
Management Accounting Systems, Top Management Team's Risk Characteristics and Their Effect on Strategic Change

Nikolaos Theriou¹ Vassilis Aggelidis

Abstract:

Globalization intensifies world competition which leads to continuous market and industry changes that force the majority of organizations to reconsider their strategic position and engage in strategic changes, mostly, through continuous innovation and new product development with smaller life cycles. These strategic actions have developed an environment with increased complexity, uncertainty and risk. On the other hand, organizations differ in their ability to realize strategic changes, depending on many factors that affect their strategic management process. The aim of this paper is to examine the effect of TMTs risk characteristics (risk propensity, risk perception and risk taking), on the extent of strategic change both, directly and indirectly, through the design and use of the management accounting system (MAS). The proposed research model is tested via a survey on 133 top management teams, from large size enterprises with more than 250 employees throughout Greece. Our finding suggest that (a) risk taking characteristic is determined by the other two risk characteristics of risk perception and risk propensity, and (b) there is a direct and a significant indirect relationship between TMTs' risk taking decisions and their strategic changes, affected by the intervening mediating role of the broad-scope and interactive use of MAS. The results of the study will help organisations to understand the significance of MAS use and the intervening effect on the relationship between TMTs risk characteristics and their strategic decision making process when considering new strategic changes.

Key Words: *Risk Perception, Risk Propensity, Risk Taking, Management Accounting Systems, Strategic Change*

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¹ Corresponding author: N. G. Theriou, Eastern Macedonia & Thrace Institute of Technology, Agios Loukas, Kavala 65404, Greece, telephone: 00302510462371, fax: 00302510462148, email: ntheriou@teiemt.gr

1. Introduction

In the current business environment characterized by fast changes in customers, technologies and competition, organizations need to continuously renew themselves to survive and prosper (Danneels, 2002; Henri, 2006). Decision making concerning strategic changes for overcoming environmental pressures may have significant effect on firm's performance (Nyamori et al., 2001). Carpenter, Geletkanycz and Sander (2004) argue that the structure of firm's top managerial team has significant impact on strategic decision making and on the effectiveness of strategic change implementation.

However, our knowledge about the organizational factors and mechanisms that enable strategic change is incomplete and fragmented (e.g., Frow et al., 2005; Henri, 2006; Chenhall and Langfield-Smith, 2003), despite clear evidence across the management literature that organizations systematically differ in their inclination and ability to pursue strategic change (e.g., Abernethy and Brownell, 1999; Lant and Montgomery, 1987; Wiersema and Bantel, 1992). The strategic management literature, for example, suggests that the composition of the organization's top management team (TMT), which is the echelon ultimately responsible for strategy development and deployment, affects the strategic choices of the organization, and the ability to execute them (see, e.g., Carpenter, Geletkanycz, and Sanders, 2004). Several studies following the so-called upper echelon (UE) perspective show that TMT heterogeneity, which is the extent to which the team consists of managers with varying backgrounds and competences, systematically varies with the organization's inclination and ability to engage in strategic change (e.g., Hambrick and Mason, 1984; Finkelstein and Hambrick, 1996; Golden and Zajac, 2001; Jarzabkowski and Searle, 2005; Naranjo-Gil and Hartmann, 2007).

Others argue that although research on upper echelons reveals the importance of TMTs, CEO's are rarely distinguished from the TMT as a whole (Jackson, 1992). It is obvious, from everyday observation and a wealth of related literature, that the top group leader has a disproportionate, sometimes nearly dominating influence on the group's various characteristics and outputs (Peterson et al., 2003).

Moreover, the potential for ambiguity associated with underlying phenomena has led numerous scholars to argue that more questions remain or have been created by UE research than have been answered suggesting that demographics should be abandoned in favor of richer variables with more substantive dimensions, like processes, attitudes and judgments (Priem et al., 1999) or top management cognition, values, and perspectives, and, consequently, strategic choices (Carpenter et al. 2004). A movement away from the use of demographics as proxies is likely to provide

greater insight into the actual activities of senior managers, and the actual processes by which executive's impact organizational outcomes (Lawrence, 1997).

The various corporate frauds, especially in our days, and the world economic crisis that we live today, make risk to be more important than ever, increasing the interest in assessment and risk management to a level where "it is more important than ever before" (Lam, 2006). Firms have to operate in an environment which hides a number of threats and opportunities.

Although up to 1980's and 1990's management brought up a number of tools and techniques reducing risk, which resulted in the economic growth of corporations, during the last twenty years the unstable economic, political and competitive climate have brought back the concept of risk. Brouthers (1995) regards risk as key influence in the decision of a firm to enter a new market but also to choose the entry mode. Firms, especially those operating on industries with high level of uncertainty, would like to find ways to reduce risk. The potential of a strategic failure is not the worst scenario only for the firm but also for a number of stakeholders such as the employees, shareholders and suppliers. Everybody within a firm wants to be sure that the firm has taken all of the necessary measures to reduce risk.

Besides the avoidance of a failure, there is another view of risk; the lucrative one. According to Chen (2009) during the last decade most of the well known startups were on sectors with high risks while most of the new ventures that operated as boosters of their economies were firms that decided to take up the risk and to enter new markets with high risk, such as the computing industry. During the 90's and 00's we noticed tens of new ventures that invested billions of dollars into new projects and entrepreneurs in order to create new markets or increase their market share. Basu *et al* (2008) empirically found that the more risky a market is the higher is the probability for a firm to have high long term benefits if it manages to survive, or huge losses if it does not manage the risks properly and effectively.

In general, there is the assumption that decision makers prefer less risky decisions in times of high uncertainty, such as the one we live today. However, managers can choose from a variety of management tools, such as management accounting systems (MAS), to moderate the environmental uncertainty. For example, Naranjo *et al.* (2007) argue that MAS can be used by a variety of business in order to improve the quality of the information received from the external and internal business environment and used by top managers in order to take risk decisions under a continuous changing complex environment with high risk and uncertainty.

The aim of this paper is to examine the basic risk characteristics of top managers, based on risk theory, and their direct and indirect effect, through the use of management accounting systems (MAS), on the strategic change of the firm.

Having in mind the fact that we live in an economic turmoil, it is crucial to measure the views of the top managers, including those of the CEOs, of Greek large firms in terms of how much risk they are prepared to take in order to lead their companies to the necessary changes in accord with the changes occurring on their external environment.

The remainder of this paper is structured as follows. Section “Literature review and hypotheses development” reviews the literature and develops hypotheses about the relationships between TMT risk characteristics (risk perception, risk propensity, and risk taking decision making), the use of MAS and strategic change. Section “Empirical study” describes the method. Section “Results” presents the results of the empirical analysis. Finally, section “Discussion and conclusions” presents the discussion and conclusions of this study.

2. Literature Review and Hypotheses Development

2.1 TMT Risk Taking Decision and Strategic Change

We begin our literature review with a definition of TMT which, we believe, suits to the Greek context of our research sample, i.e., large companies employing more than 250 employees: TMT members are senior executives, who also served on the board of directors (Finkelstein and Hambrick, 1990; Halebian and Finkelstein, 1993; Norburn, 1989). This implies that CEO is also a member of the TMT.

