Risk management and management accounting

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Abstract

The traditional approach to risk and risk management is based on a rational model of decision making, adapted to include probabilities of identified events. Management accounting attempts to incorporate elements of risk and uncertainty into decision taking, objectifying and quantifying risk. The treatment of risk in management accounting models are reviewed - decision trees, CVP analysis, discounted cash flow analysis, budgeting, and strategic management accounting. In management accounting, risk is taken as relating to external events which cannot be managed. This contrasts with risk management approaches, such as ERM. Nevertheless, in such models, calculative rationality is maintained. Alternative models of decision making involving intuitive and subjective elements – bounded rationality, social and political approaches, garbage-can models - approximate more closely the complexity of decision making in situations of incomplete and contradictory information, unclear objectives, and interests of powerful actors. There is a lack of qualitative research into such models of dealing with risk and uncertainty.
Risk management and management accounting

1.0 Introduction

Traditionally, risks have been defined by management accountants in terms of the possibility of danger, loss, injury or other adverse consequences (Collier, Berry and Burke, 2007; Wood, 1986). However, the concept of risk management includes not only adverse outcomes but also potentially pleasant surprises. In 2002, the Institute of Risk Management (IRM) published the Risk Management Standard and defined risk as the combination of the probability of an event and its consequences, with risk management being concerned with both positive and negative aspects of risk.

Risk generally arises out of uncertainty. In risk management, risk is different from uncertainty, because risk is predictive and some risks can be measurable, while uncertainty cannot be predictive and measurable. However, some management accountants (for example, Phillips (1994)) suggest the distinction between risk and uncertainty is a theoretical rather than practical concept. Some management accountants imply that risks cannot be managed (Torok and Wood, 2006). Such a view contrasts with the concept of risk management which is an attempt to manage risk, dealing with risk as opportunity and seeking to maximize the gain and minimize the downside.

The traditional approach to risk and risk management is based on a rational model of decision making, adapted to include probabilities of identified events. The calculative rationality is maintained. Alternative models of decision making – bounded rationality, social and political, garbage-can models, approximate more closely the complexity of decision making in situations of incomplete and contradictory information, unclear objectives, and interests of powerful actors. There is a lack of qualitative research into such models of dealing with risk and uncertainty.

These contrasting understandings will be examined in the following sections and reflections made on how management accounting techniques may include risk
analysis but not satisfy the demands for a strategic management perspective. The objectives of this paper are as follows: firstly, to find out the distinction between the concepts of risk in management and in management accounting; secondly, to find out how management accountants can possibly play a positive role in assisting risk management in companies.

2. Treatment of risk in management accounting

According to Collier, Berry and Burke (2007), the accounting literature addresses risk as it incorporates probabilities in decision trees; uses probability distributions in discounted cash flow analysis; and attempts to incorporate elements of uncertainty in cost-volume-profit analysis. They assert that the definition of risk in accounting is narrow and has some limitations (ibid, p.6):

- The usefulness (or value) of quantification techniques for measuring risk probabilistically was recognized in the 1930s as being questionable, although this has been forgotten;
- The treatment of risk has reduced human agency to irrelevance.
- Risk has traditionally been viewed as negative, despite the well accepted idea of a risk/return trade-off

Risk was defined by the International Federation of Accountants (IFAC) (1999) as “uncertain future events that could influence the achievement of strategic, operational and financial objectives” (quoted in Collier and Berry, 2002, p. 274). Risks have traditionally been defined by management accountants in terms of the possibility of danger, loss, injury or other adverse consequences (Collier, Berry and Burke, 2007). Torok and Wood (2006) define risk as an event which will occur and adversely affect the achievement of objectives over time. In other words, risk is an expectation of loss rather than a positive opportunity. The CAM-I’s Risk Management Interest Group has the same definition. Perhaps influenced by the treatment in finance, Shaoul (2005) suggests that risk is required to be costed in British government’s Private Finance Initiative (PFI). Moreover, Torok and Wood (2006) also suggest that “Risk itself cannot be managed”, but we can “influence both the likelihood and consequence of adverse events” by the activities we perform to assess, evaluate and treat risk (p. 38).
Whether risk can be managed is a major difference between risk management and management accounting.

