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RISK CONCEPTION AND RISK MANAGEMENT IN CORPORATE INNOVATION: LESSONS FROM TWO SWEDISH CASES

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Risk is central to innovation, but in order to be theoretically interesting and of practical use, the relation between risk and innovation needs to be investigated in more specific situations. This paper explores the risk conceptions of innovators in two large corporations and identifies three themes that illuminate the relationship between risk and innovation in the corporate setting. The first relates risk to the issues of boundaries and control over parts of the innovation process; the second shows how risk is primarily related to innovation as process and not as output, and the third shows how a flexible view of business models can be used to manage risk in corporate innovation.

Keywords: Innovation; risk conception; risk management; innovation process.

Introduction

This paper elaborates the relationship between risk and innovation by exploring how conceptions of risk relate to innovative activities in two large corporations. All purposeful action is risky because it aims at an inherently uncertain future. Risk is thus a natural part of human life and evolutionary biologists have even suggested that an inclination for risk-taking has evolved as a fundamental characteristics of the human species, concluding that: "Making deals with uncertainty marks us as plainly as bipedalism" (Tiger, 1979: 35). On first thought, the notion of risk seems straightforwardly related to probabilities and hazard. A closer examination, however, reveals that the concept of risk receives much of its theoretical as well as practical meaning when related to more specific situations, goals and overarching priorities. This is evident not least in research on managerial risk, where risk conceptions have been shown to deviate substantially from the prescriptions of both classical decision theory and refined frameworks such as prospect theory (*cf*. Shapira, 1995).

If risk is a natural part of management, it is even more closely associated with innovation, which entails the pursuit of perceived opportunities under conditions of uncertainty. While the hypothesis that innovators and managers have different "risk-taking personalities" has long been rejected (*cf.* Brockhaus, 1980), there are more nuanced differences related to how innovators and managers think about and enact risk (Dutton and Jackson, 1987; Busenitz and Barney, 1997). Most research on the relationship between risk and innovation has focused on independent ventures (e.g., Sarasvathy *et al*., 1998; Berglund and Hellström, 2002), which constitute quite a different innovation milieu compared with the corporate setting (*cf*. Chesbrough and Rosenbloom, 2002). Consequently, we need more knowledge about risk conceptions and risk management options in the context of corporate innovation.

This paper addresses the issue in an explorative study that examines the risk conceptions of two units that are part of the innovation processes in radically different corporations. Both units are part of large Swedish multinationals. The first unit develops advanced service solutions in the telecom industry, and the second develops new technologies for nozzles and funnels in the aerospace industry. In both units, a cross-section of individuals with roles central to the innovation process were identified and interviewed in a group setting. By exploring and comparing what individuals in these units view as pressing risks to the development of new innovations, it is possible to gain some insights into the relationship between risk and innovation in the context of corporate innovation. The results show that what are seen as main risks differ between the two units. At the same time, a number of more general insights could be gleaned regarding boundaries and control over parts of the innovation process, attention to innovation *qua* process and output, and experimenting with "business models for innovation" as a risk management tool.

Elements of the Topic

Management and risk

Risk-taking has traditionally been defined as choice among alternative outcomes under conditions of probabilistic uncertainty. This definition comes from decision theory, where risk has been associated mainly with variation, i.e., including both positive and negative outcomes (Boyne, 2003). Over time, risk has become almost exclusively associated with negative outcomes, and today risk is commonly seen as "the possible loss of something of value" (Blomkvist, 1987: 89).

Managers also tend to associate risk with hazard, and studies show that they also deviate from classical decision theory in many other ways (Shapira, 1995; MacCrimmon and Wehrung, 1986). For instance, managers rely less on precise probability estimates than on cruder approximations. As a result, high-impact outcomes with

extremely low probability tend to be systematically ignored (Shapira, 1995). Some organisations such as nuclear power plants and air traffic control centres need to be mindful of low-probability events. These organisations have also developed a capacity to identify and manage potential risks at a very early stage, e.g., by not oversimplifying interpretations, deferring decision authority to local expertise, and encouraging improvisation as a means to contain and manage risk (Weick and Sutcliffe, 2001). Still, in most organisations, decisions are made by professional managers who focus on specific outcomes with expected amounts of risk but without factoring in their likelihoods.