In their original thesis, HandM were explicit in arguing the need to focus on the top management *team* as opposed to other units, most especially the CEO alone. Their collectivist approach was born of observations that strategic choice is an arduous task, far exceeding the capabilities of individual executives (Cyert and March, 1963). In subsequent research Hambrick (1994) instituted a challenge to the TMT label, arguing that top management *group* (TMG) may be a more apt moniker given the high potential for intrateam fragmentation. Among the greatest benefits of this reframing is attention to the diverse array of interactions and configurations possible within senior organizational ranks (e.g., competitive, coalescing). However, a shift from TMT to TMG label nevertheless maintains emphasis on the broader collectivity of senior management.

The management literature on strategic choice (e.g. Child, 1972; Hrebiniak and Joyce, 1985), and on the role of upper echelons (UE) in strategic management (e.g., Carpenter et al., 2004; Hambrick and Mason, 1984) both emphasize the importance of TMTs in the formulation and implementation of an organization’s strategy. The latter perspective seeks to explain strategic choices of organizations by the composition of their upper echelons, claiming that organizations’ strategic directions can be explained by the demographic backgrounds of TMT members.

However, they also state that "it is doubtful that this research stream can progress far without greater attention to relevant literature in related fields, especially psychology and social psychology" (Hambrick and Mason, 1984, p. 203).

Wiersema and Bantel (1992), for example, argued that because of different values, experiences and cognitive make-up, top managers differ in their inclination and ability to change organizational strategies when they are confronted with competitive or other external pressures. Indeed, addressing turbulence and dynamism require specific managerial skills and competences, the availability of which varies across individual managers, and across the management teams they operate in. Priem *et al.* (1999) suggested that demographics should be abandoned in favor of richer variables having more substantive dimensions including processes, attitudes and judgments.

Finally, Carpenter *et al.* (2004), stated that it is critical to recall that the practice of using demographic proxies is only a methodological convenience. Demography is used to proxy larger, complex, and hard-to-get-at constructs. Demography itself is not the key theoretical driver of strategic processes and choices. Rather, the theoretical model posits that cognitions, values, and perceptions affect strategic choice. Consequently, with recent developments in measures, there is ample opportunity for scholars to supplement simplistic measures of demographic profiles with richer measures of top management cognition, values, and perceptions and, consequently, strategic choices. The work of Peterson *et al.* (2003), for instance, provides dramatic evidence of the impact of CEOs on firm performance through their effect on TMT dynamics.

In our case, the relationship between TMT risk taking decisions and strategic change will be examined. Risk is not easy to be defined (Skipper, 1997), though risk is used from managers to judge the potential threats from a decision that they are about to take (Shimpi, 2001). Risk is found on every firm and industry, hence a manager, executive or even a junior employee is obliged to take some risk. The risk is linked with the ability to understand when a decision lead into a deviation from the industry's standard paths and therefore to a failure (Gupta, 2004). Li (2009) states that, in the business world, a risk taker has much different characteristics from an adventurer or a gambler. However, in some cases, he has to use his luck when the time requires a decision to be taken. However a decision maker that wants to take some risks must develop critical analysis traits. For Jorion (2001) the risk taker must have a sound understanding of the market and how it works. He must sense the threats and be ready to provide a genuine solution. This means that the risk taker has developed a good experience of the market but also he is able to work with his senses. His experience may say which decision is risky and which is not. Even if it's a risky one, he must be able to judge the level of risk and how the firm can avoid this risk.

Audia *et al.* (2000) believe that firms that want to be pioneer and gain a momentum against their competitions must take the risk to make changes. An example is GE, which made a number of high risk changes during the 80's, on some occasions those changes were pretty risky such as job layoffs and investments, but in the end GE manage to get away from the crisis.

High risk taking decisions can be found in firms which are pioneers in change. Previous research indicates that pioneers often encounter significant challenges to their viability (Robinson and Min, 2002; Min *et al.*, 2006). For example, pioneers frequently deal with customer needs and technologies that are rapidly evolving (Carpenter and Nakamoto, 1989; Kerin *et al.*, 1992). Given that market pioneering is widely regarded as a risky activity (Golder and Tellis, 1993; Min *et al.*, 2006), the extent to which top management uses a decision making style that accepts risk may be critical to adopting a strategy of market pioneering.

According to Narayanan (2001), firms engaging in new products or markets development are considered as pioneers. This means that those pioneering acts hide many risks. This is quite popular with firms that operate in the high technology and similar industries. The principal impetus can be a new product or service which will be launched in the markets for the very first time. The firms that belong to this industry will take a high risk that may require important strategic changes. We can recall how Apple from an IT firm ended up a firm producing mobile phones and other non-computing products. Allen (2003) claims that radical changes may be needed also to avoid risks or to enforce a risky decision. Someone who seeks to be the first entrant in a market, thereby to be called a pioneer, must be ready to make extended strategic changes so as to minimize the risks involved.

Garret *et al.* (2009) point out that firms willing to take risks must also be prepared to commit in changes. They argue that managers and top executives who are willing to take the risk will also have a positive reaction to strategic change. Therefore we can formulate our first hypothesis:

H1: TMT risk taking decisions is positively related to strategic change

Risk perception, risk propensity, and risk taking decisions

Risk perception and decision-making

While numerous studies have been conducted on decision-making, there appear to be few examples in which risk perception was either directly manipulated or actually measured. Although researchers generally agree that there is a relationship between perception and decision-making (Keyes, 1985; Bromily and Curley, 1992; Krueger and Dickson, 1994; Sutcliffe, 1994), there are inconsistencies concerning the nature

of the relationship. One would expect that as the level of perceived risk increases, a person is less likely to engage in risk-taking behavior (Staw *et al.*, 1981; March and Shapira, 1987; Dunegan *et al.*, 1992), but there is evidence indicating that this is not always the case. For example, Kahneman and Tversky (1979) have found that under negative problem framing, decision-makers perceiving high levels of risk respond with risk-seeking behavior.

There is some empirical literature on the role of risk perception in entrepreneurship and management but it offers little evidence on its effect on business performance. Antonides and Van der Sar (1990) show that risk perception has an effect on the expected profitability of holding stocks and thus on the investment decision making of Dutch investment clubs but they do not consider actual returns. Koellinger, Minniti, and Schade (2007) and Simon, Houghton, and Aquino (1999) show that perceptions also matter in the decision to start a business. Finally, Willebrands *et al.* (2011) found a positive effect between risk perception and business success.

Risk propensity and decision-making

An individual's propensity to take or avoid risks may have a significant impact on decision-making under conditions of risk and uncertainty. It has been commonly observed that people differ in their willingness to take risks (Fishburn, 1977; MacCrimmon and Wehrung, 1990; Farmer, 1993; Fu, 1993), but there is disagreement about the nature of this trait and the impact it has on decision-making. One possibility is that risk propensity is a general personality trait which causes individuals to demonstrate consistent risk-seeking or risk-averse tendencies across a variety of situations. This possibility has led to the development of instruments which attempt to measure an individual's general risk propensity (Kogan and Wallach, 1964; Jackson *et al.*, 1972; Harnett and Cummings, 1980). For example, Keinan *et al.* (1984) developed a risk propensity instrument in an attempt to identify individuals who have high risk-taking propensities. They based the development of their instrument on the "assumption that risk-taking is an expression of personality traits that affect individuals beyond situational variables" (Keinan *et al.*, 1984, p. 163). Similar instruments have been used in a number of studies and the results have suggested that individuals have a general risk propensity which affects their decision-making under conditions of risk or uncertainty (Taylor and Dunnette, 1974; Ghosh and Ray, 1992; Kim, 1992).