The following sections will demonstrate the usual treatment of risk in management accounting techniques such as decision trees, probability distributions, cost-volume-profit analysis, discounted cash flow, and budgets.

2.1 Decision trees

The decision tree is one of the tools presented for decision-making under risk. Chelst and Bodily (2000) point out that the objective of a decision tree is to incorporate risk and find out the best alternative for a decision. According to Hoogenboom and Dale (2005): “the decision tree is a graphical representation of a sequence of decisions given the outcome of uncertain future events and uncertain costs and payoffs” (p.153).

An implicit notion in textbook presentations is that ‘decision makers’ are able to gather data or use an expert to clarify the states of nature but nothing can be done to change the probabilities. The very term state of nature suggests “immutability” (Chelst and Bodily, 2000, p. 2). However, they claim that in practice managers believe that risk is not immutable. Managers view part of their responsibilities as doing something to change the state of nature and associated probabilities. Shareholders of companies require that managers have this kind of capability. If a decision analysis is going to find out the best alternative based on an assessment of given probabilities, an opportunity may be missed.

2.2 Cost-volume-profit analysis

Cost-volume-profit (CVP) is used by managers and management accountants in short-term planning analysis. CVP analysis can be used in many situations, including “performing break-even analysis, evaluating pricing strategy, determining special order/booking acceptance or choice of sales mix” (Phillips, 1994, p.31). The traditional CVP model does not include risk analysis in the decision-making process. The model assumes that variable costs will vary with sales volume, which is the only factor affecting revenue, costs and profit. However, companies are operating in an
environment with much turbulence. In other words, there are many other factors except sales volume affecting revenue, costs and profit. Therefore, some researchers, such as Bierman (1963), Jaedicke and Robichek (1964), Johnson and Simik (1971), and Dickinson (1974) have suggested that CVP analysis should involve risks within its basic model.

Phillips (1994) undertook a case study entitled “Welsh Hotel: Cost-volume-profit analysis and uncertainty”. The CVP analysis in this case study was to help managers make the budget for the coming year. Phillips did not differentiate between risk and uncertainty. In the case study, sales volume is assumed to be uncertain. However, managers believed that there was a 50/50 opportunity that rooms could be sold to meet break-even point, given fixed and variable costs. Phillips applied probability theory to calculate the different probabilities for different expected amounts of profit. Risk-adverse managers may choose the subjective optimal amount of profit associated with least risk and incorporate that choice into the budget. CVP analysis delivers messages to managers that risk cannot be managed, but simply accepted as part of the decision process.

Yunker and Schofield (2005) undertook a case study to find out how to apply a stochastic cost-volume-profit model to determine the best price for a product. In their case study, price is neither a constant nor a random variable. Price can generate risks to managers because it affects sales volume and profit. However, price can be controlled by decision-makers. Managers can get the information that expected profit probabilities are determined by different sets of prices. Furthermore, they suggest that the variable of sales volume can be controlled by managers. Decision-makers should get such information about price and other variables affecting profit to assist decisions.

The basic difference between these two case studies is whether variables determining profit can be controlled by decision-makers. In the first case study, undertaken by a management accountant, risks connected to variables cannot be managed by managers. Decision-makers avoid risks as much as they can. The second case study, by economists, suggests a different story. Risks generated by the variables that relate to profit can be managed by managers. Therefore, managers should be more intentional in taking risks to maximise profit as much as they can. Management accounting
recognizes risks in business operation, but suggests that risk should be viewed as negative to companies’ objectives and be avoided rather than be taken and optimised.

## 2.3 Discounted cash flow analysis

Discounted cash flow (DCF) methods have been widely used by companies to analyse capital expenditure decisions (Yao and Jaafari, 2003). The net present value (NPV) and internal return of return (IRR) are two widely-used methods of discounted cash flow analysis, which can be undertaken under conditions of certainty or uncertainty/risk.