Not only do managers focus on specific outcomes rather than comprehensive probability estimates; their risk propensities also depend on how the situation is perceived. It is well known that aspiration levels, which frame situations as either threats or opportunities, will affect people's willingness to take risks. In prospect theory, the aspiration level is typically the status quo (Kahneman and Tversky, 1979) whereas managerial risk conceptions are typically shaped by two socially determined aspiration levels, namely critical performance targets (e.g., break-even or budget constraints) and survival (e.g., Shapira, 1995). In practice, this means that managers who are doing well, i.e., are meeting performance targets, will avoid risks that may put them below the performance target. However, if they are underperforming, i.e., not meeting performance targets, managerial attention is instead focused on opportunities that can push them back above the performance target. This is true even if the potential downside of such opportunities is great. If such "high-risk opportunities" may jeopardise overall survival, the manager again becomes risk-averse, as survival becomes the relevant aspiration level (March and Shapira, 1987). Others instead argue that poor performance leads to increased risk aversion in the form of "threat rigidity" among managers (Staw *et al*., 1981). On this account, the anxiety and stress that may accompany poor performance will affect the manager's ability to generate action alternatives and in some cases paralyse action altogether. Still others have shown how past success can induce rigidity and limit the ability to envision alternatives (Christensen, 1997).

On a more general note, managers believe themselves to be more skilful risk-takers than others, and that they can manipulate risky odds (MacCrimmon and Wehrung, 1986). This belief, of course, also goes against classical decision theory, where risk is seen in the context of given probabilities rather than ongoing social action. Managers have been shown to undertake risky actions when the perceived control over outcomes is high (Forlani, 2002). Managers thus take high risks with the explicit expectation that they will be able to renegotiate relevant conditions after the fact. To this end, a range of tactics are employed, such as sharing risk with others and delaying or delegating decisions (MacCrimmon and Wehrung, 1986).

Since (successful) risk-taking is seen as a desirable trait, managers also tend to reinterpret events after the fact, e.g., inflating the perceived riskiness of their own successful initiatives (March and Shapira, 1987).

The relationship between risk and innovation

The relationship between innovation and risk is a matter of some debate. Economists like Schumpeter (1934) and Kirzner (1973) conceptually distinguish between entrepreneurs and capitalists, and do not see risk-taking as an important issue in innovation. Still they agree with Knight (1971) that innovation is risky in the sense that innovative actions aimed at the future always confront uncertainty. In reality, acting under conditions of uncertainty always entails more or less tangible risks, as the innovator stands to gain or lose things like waged capital, corporate promotion, social standing, or self-esteem (*cf.* Brockhaus, 1980; MacCrimmon and Wehrung, 1986).[1] How risk is conceived will thus influence what innovative actions are taken.

In research on independent entrepreneurship, the trend is to investigate individuals *qua* risk-takers, in terms of how they construct relevant problem spaces (Sarasvathy *et al*., 1998) and what strategies they use to enact the risks they perceive (Berglund and Hellström, 2002). Independent entrepreneurs typically want to be in control and often use personal values when framing the riskiness of a situation (Sarasvathy *et al*., 1998). This is in line with the important role that aspiration levels and risk-manipulation tactics play in managerial risk-taking. Compared to independent ventures, large corporations are more rigid and tend to develop organisational routines or industry-wide "recipes" as a way to reduce complexity and manage risk (Spender, 1989). As a result, the problem space in corporate innovation is less personal, since the innovation process takes place within established structures and cognitive frameworks (Chesbrough and Rosenbloom, 2002). To set the stage for the present investigation, a generic perspective on the corporate innovation process is described.

The innovation process

Innovation has traditionally been taken to mean both the final event, i.e., novel ideas, practices or artefacts, and the processes through which these are developed (Ghoshal and Bartlett, 1987). This study explores the risk conceptions of corporate innovators, especially as distinct from independent entrepreneurs. Therefore, the

[1] Knight, of course, saw risk-taking as essential to innovation, but also Schumpeter and Kirzner acknowledged that real-life entrepreneurship often entails financial and other forms of risk.

corporate innovation process is introduced as the relevant context in which such risks are conceived.

