Enterprise-wide risk management and organizational fit: a comparative study

Michela Arnaboldi

Dipartimento di Ingegneria Gestionale, Politecnico di Milano

MILAN, ITALY

Irvine Lapsley

IPSAR, University of Edinburgh Business School

EDINBURGH, UK

Corresponding author:

Michela Arnaboldi, Email: michela.arnaboldi@polimi.it

1. Introduction

Enterprise Risk Management (ERM) may be considered the culmination of the risk management explosion (Power, 2007) which started during the 1990s. ERM is intended to be a holistic approach for assessing and evaluating the risks that an organisation faces (COSO, 2004). Interest in ERM has grown rapidly in the past fifteen years and after recent financial scandals there has been further pressure, from various parties, to adopt and embed ERM in business processes. In the UK, the publication and the review of the Turnbull Report signalled a close coupling between internal control and risk management, and made ERM a central focus of corporate governance.

ERM is most frequently defined with reference to the 2004 Guidance document published by the Committee of Sponsoring Organizations of the Treadway Commission (COSO), which states:

> "Enterprise risk management is a process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risks to be within its risk appetite, to provide reasonable assurance regarding the achievement of the entity's objectives" (COSO, 2004).

The COSO definition and guidance document depict ERM in a managerial and prospective light (Burton, 2008), claiming it benefits corporate objective-setting, decision making and management control. According to the COSO (2004) framework, ERM is a clear and rational approach made up of eight components, each of them carefully described in the guidance, setting out what should be done to develop a sound ERM.

Notwithstanding the rational and normative approach of COSO (2004), the transition of risk management from a narrow, technical focus (Jaafari & Manivong, 1999; Kalu, 1999; Jaafari, 2001; Aseeri & Bagajewicz, 2004; Barbaro & Bagajewicz, 2004; Pongsakdi et al., 2006; Verbeeten, 2006) to the strategic sphere has turned ERM into a fluid and poorly defined instrument. Highlights this fluidity by defining four types of risk management that can be combined to form different ERM paradigms. Thus, ERM can be different things in different organizations, or even within the same organization at different times (Arena & Arnaboldi, 2011; Arena et al., 2010; Mikes, 2005). That said, ERM approaches do have the common trait of aiming to provide an overarching and prospective approach to managing risks. In this light, ERM becomes a company-wide control process that is allocated personnel and infrastructures, and which is shaped by internal and external dimensions. Both Mikes (2005; 2009) and Power (2007) highlight these influences, pointing out how ERM can be differentiated both in its technocratic attributes and in its organisational elements.

The present work contributes to this debate by exploring not only the nature of ERM but also its impact on managerial processes. We analyze this question by looking at budgeting, a central managerial and control process that is particularly interesting on various levels. First, the relation between risk and budgets is not new, and budgeting can itself be considered a form of risk management. Since the 1950s, both researchers and practitioners have conceded the need to consider risk in planning, and sought better models for dealing with uncertainty (see, for instance, Aseeri & Bagajewicz, 2004; Collier & Berry, 2002; Kalu, 1999; Greer, 1954; Lewis, 1952). Such attempts were given new impetus by the escalation of interest in risk management, with some authors claiming the need to exploit synergies between risk management and planning processes (Beasley & Frigo, 2007; McWhorter, Matherly & Frizzell, 2007; Beasley, Chen, Nunez, & Wright, 2006; White, 2004); proposing new integrated tools such as the risk scorecard (Scholey, 2007; Calandro & Lane, 2006) and key risk indicators (Lam, 2006; Scandizzo, 2005); and setting out regulatory guidelines for integration (Chesley & Gormly, 2007). Budgeting is also interesting by virtue of its organizational relevance, since it is an enterprise-wide activity carried out by nearly every organization which involves management at all levels (Hansen, Otley & Van der Stede, 2003; Merchant & Van der Stede, 2003; Anthony & Govindarajan, 1998).

In this paper we adopt a socio-organizational perspective to examine in detail the effects of ERM on budgeting as a situated practice (Chua, 2007), looking at the cases of three companies in the UK that implemented enterprise-wide risk management approaches. During the multiple case study we gathered official documents, were given access to archival data and internal confidential documents (budgets, risk maps, senior management reports), and formally interviewed 19 managers from the three organizations.