The discount rate to be used in DCF is the required rate of return that is based on an organization’s weighted average cost of capital. The weighted cost of capital “may” be adjusted by the risk associated with certain projects (Langfield-Smith, Thorne and Hilton, 2003, p. 993). Christensen, Feltham and Wu (2002), Dutta and Reichelstein (2002) and Lambert (2001) argued that weighted cost of capital should be adjusted by market risk. Management accountants should adjust the weighted cost of capital to include the risk free rate plus a risk premium. Yao and Jaafari (2003) suggested that the discount rate include: 1) project risks; 2) market risks associated with the project's expected sales and revenue stream; and 3) time-dependent value of money, or the rate at which lending and borrowing takes place freely. Market risks are known as non-diversifiable risks in the sense that these are beyond management’s control. The higher the market risks, the higher the discount rate used to discount the project's cash flow (Yao and Jaafari, 2003). There are problems, however, with project specific risks and Peccati suggested that “this requirement that the discount rate should characterize investments that are similar under their risk profile is misleading” (Tallia, Judd and Pattison, 1996, p. 41). It is not necessarily true that similar risk profiles do in fact exist, especially when thinking about multiple-period horizons.

It may be preferable simply to take account of risk through a worst-case, best-case scenario analysis.

### 2.4 Budgeting
Budgets can be thought of as “management tools to portray in quantitative terms the environment-organizational interface” (Collier and Berry, 2003, p. 275). There is little literature that has studied the concept of risk in the budgeting process and the budget document. The case studies undertaken by Collier and Berry (2003) suggest that the budget process is different to “the content of the budget in which there is little evidence of risk modelling or the use or probabilities” (p. 273). In other words, risk is considered in the budgeting process, while the budget document is risk-excluded and only considers consequences of risk. Collier and Berry also suggest that “the top-down imposition of budgets is an open ‘rational system’ while the perceptions of risk is an open ‘natural system’” (p. 289).

The irrelevance of budgeting to risk taking has been emphasised by the Beyond Budgeting Roundtable. Fraser and Hope (2001) under an emotive title of “Figures of Hate” argue for their abolition.

**2.5 Strategic management accounting**

Strategic analysis focuses on what changes are taking place in the market, how these changes affect particular company and its activities and how the company take use of its resource to deal with these changes in order to meet the needs (financial or other) of stakeholders. After the strategic analysis, the company need to generate some strategic options and evaluated these options based on whether they can improve the company’s strengths or overcome its weaknesses. Finally, the best one will be selected and implemented, which will help the company to seize the opportunities in the market and counter treats from competitors.

Some of the strategic investment analysis tools, such as the internal rate of return and net present value (NPV), are rooted in rational economic principles. The new strategic investment appraisal tools, such as the balanced scorecard, strategic cost management analysis and technology roadmapping, focus on how to improve conventional financial and risk analysis by bringing together financial and strategic aspects of project appraisal (Hopper, Northcott and Scapens, 2007). In other words, these new developments still pay attention to the identification and analysis of risks. The study
undertaken by Alkaraan and Northcott (2006) suggests that managers worry that they may miss many opportunities because the decision models aim to minimize risk and spend on too much time on gathering information. March and Shapira (1987), and Bettis and Thomas (1990) called for a better understanding of risk preference in the strategy literature.

It may be summarised that the traditional decision making models in management accounting treat risk as a danger to be incorporated in decisions as something to be minimised. Risk is an external reality that managers have little control over. What does the management literature have to say about risk in management decisions?

3.0 Risk management

In the management literature, risk management has developed into a comprehensive, proactive approach. The Institute of Risk Management (IRM) (2002) provides an official definition of risk management:

*The process by which organisations methodically address the risks attaching to their activities with the goal of achieving sustained benefit within each activity and across the portfolio of all activities.*

According to Banham (2004) the term Enterprise Risk Management (ERM) evolved to reflect high-level oversight of a company’s entire risk portfolio, rather than having different overseers managing specific risks - the so-called silo or stovepipe approach. The Committee of Sponsoring Organizations of the Treadway Commission (COSO) published the new ERM framework in 2004. COSO defined ERM as:

*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 entity objectives.*

Treatment of risk in risk management

Risk means both potential loss and potential gain in risk management. When risk management deals with the risk that has the probability of negatively impacting on the
business objective, it attempts to reduce the variance between anticipated and actual outcomes. Dealing with risk as opportunity, risk management attempts to maximize the gain and minimise the downside. Risk management is “neither intended nor expected to eliminate risks altogether, as doing so would eliminate the potential for significant rewards in many scenarios” (Mcgee, 2005, p. 31; Anonymous, 2006). Companies are required to take risk and there is usually a trade-off between risk and return. The concept of risk management requires companies to develop the appropriate response to risk so that they can gain competitive positions in the market. Treloar (2003) suggests that risk management has a forward looking approach, which requires using a “structured methodology” to identify, assess and treat risks.