Traditionally, the innovation process has been seen as linear, comprising distinct phases such as basic research, applied research, product development, production, marketing and diffusion. This model is often criticised for being overly simplistic and deterministic. As a result, more complex models have been proposed that emphasise causal feedback loops between stages, downplay the role of basic science and highlight interaction with external actors (e.g., Kline and Rosenberg, 1986). Both the linear and more complex models tend to retain a focus on the kinds of functional elements described above. This makes them pertinent frameworks for policy and strategic innovation management, but may also limit their usefulness for the present purpose since, it is argued, they do not represent a phenomenologically relevant image of the innovation process as held by corporate innovators. Instead, the corporate innovation process may be conceptualised as renewal and change within a rudimentary development chain comprising inputs, internal transformation, distribution and consumption (see Fig. 1). The argument is that corporate innovators will regard these generic elements and relationships as relevant components of the corporate innovation process.

This means that the innovation risks perceived by corporate innovators should be related to identifying and managing suppliers, partners and other sources of inputs, risks inherent in the relevant internal transformation processes, risks of delivery and distribution, and finally consumption risks regarding, e.g., output markets and ways to package the offer. One may also expect perceived risks to focus on the interfaces between these general areas, including the negative effects that suppliers of inputs and distribution systems may have on the internal transformation process.

This recalls the rich literature on barriers to innovation (Bond and Houston, 2003) and especially boundary spanning as a means to overcome these (Aldrich and Herker, 1977). Research on rigidly defined barriers and determinants of innovation have met with limited success (*cf.* Fiol, 1996). Many have also noted that the main barriers to innovation are to be found in the "thought worlds" and perceptions that guide innovative actions (Dougherty, 1992; Storey, 2000). In keeping with this

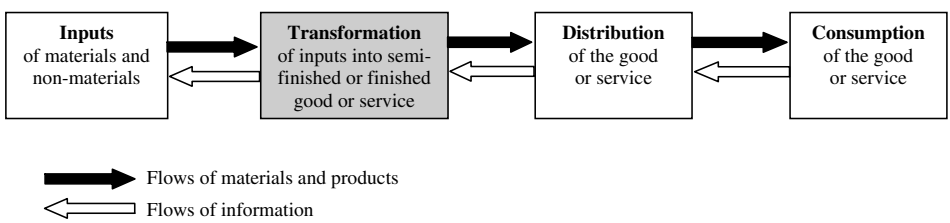

Fig. 1. The production chain (*cf.* Dicken, 2003).

insight, the present investigation explicitly explores how risk conceptions relate to innovative activities in the corporate setting. An important purpose of the investigation is also to test whether the generic innovation process described above is useful as a framework for theorising about risk conceptions in corporate innovation. Given the empirical results, it may provide relevant focal points for strategic management of corporate innovation risk.

Method

As mentioned, corporations in the same field tend to develop shared "industry recipes" which are used to interpret the general situation (Spender, 1989). Such tendencies can also affect how managers in an industry perceive risk specifically (Pablo, 1999). However, there is also evidence that the risk conceptions of independent entrepreneurs, regardless of industry, are quite homogeneous when compared to other professionals such as bankers (Sarasvathy *et al*., 1998). So while there may be important differences on the industry level, these were not specifically considered in this study. Instead, the main purpose was to explore whether and how corporate innovators, regardless of industry, conceive risk and how this may affect innovative activities. To make sure that the findings did not merely reflect industry differences, two units were selected from quite different industries. The samples were thus selected using a form of maximum variation strategy (Miles and Huberman, 1994) that sought to identify central similarities in the general population of corporate innovators, while minimising the risk of highlighting specific sub-group variations. The units selected differ dramatically in terms of the work performed, while sharing a need to develop innovative products and services. Both units are part of larger corporate innovation processes that include other parts of the parent organisation as well as external partners. The Service Development Unit (SDU) is part of TeliaSonera, an old state monopoly that is now active on the deregulated Swedish telecommunications market. The unit develops telecommunications packages that include product and service which are sold to operators and service providers. While the unit has some technical staff, most employees do not have a technical background. The Technology Development Unit (TDU), a part of Volvo Corporation, is active in the aerospace industry, which is characterised by very high technological sophistication. The unit develops new technologies and products, e.g., nozzles and funnels, in the aerospace industry. Many employees are MScs and PhDs and the groups' technology development work is often leading-edge.