Other studies, however, have found risk propensity to be a situationally - specific variable, meaning that an individual's risk propensity will not be the same in every situation (MacCrimmon and Wehrung, 1985). A large number of researchers have found no evidence of a general risk propensity across situations (Slovic, 1962; Kogan and Wallach, 1964; Higbee, 1971; Slovic, 1972; Keyes, 1985; MacCrimmon and Wehrung, 1990). Rather, the bulk of the evidence shows more support for "the

importance of situational factors than support for the notion of risk-taking propensity as a stable trait" (Slovic, 1972, p.133). Therefore, in order to predict an individual's decision-making in a particular risk context, it is necessary to examine the individual's risk propensity in a similar situation (MacCrimmon and Wehrung, 1985). This suggests, for example, that if one is interested in predicting decision-making in a strategic context, then it is necessary to examine risk propensity in situations concerning strategic decision-making. We turn now to the relationship between risk propensity and risk perception.

Risk propensity and risk perception

Although risk propensity and risk perception both appear to influence decision-making, there is also evidence indicating that they interact with each other as well. More specifically, it appears that risk propensity may have an impact on risk perception. For example, if an individual has a high risk-taking propensity, he/she may tend to underestimate the risks involved in a situation. A risk-seeking decision maker is more likely to recognize and weigh positive outcomes, thereby overestimating the probability of a gain relative to the probability of a loss (Brockhaus, 1980; Vlek and Stallen, 1980). This overestimation will result in a lowering of risk perceptions. Additionally, a risk-averse decision maker will weigh negative outcomes more highly, leading to a heightened perception of risk (Schneider and Lopes, 1986). Forlani and Mullins (2000), examining the perceived risks and choices in entrepreneurs' new venture decisions, concluded that there is no statistically significant relationship between the risk propensity of the entrepreneur and his perceived risk associated with a particular new venture.

To conclude, the exact nature of the relationship between risk perception, risk propensity, and risk decision-making is not well understood. While prior research has examined the effects of risk perception on decision-making and the relationship between risk propensity and decision-making, we know of only two studies that have examined all three constructs together (Sitkin and Pablo, 1992; Keil *et al.*, 2000). Sitkin and Pablo (1992, p. 12), synthesizing much of the literature on risk taking behavior, define three key variables: risk preference, risk perception and risk propensity. For risk preference they refer to decision makers who enjoy the challenge risks entail. Risk perception is defined as a decision maker's assessment of the risk inherent to a situation. Risk propensity is conceptualized as an individual's actual risk-taking tendency. There is, however, no agreement in the literature on how the three key variables are related. The view of Sitkin and Pablo (1992) is that, the propensity to take risks is partly determined by the risk preference of the decision maker, as one would expect, but they also suggest that risk propensity influences risk perception. In an experimental setting, Sitkin and Weingart (1995) conversely show that risk perception completely mediates the effect of risk propensity on risky decision making behavior: risk propensity negatively affects risk perception but has

no direct effect on risk taking behavior, while risk perception has a significant (negative) effect on risk taking behavior. On the other hand, Keil *et al.* (2000), in their undertaken experiment, found evidence to support only a significant negative relationship between risk perception and risk taking.

Because of this inconsistency and because of the lack of other empirical studies on the inter-relationships between these three constructs, there is a clear need for further study to see if the results obtained by Sitkin and Weingart (1995) are replicable.

Forlani and Mullins (2000), examining the perceived risks and choices in entrepreneurs' new venture decisions, concluded that there is a statistically significant relationship between risk perception and the strategic decision taken (to create a new venture). They also found a statistically significant relationship between risk propensity and the strategic decision taken (to create a new venture), and no significant statistical relationship risk propensity has no effect on risk perception. Consequently, both their results agree with those of Sitkin and Pablo (1992).

Based on above review of risk literature the following hypotheses were formulated:

H2: Less risk perception lead TMT members to take more risky decisions and actions (i.e., actions that have a high possibility of disappointing outcomes) because they perceive less risk than more. Thus, there will be a negative relationship between risk perception and risk taking decisions.

H3: The higher a decision maker's risk propensity, the lower the level of perceived risk. Thus, there will be a negative relationship between risk propensity and risk perception.

H4: The higher a decision maker's risk propensity, the higher is his/her risk taking behavior. Thus, there will be a positive relationship between risk propensity and risk taking decisions.

Risk taking decisions, management accounting systems, and strategic change

Risk taking decisions and management accounting systems (MAS)

Based on a review of the upper echelon literature, Miller *et al.* (1998, p. 40) conclude that 'the mediating effects of process variables have not been examined in most studies of executive diversity and organizational outcomes'. Similarly, Carpenter *et al.* (2004, p. 763) labels these process factors as the 'black box' of upper echelon research.

Traditionally, MAS have been associated with mechanistic organizations (Burns and Stalker, 1961), where their purpose was to reduce variety and implement standardization as portrayed in the cybernetic model (Ashby, 1960; Anthony, 1965).

Accordingly, they were frequently perceived as a hindrance to any innovation and change effort in the organization. Recent theory and empirical studies have questioned the traditionally held assumptions about the negative effect of MAS on innovation and change, and highlighted instead the positive effect that MAS may have on innovation (Chapman, 1998; Abernethy and Brownell, 1997; Lukka, 1988; Ahrens and Chapman, 2002, 2004; Zirger and Maidique, 1990; Cooper, 1995; McGrath, 1995; Brown and Eisenhardt, 1997; Nixon, 1998; Davila, 2000; Cardinal, 2001). They developed alternative interpretations to the command-and-control view. MAS should be flexible and dynamic, adapting and evolving to the unpredictable needs of innovation, but stable enough to frame cognitive models, communication patterns, and actions (Lorange *et al.* 1986; Simons, 1995; Fiol, 1996; Abernethy and Brownell, 1999; Hoskisson *et al.* 1999; Gavetti and Levinthal, 2000; Miner *et al.* 2001; Burgelman, 2002; Feldman and Rafaeli, 2002; Bisbe and Otley, 2004; Chenhall, 2005).

As the recent management accounting literature generally suggests that MAS design and use is a relevant component of strategic management (Gerdin and Greve, 2004; Langfield-Smith, 1997), we could argue that MAS is likely to be such a mediator of the relationship between TMT risk characteristics and strategic change (Naranjo-Gill and Hartmann, 2007). Moreover, the upper echelon literature emphasizes that TMTs formulate their strategic decisions through their search, interpretation and ‘filtering’ of information about the external and internal environment of their firms, typically provided, mainly, by their established MAS (Hambrick and Mason, 1984; Knight *et al.*, 1999; Miller *et al.*, 1998). We expect that the typical searching and filtering behavior of top managers will be reflected in TMTs’ use of the MAS in making and executing strategic decisions (Langfield-Smith, 1997; Abernethy and Brownell, 1999; Young *et al.*, 2001; Chapman, 2010).