To present our results the paper is organized as follows: section 2 reviews literature on ERM and its organizational fit, with a specific focus on budgeting; section 3 illustrates the methodology adopted; section 4 is devoted to the findings; section 5 provides concluding remarks.

2. Enterprise-wide Risk Management and managerial processes

Recent years have seen an explosion of interest in risk management (Power, 2007; 2004; Smith and Tombs, 2000), which has moved from peripheral functional areas of the organization to the corporate level. Publications, corporate websites and official reports often contain specific sections devoted to how organizations manage their risks. A wide array of risks are considered, including financial exposure, information system interruptions, fraud, raw material price rises, client bankruptcies, regulatory changes, and failure to understand customers' needs. The rise of risk management, which started in the mid 1990s, can be attributed to a number of factors. One, from a rational-economic perspective, is the change in the external and internal competitive environment, with a tendency toward greater turbulence and complexity (Chapman & Ward, 2003; Giddens, 2003; Rahman & Kumaraswamy, 2002; Crouhy, Galai & Mark, 2001; Floricel & Miller, 2001; Miller, 1998; Rasmussen, 1997). A second cause of the upsurge of risk management that did instead coincide with that time was a series of major financial and business scandals, in particular those that occurred during the 1980s and the beginning of the 1990s, such as Mirror Group Newspapers, Barings Bank, Polly Peck, Maxwell and Guinness. These events starkly demonstrated not only that companies can fail, but that the consequences of such failures can affect a huge number of actors: banks, consulting firms, managers, shareholders, bond holders, citizens and government authorities. Governments and financial control bodies responded to the situation by issuing new codes of practice and regulations. The first was the Cadbury Committee report, published in 1992 in the UK (the Cadbury Code), were self-regulatory approach remained core (Smith and Tombs, 1995), arriving to the promulgation of the Sarbanes-Oxley Act (SOX). SOX further reinforced the need for risk-based internal controls, creating a sense of urgency among firms to legitimize themselves through risk based approaches, which became “an all-pervasive organizational, legal and regulatory principle” (Power, 2004).

All the regulations cited above framed risk management as a corporate governance requirement, implying a relation with internal control (see, for instance, Fraser & Henry, 2007; Spira & Page, 2003) and a broadening of the scope for detecting risk. With this shift, the concept of risk became broader and more systemic (Power, 2007), covering a wide array of events that might affect the attainment of corporate objectives. This emergent, all-encompassing approach was formalized in 2004 by the Committee of Sponsoring Organisations of the Treadway Commission (COSO), which issued a “definitive guidance” for building effective Enterprise Risk Management - ERM (COSO, 2004). COSO (2004) envisions a role for ERM in supporting managers at all levels of decision making and planning, and also provides a precise guide for its design and implementation. ERM is represented as a three-dimensional matrix of eight elements deemed essential for achieving strategic, operational, reporting and compliance goals.

Notwithstanding the COSO recommendations, the ERM label is applied to many different approaches (Mikes, 2005; Power, 2007), raising the question of what ERM is in practice. Mikes (2005) highlights this variability with the cases of two financial institutions that have very different company-wide paradigms: Value-based ERM and Strategic ERM. Value-based ERM focuses on “uniting and controlling risks and return objectives within a common framework” (Mikes, 2005, p.

30). Under this paradigm, quantifiable risks predominate and risk practices are shaped by the shareholder value imperative (Mikes, 2005). Strategic ERM is instead closely tied to the need to control risks within a “common framework because the organizational actors who take risks are different from those who try to minimize them” (Mikes, 2005, p. 30). Here both quantitative and qualitative measures are used, and the role of Chief Risk Officer emerges as a possible orchestrating figure.

However the work of Mikes focuses on the types of ERM and their possible evolution, without looking at how ERM actually impacts on managerial processes. A first study in this direction is the study by Arena et al. (2010), where the authors showed one case in which ERM was coupled with budgeting. Yet the focus was still on ERM and its variations and not on the impact on budgeting or managerial processes. This issue still remains largely unexplored, leaving open the possibility that firms introduce ERM merely as a compliance device–an eventuality borne out by a PricewaterhouseCoopers survey (2004) in which CEOs said they viewed ERM as an external accountability device that does not impact on managers’ decisions and operations. Yet practitioners (for example Stowe & Jeffery, 2008; Aquila, 2006) and even rating firms continue to make claims for a potentially wider role of ERM. Recently, Standard & Poor announced they would expand their ratings analysis of non-financial corporations to include a review of enterprise risk management (ERM) (Standard & Poor, 2008).