At both units, a cross-section of individuals with roles central to the innovation process was identified through discussions between the researchers and representatives of the respective organisations. As a group, the six people from the TDU and five from the SDU covered all important aspects of their respective

departments' innovative activities. The participants were asked to participate in a form of focus group interviews (Krueger and Casey, 2000) that combined the strengths of individual responses with the advantages of group discussions. These group interviews lasted half a day each and were conducted in seminar rooms at the two corporations. First the general topic, i.e., risk and innovation, was very briefly introduced and the theme question for the exercise was established as: "What are the major risks/threats hindering us from achieving our innovation objectives?" Thereafter all participants, individually and without communicating with each other, reflected on the theme question and wrote brief descriptions of a number of risks on separate post-it notes. This part of the exercise lasted about 30 min. The participants were encouraged to take their time and to include anything that came to their minds. At both locations, the participants asked if they could also write down opportunities for improvement, which all participants were encouraged to do. The participants then proceeded to jointly, as a group, discuss and merge the individual accounts. During this stage, all the post-it notes were placed on a white board so that the participants could see and rearrange each other's notes into a set of thematic categories. These categories were then discussed and reflected upon for as long as needed. During the discussion, the categories were allowed to change, merge and split up, so that the end result represented a negotiated common understanding of each category. When the categories had been established, the participants proceeded to grade them. Each participant was given an equal number of points to assign, and was then encouraged to grade the categories freely. The numbers in the results section indicate the weighting assigned by the participants on a scale of 1–10. During the process, the researcher stayed in the background to minimize influence.

Results

The results of the two group interviews are presented separately below. For each unit, the different categories are based on the individual risks and additional insights that emerged during the categorisation procedure and subsequent group discussions. The headings were similarly assigned by the participants themselves (Table 1).

The service development unit (SDU)

Quality assurances (10)

There seems to be a chasm between the selling and delivery of services. This affects the cooperation between sales, specific project teams and the SDU. Two specific aspects were brought out: the lack of focused and coordinated discussions of new contracts, and a lack of documentation and knowledge-sharing regarding customers' existing solutions. The main consequence is slower implementation processes. It

Table 1. Risk/innovation categories from the two units.

The Service Development Unit	The Technology Development Unit
Quality assurances (10)	Overall economic conditions (10)
Customer relations management (8)	General attitudes toward new ideas (9)
Relations to partners (7)	Processes and method (9)
Dated support systems (5)	Quality structures (9)
Organisational efficiency (4)	Working environment and competence development (8)
Customer contracts (3)	Generally expensive industry (5)
Human capital risk (1)	External relations (3)
Business culture (1)	Business model and vision (1)
Development (1)	

was suggested that this problem could be remedied by increased inter-group communications and more clearly defined roles and responsibilities within the parent group.

Customer relations (8)

A rather specific risk concerns customer relations. It is difficult to explain to customers why customised service solutions command a relatively high price. The perceived solution is either that the services must become more standardised, or that customers must be taught to appreciate the actual costs. If not, the complexity of the product, in combination with a high level of customisation, makes for unreasonable customer demands. A related risk was that customers may go bankrupt, and the question was raised of how to monitor customers' solvency.

Relations to partners (7)

Partners and suppliers do not always manage to deliver as agreed. Some of them are expensive or do not deliver in time, and some sub-systems suppliers have shown poor ability to solve complex problems. There are also problems with the supply of spare parts, as well as general quality issues. A clearer contractual situation and a more extensive use of supplier reassurances were suggested as ways to address the problem.

Dated support systems (5)

The support systems in use are out of date. The existing systems are designed for the routine work of yesteryear, when the parent group was in a monopoly position. More flexible systems would include, e.g., updated information regarding existing

customers' present equipment, their solvency and information about previous deliveries. This would allow more informed customer relations and generate trust on the part of customers.

Organisational efficiency (4)

The parent organisation is not efficiently designed for customer-oriented project work. This is partly due to an economic model which encourages internal competition and local optimisation — a problem that is present both in the SDU unit and between the SDU and other parts of the parent organisation. Another problem is that the SDU is very customer-oriented, whereas the parent organisation historically has worked with large standardised products and services. Customer-oriented thinking has very limited support in the parent organisation generally. The members of the SDU feel constrained by the many interfaces with the parent.

Customer contracts (3)

The complexity of many large service solutions has the company's sales people entering into poorly designed customer contracts with unclear specifications. This affects the profitability of specific projects because the prices are too low. It also influences customer relations because of time overruns.

