out a $25 million limit you can say that's, that's a little bit more volatility than I want and then I buy reinsurance to protect that […] So for us it's the old risk and reward I guess. What are we prepared to spend to protect ourselves? (Interview)

	Case 1: Organization 7 cont.	Case 2: Organization 15 cont.	Case 3: Organization 23 cont.
Centralizing	**Moderately low centralizing** Other type structures go to one extreme by saying we're going to assume absolutely everything [centrally] [...] So all the decision making […] all goes central and all that power's taken away. We're not doing that, we're saying we want to see everything so we can do a few things, so we can generate this overall view of global risk. But it's your business, it's you grinding at the coalface day to day (Interview)	**Moderate centralizing:** "After the World Trade Centre onwards, my toughest job was getting underwriters not to buy reinsurance […] Now no line of business can buy reinsurance… but if they [local entity-underwriter] want to protect their P&L, we'll let them buy it. So tactics as long as they [local entity-underwriter] are within the broad parameters [decided centrally] and within budget, can be decided in these units." (Interview)	**High centralizing:** "So it all comes through the central team that I'm in, yes, and we look after all the reinsurance"(Interview). "in the placement of the programmes […]at the Cat it's the CEO level." (Interview)
Model-ability	**(moderately) High modelling** "We have a very blunt view. We have that beautiful, you know, relationship between the modelled view of the world and the aggregate view of the world… So we run both in terms of we sort of set our own limitations on the amount of aggregate that we want to expose in any given scenario… we will be shot and sort of chased out the tree and set fire to, is if we end up sort of presenting a loss that is a magnitude greater than expected" (Interview) *Some reservations expressed*: "You cannot predict these severe weather events or severe geophysical events." (Interview)	**Moderate modelling** "This [Catastrophe] is commodity business and so it has to be run through a model to make decisions… I mean whatever you think about models, we've consistently used them and they have been embedded in everything we do in the business. And we do take them with a pinch of salt and, you know, we use a common sense approach as well, but we've had that embedded in our business for probably 10 years" (Interview)	**Low modelling** "We're never getting it right but that's the first thing you'd say, all models are wrong… They're consistently wrong (Interview). "We don't run any models internally…Mainly because to buy RMS, for example, the licenses are a huge amount of money." (Interview)
Diversification	**High diversifying** "So actually our cost of capital theoretically is less because we've got far more diversification credit. So it's unlikely that at the same time the motor portfolio would go wrong together with a Japanese quake, that would go with aviation." (Interview). If you assume independence from natural events that the more groups of portfolio you put together the lower your cost of capital charge…broadly you can see some form of diversification for, for portfolio spread.	**Moderate diversifying:** "We've got diversification on our book, we write so many diverse areas…but when we underwrite accounts in [Subsidiary 1] and [Subsidiary 2], that's protected separately" (Interview)	**Low diversifying:** Diversification only with a certain country: "Earthquake in Melbourne, a category seven in the western sphere. And when you put the numbers together you actually get actually diversification." (Interview) Interviewer: so for you guys there's no point in having a captive [holding company to capture diversification benefits]...Because actually you can't diversify enough anyway. Interviewee: That's correct." (Interview)

Table 4. Variation between organizations

		i. Risk Protectors	ii. Risk Optimizers	iii. Risk Jugglers
A. Constructing the risk object		Tangible/ Proximate	Abstract/ Distant	Mixed
B. Constructing controllability		Protection	Efficiency	Mixed
C. Organizational features	1. Centralizing	Low	High	Mixed (see table 3)
	2. Modelling	Low	High	
	3. Diversifying	Low	High	