In this paper we build upon the previous contributions of researchers and practitioners by exploring not only the effective nature of ERM in three non-financial companies, but also by analyzing its impact on managerial processes. In particular we focus on budgeting by considering it, along with ERM, as a fluid element of control for managing uncertainty.

3. Research methodology

The research was carried out with a case study approach. This approach was chosen to gain a deeper understanding of the actual impact of ERM on budgeting, but also to capture the nature of ERM within each of the organizations and the factors shaping its achievements Adoption of a case study approach is also consistent with claims made for this type of investigation (Chua, 2007; Robson, Humphrey, Khalifa & Jones, 2007), and with studies on implementation and integration (Chenhall & Euske, 2007; Curtis & Turley, 2007; Dechow & Mouritsen, 2005). Three UK companies have been chosen for this analysis; the choice was made starting from secondary sources (documents such as company reports and also risk management associations and management accounting bodies) to include cases relevant for analyzing the implementation of ERM and its relationship with budgetary control. Finally, our three case studies were selected to cover different industries, company sizes and levels of risk, also taking into account the willingness of the firms to grant wide access to the researchers and disclose confidential information. The table below shows the main descriptive parameters of the three selected organizations. For reasons of confidentiality, we have used three pseudonyms (Telco, Utility, System) instead of the companies' real names.

Information was gathered from a wide variety of sources: companies' published reports, internal documents; archival data; and newspapers for statements by top management and other public coverage of the companies. Yet the most important source of data was face to face interviews. We formally interviewed 19 managers, carrying out interviews each lasting an average of two hours. We were not allowed to register the interview with the Risk Manager in UK-SYSTEMS, to respect the non disclosure by the informants' interviewees.

	Employees	**Industry**	**Interviews**
TELCO	More than 10,000	Telecommunications	7
UTILITY	Between 5,000 and 10,000	Utility	6
SYSTEMS	Less than 5,000	Systems, Electronics and Control	6

Table 1 – cases studies

Although details are not provided to guarantees anonymity, some information on the company setting is useful to introduce results. TELCO is a multinational company operating in the telecommunication sector; it is an established company which suffered in the last decade the entry in the market of new operators, which based their success on flexibility and innovation. Market risks are for this company central and they are linked to customers' choices, competitors and regulatory setting. UTILITY is a national provider part of a wider international group. They operate in regulated sector where however there is competition between several providers. Although the sector is considered no highly turbulent, commodity and operational risks are significant for this company. Finally SYSTEM is company mainly operating by project with a multi-year duration and significant value. The portfolio of clients for this company is limited and the critical success factor to be competitive is linked to time of delivering, continuous technological innovation and total reliability of the output delivered.

4. Results

The main findings of the research are related to three areas: (1) the variation in ERM techniques; (2) the heterogeneity of ERM champions; (3) the different impacts on budgetary control.

(1) Variations in ERM techniques

The three cases evidenced variations in how ERM is technically implemented and risk quantified (Smith and Tombs, 2000). Different approaches have been chosen by the three companies which can be differentiated across three elements: how risks are measured, how they are presented in a unique framework/measure and which type of interaction is maintained with managers.

TELCO and SYSTEM measure risks in terms of impact and probability with a qualitative scale, which are then presented holistically with a qualitative risk map (Collier et al., 2007; Jordan et al., 2013). In both cases the risk map is graphically represented with a 3X3 matrix, with coloured areas, where the left-bottom quadrant includes risk with low impact and probability and the right-top quadrant the risks with high impact and probability. The qualitative position of risks is carried out through interviews, made by the risk management teams to business unit managers. This system satisfies TELCO, which sees in the risk map a conceptual device to challenge managers, as explained by the CRO:

> "the risk map has not the goal to provide a perfect position of risks for that we already know, but it is the visualization of TELCO threads and opportunity. My question in stimulating managers is always: are we grasping the dark swan? Are we concentrating too much on what we already know?" (CRO at TELCO).