Risk taking decisions and the use of MAS

The TMT literature predicts that TMTs will differ in the scope of the management information that they consider useful in the (strategic) decisions that they take (Finkelstein and Hambrick, 1996; Jarzabkowski and Searle, 2005; Knight *et al.*, 1999). The scope of MAS has often been associated with strategy, under the expectation that a broader range of information allows managers to better understand the relationship between activities, processes and strategic outcomes (Abernethy and Guthrie, 1994; Chenhall and Morris, 1986; Gerdin, 2005a; Gul, 1991; Gul and Chia, 1994). Mia and Chenhall (1994, p. 4) showed that broad scope² MAS information is

² Broad-scope MAS information is information that is ‘externally focused, non-financial, and future oriented’ (Bouwens and Abernethy, 2000, p. 223), which ‘provides managers with a wider range of solutions to consider’ (Bouwens and Abernethy, 2000, p. 226). Broad-scope information thus complements typical ‘narrow scope’ information, which reflects traditional management accounting

crucial for managerial decision making, for example when organizations are facing complex situations, high environmental dynamism and strategic uncertainty (Abernethy and Guthrie, 1994, p. 55). Consequently, we believe that broad scope MAS information will be especially valued by TMTs, who are more inclined to change and innovation and take highly risky strategic decisions (Bantel and Jackson, 1989; Jensen and Zajac, 2004). Thus, we form the following hypothesis:

H5a: Risk taking is positively related to the perceived usefulness of broad-scope MAS.

Simons (1995, 2000) describes the diagnostic and interactive use of control systems arguing that the interactive use of MAS is essential for both enabling strategic change (Abernethy and Brownell, 1999, p. 192), and supporting innovation (Bisbe and Otley, 2004, p. 729). An interactive use of MAS involves dialogue and communication among top managers (Widener, 2006, p. 5), as well as between top management and subordinates, which 'stimulates opportunity-seeking and encourages the emergence of new initiatives (Simons, 1995, p. 93). Henri (2006, p. 5) asserted that when MCS are used interactively 'data are discussed and interpreted among organizational members of different hierarchical levels'.

We could thus assume that the riskier the decisions under consideration by TMT members the more the need for interactive use of MAS which stimulates dialogue and communication among top managers and between top managers and their subordinates for opportunity seeking and the emergence of new initiatives. Consequently, we propose to test the following hypothesis:

H5b: Risk taking is positively related to the interactive use of MAS.

Use of MAS and strategic changes

Empirical evidence suggest that the availability of a broader set of information facilitates and encourages management debates and interactions on strategic issues (Abernethy and Brownell, 1999, p. 192; Bisbe and Otley, 2004, p. 711).

Strategic change involves venturing into new contexts, whose complexity and unpredictability (Abernethy and Brownell, 1999, p. 191) requires broad-scope information (Bouwens and Abernethy, 2000. p. 226; Mia and Chenhall, 1994, p. 2). This suggests that the use of broad scope MAS is a necessary requirement for strategic change. In addition, broad-scope MAS information appears to facilitate

information that is 'internally focused, financial, and historically-based' (Bouwens and Abernethy, 2000. p. 223).

interdepartmental planning and coordination (Bouwens and Abernethy, 2000), technological change (Mia and Chenhall, 1994, p. 1), decentralization (Gerdin, 2005b; Hartmann, 2005), customization (Perera, Harrison, and Poole, 1997), organizational flexibility, and the organization of interdependent operations (Abernethy and Lillis, 1995; Eccles, 1991, p. 131), which are all constitutive elements of prospector strategies, rather than of defender strategies (Shortell and Zajac, 1990). This suggests that broad-scope MAS supports strategic change, especially for organizations moving towards prospector positions. To explore these issues empirically, we propose to test the following hypothesis:

H6a: There is a positive relationship between the perceived usefulness of broad-scope MAS and the extent of strategic changes.

A parallel point can be made regarding the relationship between the interactive use of the MAS and strategic change (Simons, 1995). Since the interactive use of MAS focuses on the use of information for dialogue and communication (Abernethy and Brownell, 1999; Simons, 1995), TMTs should use the MAS interactively when they aim to redefine or change strategic priorities. Abernethy and Brownell (1999, p. 192) asserted that management requires information ‘that is more prospective in nature’ and thus need an ‘information exchange process that is interactive and dynamic’ to manage strategic change effectively. Such a process enables management teams ‘to collectively make sense of changing circumstances’ (Chapman, 1997; Simons, 1995). Moreover, by stimulating organizational dialogue and debate, interactive MAS use contributes to the emergence of strategic actions (Henri, 2006, p. 9; Malina and Selto, 2001). Thus, we expect that the interactive use of MAS encourages and facilitates strategic change, and propose the following hypothesis:

H6b: There is a positive relationship between the interactive use of MAS and the extent of strategic changes.

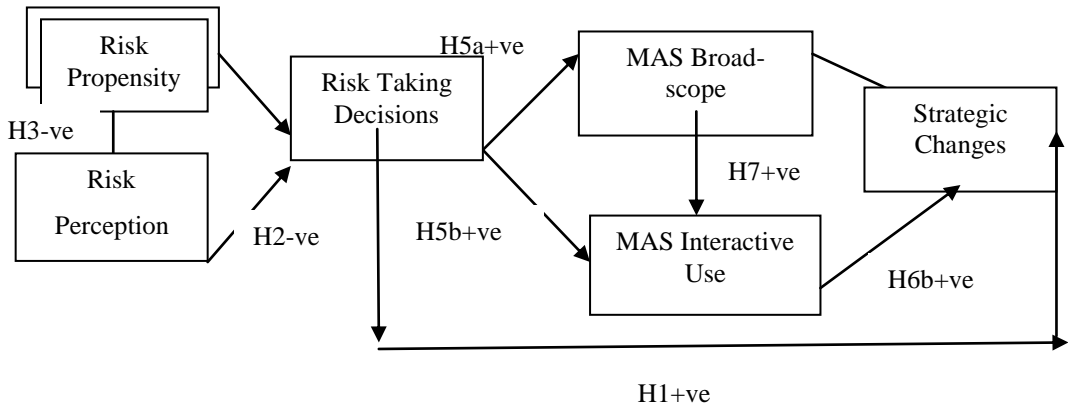
Broad scope of MAS and the interactive use of MAS

Although Simons (1995) initially asserted that the interactive use of MAS could relate to any MAS aspect, thus suggesting the independence of these two factors, Bisbe and Otley (2004) and Abernethy and Brownell (1999) both argued that the use of broad scope MAS might not only facilitate, but also encourage debates and managerial interactions. We therefore propose to test the following hypothesis:

H7: There is a positive relationship between the perceived usefulness of broad-scope MAS and the interactive use of MAS.

Finishing our stated hypotheses we could now proceed to the proposed model that will be tested empirically:

Figure 1: The Proposed Model



3. Research Methods

3.1 Data Selection

To test the hypotheses, we collected data through a structured questionnaire, which was distributed to members of senior management team (TMT) of randomly selected enterprises employing more than 250 employees. In order to achieve sufficient sample size and generalizability of the result the initial sample for this study consisted of the total population of 506 large Greek companies. The population was drawn from a database compiled by ICAP, which is a well-known and reliable source of data for Greek companies. The size limitation was introduced for the reason that small and medium firms present some difficulties and mostly these companies do not have the appropriate strategic and management accounting tools (Chenhall and Langfield-Smith, 1998).

A pre-test was performed to establish content validity (Zikmund, 2003). The instrument was pre-tested through in-depth discussions with academics and professionals. Nine senior managers along with six academics participated in the pre-testing process.

It should be mentioned that due to time constraints or company privacy concerns many senior managers declined to participate. 274 companies stated that it was against their policy to respond to research questions. The questionnaire was sent only to those senior managers of the 232 companies who agreed to participate in the survey (mailed or e-mailed, depending on their preference).

A cover letter explaining the study objectives was attached and a stamped return envelope was enclosed. Follow-up letters were sent approximately three weeks after the initial mailing. Since the number of members in the TMT may vary slightly, we consider as a full TMT those for which three observations, including that of the CEO, were available. Thus, we formed a total of 232 TMTs sending 696 questionnaires to be completed.