Various categories of risk have been identified - the IRM classified risk in terms of financial, strategic, operational, environmental and reputation risk. According to McGee, 2005, p.33:

*Strategic risks include risk such as industry, social, and political risks, while operational risks include risks such as environmental, financial, and business continuity. Reporting and compliance risks include those risks with which leaders can typically identify when contemplating the notion of risk within the organization.*

Based on these distinctions, Collier, Berry and Burke (2007, p.7) suggest that risk can be thought about by reference to:

- The existence of internal or external events
- Information about those events
- Managerial perception about events and information
- How organisation establish tacit / informal or explicit / formal ways of dealing with risk

Enterprise Risk Management (ERM) is a term applied to the comprehensive, rigorous and coordinated approach to assessing and responding to all risks that affect the achievement of an organization’s strategic and financial objectives, including both upside and downside risk (Merkley, 2001, p.25). ERM has eight components: Internal environment, objective setting, event identification, risk assessment, risk response, control activities and information, communication and monitoring (Levinsohn &Williams, 2004, pg 57). As reported in Ballou and Heitger, (2005, p. 2).
So ERM tries to align risk management with business strategy and to embed a risk management culture into business operations. It follows that boards of directors and senior managers can oversee the operation of risk management that every employee is responsible for in companies.

According to Levinsohn and Williams (2004), the eight components of ERM are as follows:

**Internal Environment.** The internal environment gives people in an organization a basis for viewing and addressing risk.

**Objective Setting.** ERM ensures that management has a process for setting objectives and to make sure these objectives align with organization’s mission and are consistent with its risk appetite.

**Event Identification.** Internal and external events must be identified and distinguished from risks and opportunities.

**Risk Assessment.** Risks are analyzed to help determine how they should be managed.

**Risk Response.** Management decides how to respond to different risks based on the organization’s risk tolerances and risk appetite.

**Control Activities.** Policies and procedures are established and implemented to help ensure risk responses are carried out effectively.

**Information and Communication.** Relevant information is identified, captured, and communicated throughout the organization to help people carry out their responsibilities.

**Monitoring.** Every aspect of ERM is monitored, and modifications are made as necessary (p. 55).

Banham (2004) suggests that ERM “centralizes management under a chief risk officer or ERM committee who manages the individual oversees to help identify overall how much risk the entity can tolerate, assess mitigation tactics and otherwise take advantage of risk opportunities (p. 65). Therefore, ERM calls for “high-level oversight of a company’s entire risk portfolio rather than for many different overseers managing specific risks” (p. 65). Risk management is brought into the strategic planning process so that a company’s overall appetite for risk is aligned with its business strategies. Moreover, ERM is both a bottom-up and top-down process
Risks need to be identified and assessed by the business unit and department at local level. The top management will see more strategic risks. “Both processes need to be combined to ensure risks are identified and assessed throughout the organization” (p. 43).

### 3.3 Implementing risk management framework

Ballou and Heitger (2005) suggest that “one concern regarding the ERM framework is that its over-reaching nature can appear overwhelming for some organizations, particularly those that are small in size or have not previously established an ERM culture” (p. 1).

ERM has not yet been widely implemented. A study by Pricewaterhouse- Coopers in North America indicates that “60% of U.S. CEOs still see governance, risk management and compliance expenditure primarily as a cost rather than an investment” (Scholey, 2006, p.32). One of the key reasons is that ERM is very complex so that the existing tools and technologies to support it are not designed to manage such complexity well (Shaw, 2005). Risk is a six-dimensional problem. The six dimensions are “the likelihood a relevant trend or event; the magnitude of the effects of the trend or event; the degree of uncertainty in the estimate of event likelihood; the degree of uncertainty in the estimate of the magnitude of the effects; the ability to influence the trend or event’s likelihood; and the ability to influence the magnitude of the effects” (p.26).