Also managers at SYSTEM consider the risk map as a useful visualization tool which provides a synthetic view of the company risks, but they are more doubtful about the qualitative scale, as the comment from a project manager highlights:

> "at the moment we are adopting a qualitative scale, but we are also considering other quantitative options. The problem is that some risks can be easily translated in financial flows, such as EBIT, but other risk are not, such as the decision of [name of its main client] to change supplier or to reduce its spending. I mean we clearly know that the impact will be failure, but is this useful input? It is something that we already know very well" (project manager at SYSTEM).

Although with a different reasoning, SYSTEM and TELCO highlight the fact that the instrument choice (risk map), but in particularly the measurement scale, impacts on the type of risks included in the assessment: using a quantitative measurement potentially excludes risk that cannot be easily quantified.

The two companies share similarities also in terms of their approach with managers: they both use a very interactive style (Simons, 1995) although different actors are involved. TELCO focuses its discussion and interaction at the strategic level, in line with the use of ERM as an instrument to challenge the long term view of the business, as the comment from the Chief Risk Officers (CRO) highlights:

> "our monthly meeting can be seen as a strategic brainstorming more rather than an analysis of data on risks; in the last years we have seen a dramatic change of telecommunication industry, our capability to have a long term view on technologies, market and even political trends is crucial to stay in the business" (CRO at TELCO).

SYSTEM instead spreads the ERM culture and awareness through its project managers, who are key in business operations:

> "our business is based on large multi-annual projects; each project is critical from the financial perspective and in term of reputation. Project managers are key in the business development and operations; if ERM has to be really a tool to manage risks it needs to be near to people who manage and act every day the business" (CRO at SYSTEM).

	Risk Measurement	**Holistic measure**	**Interaction with managers**
TELCO	Qualitative scale	Risk map	Through meetings, monthly
UTILITY	Impact on profit and cash	Risk capital	Through meetings, continuous
SYSTEM	Qualitative scale (with indication of financial ranges)	Risk map	Through meetings, continuous (system still under development)

Table 2 – The ERM techniques

The highest level of interaction is visible in UTILITY, where the CRO has a team of twelve people, who support managers across the organisation on a daily basis. Through this human network UTILITY tries to support both operational decisions and actions, and strategic thinking. Regarding measurement, UTILITY has chosen to measure risk quantitatively, through risks impact on profit and cash. Punctuated measures are then synthetized in an aggregated measure: the organization's Risk capital. This latter concept is an attempt to quantify that portion of the company's resources which is deemed to be "at risk" during normal business operations. The proportion of risk capital is a major consideration in new investment programs. The CRO highlighted that the use of risk capital was a result of a learning process:

> "finding a unique measure to synthesize all risks isn't easy; it's been in use since 2001, when we decided to introduce ERM but we have been trying different alternatives. Actually even now there are areas of improvement and we continue to discuss, also looking at the capability of our measures to help managers in the business"

UTILITY is an interesting case of an "integrated" technique, trying to provide an enterprise wide view of risk and to raise responsibilities in managers at both the strategic and operational level.

(2) The corporate roles involved

One of the first choices companies need to face when they undertake ERM is choosing who is going to implement the system and who will manage it on a routine basis. The three companies analyzed had all chosen to develop ERM internally without external consultants. However they can be differentiated on three main interrelated decisions: which competencies and background they wanted; whether they hire a new person or not; and where the implementers were positioned within the organization. As shown in the following table, their choices were different.

	Background and competencies	**Newly hired**	**Organisational/hierarchical positioning**
TELCO	Risk Management consultancy	Externally hired	CFO and Audit Committee
UTILITY	Operational Risk Management	Designated from inside	Executive Committee and Group Risk Director
SYSTEM	Project management, Internal auditing	Designated from inside	Internal auditing

Table 3 – The ERM champions/owners

TELCO decided to search for competencies outside, enrolling a consultant with specific experience in risk management. The CRO in TELCO stressed that his experience in risk management was never technical but "organizational and behavioral" and this background was brought into the ERM implementation:

> "I had worked on several projects for implementing ERM but always with an organizational view, trying to focus on the behavioral side, trying to stimulate in managers the capability to think different. When I was hired here I was asked to bring this view in TELCO. They were already doing operational and financial risk management. What was missing was a strategic view; look at the telecommunication industry, it changed dramatically and very fast, we need to be think to unpredictable not predictable even" (CRO at TELCO).