A total of 442 questionnaires were returned, which corresponds to a 63.50 per cent overall response rate. Of these, forty three (43) questionnaires were discarded because either they were not appropriately completed or some companies sent only one or two questionnaires instead of three. 399 questionnaires retained for analysis (a response rate of 57.33 per cent), forming a total of 133 TMTs from 133 firms. A brief presentation of the demographic characteristics is given in Appendix 1 (Table A2).

Generally speaking, researchers normally work at a 95 percent level of certainty. This actually means that with a total population of 506 firms the minimum sample size should be around 220 instead of 133 firms (Saunders, Lewis and Thornhill, 2000. p.156). Although the smaller size could be considered as one of the limitations of this research, we could defend it on the grounds stated by the famous scholar Shelby Hunt who argues that non-response bias does not consists a base rule for rejecting a manuscript, unless there are serious differences between respondents and non-respondents, therefore results are unreliable (Hunt, 1990).

To test whether our respondents were different from the non-respondents, we examined if there are any differences in the mean of all variables used in this study between early and late respondents. The rationale behind such an analysis is that late respondents (i.e. sample firms in the second mailing) are more similar to the population, from which they were drawn, than the early respondents (Armstrong and Overton, 1977). No statistically significant differences were found, thus suggesting that non-response bias is not a serious issue in the study.

According to current literature a sample size between 100 and 200 cases is adequate for small to medium size structural equation models.

3.2 Measurement of variables

The survey questionnaire used for the measurement of the following six complicated constructs:

Risk perception was measured using four questions in which subjects were asked to indicate their perception of the overall risk associated with exports and selling of products in foreign markets along a five-point Likert scale, where 1=totally disagree and 5=totally agree (questions 1-4 from Sitkin and Weingart, 1995).

Risk propensity was based on a five-point Likert scale (where 1=very unlikely, and 5=very likely) and includes four questions (questions 5 to 8), which are related to the decision which affects the company's financial future (Kwon and Lee, 2009).

The **risk taking** was measured using statements from the risk scale taken from Miller and Friesen (1982), based on a five-point Likert scale and includes two questions, each one containing two statements (questions 9 to 10).

The **interactive use of MAS** was measured using six questions taken from Naranjo-Gil and Hartmann (2007) based on a five-point Likert scale, where 1= very little and 5=very much. Respondents were asked to indicate the extent of using the MAS for five managerial actions, for negotiating goals and targets, for encouraging new goals and priorities, for signaling key strategic areas, for encouraging new ideas and actions, for involving subordinates in face-to-face discussions and for use as a learning tool (questions 11 to 16 of the questionnaire).

The **broad-scope MAS** was measured using four questions taken also from Naranjo-Gil and Hartmann (2007), based on a five-point Likert scale, where 1= very little and 5=very much. Respondents were asked to indicate the extent of the usefulness of the following four types of information: future – oriented, external, non- financial and long-term information.

The **Strategic Changes** was measured using the instrument from Abernethy and Brownell (1999) and Abernethy and Lillis (2001). They used the strategic typology of Miles and Snow (1978). TMT managers were presented two descriptions, one of defender firm and another of a prospector firm, and were asked to indicate their firm's strategic position three years ago as well as their current strategic position, along a five point Likert-scale (where 1=defender and 5=prospector). Strategic change was measured as the absolute difference between the past and current strategic position.

3.3 Validation of Proposed Constructs

It is well known that survey research, if not properly conducted, can provide misleading results with measurement errors representing one of the most significant sources of bias. While however, measurement errors are almost inevitable, the extent to which these errors affect the findings is a function of what particular efforts and what checks have been undertaken, in order to minimize and assess the potential bias.

On this account construct validation is particularly relevant. In effect it involves a multifaceted process comprising three basic steps. The first, *content validity*, requires the identification of a group of measurement items which are deemed to represent the construct of interest. The second step, *construct validity*, seeks to establish the extent to which the empirical indicators actually measure the construct. The final step, *nomological validity*, involves the determination of the degree to which a construct relates to other constructs in a manner predicated by theory. These issues are dealt with in Appendix 1, with the exception of nomological validity which is implicitly addressed in the context of the substantive relations examined in this study (see also note 2). All analyses (see Appendix 1 for detailed description of procedures and results) provide reasonable confidence that the measures used are valid and reliable.

4. Results

Data screening was performed to identify data entry errors and to examine whether data met all statistical assumptions. Then a preliminary descriptive analysis was performed in order to extract specific statistics (central tendency and dispersion) for the items included in the questionnaire. Then, test of data normality followed to check whether the used items are normally distributed and hence are accepted for further analysis. Skewness and kurtosis values of all data items are below 2 and 7 respectively, proving the normality of the data used (West *et al.* 1995). Correlation, exploratory and confirmatory factor analysis was also used to check the reliability and validity of the measurement model.

Then a two-step data analysis approach of the structural equation model was followed as suggested by Anderson and Gerbing (1988) to evaluate the goodness-of-fit of the structural models, i.e., separate estimation of the measurement model prior to the simultaneous estimation of the measurement and structural models³.

³ The measurement model in conjunction with the structural model enables a comprehensive, confirmatory assessment of construct validity. The measurement model provides a confirmatory assessment of convergent validity and discriminant validity. Given acceptable convergent and discriminant validities, the test of the structural model then constitutes a confirmatory assessment of nomological validity (Anderson and Gerbing, 1988).

SPSS was used for the descriptive statistics and correlation analysis, while structural equation modeling techniques with Amos 7.0 were used to examine the models and all paths within the models.

Table 1 show the descriptive statistics for all variables and Table 2 shows the correlation analysis:

Table 1: Basic Statistics

Factor	Mean	Std. Deviation	Coefficient of Variation
Risk Propensity	4.45	0.31	6.96%
Risk Perception	4.43	0.33	7.44%
Risk Taking	4.51	0.73	8.76%
Interactive Use of MAS	4.46	0.48	6.53%
Use of Broad-Scope MAS	4.53	0.27	5.96%
Strategic Changes	3.61	0.27	6.19%

Table 2: Correlation Analysis

	1.	2.	3.	4.	5.	6.
1. Risk Propensity	1					
2. Risk Perception	-0.259*	1				
3. Risk Taking	0.264*	-0.498**	1			
4. Interactive Use of MAS	0.040	0.065	0.661**	1		
5. Use of Broad-Scope MAS	0.142	0.141	0.524**	0.463**	1	
6. Strategic Changes	0.080	0.125	0.314*	0.451**	0.365*	1

*Correlation is significant at the 0.05 level

**Correlation is significant at the 0.01 level

Figure 2 displays the results from the structural equation model path analysis using the maximum likelihood estimation (MLE) procedure of the SPSS-AMOS statistical package. Table 3 presents the direct, indirect, total effects (paths) and regression weights, and Table 4 the statistics for the overall fitting of the model. Seven common model-fit measures have been used to assess the model's overall goodness of fit: the ratio of χ^2 to degrees-of-freedom (χ^2/df), the comparative fit index (CFI), the normalized fit index (NFI), the Tucker-Lewis Index (TLI), the root mean square residual (RMR), the root mean square error of approximation (RMSEA) and the goodness-of-fit index (GFI). Generally, good fits are obtained when CFI, NFI, TLI and GFI are equal or greater than .90 and RMR and RMSEA are equal to or less than 0.1 or .05 (Hair *et al*, 1998).