Human capital risk (1)

There is an ever-present risk of losing key people, especially technically skilled personnel. Another issue is to continuously monitor and maintain a competence base that matches technological developments. There is a risk that certain projects are neglected because certain skills are lacking. The risk that senior people will retire and take with them key insights was also mentioned.

Business culture (1)

In the SDU, there are still traces of a mentality or business culture that stems from the parent organisation's history as a state monopoly. This mentality does not fit well with the new business logic of dynamic and customised solutions.

Development (1)

There is a risk that the unit will not develop new services which keep up with technological progress and customer demands. The reason is that some interesting development projects are not carried through.

The technology development unit (TDU)

Overall economic conditions (10)

The economic situation was regarded by the majority of participants as the most pressing issue. There is a general sense that parent organisation has placed too severe financial demands on the unit. As a result, the unit does not have not enough "play money" and there is a sense that good ideas are almost never given the financial support needed. Many promising ideas are held back because new initiatives must be financially justified at very early stages. These conditions have led to a biased development of ideas, since projects are consciously planned with financial calculations in mind.

Attitudes toward new ideas (9)

Besides the formal fiscal constraints, there is, within the unit, too little actual experience of taking an interesting idea to a finished product or saleable technology. This has led to a general attitude where new ideas are easily criticised because focus is on early validation of the end product. In combination with the thoughts of upcoming demands and costs associated with formal verification procedures, it has the consequence that fairly conventional ideas tend to be selected for development. A remedy could be to work more closely with technologically sophisticated customers who appreciate new ideas.

Processes and methods (9)

Formal processes were regarded both as a threat to novel business development and as constituting a potential area of improvement. Opportunities for improvement were associated with the existing processes of project verification. The participants prided themselves on having a well-functioning and efficient process once key project parameters had been established. The threat concerned the establishment of those very parameters. In some ways, the existing process was too rigid and the group wanted procedures for early conceptual analysis that was more sensitive to novel ideas. An issue that was mentioned as both a risk and an opportunity was more detailed work-monitoring.

Quality structures (9)

This category is related to the above, but here the focus is specifically on the lack of a structured process for developing, evaluating and choosing among projects at an early stage. Especially pressing is the need for structures that outline how new ideas should be managed and evaluated. The fact that such processes are not in place is

explained by a general lack of support for early-phase development, as well as a historical lack of such development work. One suggestion was that good ideas be "shelved" until money or more feasible applications exist. Another suggestion was to examine ways of "marketing" ideas to different customers without losing them. As a general reflection, it was noted that "small" ideas often tend to spin off into bigger ones.

Working environment and competence development (8)

The unit is rather small, which means that it is vulnerable to personnel losses. There is a general sense of being understaffed, which in turn increases the stress level and stifles creativity. On the other hand, the competence level is high and people are committed, which leads to stimulating informal discussions about new ideas.

Expensive industry (5)

The industry in which the unit is active uses very sophisticated technology, and this makes it very expensive. Industry turnover on a global level cannot match existing development costs.

External relations (3)

Many participants mentioned that the unit has too little contact with the world outside. Conferences, corporate visits, and better access to market information were mentioned as potential sources of new ideas and as a way to validate existing ones. Better knowledge of production technologies was seen as important, as was the possibility of cooperating with the parent organisation's marketing department.

Business model and vision (1)

The unit's business model and general vision are both too unclear and too constraining when it comes to creating clear goals and priorities for idea development and commercialisation. This relates to the previous category in that some employees do not always know how to handle an idea which is on the border of the unit's work area. Since ideas that are in the periphery are not prioritised, many good ideas are neglected, when they might be transferred to other units within the organisation.