### Contribution of Accountants

CMA Canada and the AICPA issued a new Management Accounting Guideline, which included a Risk Management Payoff Model (McGee, 2005). The guideline offers the following:

- *A comprehensive overview of risk management, highlighting the role of risk identification and measurement within the risk management process;*
- *A broader framework for risk identification;*
A detailed description of the key elements—inputs, processes, outputs and outcomes—of a measurement model that will allow organizations to successfully address risks, both strategically and operationally, by identifying and evaluating risks and the potential benefits of risk management initiatives;

Examples of risk management drivers and the causal relationships among them;

Specific performance metrics that organizations can select and/or adapt to effectively accommodate their unique risk management strategies; and

An illustration of risk management initiatives (ibid, p. 31).

According to this approach, it would make sense for management accountants to get the information required to treat risk. Management accounting needs to be concerned with information used in “formulating business strategy, planning and controlling activities, decision-making, efficient resource usage, performance improvement and value enhancement, safeguarding tangible and intangible assets and corporate governance and internal control (Collier, Berry and Burke, 2007, p 20). Management accountants can provide useful information to risk managers and financial directors in the risk identification, risk assessment process.

With the greater involvement in the decision-making process, management accounting may be a good partner of risk management. As the Chartered Institute of Management Accountants (2002) suggest, management accountants, whose professional training includes the analysis of information and systems, performance and strategic management, can have a significant role to play in developing and implementing risk management and internal control systems within their organisations.

According to Collier, Berry and Burke (2007, p 20), management accountants need to be concerned with information used in “formulating business strategy, planning and controlling activities, decision-making, efficient resource usage, performance improvement and value enhancement, safeguarding tangible and intangible assets and corporate governance and internal control”. Management accountants could provide useful information to risk managers and financial directors in the risk identification and risk assessment process.
**Another perspective: need for a reconceptualisation?**

The calculative rationality often assumed (taken for granted) in traditional management accounting models is an abstraction from complex situations and is difficult to achieve by decision-makers. Some theorists have relaxed the simplifying abstraction and argued that in the drama of everyday life, decision makers have to make informal and subjective judgments rather than fully-informed calculated rational decisions (Tversky & Kahneman, 1974).

To reconceptualise the way management accountants could assist in the incorporation of risk, we first have to examine and question the underlying assumptions of the traditional models. The traditional model derives from neo-classical economics in which human agents are calculating machines rather than complex human beings. Five different models of (strategic) decision-making have been identified: the rational model; the bounded-rationality model; the political model; the garbage can model and the incremental-adaptive decision-making model (Hopper, Northcott and Scapens, 2007).

In the first (rational) model, decision-makers are assumed to have full information about all possible alternatives and the consequences of them. Because these decision-makers have clear and unambiguous objectives, and have the abilities to choose the best alternative, the best financial returns from strategic investments can be achieved (Simon, 1957). Risks and uncertainties can be identified and incorporated into decisions and the process is still rational (Hopper, Northcott and Scapens, 2007).

Simon (1957) and Cyert and March (1963) introduced a model with more realism, that of bounded-rationality. They challenged the ability of decision-makers to make satisfactory decisions to maximize investment returns, because they cannot get full information about the consequences of different alternatives. Also, they argued the validity of the rational model and rationality of decision makers are bounded by decision-makers’ cognitive limitations, which prevent them from following a completely rational-analytical approach.
The third model, the political model, challenges a major assumption underpinning the rational model that decision-makers have a single, super-ordinate objective. Pettigrew (1973) suggests that decision-makers in different parts of the organization have their own self-interest; therefore, organizations are characterized as having multiple and conflicting objectives. People compete for control of companies’ resources. Pettigrew’s ideas have had a great impact on subsequent accounting literature (e.g., Hopwood, 1983; Hopwood and Miller, 1994; Boland and Pondy, 1983).

Following this line of increasing realism, the ‘garbage can’ model introduced by Cohen, March and Olsen (1972), argued that there are ambiguous, ill-defined and inconsistent goals in the decision-making process. Decisions are assumed to result from “the random union of people, problems, solutions and choice opportunities”, therefore, decision-makers “discover their goals as they act, rather than having predetermined goals that direct their action” (Hopper, Northcott and Scapens, 2007, p. 201). Specifically, like the bounded-rationality model and the political model, this model also challenged the rational decision-making model.