Figure 2: The Structural Model

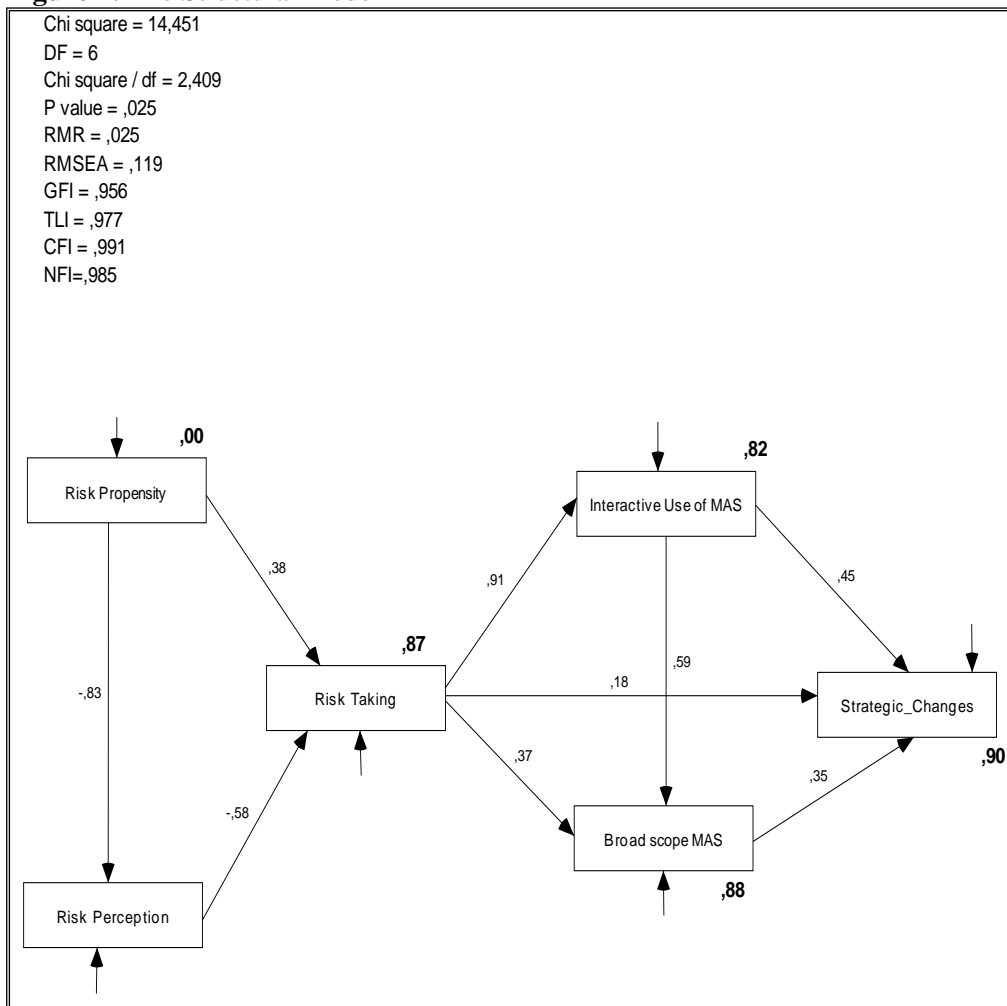


Table 3: Path Analysis

Standardized Total Effects

	Risk Propensity	Risk Perception	Risk_Taking	Interactive Use of MAS	Mas Broad-scope
Risk Perception	-0.834	0	0	0	0
Risk Taking	0.872	-0.585	0	0	0
Interactive Use of MAS	0.790	-0.530	0.906	0	0
MAS Broad-scope	0.789	-0.529	0.904	0.588	0
Strategic Changes	0.785	-0.526	0.899	0.657	0.347

Standardized Direct Effects

	Risk Propensity	Risk Perception	Risk_Taking	Interactive Use of MAS	Mas Broad-scope
Risk Perception	-0.834	0	0	0	0
Risk Taking	0.384	-0.585	0	0	0
Interactive Use of MAS	0	0	0.906	0	0
MAS Broad-scope	0	0	0.371	0.588	0
Strategic Changes	0	0	0.176	0.453	0.347

Standardized Indirect Effects

	Risk Propensity	Risk Perception	Risk_Taking	Interactive Use of MAS	Mas Broad-scope
Risk Perception	0	0	0	0	0
Risk Taking	0.488	0	0	0	0
Interactive Use of MAS	0.790	-0.530	0	0	0
MAS Broad-scope	0.789	-0.529	0.533	0	0
Strategic Changes	0.785	-0.526	0.724	0.204	0

Regression Weights

			Estimate	t.	P value	
Risk Perception	→	Risk Propensity	-0.834	-15.046	**	H3 supported
Risk Taking	→	Risk Propensity	0.384	5.746	**	H4 supported
Risk Taking	→	Risk Perception	-0.585	-8.74	**	H2 supported
Interactive Use of MAS	→	Risk Taking	0.906	21.236	**	H5b supported
MAS Broad-scope	→	Risk Taking	0.371	4.518	**	H5a supported
MAS Broad-scope	→	Interactive Use of MAS	0.588	7.158	**	H7 supported
Strategic Changes	→	Risk Taking	0.176	2.147	.032*	H1 supported
Strategic Changes	→	Interactive Use of MAS	0.453	4.936	**	H6b supported
Strategic Changes	→	MAS Broad-scope	0.347	3.815	**	H6a supported

*p=0.05, **p=0.001

Table 4: Overall Model Fit Indices

Indices	Recommended value ^a (cut-off limits)	Values of the Measurement Model
Chi- square	-----	14.451
d.f	-----	6
$\chi^2/d.f$	$1 < \chi^2/d.f < 3$	2.409

GFI	>0.90	0.956
NFI	>0.90	0.985
RMR	<0.1	0.025
RMSEA	<0.1	0.119
CFI	>0.90	0.991

The overall model shows a chi-square/degree of freedom value of 2.409 having a p-value of <0.01, indicating an excellent fit to the data. Moreover, comparative fit index (CFI) and general fit index (GFI), have a value of 0.991 and 0.956 respectively (i.e., more than 0.90 which is the cut-off point in both statistics), and RMR is 0.025<0.1. They all indicate acceptable levels of model fit.

Table 3 presents the estimates (regression weights) of the structural model and their corresponding t values. According to these estimates we could come to the conclusion of accepting all hypotheses, since each relationship has got the proper sign, as was indicated by theory, and it is statistically significant at 0.001 (all hypotheses except H1) or 0.5 level (for H1). Moreover, the initial correlation analysis (table 2), figure 2 and the path analysis of table 3 indicate a strong verification of theory which supports and explains that the interactive use of MAS mediates the relationship between top management risk taking decisions and strategic change (s)⁴: (a) the single regression coefficient (or correlation coefficient) of the direct relationship between TMT risk taking (independent variable) and the strategic change (the dependent variable) is 0.314 (and statistically significant at 0.5 level, as table 2 shows), (b) the independent variable affects positively both mediating variables (broad-scope and interactive use of MAS) (figure 2 and table 3), (c) the mediating variables affect the dependent variable of strategic change, and (d) the effect of the independent variable (TMT risk taking decisions) on the dependent (strategic change) is less in the structural model (0.176) which includes both mediating variables, than in the single regression analysis (0.314). In other words, the inclusion of the two mediators in the proposed model leads to the significant reduction of the direct effect of the independent variable on the dependent variable but, simultaneously, increases its total effect, which is equal to its direct effect plus the sum of the indirect effects through the use of the interactive MAS and the indirect effects of broad-scope use of MAS (calculated as a multiplication of the statistically significant indirect effects on and from MAS use (Sarkar, *et al.*, 2001).