The other two companies opted to search for internal corporate competencies inside. UTILITY has assigned the task to a person with considerable experience in operational risk management. SYSTEMS assigned the responsibility for ERM implementation to a senior manager, at present within the internal audit function, who has a varied and long experience within the company (including work as a project manager). The choice is coherent with the technical aspects seen above. UTILITY and SYSTEMS see ERM more linked to operational activities and the knowledge of the company activity from inside is an important element, as highlighted by SYSTEMS' CRO:

> “When I was first proposed to lead the project for implementing ERM, it was clear that I needed to draw both from my experience in internal audit as well as from my project manager background; going for external consultants were never under consideration. In our business project drives risks and the divide between operational and strategic risk is blurred. Only if you are able to speak the language of project managers you can build a sound risk management”.

The hierarchical relations of ERM champions varies: positioned within internal auditing; under Executive Committee and Group Risk Director, under the Chief Financial Officer or the Executive Committee. In this respect it is important to highlight that in SYSTEM, the ERM project manager is part of internal audit, but he has a close relationship and a strong commitment from a key Operational Director. This is crucial for posing ERM as an instrument for managers rather than as a compliance tool at the corporate level.

(3) The impact on budgeting and other systems of controlling risks

In the previous two sections we analyzed how ERM was implemented with variations in terms of techniques and organizational roles involved. Variations are visible also in relation to our last research question: the managerial role of ERM and its impact on budgeting. All the three cases firstly evidenced that entering into managerial processes is not easy for ERM and their owner or champion. ERM in the COSO (2004) has the ambition of being a management control tool, which however, entered into a setting where other control tools already exist and they need to find an organizational space for implementation and development. Interviews pointed out that when ERM is implemented the first time, history cannot be neglected. In all three organizations analyzed, there were other processes dealing with risk before the introduction of ERM. Specifically two types of expertise were present: the risk specialists in charge of specific categories of risks, such as financial risks and Information Technology risks; and management accounting, where risks are considered within the planning and control cycle.

The implementation of ERM changed organizational equilibrium originating new, sometimes fragile, alliances. The following table presents the relation between ERM and these processes in the companies.

	Risk specialists	**Management Accounting**
TELCO	Supporting both CRO and managers	Separated
UTILITY	Supporting managers, CRO and the controller within ERM framework	Collaborating
SYSTEM	Supporting both CRO and managers	Reciprocal consideration

Table 4 – The ERM relationship with risk and control processes.

In TELCO the three sets of competences (ERM, Risk Management and Management Accounting) remained separated: ERM dealing with strategic risks and managers; operational and financial risk managers covering the homologous risks; with management accountants addressing risks to be included in the budget and scenario analysis with a short-medium horizon. This latter configuration was evidenced by the head of planning and budgeting:

> "ERM is working at the strategic level with a very long perspective; instead we prepare the budget and the three-year plan where risks need to be linked to financial results. Yet we interact a lot with people in finance and operational risk management because their risks are very important for our scenario analysis. At the end of this process, we always add some new risks from our own interaction with the managers" (Head of Planning and Budgeting in TELCO).

A higher embeddedness is present in UTILITY. Here CROs, risk specialists and management accountants collaborate in the attempt to build an overall risk and control awareness in managers. The following comment from the Head of Budgeting in UTILITY may clarify this:

> "[answering to our question about links between budget and ERM] it is hard to tell you when and where in the process we interact. We cooperate continuously: risk capital is strictly linked to our forecasts and our forecasts are related to risks" [Head of Budgeting in UTILITY].

The budget and ERM are closely linked because the outputs of the processes are interconnected. ERM needs a forecast to define Capital at Risk and its allocation across organizational functions; budgeting needs an analysis of risk to understand variability and solidity of financial forecasts. Although formal interactions are defined in this way, the two processes and their owners work the majority of time informally, involving also managers who might be interested or relevant in improving "their capability to prevent risks and seize opportunity" (informants words).

An interlocutory or temporary situation is represented by the SYSTEM example. At present the company is improving ERM and all the corporate roles (but even project managers) are collaborating to find the best way to integrate three types of analysis: budgeting, project risks and ERM. At the moment the risk map is the tool used to created confrontation between owners of the three processes, but there is a need to move forward and enhance this approach, as highlighted by a project manager:

> "We are used to controlling our project with a systematic analysis, planning costs, times and variances, with Earned Value techniques; we have also a catalogue of common events which cause variances. These events were the basis for the risk map, which is fine for giving us an overall picture, but I think we need something more if we want to *control* risks" (Project Manager at SYSTEM).