The incremental-adaptive decision-making model combines the elements of the above four models. Under this model, decision-makers are assumed to have cognitive limitations, and to have different values, attitudes and interest amongst them (Northcott and Alkaraan, 2007). The decision-making process has a mixture of both incremental and rational elements whereby “objectives are reconsidered and sometimes reformulated as the decision progresses” (Hopper, Northcott and Scapens, 2007). These authors (ibid, 2007) also suggest that the decision-making process has both rational / analytical and power / behavioral aspects. Boland and Pondy (1983) suggested organizational life has characteristics of both natural and rational systems, one or the other taking the foreground and being in the ascendancy at different points in time.

So, in practice, decisions have political, social, and moral aspects as well as economic influences. Context becomes paramount in understanding which aspect becomes dominant in any decision, and how calculative procedures are used in decision making. Such reasoning may apply to decisions about risk.
However, the findings of research by Alkaraan and Northcott (2006) found that financial analysis techniques still dominate the formal appraisal of all categories of capital investment projects with minimal analytical attention given to the incorporation of risk. Risk analysis remains simplistic, and subjective, even for complex strategic projects. The appraisal of capital projects seems to reflect a ‘simple is best’ philosophy and a commitment to the role of intuition and judgement in assessing how the strategic dimensions of capital investments connect with their financial outcomes.

Trevor Gambling (1983) argued that the use of financial calculations for determining decisions under conditions of uncertainty performs the same function as the use of witchcraft in less advanced cultures. In some cultures, a witch doctor is called in when a particularly important and complex decision has to be taken. The witch doctor makes the decision on the basis of the direction in which chicken bones fall to the ground. Gambling suggests this is what happens when accounting numbers are thrown into the air and decisions made on the basis of which way they point. Such practices help people get on with life in conditions of great uncertainty.

To understand the approach to risk in practical decision making situations may require a different theoretical approach than rational economics. What is being proposed here is a move towards a more descriptive and qualitative understanding of risk management.

Even the assumed relationship between risk and return may be questioned. Traditionally, a risk return trade-off has been presumed. An alternative hypothesis could be imagined. If firms earn high rewards from gaining competitive advantages through having primacy of access to scarce materials, skills, experience which others cannot match, then there may be an inverse relationship between risk and return. Some argue that all management is risk management. The meaning of that term may imply that firms can socially construct their environments so they are protected from competition and earn (semi)monopoly profits. Much of strategic management is an effort to gain such favourable outcomes for a firm (Bromwich, 1990). And it is why ‘markets’ have to be regulated. Markets are social constructs, not natural phenomena.
Understanding accounting as social and institutional practice may be appropriate (Hopwood and Miller, 1994). For example, Institutional Theory suggests that one way to deal with risk is to develop routine, habitualised ways, of behaving. According to Institutional Theory, people overcome feelings of ontological insecurity (of uncertainty) through the development of habitualised routines. Once life is institutionalized, it takes a massive shock or jolt to change an organisation’s behavior. Risk is not considered consciously as people go about their daily routines. If these routines involve risk, so be it. Routine behaviour can involve enormous amounts of risk, especially when, as in the financial markets, people are habitually driven to take decisions to maximize short-term gains.

Rather than rational models of decision taking, we may need more understanding of management perspectives on risk and risk taking (March and Shapira, 1987), and strategy formulation as an ongoing and emergent activity (Pettigrew, 2002).

**Conclusion**

Having reviewed the traditional management accounting approaches to incorporating risk into decision models, the concept of risk management from management literature was introduced. The latter emphasises more the positive as well as negative aspects of risk in holistic risk management approaches. Both literatures tend to take for granted that organisations exist in an objective external environment which is a given. Events occurring in the environment are extraneously determined events whose probability of occurrence may be known and incorporated in the rational, decision making models. Does such an image reflect the reality of decision making in most organisations? An alternative view would take a processual approach (Pettigrew, 2002) which is a more inductive process of discovering how managers and organisations actually behave in conditions of uncertainty; and how they manage risk as part of their day-to-day activities. Qualitative research approaches may be revealing of new understandings of risk management and of ways in which management accountants may play their part in assisting decision makers in conditions of uncertainty.
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