⁴ Baron and Kenny (1986) argue that four conditions must hold for testing mediating effects: (1) the independent variable must be significantly correlated with the dependent variable; (2) the independent variable must be significantly correlated with the mediator variable, and (3) the relationship between the independent and dependent variable must be weaker in (2) than in (1).

5. Conclusion

The objective of this paper was twofold, to verify the relationship(s) between the three risk characteristics of the TMT as initially proposed by Sitkin and Pablo (1992) and later by Sitkin and Weingart (1995), and to improve our understanding of MAS as a mechanism that mediates the relationship between top management team risk characteristics and organizational strategic change. Broad-scope MAS and interactive use of MAS were argued to mediate the relationship between top management risk characteristics and the extent of strategic change. Our findings can be summarized as follows.

Regarding the relationship between the three risk characteristics the findings show a negative relationship between risk propensity and risk perception and a negative relationship between risk perception and risk taking decisions, coming in agreement with the findings of Sitkin and Weingart (1995), but also a significant positive relationship between risk propensity and risk taking, coming in agreement with the findings of Sitkin and Pablo (1992). In other words, risk taking characteristic (or risk decision making behavior as Sitkin and Weingart (1995) call it sometimes interchangeably) is determined by the other two risk characteristics of risk perception and risk propensity. Risk perception affects negatively risk taking directly while risk propensity affects risk taking twofold, one directly and positively, and one indirectly through risk perception. Consequently, our model's major relationship becomes the one between risk taking and strategic change(s).

Regarding the relationship between TMT risk decision making behavior (TMT risk taking) and strategic change, the findings show that TMT risk taking decision is positively related to the extent of strategic change, and especially for the strategic change towards prospector positions. This finding supports the idea that high risk taking decisions can be found in firms which are pioneers in change (Golder and Tellis, 1993; Narayanan, 2001; Min *et al.*, 2006; Garret *et al.*, 2009). We could not argue or draw separate conclusions for the relationship between TMT risk characteristics and strategic change for organizations moving towards defender positions, because these organizations constituted only the 5.68 percent of our total sample.

Regarding the relationship between TMT risk characteristics and MAS, the findings show that TMT risk taking decision is positively related to both the interactive and broad-scope use of MAS. This support the argument that MAS design and use is a relevant component of strategic management (Langfield-Smith, 1997; Gerdin and Greve, 2004; Naranjo-Gill and Hartmann, 2007) because top management formulate their strategic decisions through their search, interpretation and 'filtering' of information about the external and internal environment of their firms, typically

provided by their established MAS (Hambrick and Mason, 1984; Knight *et al.*, 1999; Miller *et al.*, 1998; Abernethy and Brownell, 1999; Young *et al.*, 2001; Chapman, 2010).

The results also support the ideas that the interactive use of MAS is essential for both enabling strategic change (Abernethy and Brownell, 1999; Abernethy and Lillis, 1995, 2001), and supporting innovation (Bisbe and Otley, 2004) because it involves dialogue and communication among top managers (Widener, 2006), as well as between top management and subordinates, which stimulates opportunity-seeking and encourages the emergence of new initiatives (Simons, 1995). Moreover, results support the arguments that broad scope MAS information is crucial for managerial decision making, especially when organizations are facing complex situations, high environmental dynamism and strategic uncertainty (Abernethy and Guthrie, 1994). Consequently, broad scope MAS information will be especially valued by TMTs, who are more inclined to change and innovation and take highly risky strategic decisions (Bantel and Jackson, 1989; Jensen and Zajac, 2004).

Regarding the relationships between MAS and strategic change, the findings show that broad-scope MAS is positively related to strategic change, mainly, for organizations moving towards prospector positions. These results are in line with Chenhall's (2003) arguments that broad-scope design of MAS overcomes the lack of relevance of narrow scope MAS information for managing flexibility, decentralization and innovation (Bisbe and Otley, 2004; Gerdin, 2005b; Hartmann, 2005). The results also show that the interactive use of MAS is also positively related to strategic change, mainly, for organizations moving towards prospector positions. This confirms the suggestions of Abernethy and Lillis (1995, 2001), and Bisbe and Otley (2004) mentioned earlier. Finally, we found a positive relationship between MAS scope and the interactive use of MAS, suggesting that the perceived usefulness of broad-scope affects the way in which the information is used.

Overall, we conclude that our results provide evidence for the mediating role of MAS use on the relationship between TMT risk taking decisions and strategic change. In this way we could give some answers to all these quests in the strategic management and management accounting literatures for a better understanding of the processes and arrangement through which organizations change their strategies (Carpenter *et al.*, 2004; Luft and Shields, 2003; Miller *et al.*, 1998; Rajagopalan *et al.*, 1993; Chenhall and Langfield-Smith, 2003). We find that this mediating role concerns all large size companies in Greece, but is particularly prevalent for changes towards prospector positions, since 94.32 percent of the sample identified themselves as prospectors.

This paper has several limitations, beyond those typically related to the use of the questionnaire survey (Young, 1996). One of these limitations is the fact that the

paper is not focused in one industry as Hambrick and Mason (1984, p 203) proposed because the sample would be quite small. Another limitation of this paper is its focus on top management teams 'as the sole custodians of strategy, ignoring the contributions of middle and lower level managers to the strategic process' (Nyamori *et al.*, 2001, p. 72). Other groups of managers may influence the relationships studied as well.

This study is exploratory in nature and leaves ample room for future research. First, the findings of this study focus on the TMT, and future studies may look at the potential effects of other groups/levels of managers' risk characteristics on MAS use and strategic change. Also, other variables beyond risk characteristics could be analyzed for the TMT, such as the distribution of power and authority (Abernethy and Vagnoni, 2004). Further, other MAS design characteristics could be analyzed (e.g., timeliness, aggregation and integration, Chenhall and Morris, 1986), as well as specific management accounting techniques, such as the budgeting method, the use of ABC-costing or the use of scorecard-type instruments for performance appraisal. Finally, the path analyses explored here, that suggest mediation fit, could be complemented with tests for moderation forms of contingency fit, given that the proper theoretical foundation can be found (Hartmann and Moers, 1999, 2003; Gerdin and Greve, 2004).

APPENDIX

MEASURES AND CONSTRUCT VALIDATION RESULTS

Content Validity

Content validity refers to the agreement that exists among scholars about whether or not a scale is measuring what is supposed to measure. In our case most of the scales employed have been adopted from existing and validated scales used in the extant literature. However, the questionnaire was translated in to the Greek language, and thus, there was a discussion with professionals (academics and practitioners), in order to eliminate any wording problems (such as biased, ambiguous, inappropriate or double meaning items) and verify whether or not the questions were correctly translated and easily understood.