The search for a different instrument from the risk map was also highlighted by the CRO; yet he also pointed out that project managers tend to focus on project risk, losing sight of transversal risks and the act of confrontation through a simple tool like the risk map can be a very useful management practice:

> "Sitting around the same table the Head of Budgeting and project managers helped us in seeing connections; for example the overall cash management and forecast is something that is not taken into account at the project management level, but emerged as relevant for budgeting. Just analyzing how positioning cash/credit risk in the map supported an enterprise-wide vision" (CRO at SYSTEM).

5. Conclusions

Enterprise-wide Risk Management (ERM) belongs to a new wave of self-regulating approaches that started to emerge with the rise of internal controls during the 1990s. ERM is intended to be a holistic process for identifying all the possible risks that may affect an organization; it is a preventive strategy "to provide reasonable assurance regarding the achievement of entity objectives" (COSO, 2004). Although ERM emerged in the domain of internal controls, it aims to be a managerial philosophy that permeates the everyday life of a company. The question of whether ERM impacts on managers' decisions or remains purely a compliance device was envisioned as a complex problem, in which technical and socio-organizational elements interact. In this paper we explored this issue in three non-financial companies, analyzing how ERM impacted on budgeting - one of the managerial processes potentially most affected by this holistic approach. The empirical case studies revealed different degrees of success, with the impact on budgeting being dependent on the translation and penetration of ERM across the organization. Three challenges can be highlighted.

The *first challenge* is related to the positioning of ERM as a managerial tool. ERM is surrounded by the 'aura' of corporate governance, external requirements, self-regulatory style (Smith and Tombs, 1995), which may undermine its implementation as a tool for enhancing managerial actions and decisions. The cases highlighted that the choices in terms of measurement (qualitative versus quantitative), 'owners' or 'champions' approach (interactive versus diagnostic), and hierarchical line or commitment (management control, internal auditing, strategic committees) do affect the perception of its managerial utility within the organization. This perception of utility is essential for a sound implementation not only for convincing managers in using ERM, but, in turn, also for the essential need to have managers collaboration for the implementation and continuous evolution of ERM. In the cases in which ERM has become a managerial instrument, there is a collaborative tension between ERM owner and managers, who are continuously challenged to think of the unexpected (the so called ‘dark swan’ (Taleb, 2007) effect).

The *second* challenge is related to the space for the ERM champions or owners within the corporate roles already in charge of controlling risks at the managerial level. These roles include management accountants but also risk specialists. When other systems of risk management and control are perceived to be satisfactory by managers, ERM - and its owner - struggle to find a space. The cases evidenced that a new managerial sensitivity is achieved by showing them real examples of how current systems may fail in managing risks holistically or with a longer term perspective. But this does not mean a contraposition with other corporate roles; on the contrary, the more effective cases evidenced a constant search from ERM owner of alliances with other actors in charge of controlling risks and performances.

The *third* is both a challenge and a strategic choice: the integration of ERM and budgetary control. The three cases showed a spectrum of situations moving from: *output integration* (i.e. risks and performances) for UTILITY; *reciprocal consideration* for SYSTEM, though this case is still evolving); *voluntary separation* for UK-TEL posing ERM as a strategic tool and budget (and its risks) as a short/medium term device. These three situations appear coherent with the intended strategy of the company in term of managerial control, but each of them open up wider issues. The output integration entails technical capability on both sides(the budget and ERM) and the risk of a high reliance on numbers; at the moment this risk is kept under control in UTILITY thanks to a continuous interaction with managers but future research might focus in analyzing different style of control (Simons, 1995). The voluntary separation of UK-TEL is apparently working well and risks are said to be kept under control; yet there are questions over the opportunity and feasibility of fusing these two activities(budgeting and ERM) which at the moment are kept separate, which implies a separate treatment of short-term and strategic risks.

Although these findings are not generalizable beyond the specific cases in this study, they do provide some insights for future research. From an economic perspective, the inclusion of risks in the negotiation opens up new challenges for budgeting research, and in particular for the large body of literature that has tackled different aspects of this topic. At the organizational level, there is scope for a better understanding of the impact on management accountants, and more generally on the jurisdictional boundaries of the professions involved in budgeting and risk management. A final element for further investigation is the overlap between the two spheres of control: internal control and management control. Some researchers and practitioners caution against mixing these two spheres, as this may undermine the independence of control and the relationship of trust between the company and external shareholders.