Discussion

The purpose of this paper was to elaborate the relationship between risk and innovation by exploring how conceptions of risk are connected with innovative activities

in two large corporations. The results indicate clear differences in what are seen as the main risk issues in the two units. In the TDU, economic constraints were viewed as the most pressing risk factor. Strict financial demands in combination with organisational history, have led to a general mind-set that prioritises financially safe bets, and also limits the room for creative idea generation by focusing on pre-project risk analyses (Staw *et al*., 1981). As a result, specific support systems and routines have been designed to manage long-term projects with clear end-goals. The dominant issue in the SDU was instead a lack of communication. The service solutions developed by the SDU crucially depend on coordinated efforts between actors internally in the unit, with other parts of the parent organisation, and with external stakeholders and customers. Communication is hampered by the old monopoly culture as well as destructive incentive systems. The main risks were consequently related to interfaces between units, and to the management of relevant knowledge and information. These differences are not surprising, given that the units represent highly different industries (Pablo, 1999). Despite these and other quite specific differences between the units, a number of common themes could be discerned on a more general level of analysis. Three such themes in particular stand out: the issue of boundaries and control over parts of the innovation process, how risk is primarily related to innovation as process and not as output, and how a flexible view of business models can be used to manage risk in corporate innovation. In what follows, these themes are used to expand on the relationship between risk and corporate innovation.

Boundaries and control

As hypothesised, the functions used in traditional innovation models (e.g., Kline and Rosenberg, 1986) did not figure very prominently in the reported risk conceptions. Instead, most of the categories could be mapped onto the generic process described in Fig. 1. Besides internal processes of innovation and transformation, most of the risks as well as proposed opportunities for improvement concerned relationships between the two units and distribution systems, suppliers of information and materials, and even consumers. However, the units differed markedly in how they viewed boundary-spanning activities. In the TDU, external contacts were almost exclusively discussed as something positive and as constituting opportunities for improvement. Collaborations with other parts of the parent organisation and with external entities were not only seen as sources of novel ideas, but also as potential ways of sharing ideas with others. This positive view of external relationships may be related to the unit's high technical competence in combination with a historical focus on technology development rather than business creation. The TDU often feels comfortable and in control of its relationships, probably because of its high

technological expertise (*cf.* Forlani, 2002). In the SDU, on the other hand, external relationships were almost exclusively mentioned as sources of problems — with suppliers who did not deliver, partners who did not communicate, and customers who did not understand and sometimes could not pay. The SDU people did not perceive themselves to be autonomous and in control. Instead they often felt that the specific conditions of their many relations were controlled by others, thus turning relationships into externally imposed constraints that had to be managed.

Despite the differences in attitude and specific content, it is interesting to note that "boundary management", with respect to the innovation process, was a key area of attention in both units. Boundary management has a long history (Aldrich and Herker, 1977) but, contrary to much of the literature, the findings indicate that the self-image and the way boundaries are conceived — rather than how and by whom they are crossed — may be central to the management of innovation (*cf.* Storey, 2000). Since willingness to engage in uncertain projects relates to perceived control over decisions and outcomes (Forlani, 2002), it may be a good idea to manage organisational boundaries with the goal of assuring that suitable levels of influence and control are aligned with more overarching innovative ambitions (Weick and Sutcliffe, 2001). Changes in how innovative work is organised should therefore also consider the potential effects of perceived control and autonomy, and on what are perceived as legitimate ways to exploit new ideas (Chesbrough and Rosenbloom, 2002). More on this shortly.

Innovation as process or output

The topics of allocation of attention and making relevant priorities can also be lifted to a somewhat higher level of analysis. Innovation has traditionally been related to both outcomes and processes (Ghoshal and Bartlett, 1987). Consequently, innovation risk can be broadly divided into risks to, or inherent in, specific innovation processes — or risks to the production of innovative ideas and products *per se*. These are, of course, often connected, but the results indicate that the connections can take different forms. In the SDU, the concept of risk was closely associated with quality controls and guarantees which explicitly concerned the management of existing processes and relationships. The problems with suppliers and partners were, for instance, addressed in terms of getting insurances and improving contracts. Customer complaints were primarily met with persuasion. In the TDU, discussions also focused on existing processes and quality structures. Many of the categories show how the notion of quality was related to having well-defined development processes, and risks typically concerned the problems and limitations of existing procedures. However, this focus was also complemented by a number of suggestions for innovative outputs and idea management, e.g., shelving interesting ideas and

finding ways of including external actors in the idea development process. Such initiatives point to a more output-oriented view of innovation that assigns process issues a subordinate role.