Construct Validity

Construct validity shows whether or not the chosen items are true measures of each construct (Straub, 1989). We tested the construct validity of our measures by employing confirmatory factor analysis (CFA) using AMOS 7.0 (see Figure A1). Unlike the traditional and more commonly used exploratory factor analysis (EFA),

CFA contains inferential statistics that allow for hypothesis testing regarding the construct validity of a set of measures, leading to a stricter and more objective interpretation of validity than does EFA (Gerbing and Anderson, 1988). The indices used to assess the model are among the most frequently reported, namely Normed Fit Index (NFI), CFI (comparative Wt index), and RMSEA (root mean square error of approximation). The threshold values recommended are (i) NFI > 0.90 (Bentler and Bonett, 1980) and (ii) CFI > 0.95 (Hu and Bentler, 1999), and (iii) RMSEA < 0.10 (Browne and Cudeck, 1993).

Convergent validity relates to the extent that many methods of measuring a variable gives the same result (Churchill, 1979). Convergent validity was examined by computing the indexes of average variance extracted that is the amount of construct variance relative to measurement error. An average variance extracted of at least 0.50 (i.e., 50 percent) provides support for convergent validity (Gerbing and Anderson, 1988; Fornell and Larcker, 1981) (table A2)

Construct reliability was assessed using Cronbach's a-value. In order to test the convergent validity of the measurement models, the methodology suggested by Fornell and Larcker (1981) , which includes the estimation of the items squared factor loadings (greater than 0.5 are considered very significant), the composite reliability for each construct (has to exceed the threshold of 0.70), and the extracted variance for all constructs (greater than 0.50) (table A2).

Finally, Discriminant validity is concerned with the degree to which a variable measures a concept that is uniquely defined and is not highly correlated with other variables included in the model. The discriminant validity of variables is considered acceptable when the correlation between two variables is less than the average variance extracted (Fornell and Larcker, 1981) (table A1):

Table A1: Discriminant Validity

	1.	2.	3.	4.
1. Risk Propensity	0.883			
2. Risk Perception	-0.259*	0.877		
3. Interactive Use of MAS			0.872	
4. Use of Broad-Scope MAS			0.524**	0.883

*Correlation is significant at the 0.05 level

**Correlation is significant at the 0.01 level

Figure A1: Confirmatory Factor Analysis (The Metric Model).

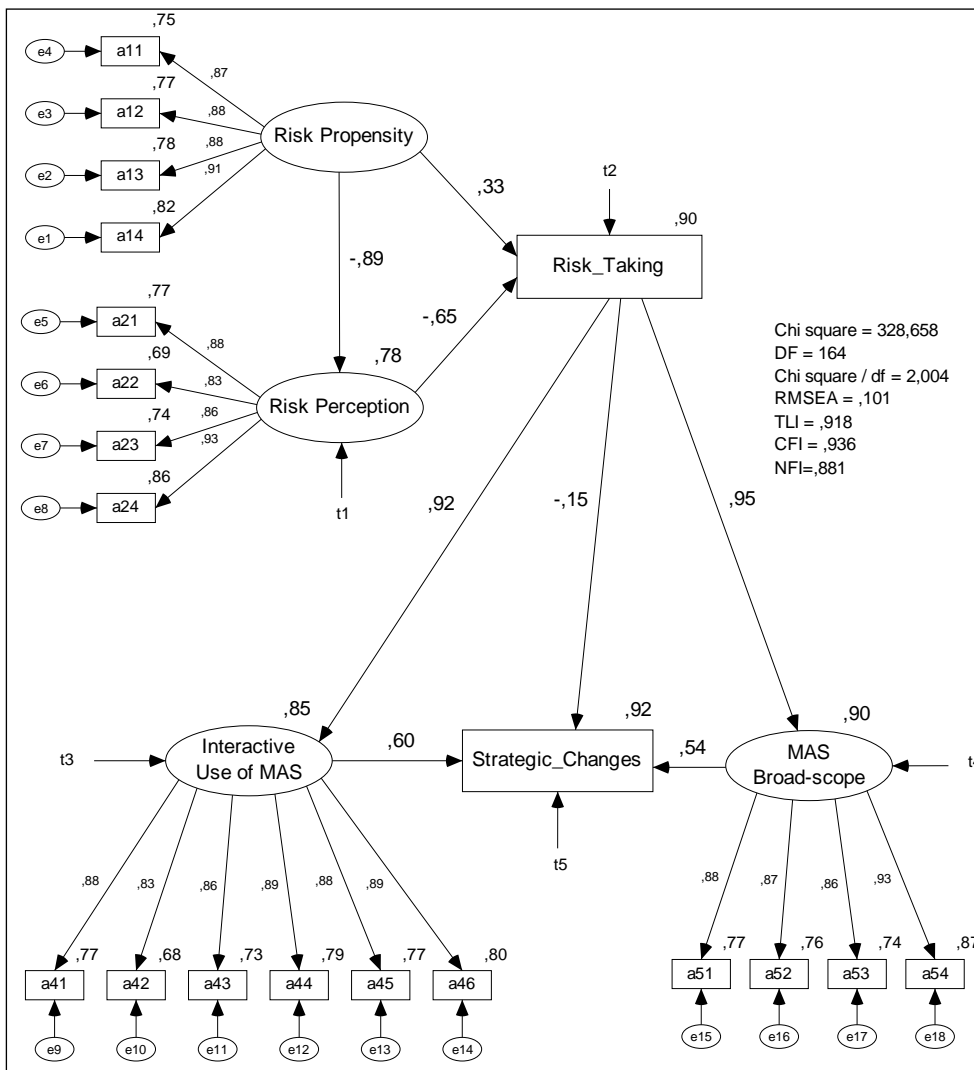


Table A2: Convergent validity – Construct reliability.

Items	Constructs	CFA Model			
		SFL's	CR	AVE	Cronbach's a
Choose less risky alternatives to ensure financial security (R)	Risk Propensity	.75	0.94	78%	.93
Choose riskier alternatives to maximize potential gains		.77			
Choose riskier alternatives to achieve financial goals		.78			
Choose less risky alternatives to stabilize financial status (R)		.82			
Selling products in foreign markets implies high risk	Risk Perception	.77	0.93	77%	.92
Exports are an important opportunity for my firm		.69			
International activity is a positive thing in my business		.74			
My firm has a high probability of success in foreign markets		.86			
Setting and negotiating goals and targets	Interactive Use of MAS	.77	0.95	76%	.95
Encouraging new goals and priorities		.68			
Signalling key strategic areas for improvement		.73			
Encouraging new ideas and actions for doing tasks		.79			
Involving subordinates in face-to-face permanent discussions		.77			
Use of MAS as a learning tool	.80				
Future-oriented information	MAS Broad-scope	.77	0.94	78%	.93
External information		.76			
Non-financial information		.74			
Long-run oriented information		.87			

(Squared Factor Loadings (SFL's) for each construct, Composite Reliability (CR), Average Variance Extracted (AVE), and Cronbach's a-value of each construct should be greater than 0.5, 0.7, 0.5 and 0.7 respectively. (Hair, Anderson, Tatham, and Black, 1988; Nunnally and Bernstein, 1994).

Table A3: Demographic Characteristics

	<u>Mean</u>	<u>St.</u> <u>Deviation</u>	<u>Statistics</u>	
Position			General Manager-Chief Executive Officer (CEO):	33.3%
			Senior Finance Manager (CFO):	39.1%
			Senior Operations Manager (COO):	27.6%
Education			University:	64.3%
			Postgraduate:	35.6%
Sex			Male: 75.3%	
			Female: 24.7%	
Age of respondent	43.79	8.70		
Experience	16.15	6.41		
Establishment Date	1977	28.40		
Total Number of employees	426	332	251-500	78.7%
			501-1000	19.2%
			>1000	2.1%

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