References

Anthony, R., & Govindarajan, V. (1998). *Management Control Systems*, Irwin-McGraw-Hill.

Aquila, A. (2006). Best practices in risk management for firm. *Accounting Today* sept. 4-17, 2006/www.webcpa.com

Arena M., Arnaboldi M., and Azzone, G. (2010) "The organizational dynamics of Enterprise Risk Management" *Accounting, Organization & Society*, Vol. 35, Issue 7, October, pp. 659-675.

Arena M., Arnaboldi M., and Azzone, G. (2011) Is enterprise risk management real? *Journal of Risk Research*, Volume 14, Issue 7.

Aseeri, A., Bagajewicz, M.J., 2004. New measures and procedures to manage financial risk with applications to the planning of gas commercialization in Asia. *Computers and Chemical Engineering*, 28(12), 2791-2821

Barbaro, A., Bagajewicz, M.J., 2004, Managing financial risk in planning under uncertainty. *AIChE Journal*, 50, (5), 963-989.

Beasley, M., & Frigo, M. (2007). Strategic Risk Management: Creating and Protecting Value. *Strategic Finance* May, 25-53.

Beasley, M., Chen, A., Nunez, K., & Wright, L. (2006). Working Hand in Hand: Balanced Scorecard and Enterprise Risk Management, *Strategic Finance* March, 49-55

Burton, E.J. (2008). The Audit Committee: How Should It Handle ERM? *The Journal of Corporate Accounting & Finance*. 19(4), 3-5.

Calandro J. & Lane S. (2006). Insights from the Balanced Scorecard - An introduction to the Enterprise Risk Scorecard. *Measuring Business Excellence* 10(3), 31-40.

Chapman C. & Ward S. (2003). Constructively simple estimating: a project management example. *Journal of the Operational Research Society* 54 (10), 1050-1058.

Chenhall, R.H. & Euske K.J. (2007). The role of management control systems in planned organizational change: An analysis of two organizations. *Accounting, Organizations and Society* 32, 601–637

Chesley D. & Gormly R. (2007). Integrating Risk, Compliance and Control for Efficiency and Effectiveness. *Bank Accounting & Finance* April-May, 33-48.

Chua, W.F. (2007). Accounting, measuring, reporting and strategizing – Re-using verbs: A review essay. *Accounting, Organizations and Society* 32 (4-5), 487–494.

Coles, E., Smith, D., and Tombs, S. (2000) "Changing Perceptions of Risk: The Implications for Management", in *Risk Management and Society*, by Coles, E. Smith, D., and Tombs, S, Springer series in Advances in Natural and Technological Hazards Research (Volume 16).

Collier, P.M, Berry, A.J., 2002. Risk in the process of budgeting. *Management Accounting Research* 13(3), 273-297.

Committee of Sponsoring Organizations of the Treadway Commission (COSO) (2004). *Enterprise Risk Management Framework*, New York: American Institute of Certified Public Accountants.

Crouhy, M., Galai, D., & Mark, R. (2001). *Risk Management*. 1st edition. New York, USA: McGraw-Hill.

Curtis E. & Turley S. (2007). The business risk audit – A longitudinal case study of an audit engagement. *Accounting, Organizations and Society* 32, 439–461

Dechow N. & Mouritsen J. (2005). Enterprise resource planning systems, management control and the quest for integration. *Accounting, Organizations and Society* 30, 691–733.

Floricel, S. & Miller, R. (2001). Strategizing for anticipated risks and turbulence in large-scale engineering projects. *International Journal of Project Management* 19, 445–455.

Fraser, I., & Henry, W. (2007). Embedding risk management: structures and approaches. *Managerial Auditing Journal* 22(4), 392-409

Giddens, A. (2003). *Runaway World: how globalization is reshaping our lives* (London: Routledge).

Greer, H.C. (1954). *Managerial Accounting-Twenty Years from Now*. *Accounting Review* 29(2), 175-185.

Hansen, S.C., Otley, D.T., & Van der Stede W.A. (2003). Practice Developments in Budgeting: An Overview and Research Perspective. *Journal of Management Accounting Research* 15, 95–116.