While efficient processes should not be neglected, an extensive emphasis on quality *qua* efficient processes may take focus away from what should always be the overarching goal, namely developing novel ideas and products. Hence, notions like quality and risk should be conceptualised in a way that explicitly focuses on threats to the development of novel outputs. Stated differently, an overemphasis on innovation *qua* process may increase the risk that opportunities outside the present focus may be missed (Forlani, 2002). By shifting attention from existing processes and priorities to a broader interpretation of "innovation risk", the realm of potential action alternatives will widen to include experimentation with new forms of collaboration and idea management (March and Shapira, 1987). Building upon the previous discussion about boundaries, control and the relationships to external actors, such a switch in focus suggests that managerial attention should focus on flexible organising for innovative outputs, rather than on managing existing processes and support systems.

Flexible business models

In both units, the innovation process was hampered by unclear and sometimes constraining business models, as well as organisational cultures that did not encourage creativity. One way of changing this situation, which brings together both the previous topics, is to encourage business model experimentation (Chesbrough and Rosenbloom, 2002), in the sense of loosening up the innovation process to align it with the overall goal of producing innovative outputs. Such experimentation involves real freedom to network and take swift action, as well as cognitive issues of expanding the perceived "risk problem space" in a way that broadens the scope of available opportunities for action (Sarasvathy *et al*., 1998). The TDU, for instance, saw a lot of potential in external collaborations, not least when it came to developing new ideas during early phases. One way of enhancing the TDU's capacity to innovate may therefore be to create new project forms in which interesting ideas are developed with external collaborators. Another idea would be to maintain a portfolio of interesting new ideas, and to continuously evaluate and match these against the units' external and internal partners. As opposed to the current system, which tends to kill ideas early on, project decisions should be based on options reasoning that appreciates the potential for learning, and considers possible upside value as well as net present value (McGrath, 1999). A number of successful experiments may also set a precedent and influence the conception of risks and opportunities throughout the organisation (Dutton and Jackson, 1987).

The SDU is also held back by its existing business model. Inefficient incentive systems, support structures, and interfaces with partners and customers limit the unit's agility. Since the SDU often works intimately with other units as part of large collaborative efforts, flexibility is naturally constrained. Still, a changed conceptualisation of the unit's overall task, including the purpose of the greater innovation process (Dicken, 2003), may allow its members to view conflicts as resolution arenas, and risks as cues for improvement (Weick and Sutcliffe, 2001). It has been argued that it may be more efficient to change risk-attention patterns than to address individual risk preferences, when trying to influence managerial risk-taking (*cf.* March and Shapira, 1987). In the context of corporate innovation, such a shift in attention would entail a redefinition of what the relevant priorities are, as well as encouraging the kinds of organisational experimentation needed to achieve them.

Summary

Risk is a major issue in all human action, not least in innovation work. By exploring the risk conceptions of two groups of corporate innovators, the relationship between risk and innovation has been elaborated in terms of how such risks are perceived and what implications this has for management of corporate innovation. The two units come from radically different industries and also differ in terms of corporate history and the work performed. Still, while the specific risks perceived diverged substantially, a number of more general themes could be discerned.

First, organisational risks were perceived mainly in relation to internal processes and relations with suppliers, partners and customers. This confirmed the working hypothesis that the generic innovation process described (see Fig. 1) provides a useful framework for theorising about risk conceptions in corporate innovation. Furthermore, the view of external relationships seemed to relate to perceived control over organisational boundaries and relationships, with the SDU seeing mainly threats and the TDU emphasising potential for improvement in external relations.

Second, there was a tendency to discuss both innovation risks and the concept of quality in relation to processes instead of outputs. While processes are important, it is imperative that the main focus is kept on innovative outputs, and that processes are designed with this overarching goal in mind.

Finally, these two themes were brought together in a discussion of how corporate innovation may benefit from a measure of interpretive and practical flexibility vis-à-vis business models. This can take the form of encouraging small-scale development projects with key customers, or encouraging gradual improvements of the greater innovation process to which a specific unit belongs. By encouraging such flexibility, what are seen as innovation risks and feasible opportunities are broadened in ways that should benefit organisational innovativeness.

This investigation has examined the risk conceptions of two radically different organisations in order to elaborate the link between risk and corporate innovation. Given the small sample size, the results are not generalisable in a statistical sense. Still, such information-rich cases do promote general theoretical discussions of the kind conducted here (Yin, 1994). To refine the results and thereby increase their robustness would require that more studies are made and that findings are systematically compared with each other. The present contribution should therefore be seen as a potential basis for further theorising and empirical testing of the relationship between risk and innovation in the corporate setting.

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