Jaafari, A. (2001). Management of risks, uncertainties and opportunities on projects: time for a fundamental shift. *International Journal of Project Management* 19(2), 89-101.

Jaafari, A., & Manivong, K. (1999). The need for life-cycle integration of project processes. *Engineering Construction and Architectural Management* 6(3), 235–255.

Jordan, S., Jørgensen, L., Mitterhofer, H. (2013) "Performing risk and the project: Risk maps as mediating instruments", *Management Accounting Research*, Volume 24, Issue 2, p. 156-174.

Kalu, T.C.U. (1999). Capital budgeting under uncertainty: An extended goal programming approach. *International Journal of Production Economics* 58, 235-251.

Lam, J. (2006). *Emerging Best Practices in Developing Key Risk Indicators and ERM Reporting*. James Lam & Associates, Inc.

Lewis V.B. (1952). Toward a Theory of Budgeting. *Public Administration Review* 12(1), 42-54.

McWhorter, L.B., Matherly, M. & Frizzell D.M. (2007). Recent Trends in ERM and Literature Review. *Management Accounting Quarterly* 8(3), 18-21.

Merchant, K.A., & Van der Stede, W.A. (2003) *Management Control Systems: Performance Measurement, Evaluation, and Incentives*. Pearson/Prentice Hall, London.

Mikes, A. (2005). Enterprise risk management in Action. *Centre for the Analysis of Risk and Regulation (CARR) Discussion Paper Report Series* No. 35.

Mikes, A. (2009). Risk management and calculative cultures. *Management Accounting Research*. 20 (1), 18-40.

Miller, K.D. (1998). Economic exposure and integrated risk management. *Strategic Management Journal* 19 (5), 497-514.

Pongsakdi, A., Rangsunvigit, P., Siemanonda, K. and Bagajewicz, M.J, 2006. Financial risk management in the planning of refinery operations, Int. J. Production Economics. 103, 64-86.

Power, M. (2004). *The Risk Management of Everything*, London: Demos.

Power, M. (2007). *Organized Uncertainty Designing a World of Risk Management*, Oxford University Press.

PricewaterhouseCoopers. (2004). *Managing risk: An assessment of CEO perspectives*, PwC, New York.

Rahman, M., & Kumaraswamy M. (2002). Joint risk management through transactionally efficient relational contracting. *Construction Management & Economics* 20 (1), 45-54.

Rasmussen, J. (1997). Risk management in a dynamic society: a modelling problem. *Safety Science*, 27 (2/3), 183-213.

Robson, K., Humphrey, C., Khalifa, R., & Jones, J. (2007). Transforming audit technologies: business risk audit methodologies and the audit Weld. *Accounting, Organizations and Society* 32 409–438.

Scandizzo, S. (2005). Risk Mapping and Key Risk Indicators in Operational Risk Management. *Economic Notes by Banca Monte dei Paschi di Siena SpA*. 34 (2), 231–256.

Scholey, C. (2007). Risk and the Balanced Scorecard. *CMA Management* 32, June/July, 32-35.

Simons R. (1995) Levers of control, *Harvard Business School Press*, Boston, MA.

Smith, D., and Tombs, S. (1995) "Beyond self-regulation: towards a critique of self regulation as a control strategy for hazardous activities" Journal of Management Studies, Vol.32 (5), p. 619-636.

Smith, D., and Tombs, S. (2000) "Conceptualising issues of risk management within the 'Risk Society'" in *Risk Management and Society*, by Coles, E. Smith, D., and Tombs, S, Springer series in Advances in Natural and Technological Hazards Research (Volume 16).

Spira, L.F., & Page, M. (2003). Risk management: the reinvention of internal control and the changing role of internal audit. *Accounting, Auditing and Accountability Journal* 16(4), 640-661.

Standard & Poor's (2008). Enterprise Risk Management For Ratings of Nonfinancial Corporations. *Ratings Direct*, 5, June.

Stowe, D., & Jeffery C. (2008). "Embracing Risk Management" *Investment Dealer Digest*, 24, 18-19.

Verbeeten, F.H.M., 2006. Do organizations adopt sophisticated capital budgeting practices to deal with uncertainty in the investment decision?: A research note, Management Accounting Research 17, 1, 106-120.

White, L. (2004). Management Accountants and Enterprise Risk Management. *Strategic Finance*, 86(5), 6-7.